

Matanuska-Susitna Borough
Asset Management Plan:
Natural Resource Management Units



Updated by: Matanuska-Susitna Borough

Prepared by: RWS Consulting
Contributions by: Alaska Map Company
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State of Alaska, Division of Forestry

Funded by: Matanuska-Susitna Borough

Adopted: October 2019

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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 made putting together this Plan possible. There are 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 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 Borough’s 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 1990¹. 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 soil maps 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, 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 resolution² 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.

This plan is based on the conclusion that much has changed since the original plan was adopted almost 30 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 Natural Resource Management Units (NRMU) are located in areas that have seen an increased population

¹ Ordinance Serial Number 90-020 AM and AM 90-071

² Resolution Serial Number 06-036AM

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.

This NRMU Plan was updated in 2019 to include current forest management regulation, current land use and classification, and the previously excluded Fish Creek Unit.

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 are 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 replaced the Forest Management Units.

This plan does not cover or affect land under other ownerships within the units.

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 Code³, 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. The land use classifications in Volume II are the current 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 borough-owned land located within designated natural 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. Figure 1 includes a map 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.

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 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-two natural resource management units. The *Fish Creek Unit* is included in this updated plan for consistency. All

Volume III

This volume contains a definitions/glossary, bibliography and informational literature in 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.

How the Plan Was Developed

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

- (1) First was a new public notice process³, 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.⁴
- (3) An intensive “Forest Inventory Report”⁵ of most of the Borough’s 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”⁵ 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”⁶ was completed in 2007.
- (6) A new chapter on Forest Management was adopted into Borough code⁷ in 2007 that established Borough policy for:
 - Forest Inventories
 - Sustained Yield
 - Annual Allowable Cut
 - Forest Management Units
 - Forest Management Plans
 - Buffers
 - Timber Sales
 - Fair Market Value Determinations

³ MSB 23.05.025 (Ordinance Serial Number 06-034)

⁴ MSB 28.60 (Ordinance Serial Numbers 06-222 (AM) and 06-223 (SUB)(AM))

⁵ Sanders Forestry Consulting

⁶ Northern Economics Inc.

⁷ MSB 23.20 (Ordinance Serial Number 07-065 (AM))

- 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 that 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 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 be 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 Organization building, and at the Central Emergency Services facility in Wasilla.

At the conclusion of the public comment period, 78 individuals and groups submitted hundreds 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 seven 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, 2010, about 82 individuals and groups submitted input that contained around 380 comments, concerns and issues to address 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 of 2010 version of this Plan.

After eight years of implementing this Plan, borough staff had identified numerous small changes and updates required to keep the Plan relevant and useful. A similar, yet abbreviated process was followed for the 2019 update of the NRMU Plan. This update was made available for a 60-day public review period. The update with the public comments was submitted to the Agricultural Advisory Board for review and comment. The update was amended based on comments from the public and the advisory board, then submitted to the Planning Commission for review and approval prior to being submitted to the Assembly for approval.

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 Borough's *1989 Forest Management Plan* and is being used in this new Plan⁸.

In 1990, the Borough Assembly placed land into Forest Management Units. Forest management lands or units are defined in Borough Code⁹ 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.

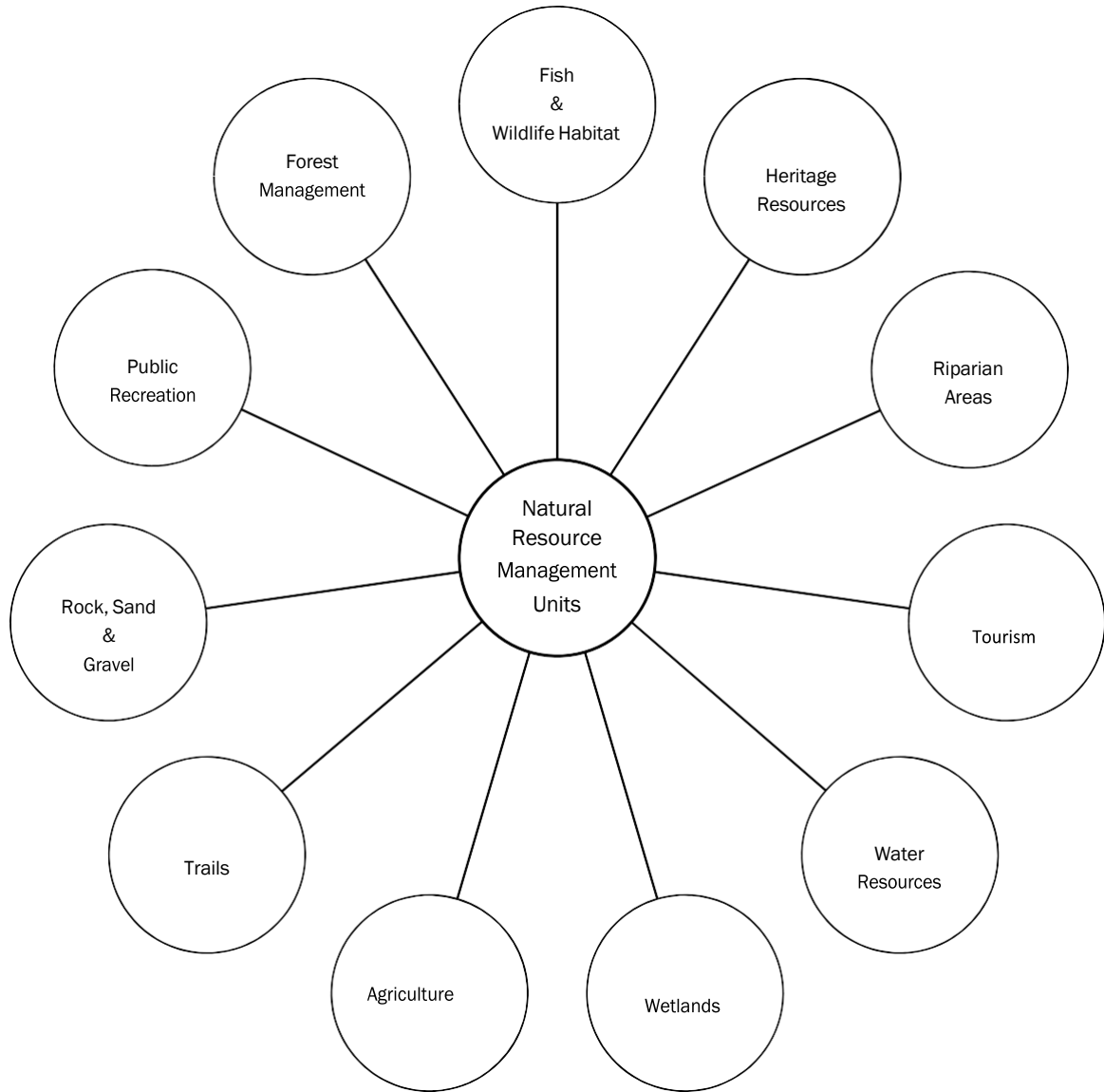
Each Natural Resource Management Unit consists of land with multiple resource values or uses. Fundamentally, multiple-use management provides that not all land within a unit be managed for timber harvest, or any other single resource. Some of the areas may be better suited for such purposes as fish and 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.

Figure 2 illustrates the multiple resources considered in the preparation of this *Natural Resources Management Units Plan*.

⁸ See MSB 23.20.050 (Multiple-Use Forest Management Units) and MSB 23.20.060 (Multiple-Use Forest Management Plan).

⁹ See MSB 23.05.100

Figure 2
RESOURCES AND USES FOUND IN NATURAL RESOURCE
MANAGEMENT UNITS



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

While all the units 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. The classification is the primary tool to be used by land managers when making decisions on proposed activities within a unit.

In order to manage 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.

Classifications are defined in Borough Code.¹⁰ Classifications identify the purposes for which land will be managed.

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.

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 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.

¹⁰ 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 3 is a broad look on how these various social, economic and land ownership portfolio and management terms apply at different levels. Figure 4 illustrates the hierarchy and function of goals, management intent, classifications, designations, guidelines and best management practices.

Figure 3
Relationship of Goals, Management Intent, Land-Use Classifications,
Land-Use Designations and Guidelines to Borough Owned Land

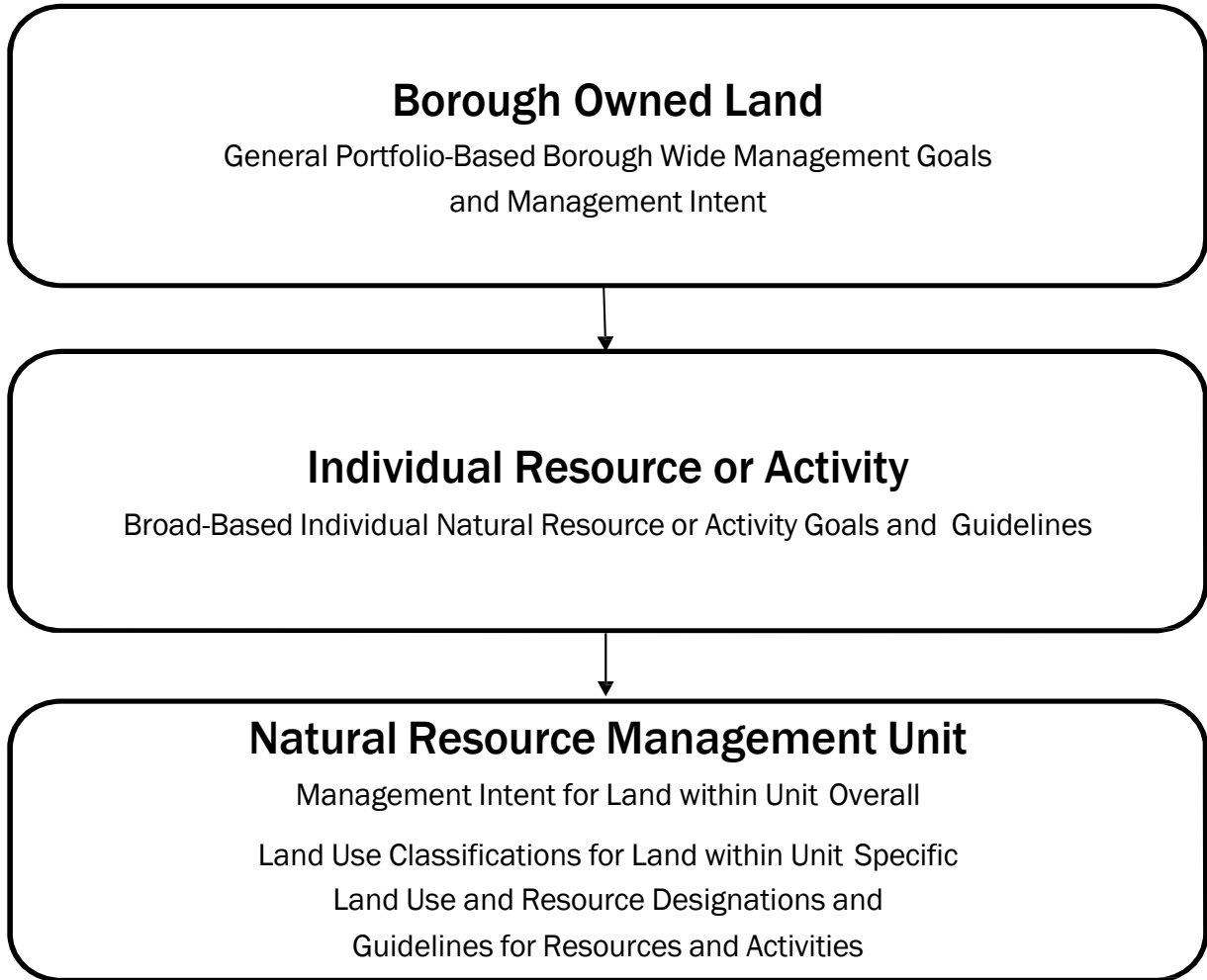
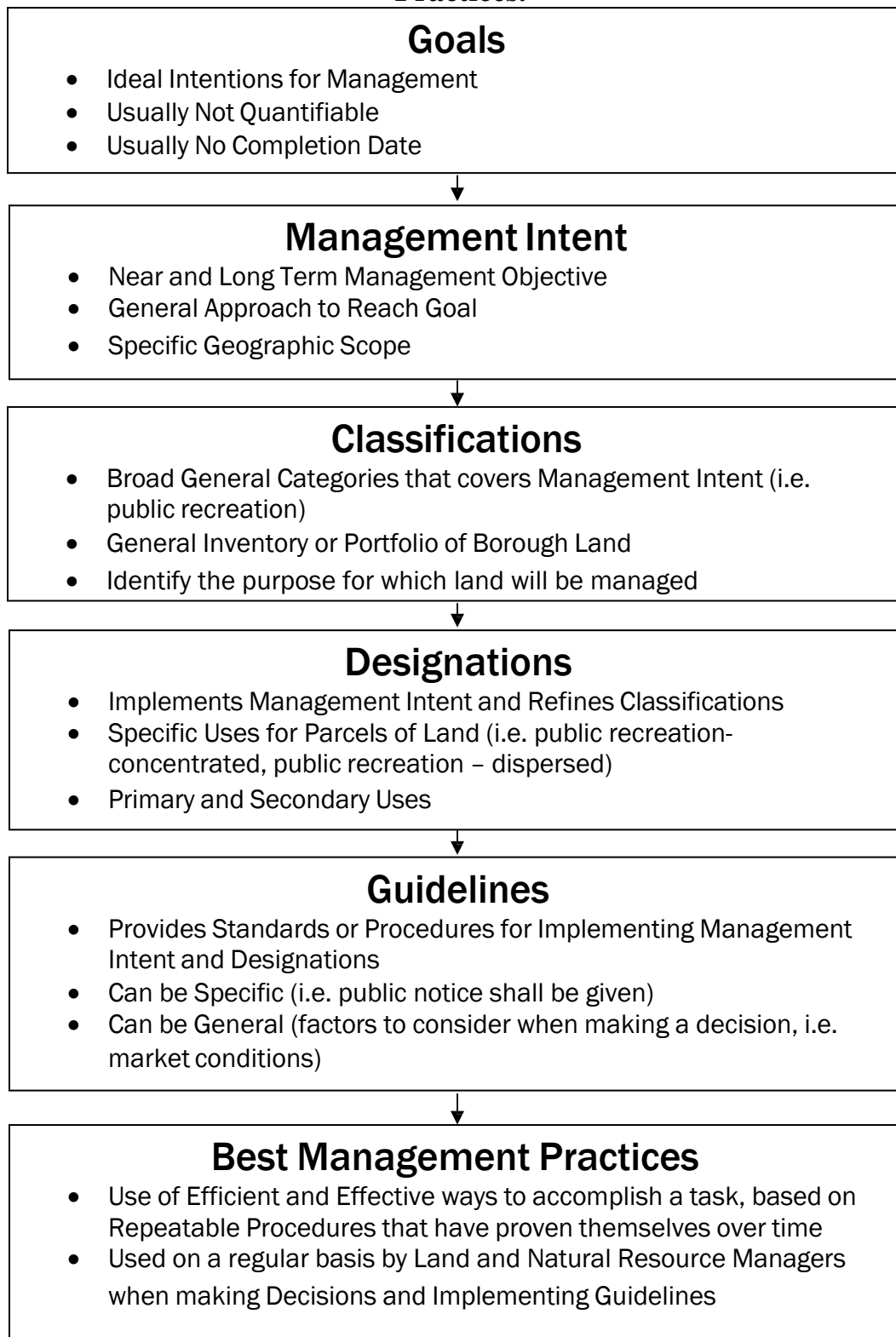
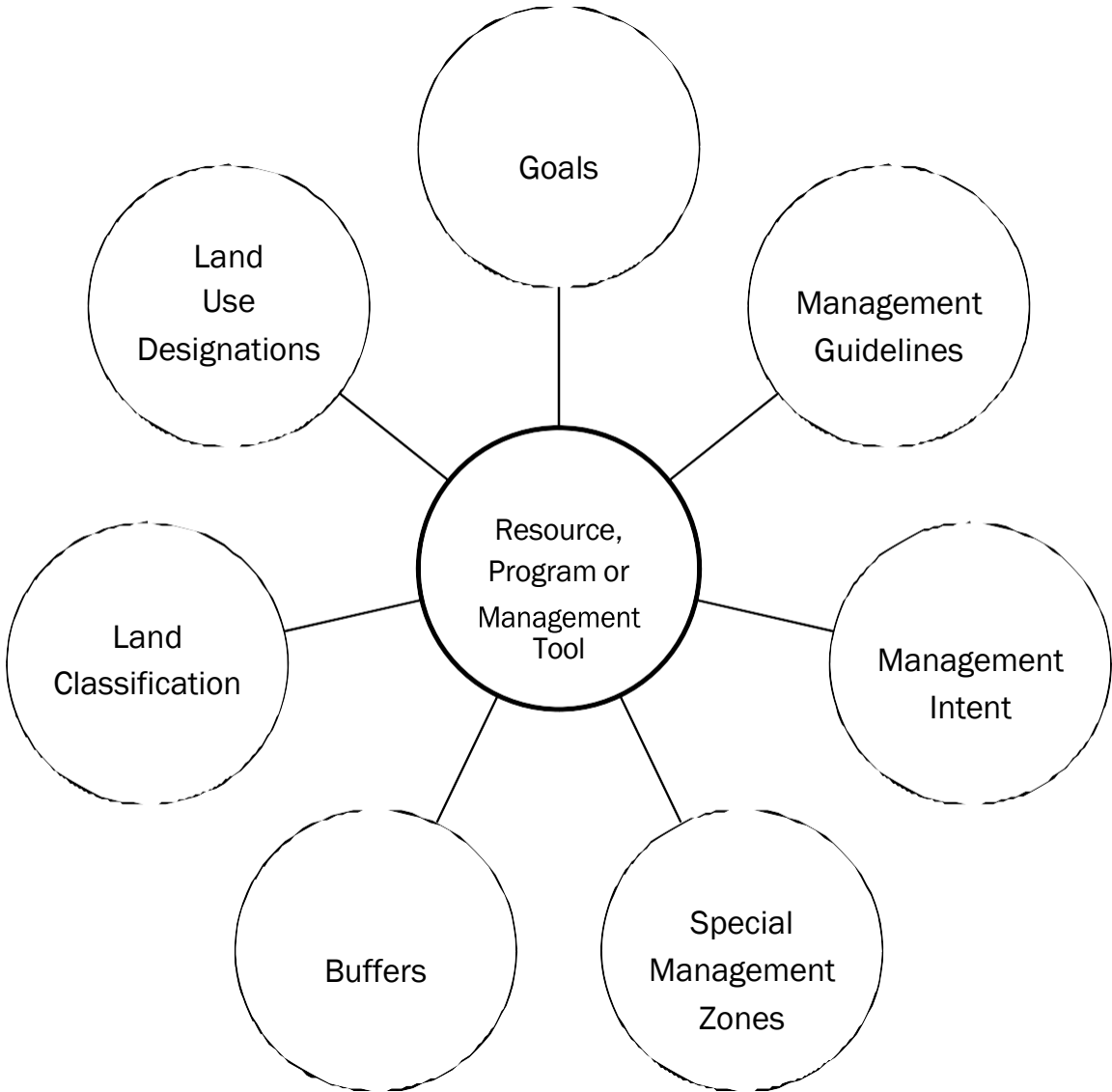


Figure 4 Hierarchy and Function of Goals, Management Intent, Land-Use Designations, Land-Use Classifications, Guidelines and Best Management Practices.



Protective and/or management measures also include a variety of tools, such as a combination of buffers and special management zones 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 5 illustrates some of these management tools.

Figure 5
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 Borough's 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 Resource 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, individually and collectively, must be integrated into land management regimes that ensure 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. The 2019 update included a consistency review of all adopted community comprehensive plans.

All these plans, including this *Natural Resource 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 with 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 Borough's 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 care 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

All residents of the Borough own the Borough’s 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 specific resource management plan¹¹, Borough Code (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 are divided 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.

¹¹ For example; Parks and Open Space Plan, Recreational Trails Plan, etc.

General Information

The Alaska Constitution¹² and Borough Code¹³ 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 the Plan scoping period expressed this was important. This Plan, and all other Borough Asset Management Plans, emphasize 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.

¹² Article 8

¹³ 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 classification 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 of 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 Parks, Recreation and Trails Advisory Board in reviewing and making recommendations on the management and proposed authorization actions for borough-owned land within Natural Resource Management Units.

General 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 in any Natural Resource Management Unit with soils suitable for agriculture, or on a case-by-case basis with Borough Assembly approval. Specific sales are subject to additional public notice under MSB 23.05.025.

Grazing may be permitted in any Natural Resource Management Unit and only as a secondary activity. Grazing may 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.

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, Buffer 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, Buffer 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, Buffer 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 Borough's *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 Planning 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-foot 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 and 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 and Game. The Alaska Department of Fish and Game shall be encouraged to consult with the U.S. Fish and 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 and 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 and Game. The Alaska Department of Fish and Game shall be encouraged to consult with the U.S. Fish and 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, under certain conditions.

Cultural Resources and Heritage Sites

Management Goals

The *Alaska Historic Preservation Act*¹⁴ and Borough Code dealing with historic preservation¹⁵ 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 qualified professionals;
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 to 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 Planning Division shall be requested to review proposals for forest management, sand and gravel extraction, development actions and other similar activities. The Planning Division 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 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.

¹⁴ AS 41.35

¹⁵ MSB 1.10.160

The Planning 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 Management 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 Survey¹⁶ 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 Planning 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*.

Cultural Resources and Cultural Sites Management Summary

Cultural resource and historic sites are not a specific land use designation category. Sites 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,

¹⁶ The Alaska Heritage Resources Survey is maintained by the State Division of Parks and Outdoor Recreation Office of History and Archeology.

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, including compatible forest management.

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 forest land, and in some cases commercial 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 were 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.

4. Consider how, and in what way, the activity might enhance wildlife habitat and for which species.

The Borough shall utilize the Wetlands Land Bank to mitigate adverse effects 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*¹⁷, the *Eagle Protection Act*¹⁸, 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

¹⁷ Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884) as amended.

¹⁸ Eagle Protection Act of 1940 (16 U.S.C. 668-668d, 54 Stat. 250) as amended

- 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 and enhancing 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 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.

Storm Water 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 view sheds; 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, 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 Code¹⁹, 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

¹⁹ 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.

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 Code²² the Borough shall attempt to notify all landowners whose land is located within one-quarter 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 one quarter 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

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.

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 include 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 patterns. 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 which 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 address 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 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 classified as Public Recreation. Public recreation can also be designated as a secondary activity on land classified as forest management, general purpose, land bank, reserve use, watershed, resource management and wetland bank lands. Public recreation designations do not exclude resource extraction where the extraction can occur without significantly damaging the recreation opportunities.

Rock, Sand and Gravel

Resource Goals

In the case of a conflict between Borough Code (currently MSB 17.28 and 17.30), 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. Conditional Use Permits. Besides these guidelines, Borough Code (MSB 17.28 and 17.30) establishes various mining (sand and gravel extraction) requirements throughout the Borough. Borough code (MSB 17.30) further requires a conditional use permit for certain mining activities. These land use regulations include air and water quality standards, visual screening, lighting, dust, and noise screening that must be met 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 MSB 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, typically sand and gravel, is necessary to provide 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 should 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 extraction as a primary use is classified as Material Land or Resource Management Land 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 agriculture, forest management, industrial, general purpose, public recreation, or resource management lands.

Settlement

Goals and Guidelines

Settlement. 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 no longer 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 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 and 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 of 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 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 already 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 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 of cuts when located at least one-mile from roads and the Alaska Railroad reduce the amount of moose mortality caused by 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 seasonal 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 and 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 and 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 wildlife²⁰ 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.

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

²⁰ Wildlife includes birds. See Volume III, Appendix A, *Definitions/Glossary*, Fish and Wildlife.

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, 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 Borough *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 Borough's *Recreational Trails Plan*.

Private Lands. Locate or relocate trails 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 Borough's *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 and Game and U.S. Army 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 Borough's *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 Borough's 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 Borough's *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, 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 needs, 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.²¹

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

²¹ 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 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 Borough's *Recreational Trails 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 Alaska Departments 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 Construction Manual*, shall be followed. Also, as required by MSB 23.20.190, the requirements of the *Alaska Forest Resources and Practices Act*²², the *Alaska Forest Resources and Practices Regulations*²³ shall be followed. In addition, the publication, “*Implementing Best Management Practices for Timber Harvest Operations from the Alaska Forest Resources and Practices Regulations*”²⁴ provide additional guidance and should be followed where applicable and appropriate.

In the case of a conflict, between the Borough Code including the *Subdivision Construction 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 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

²² Transportation facilities are generally found in AS 41.080(a)(1) and 41.05.098(d).

²³ Standards for road construction, associated facilities, and maintenance are found in 11 AAC 95.285-335.

²⁴ Division of Forestry, Department of Natural Resources, January 2005. Bruce Johnson

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 Borough²⁵.

(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

²⁵ See MSB 17.29

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 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 Construction 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.

(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 decommissioned 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, to adopt a road to provide for specific public uses, or to address aesthetic or environmental concerns.

(e) Buffer widths and Special Management Zones may vary along the length of a road because of the considerations in (d) 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 Borough's 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 Borough's Planning 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 construction²⁶.

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 applicable²⁷.

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.

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

3. 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 Code²⁸ and policies.

²⁶ See AS 41.17.083 and MSB 23.20.190.

²⁷ See 11 AAC 97.250, MSB 17.28 and 17.30.

²⁸ See MSB 2.44.050

4. 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 decommissioned, 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 “C”: *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.

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 decommissioned) 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 waterbodies²⁹.

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.

²⁹ 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*.

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 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 dependent) 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.

Policies and issues addressed in this chapter are:

- Forest Management Goals
- Interagency Coordination and Public Participation
- Economics of the Forest
- Forest Inventory
- Commercial 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 or coincide. For example, it may or may not be possible to have significant timber harvests and maximum habitat protection or habitat enhancement occur 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 overall 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 processors 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. Departments of Agriculture and Interior, and the Alaska Departments 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 in that specific location and is market driven at that time period, depending on the valuation method used. Decisions on non-timber values account for other products provided by the forest such as scenic values, wildlife habitat, public recreation, 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).

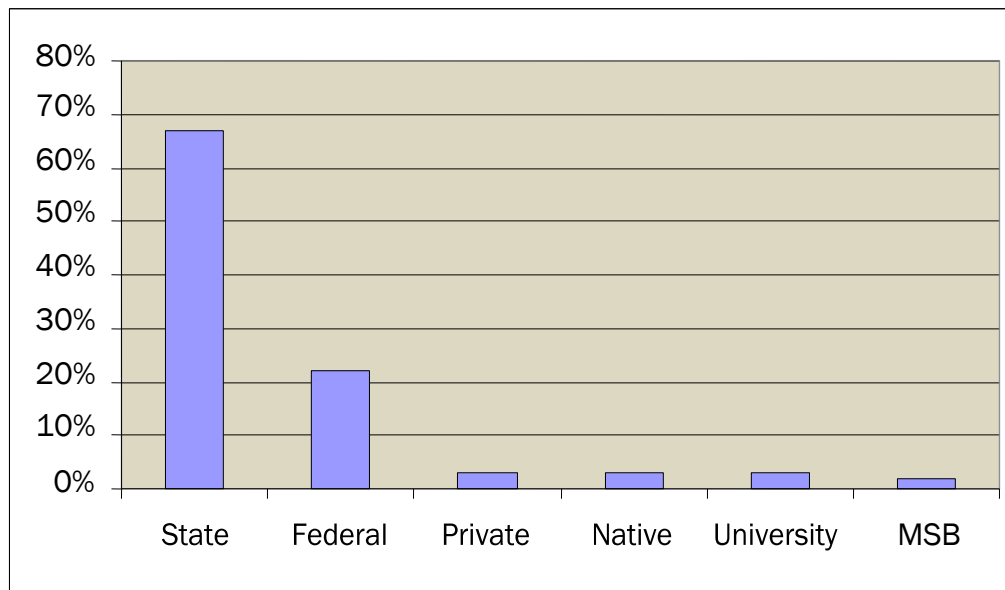
Forest valuation depends on the market. Other values such as increased recreation, improved wildlife habitat, water quality, or a scenic viewshed cannot be easily valued.

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

On its own, the Borough cannot support a large-scale timber industry, but it can help enable a viable industry along with other timberland owners such as the State of Alaska.

The chart below (Figure 6) reflects current land ownership.

Figure 6: Approximate Land Ownership within the 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.

The State of Alaska owns the majority of the forested land in the Borough. Combined, the two public landowners (borough and the state) can continue to work together to manage for healthy and sustainable forests that provide multiple-use benefits such as local and industry forest products,

wildlife habitat, economic diversity, recreation opportunities, watershed protection, and wildfire management. These are commonly overlooked in preference for specific-use purposes.

Within the Matanuska-Susitna 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 7). 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.

Stumpage Values

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

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.

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, board foot, or ton).

Figure 8 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 7: Example of Timber Harvest Costs and Values

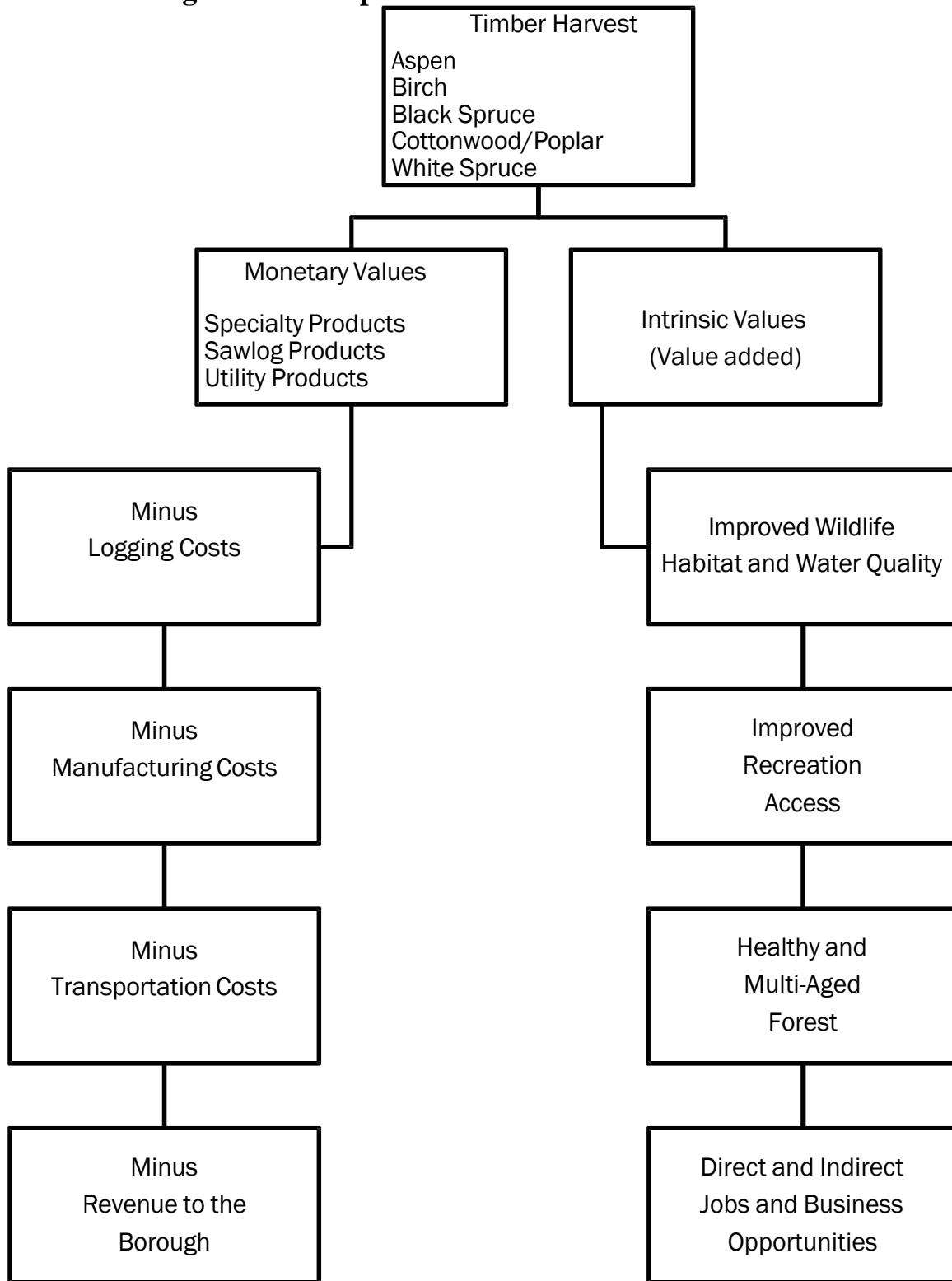
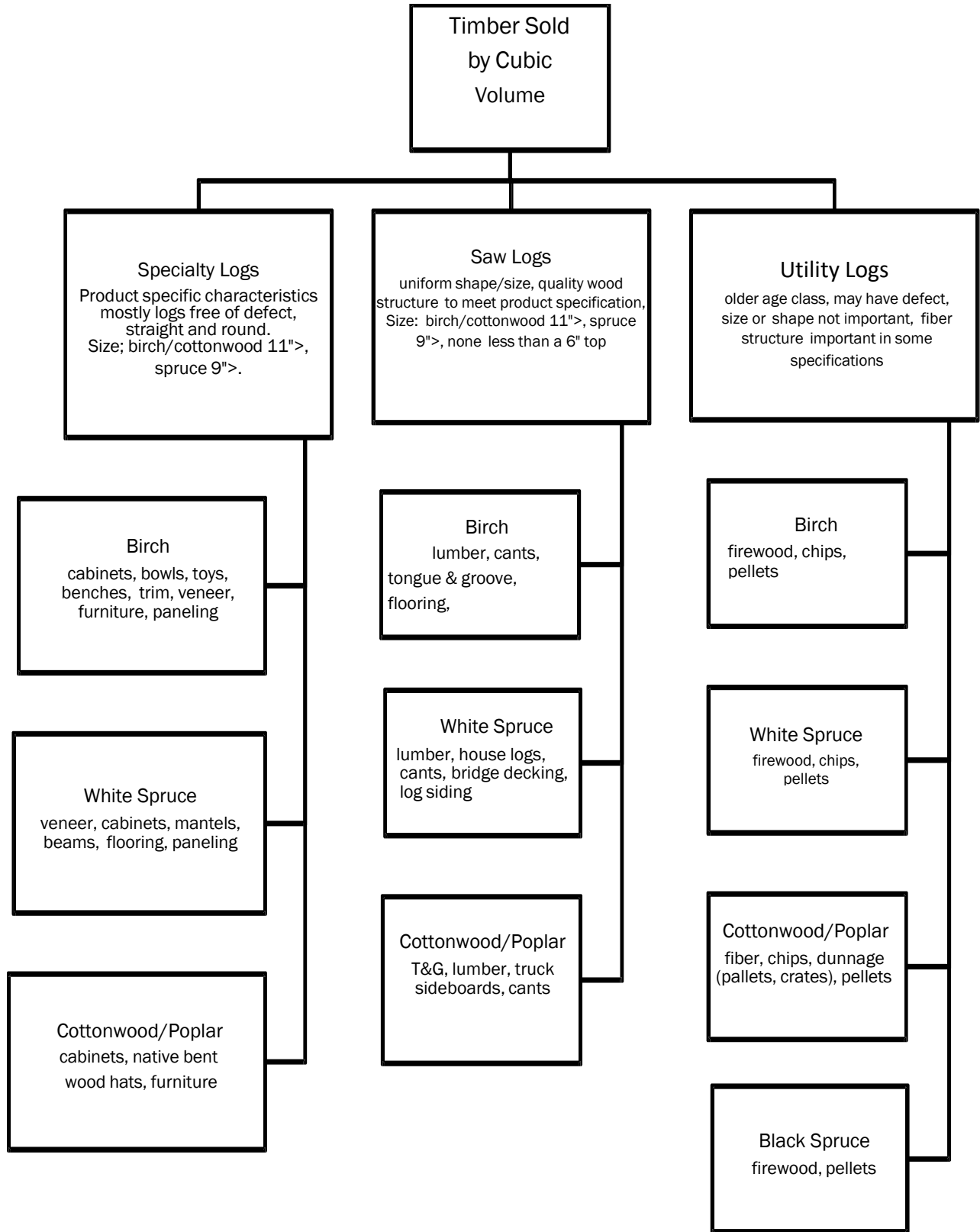


Figure 8: Timber Use Opportunities



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 harvesting may occur 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 appraisal³⁰:

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, chip, sawtimber, firewood), type of harvest (clear cut, shelterwood, single tree etc.), cutting method (mechanical or hand), distance to yarding area, road building costs, road maintenance, distance to market, and other costs of operations, etc., all affect net return to the Borough in the form of direct revenue.

Log Transportation Costs

Logs harvested 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.).³¹
- 4 MBF (thousand board feet) of sawlogs, measured on a long-log basis.

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 if it averages 50 miles per hour.

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

³⁰ *Matanuska-Susitna Borough Market Analysis and Timber Appraisal Report*. Northern Economics Inc., 2007

³¹ Measured birch logs in Anchorage from Trapper Creek area.

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 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, wildlife viewing, and tourism produce significant economic 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 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 2007³², provides some additional findings and insights into value added “non-timber derived” products.

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:

³² *Projections of Non-Consumptive and Consumptive Demand in the Mat-Su Forest: 2006 – 2026*, H.P. Cole and Associates, June 21, 2007

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.
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 and is not part of the Borough's "Commercial" or available 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*³³ and the second was *Operable Forest Land Analysis Report Phase II*³³. A copy of the *Matanuska-Susitna Borough: Forest Inventory Report Phase II* is located in the Borough Community Development office for review.

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.

Commercial Forest Lands are:

1. Those areas containing timber volumes and values that have historically been, or currently could be, harvested under commercial forestland sale agreements.
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.

Non-Commercial Forest Lands are non-commercial forestland identified by the timber inventory.

³³ Sanders Forestry Consulting, 2007 and 2009. The 2009 report supplemented and replaced the 2006 report.

(Also see the *Definitions/ Glossary* at the end of this Volume and Volume III for definitions of commercial, and non-commercial forest land).

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 occur such as forest fires, wind damage, insects, etc.

This information is included 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 (Table 1) summarizes results for Commercial Forest Land by acres and estimated net volumes by Natural Resource Management Unit, including the Fish Creek Management Unit.

Table 1: Commercial Forest Lands Total Acres by Natural Resource Management Unit

Natural Resource Management Unit	Total Acres In Unit	Total Acres Inventoried	Total Acres Commercial Forest Land	Green Tons
Anderson Creek	2,510	No Inventory	0	No Inventory
Bartlett Hills	4,785	4,838	4,255	232,182
Bunco Hills	10,440	No Inventory	0	No Inventory
Chijuk Creek	24,659	24,659	17,413	888,204
Chulitna River	6,082	5,085	3,500	180,400
Deception Creek	3,118	3,118	1,027	53,890
Fish Creek ³⁴	23,376	18,053	11,946	683,340
Kashwitna	9,358	9,366	5,024	261,565
Matanuska River North	445	446	331	19,253
Matanuska River South	540	No Inventory	0	No Inventory
Mile 233	4,146	4,146	3,738	204,537
Moose Creek	1,228	1,229	991	55,079
Olson Creek	5,119	No Inventory	0	No Inventory
Parks Highway	10,278	10,067	3,159	168,945
Point MacKenzie ³⁴	5,167	5,198	3,195	168,734
Rabideux Creek	4,477	4,477	2,692	141,677
Rogers Creek	7,039	7,038	2,193	117,188
Sheep Creek	9,703	9,703	4,924	275,051
Susitna River Corridor	6,667	6,739	4,737	249,192
Whiskers Creek North	12,757	No Inventory	0	No Inventory
Whiskers Creek South	13,965	13,964	10,241	559,731
Willow	1,077	No Inventory	0	No Inventory
TOTAL	166,939	128,126	79,366	4,258,968

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

At this time, it is not feasible to further break down the commercial forest land inventory into smaller economic or management units. In reality not all commercial 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.)

³⁴ The inventoried area and Commercial Forest Land Calculations extend slightly beyond the Natural Resource Management Unit boundaries shown in Volume II of this Plan.

Commercial Forest Land within Natural Resource Management Units

The table above (Table 1) lists the acres of the commercial 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.

Other Land within Natural Resource Management Units

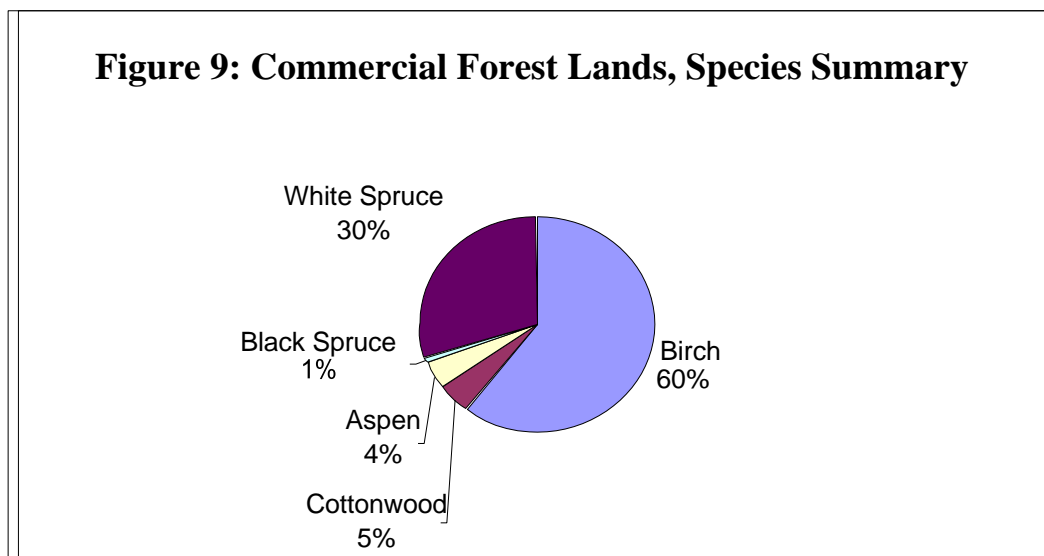
There are approximately 167,000 acres of land within the 22 Natural Resource Management Units that are discussed in Volume II of this plan. Within the Units, there are about 79,360 acres of commercial forest land or 48% of all the land within the Units. It is important to remember that almost all the land within Natural Resource Management Units will be managed for multiple purposes and uses. The commercial forest lands are all within this multiple-use category.

Commercial and Merchantable Forest Analysis

Initially adopted separately from this plan, the Fish Creek Management Plan is being incorporated into this update of the Plan for consistency. The inventory and commercial forest land figures are included in all the charts and computations in the following section of this chapter.

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 report can be found at the Borough office in Palmer .

Figure 9 shows the composition of tree species for lands that were inventoried in the *Forest Inventory Report Phase II*.



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 (Table 2). This table does not include hidden defect or logging breakage or beetle kill.

Table 2: 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 table (Table 3) shows the net volumes by species from the *Forest Lands Inventory Report Phase II*.

Table 3: Commercial Forest Approximate 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

Table 4 describes the timber inventory volumes by stratum and species.

**Table 4: Timber Inventory, Approximate 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
<i>STRATUM #1 – Pole Timber Closed 11,330 acres</i>				
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
<i>STRATUM #2 – Pole Timber Open 3,415 acres</i>				
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
<i>STRATUM #3 – 90+% Hardwood Sawtimber Closed 2,410 acres</i>				
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
<i>STRATUM #4 – 80% – 90% Hardwood Sawtimber Open 3,962 acres</i>				
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
<i>STRATUM #5 – Mixed Sawtimber Closed 43,427 acres</i>				
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
<i>STRATUM #6 – Mixed Sawtimber Open 14,015 acres</i>				
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	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 basis³⁵. State law and Borough Code for forest management provide further guidance on periodic sustained yield³⁶, and annual allowable cut³⁷. 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.

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.

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 commercial 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 1,000 per year, or a total volume of 10,000 over a ten-year period. This ten-year volume may be 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	1,000	800	1,250	700	950	1,500	1,255	1,000	750	800	10,000

³⁵ Alaska Constitution; Article VII, Section 4.

³⁶ See Volume III, Appendix "A", *Definitions/Glossary* and MSB 23.20.030

³⁷ See Volume III, Appendix "A", *Definitions/Glossary* and MSB 23.20.040

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 Commercial 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 following 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 are derived by dividing the total Commercial 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 are derived by dividing total Commercial 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 forestland production within the borough boundaries has not been undertaken, reliable growth and yield tables for commercial forestland 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 Code³⁸ 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 practice will help 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 commercial forest lands, identified as Strata 1, 2, 3, and 4 in the Forest Inventory Report,³⁹ could be managed (harvested and regenerated) on an 80-year rotation to favor birch, and commercial 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 Commercial Standing Timber Volume = 97,213,400 cubic feet⁴⁰

97,213,440 cubic/feet x 70% (birch) = 68,049,408 cubic feet /80 year birch rotation period = 850,618 cubic feet per year = 8,506 cunits/year (1 cunit = 100 cubic feet)

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

³⁸ See MSB 23.20.030.

³⁹ *Forest Land Inventory Report Phase II*, Sanders Forestry Consulting and Alaska Map Company, June 2009.

⁴⁰ *Operable Forest Land Analysis Report Phase II*, Sanders Forestry Consulting and Alaska Map Company, June 2009

$$\begin{aligned}
 &+ \underline{291,640 \text{ cubic feet per year for White Spruce}} \\
 &= 1,142,258 \text{ cubic feet per year combined Birch and White Spruce}
 \end{aligned}$$

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

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

Annual Allowable Cut Guidelines

A. Any change in the commercial forestland 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 or beetle mortality.
- Stands may produce larger spruce sawtimber trees and over additional time (150-years and greater) higher quality sawlogs (smaller knots in the first log) unless high numbers of older trees succumb to spruce bark beetles.

- 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 Commercial Forest Land is located in one or two forested areas. Of the 22 Natural Resource Management Units, 16 have Commercial Forest Land. This ranges from a low of 260 acres of Commercial Forest Land at Matanuska River North, to a high of 14,870 acres of Commercial 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 Commercial 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 Commercial 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 Commercial 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 most recent *Alaska Forest Resources and Practices*

Act⁴¹; the *Alaska Forest Resources and Practices Regulations*⁴²; and the related booklet *Implementing Best Management Practices for Timber Harvest Regulations*⁴³ is necessary.

The *Forest Health Conditions in Alaska – 2017*⁴⁴ 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 (2018)*⁴⁵ and the *Matanuska- Susitna Borough Community Wildlife Protection Plan*⁴⁶ 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 - 2017* the infested areas in the Mat-Su valley more than doubled from 2016 to 2017 and are estimated to total over 400,000 acres. The report states that there is a large-scale infestation. Some of the infected stands continue to be the focus of both state and borough harvest programs.

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 regulations⁴⁷.

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 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’s⁴⁸ also have programs in place that concentrate on surveying areas of

⁴¹ Alaska Forest Resources and Practices Act of 1990, as amended (FRPA), codified as A.S. 41.17

⁴² See 11 AAC 95

⁴³ *Implementing Best Management Practices for Timber Harvest Operations of the Alaska Forest Practices Act Regulations*, 2005, State Department of Natural Resources, Division of Forestry.

⁴⁴ The *Forest Health Conditions in Alaska – 2017* (comp. 2018, *Forest Health Conditions in Alaska – 2017*. 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.

⁴⁵ The *Alaska Interagency Fire Management Plan – 2018* 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/fireplans.htm>.

⁴⁶ 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>.

⁴⁷ See AS 03.05.010(5), AS 03.05.027, and 11 AAC 34

⁴⁸ Currently there are three Soil and Water Conservation Districts in the Borough: Palmer, Wasilla, and Upper Susitna.

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

H. 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

I. 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 "B": *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.

Silviculture 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 a growing amount of silvics data available about these local tree species. Refer to the *Silvics Manual*, published by the U.S. Forest Service. The *Silvics Manual* can be found online at <http://www.na.fs.fed.us>.

The Borough uses professional expertise and experience in the decision-making process to assure social needs can be balanced with the goal of healthy and sustainable forests. Using the *Silvics Manual*, other professional publications and exchanging information with other professionals; borough resource management professionals 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. At a minimum, the reforestation requirements of the *Alaska Forest Resources and Practices Act* are followed.

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*⁴⁹ 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.

⁴⁹ *Reforestation Handbook*, State of Alaska, Alaska Department of Natural Resources, Division of Forestry, February 2008.

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, other revegetation methods should be considered.

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, harvest should occur during the winter dormant season 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, during or just after harvest (as soon as possible).

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, 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 comply with the 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 commercial 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.

The following figures are based on Table 1 of this plan, which is from the *Operable Forest Land Analysis Report* (Sanders, 2009):

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 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 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 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.

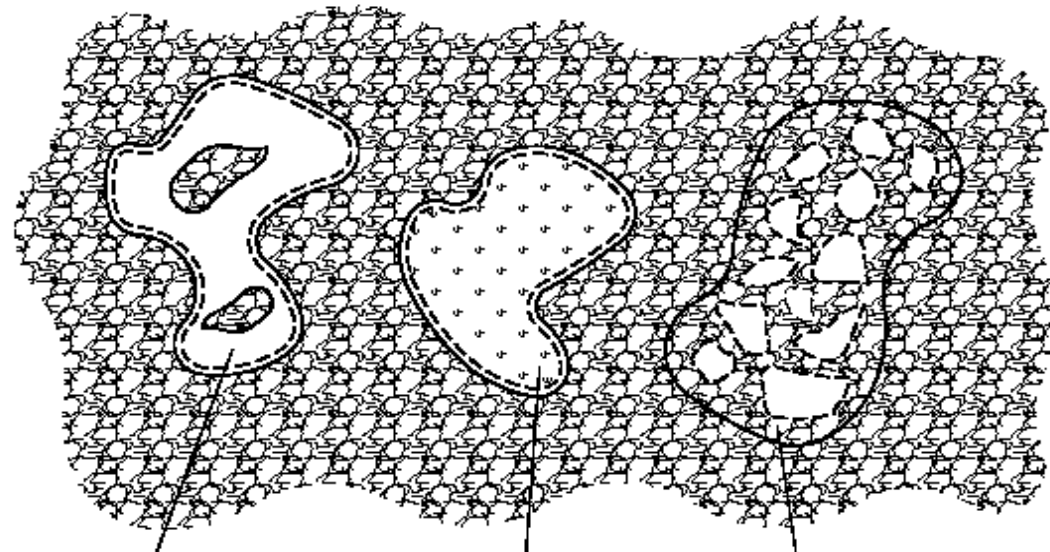
Harvesting System Guidelines

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 10 graphically shows the three basic types of cutting and harvest units.

Figure 10: Examples of Cutting and Harvest Units



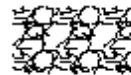
Clear Cut Harvesting System:
 110-acre clearcut with 100-acre
 cutting unit and (2)-5-acre islands

Seed Tree Harvesting System:
 harvest unit and cutting unit, harvest
 unit and cutting unit boundaries are
 the same

Group or Shelterwood Harvesting System:
 180-acre harvest unit with
 (1)-5 acre cutting unit



Cutting Unit Boundary



Uncut Vegetation



Harvest Unit Boundary



Seed Trees

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 migratory 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, 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 recommended 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 prior to burning 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 on 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 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. 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.

B. 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.

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

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

E. Agencies, particularly the Alaska Department of Fish and Game, and the public shall be given an opportunity to comment on 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.

The Borough does not have the land and forest base, staff or funding to conduct such studies itself, nor is there a need for the Borough to duplicate the existing research areas that have been established by the state, University of Alaska or Federal agencies. 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). 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.

Possible Research and Study Projects

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 use the forest as a “window” to the world. These programs are used to increase students’ understanding of forest ecology and our environment, to stimulate students’ critical and creative thinking, to develop students’ ability to make informed decisions on environmental issues, and to 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, wildlife habitat, and watershed protection. Their programs include *Project Learning Tree*, and *Forests for Watersheds and Wildlife*.

Forest Improvement Area Guidelines

- A. Local volunteers, schools, community organizations, non-profit organizations, and 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.

Timber harvest process within a Natural Resources Management Unit begins with an Assembly approved management plan. An inventory is conducted to identify commercial forest land. The commercial forest land must then be classified for Forest Management or Resource Management with a forestry designation. A Five-Year Timber Harvest Schedule is then developed in coordination with other land owners, that sets an annual allowable cut. The Schedule is reviewed by the public and approved by the Assembly. An annual or periodic timber schedule is developed in coordination with other land owners that factors in the annual allowable cut. The Schedule is also reviewed by the public. Once this has occurred, timber may be offered for sale. The Borough Manager may approve timber sale contracts up to \$25,000. Assembly approval is required for timber sale contracts valued higher than \$25,000.

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, 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 forest land 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 comply with the requirements of MSB 23.20.080 Borough Code can be found online at www.matsugov.us).

Five-Year Timber Harvest Schedule

The Five-Year and Timber Harvest Implementation Schedules 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, 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 (Borough Code can be found online at www.matsugov.us).

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 (Borough Code can be found online at www.matsugov.us).

Timber Harvest Implementation Schedule

The Five-Year and Timber Harvest Implementation Schedules 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.

C. The total Annual Allowable Cut for any given year or decadal time period shall not be located in one Natural Resource Management Unit.

D. 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.

E. 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.

F. 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 (Borough Code can be found online at www.matsugov.us).

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. (Borough Code can be found online at www.matsugov.us).

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 Forest Land Products 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, tons, 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 (Borough Code can be found online at www.matsugov.us).

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. (Borough Code can be found online at www.matsugov.us).

Plan of Operations

Management Guidelines

A. Compliance with Borough Code. All the terms and conditions specified in MSB 23.20.160 shall be followed (Borough Code can be found online at www.matsugov.us). This includes providing a copy of the State of Alaska, Division of Forestry, Detailed Plan of Operations, where the requirements of the Alaska Forest Resources and Practices Act must be followed (Detailed Plan of Operation Forms can be found online at <http://forestry.alaska.gov/forestresources>), 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.

Figure 11 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 as 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.

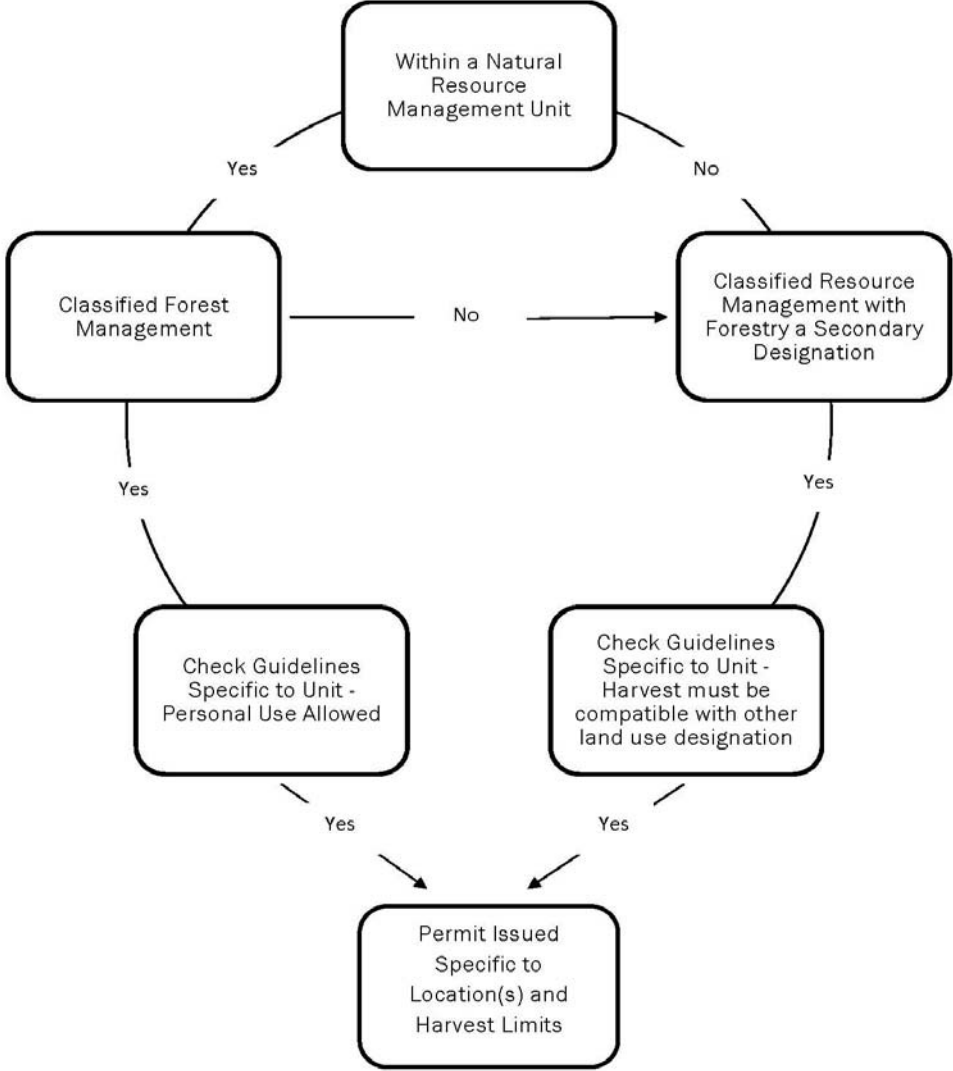
B. Locations outside of Natural Resource Management Units. Areas outside of Natural Resource Management Units may be made available for personal use timber harvest provided the proposed harvest is consistent with the land use classification and management intent for the area.

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. (Borough Code can be found online at www.matsugov.us).

Figure 11 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 as 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 on 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. (Borough Code can be found online at www.matsugov.us).

Non-Commercial Timber Products

Non-commercial timber products may be collected through the use of non-competitive permits as long as the activities conform to the requirements of this plan and Borough Code. 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 (Borough Code can be found online at www.matsugov.us).

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 generally allowed uses are allowed on Borough land as long as the use is not inconsistent with the management intent of the parcel. Generally allowed uses must comply with the rules and guidelines listed in the Land and Resources Management Division Policy and Procedures Manual. Generally allowed uses are not allowed on every Borough-owned parcel. Contact the Land and Resource Management Division to obtain a list of where generally allowed uses are allowed. Borough land with special land use designations such as active timber sales, public facilities (such as schools), parks, campgrounds, trails, recreation management areas, and special use districts are examples of where generally allowed uses are not allowed.

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 27 years since that plan was adopted and many economic, social, environmental, and regulatory changes have occurred over that time.

This Natural Resource Management Unit Plan, specifically Chapters 2 and 3, incorporates portions of 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.

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

Policies, 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 must be reviewed on a decadal basis to determine if revisions are necessary.

The review should be conducted by borough staff. 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 plan revisions that require a public review period and 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 are 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 Borough Community Development Director who 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 Amendments

1. The Community Development Director shall prepare a written Best Interest Finding (see the Land and Resources Management Policy and Procedure Manual) that specifies:
 - the reason 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. The Community Development Director shall submit a recommendation along with the public comments to the Borough Manager 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 the Land and Resources Management Division (LRMD) Policy and Procedure Manual) that specifies:

- the reason 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; and
- 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. The Community Development Director shall submit a recommendation, along with the public comments 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 Borough Manager.

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 Community Development Director's decision shall be prepared as a Best Interest Finding (see the LRMD Policy and Procedure Manual) 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 Borough Manager.

Each discretionary guideline states 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 the LRMD Policy and Procedure Manual) 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.

Forest Research

Site specific information on forest management throughout the Borough is relatively limited. 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:

Applied Forest Research

Borough-owned forest land are predominantly un-managed and over-mature. Consequently, reliable site index, and growth and yield tables for second growth commercial forestland 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 ongoing, long-term forest growth and yield research conducted by the University of Alaska research foresters need to be mapped so these areas can be protected and preserved.

Forest Succession and Wildlife

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, wind throw, 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 southcentral 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 moose 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," "startup" 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 Departments could, with the involvement of the small operators explore costs and alternatives.

A starting point may be to explore the use of a reforestation fund. The Alaska 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 commenters 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.

Code Changes

The ordinance adopting this plan made the following code changes:

The Fish Creek Management Plan was repealed and replaced by this updated plan. This plan update includes the Fish Creek Natural Resource Management Unit along with the other management units in Volume II.

MSB 17.24.030 Comprehensive Plan and Purposes

(B) The comprehensive plan consists of the following elements, which are incorporated in this chapter by reference. If elements of the comprehensive plan conflict, the element most recently adopted shall govern.

(27) Matanuska-Susitna Borough Asset Management Plan: Natural Resource Management Units, adopted 2010; **updated 2019;**

(D) – [UNTIL THE BOROUGH DEVELOPS ITS OWN LAND MANAGEMENT PLAN, BOROUGH LANDS ARE MANAGED UNDER THE SUSITNA AREA PLAN IN THIS AREA.] The Borough engages in land disposals in accordance with the authority contained in A.S. Title [29](#) and in accordance with the procedures contained in MSB Title [23](#).

This code revision recognizes this asset management plan as the Borough’s land management plan and affirms the State of Alaska Susitna Area Plan, and by inference, the Willow Sub-Basin Area Plan do not apply to borough-owned land.

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 commenters thought all or portions of these units should be added to the Alaska State Park system. The reasons varied, but the majority of commenters 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*.

Inquiries 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 be 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



Updated by: Matanuska-Susitna Borough
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: October 2019

Asset Management Plan: Natural Resource Management Units

Volume II

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Asset Management Plan:

Natural Resource Management Units

Volume II

Introduction

This volume contains individual asset management plans for the twenty-two Natural Resource Management Units.

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 Commercial Timber Available for Timber Harvest and For Computing Annual Allowable Cut
- Soil Capability to Support Agriculture
- 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 sometimes Subunits, 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 use.

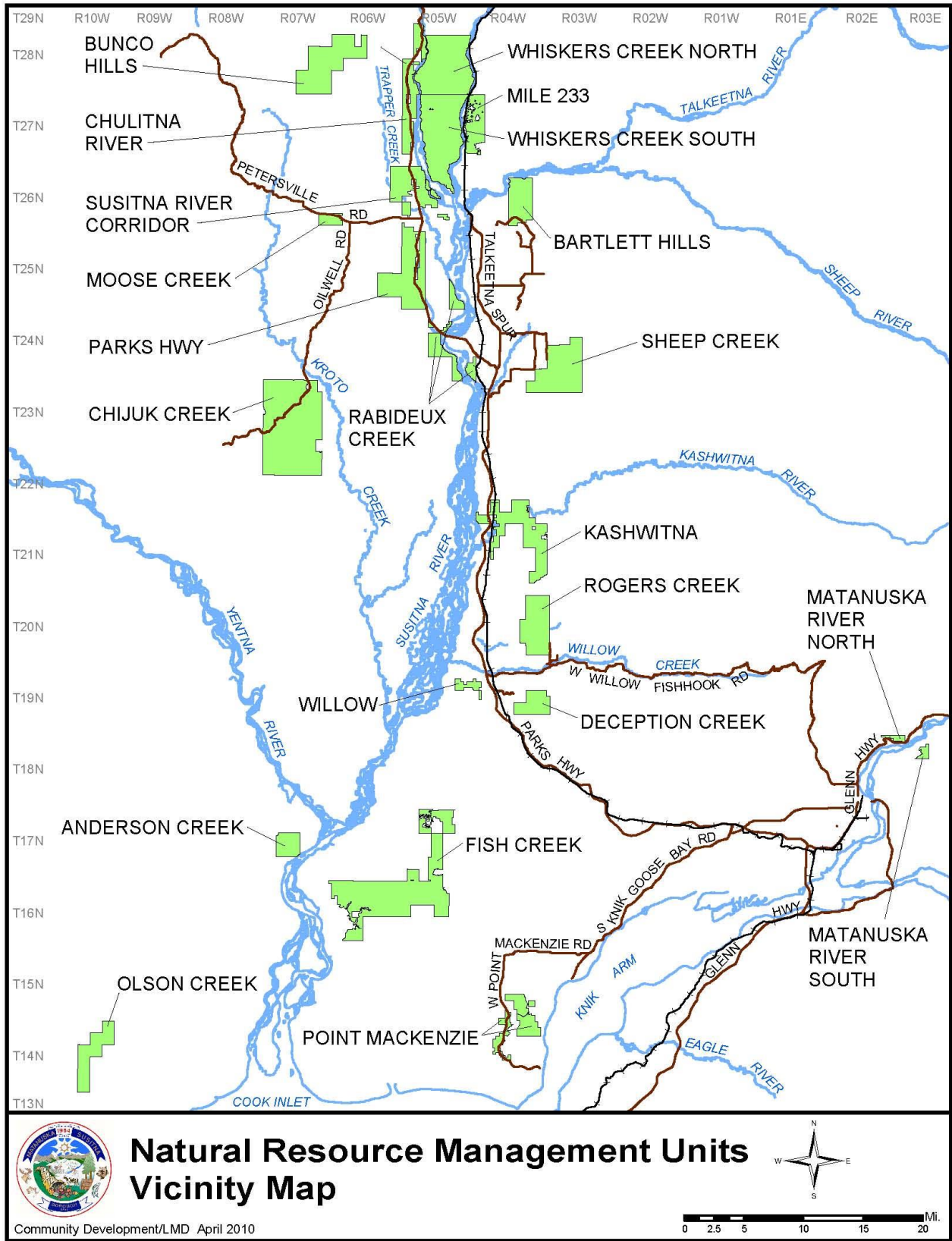
For more information on Natural Resource Management Units, see Volume I, Chapter 1: *Natural Resource Management Units*.

There are approximately 167,000 acres within the twenty-two Natural Resource Management Units included in this plan. This update of the Plan includes the Fish Creek Natural Resource Management Unit, which was previously covered by the Fish Creek Management Plan.

The Natural Resource Management Units are:

- | | |
|---------------------------|------------------------------------|
| 1. Anderson Creek | 12. Moose Creek (Petersville Area) |
| 2. Bartlett Hills | 13. Olson Creek |
| 3. Bunco Hills | 14. Parks Highway |
| 4. Chijuk Creek | 15. Point MacKenzie |
| 5. Chulitna River | 16. Rabideux |
| 6. Deception Creek | 17. Rogers Creek |
| 7. Fish Creek | 18. Sheep Creek |
| 8. Kashwitna | 19. Susitna River Corridor |
| 9. Matanuska River North | 20. Whiskers Creek North |
| 10. Matanuska River South | 21. Whiskers Creek South |
| 11. Mile 233 | 22. Willow |

The map on the following page shows the general location of these units in the borough.



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 classification and land use designations. Land use designations are listed in volume III, Appendix A, *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 #16-100).

Borough-owned 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 capacity of the land to meet primary or secondary purpose.

These classifications are the formal record of uses and resources on how borough land will be managed. In other words, the classifications establish the inventory (or portfolio) of borough land. The classifications are based on a public process that includes Assembly approval. Many units have more than one classification.

While the classifications are the formal record and are required by Borough Code, they contain no specific land management directives; those directives are expressed by the land use designations in the plan, described in detail for individual management units. There are both primary and secondary

designations. Classifications reflect the primary designation. The secondary designations are an important way to convey management intent. Borough personnel must use the classification, 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 Table II-1 below. For a complete list of land use designations and classifications and a description of them, see Volume III, Appendix A, *Land Use Classifications and Designations*.

Table 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 corresponding land use classifications that apply to each Natural Resource Management Unit. Land use designations are illustrated on the “Land Use Designation” map for each management unit. The “Land Use Designation” narrative for each unit also lists the land use classification. The same narrative contains the management intent for each designated area

Table 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	
	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, Lower	Designations	P		S										S		S		
	Classifications*	Ag																

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
Fish Creek / Flathorn Lake	Designations					S							S			P		
	Classifications*															GnP		
Fish Creek / Homestead Creek	Designations			P											P			
	Classifications*			For											ReM			
Kashwitna East	Designations														P		P	
	Classifications*														ReM		WsL	
Kashwitna West	Designations												P				P	
	Classifications*												PbR				WsL	
Fish Creek / Lakes	Designations														P			
	Classifications*														ReM			
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	

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
Moraine Ridge	Designations	S		S		S				S			S			P		
	Classifications*															GnP		
Olson Creek	Designations														P		P	
	Classifications														ReM		WsL	
Parks Highway	Designations														P		P	
	Classifications*														ReM		WsL	
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	

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
Susitna River Corridor	Designations														P		P	
	Classifications*														ReM		WsL	
Fish Creek / Wetlands East & West	Designations					P							S				P	
	Classifications*																WsL	
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 Table II-2:

Agricultural Lands.....Ag	Industrial Lands.....Ind	Reserve Use Lands.....RsU
Commercial Lands.....Com	Land Bank Lands.....LnB	Residential Lands.....Rsd
Forest Management Lands.....For	Material Lands.....Mat	Resource Management Lands.....ReM
General Purpose Lands.....GnP	Mineral Lands.....Min	Watershed Lands.....WsL
Grazing Lands.....Grz	Private Recreation Lands.....PriR	Wetland Bank Lands.....WtB
Homestead Lands.....Hom	Public Recreation Lands.....PbR	

Natural Resource Management Units With Commercial Forest Land Available for Timber Harvest and For Computing Annual Allowable Cut

Table 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 commercial forest land available for timber harvest based on the land use classifications and designations described above.

Not all Commercial 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 Commercial 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* (Sanders 2009) 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 commercial volumes and acreages within the units.

This chart (Table II-3) is only accurate at the time of adoption of this Plan. The volumes and/or areas determined to be Commercial Forest Land could change. For example, an updated inventory and commercial forest analysis could be completed, areas could be removed from the Commercial 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 when the next Five-Year Timber Harvest Schedule is adopted.

¹ Sanders Forestry consulting and Alaska Map Company, 2009

² Acreages are approximate and provide a “visual” reference. Timber harvest schedules, harvests, and Annual Allowable Cut should be based on volume, not acreage.

Table II-3: Units with Commercial Forest Land Available For Timber Harvest and For Calculating Annual Allowable Cut

Unit Name	Commercial Net Cubic Feet	Commercial Acres*	Commercial Net Cubic Feet Available For Harvest	Commercial Acres Available For Harvest*
Anderson Creek	0	0	0	0
Bartlett Hills	7,526,079	4,255	7,526,079	0
Bunco Hills	0	0	0	0
Chijuk Creek	28,501,240	17,413	28,501,240	17,413
Chulitna River (Jigsaw Puzzle Lakes subunit)	606,235	396	0	0
Chulitna River (South subunit)	5,099,606	3,104	5,099,606	3,104
Deception Creek	1,782,058	1,027	1,782,058	1,027
Fish Creek**	21,759,589	11,946	21,759,589	11,946
Kashwitna (East)	8,663,433	5,024	8,663,433	5,024
Kashwitna (West)	0	0	0	0
Matanuska River (North)	588,027	331	588,027	331
Matanuska River (South)	0	0	0	0
Mile 233	6,536,340	3,738	6,536,340	3,738
Moose Creek	1,762,680	991	1,762,680	991
Olson Creek	0	0	0	0
Parks Highway	5,362,475	3,159	5,362,475	3,159
Pt. MacKenzie (Alsop Road subunit)**	2,127,026	1,249	2,127,026	1,249
Pt. MacKenzie (Mule Creek subunit)	1,702,468	991	1,702,468	991
Pt. MacKenzie (Pt. MacKenzie Road subunit)	1,615,964	948	1,615,964	948
Rabideux	4,629,900	2,629	4,629,900	2,629
Rogers Creek	3,957,680	2,193	3,957,680	2,193
Sheep Creek	8,766,501	4,924	8,766,501	4,924
Susitna River Corridor	7,947,599	4,690	7,947,599	4,737
Whiskers Creek North	0	0	0	0
Whiskers Creek South	17,840,699	10,241	17,840,699	10,241
Willow	0	0	0	0
TOTAL	136,775,599	79,296	136,169,364	78,900

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

* 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.

** The 2009 “Timber Inventory” and “Operable Forest” analysis extended beyond the unit boundary in this Plan. The “Commercial Forest Area” has been changed to reflect that portion of the “Commercial Forest Area” located within the unit boundary in this Plan.

Soil Capability to Support Agriculture

The soils capability classification maps included with this update of the plan provide an interpretive grouping made, by the U.S. Department of Agriculture (USDA), primarily for agricultural purposes. In this classification, the arable soils are grouped according to their potentialities and limitations for sustained production of the common cultivated crops that do not require specialized site conditioning or site treatment. Nonarable soils (soils unsuitable for longtime sustained use for cultivated crops) are grouped according to their potentialities and limitations for the production of permanent vegetation and according to their risks of soil damage if mismanaged. The capability grouping of soils is designed (1) to help landowners and others use and interpret the soil maps, (2) to introduce users to the detail of the soil map itself, and (3) to make possible broad generalizations based on soil potentialities, limitations in use, and management problems.

The risks of soil damage or limitations in use become progressively greater from class I to class VIII. Soils in the first four classes under good management are capable of producing adapted plants, such as forest trees or range plants, and the common cultivated field crops and pasture plants. Soils in classes V, VI, and VII are suited to the use of adapted native plants. Some soils in classes V and VI are also capable of producing specialized crops, such as certain fruits and ornamentals, and even field and vegetable crops under highly intensive management involving elaborate practices for soil and water conservation. Soils in class VIII do not return on-site benefits for inputs of management for crops, grasses, or trees without major reclamation.³

Role of Agencies, Community Councils and the Public in Natural Resource Management Unit Management Decisions

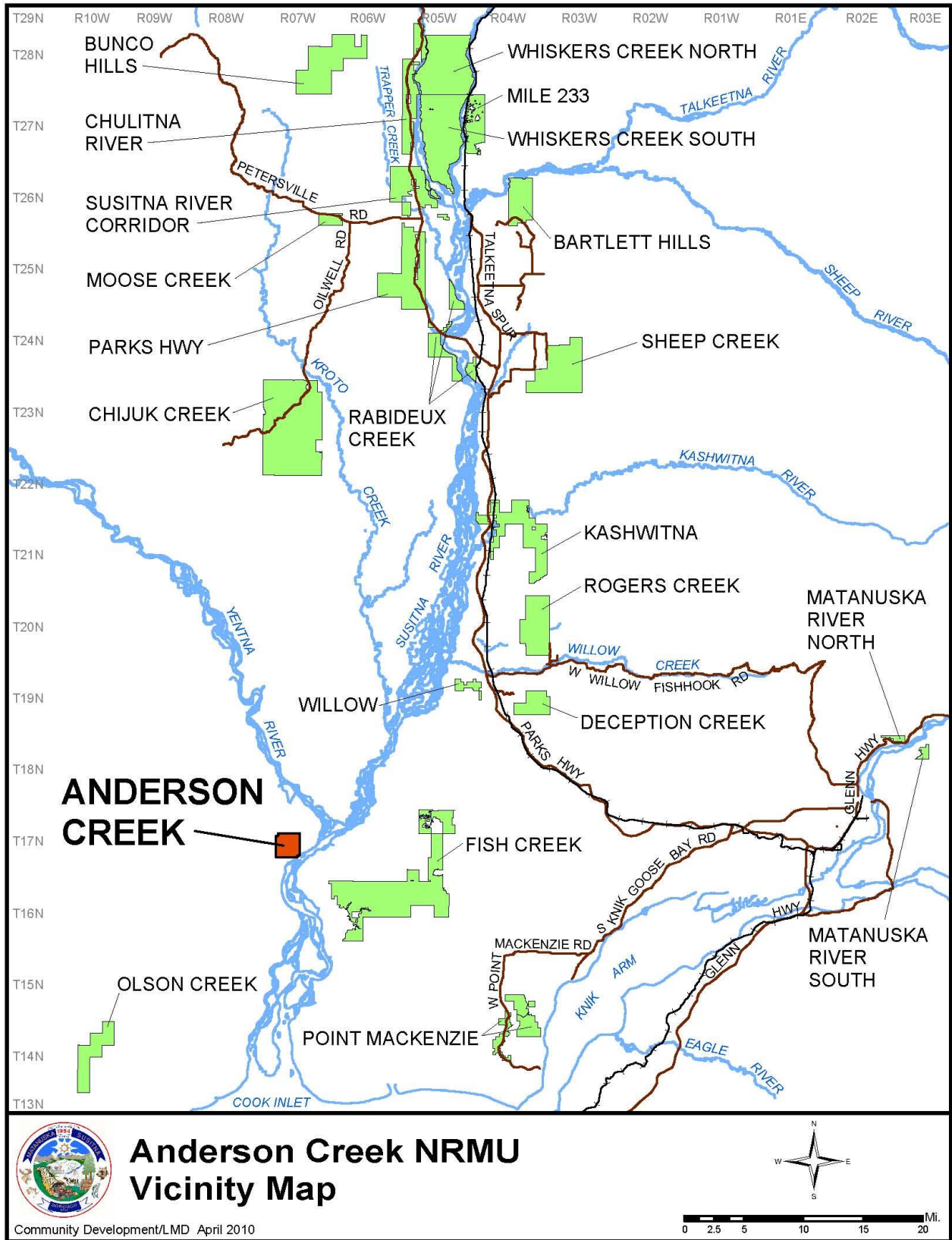
A complete description; *How the Plan was Developed* can be found in Volume I, Chapter 1. It is important to note that the majority of interest and comments received during each portion of the public involvement process as this plan was developed dealt with the actual Natural Resource Management Units.

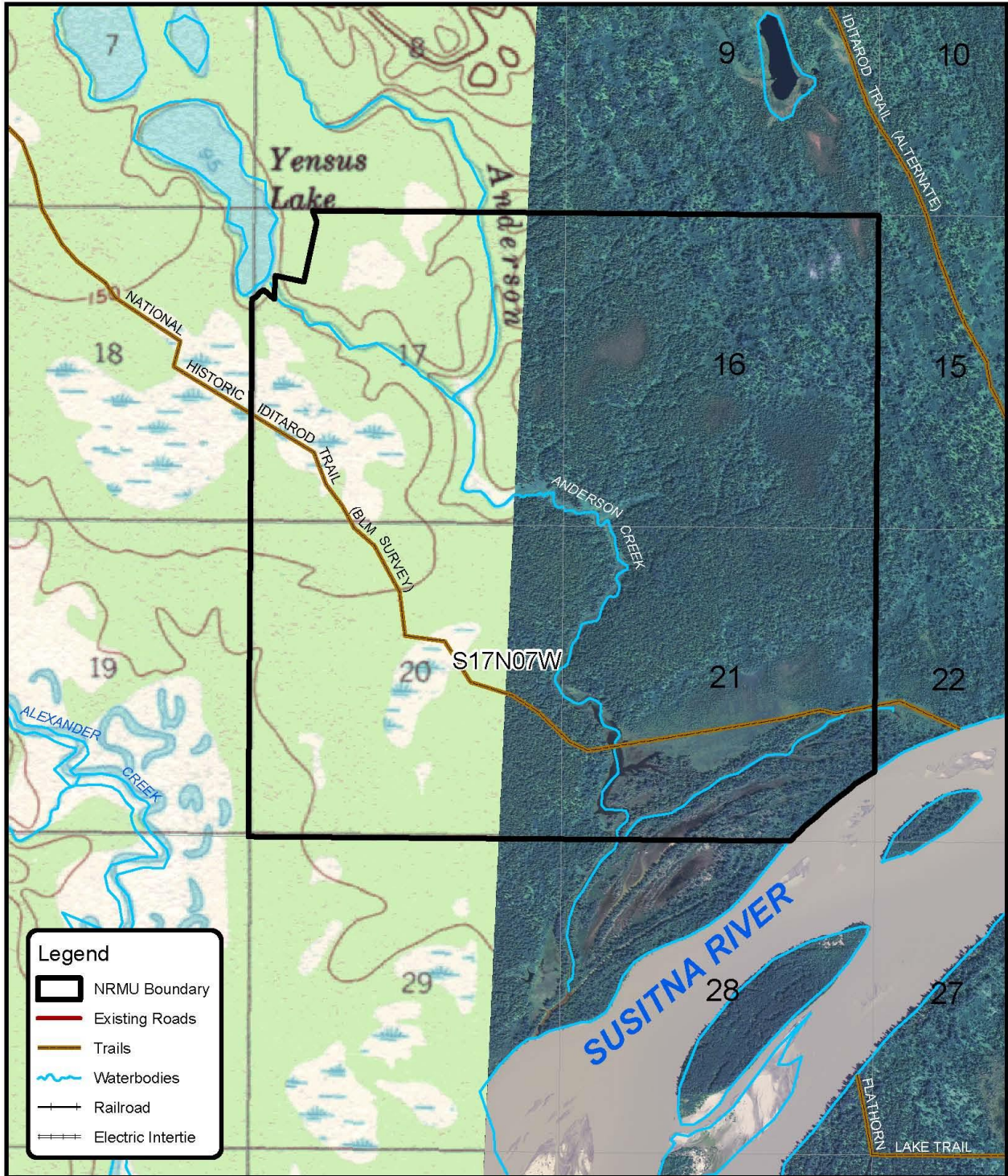
All the comments received affected the plan in one way or another. While not every concern or suggestion could be used or followed, the result of all the comments was the majority of the comments were used to better address concerns and to make the individual unit plans better.

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.

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.

³ U.S. Dept. of Agriculture, Soil Conservation Service, Agriculture Handbook No. 210





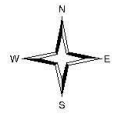
Legend

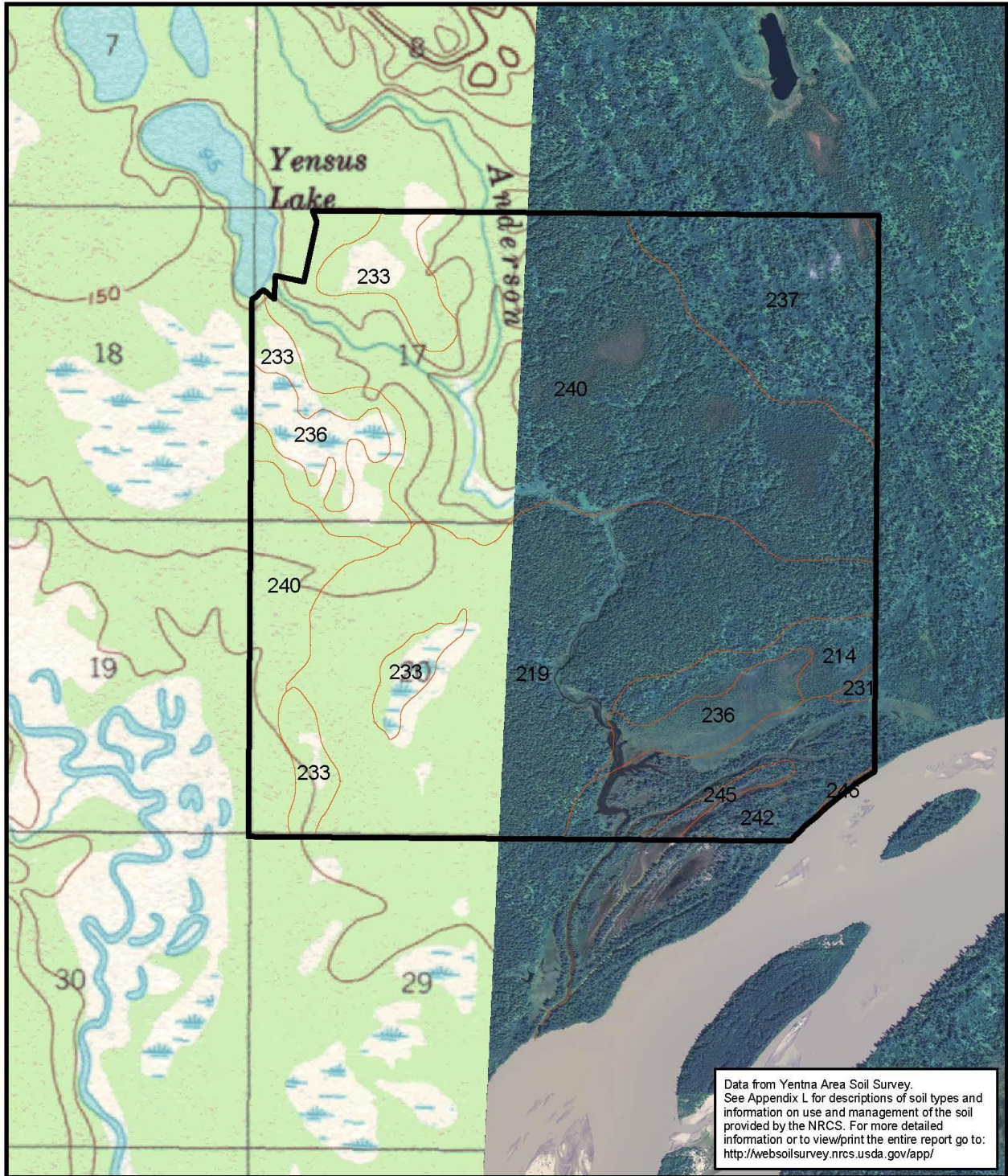
- NRMU Boundary
- Existing Roads
- Trails
- Waterbodies
- Railroad
- Electric Intertie



Anderson Creek NRMU Physical Characteristics

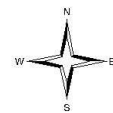
Community Development/LMD April 2010

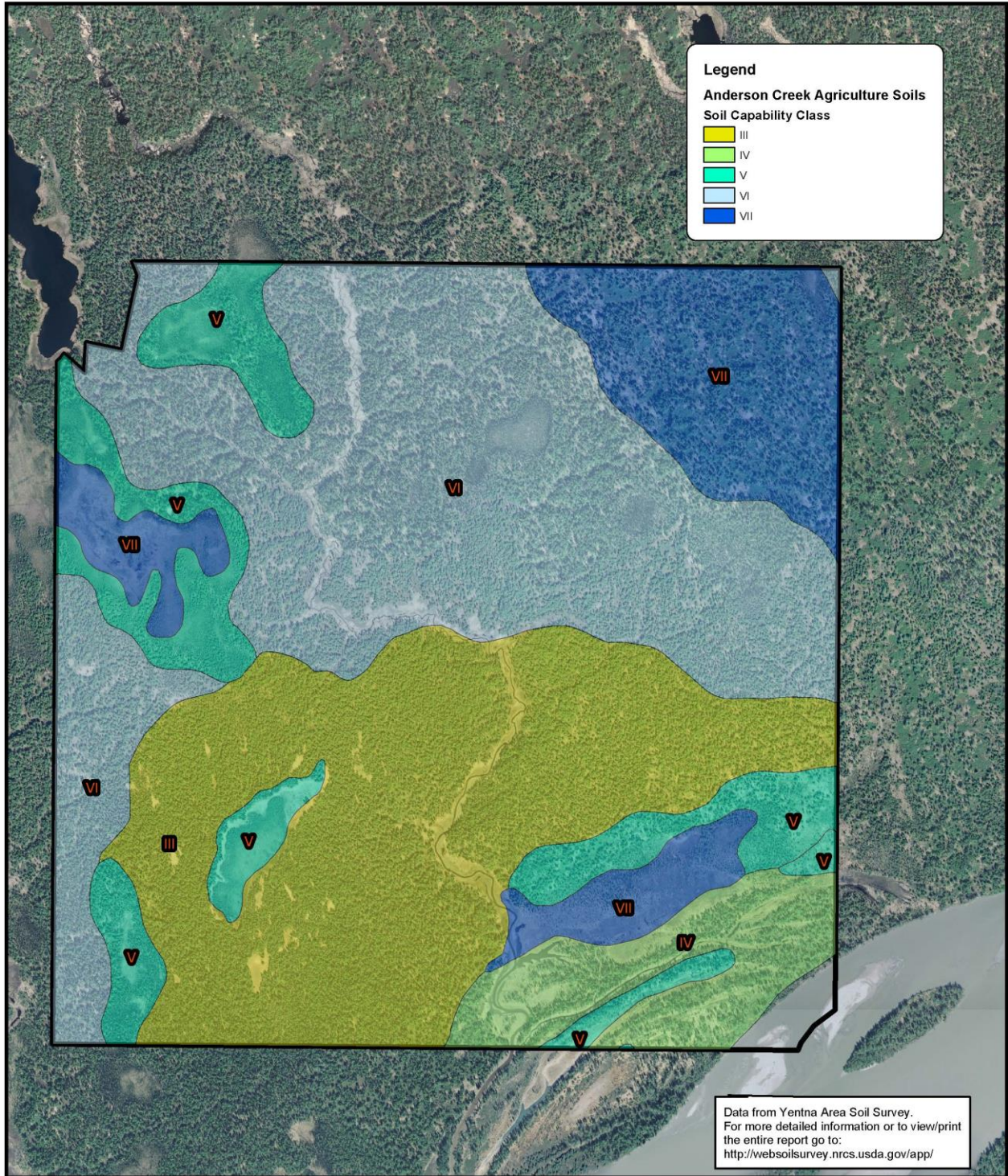




Anderson Creek NRMU Soils

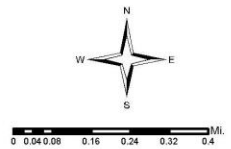
Community Development/LMD April 2010

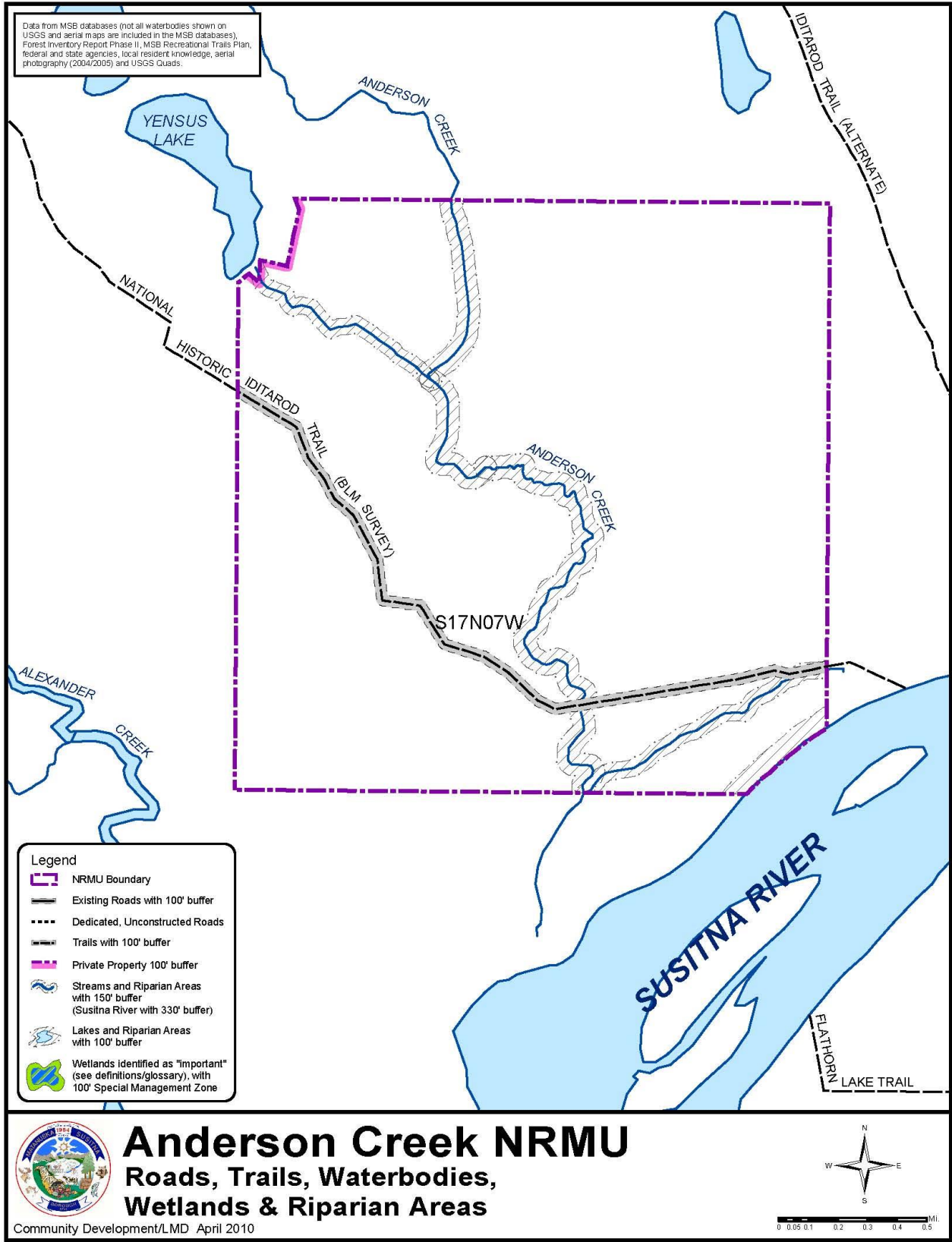


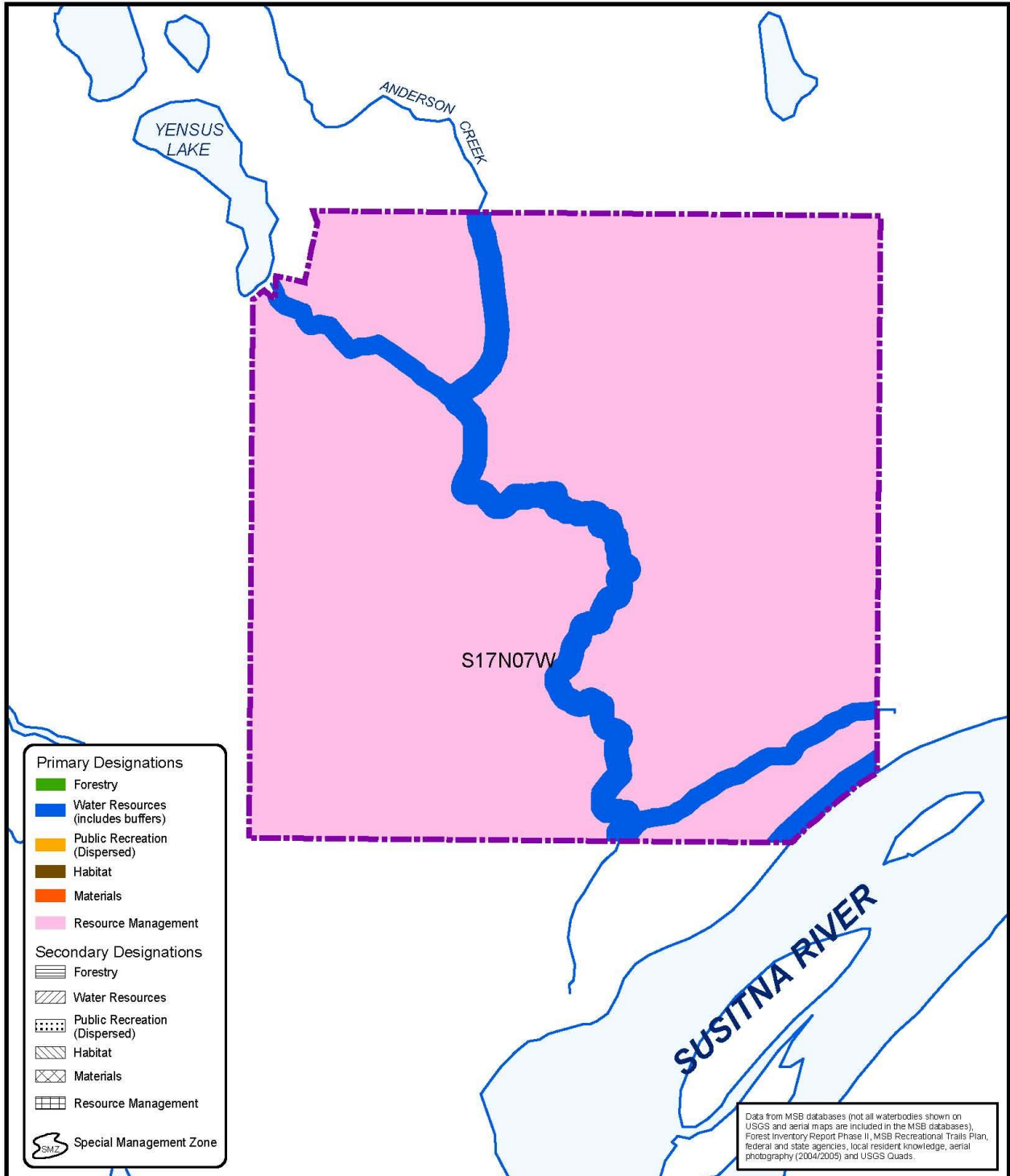


Anderson Creek NRMU Agriculture Soils

Community Development/LMD December 2018

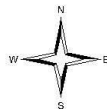






Anderson Creek NRMU Land Use Designations

Community Development/LMD April 2010



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 one mile east of Alexander Creek.

The unit is within the Susitna Lowlands, generally characterized by 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 near the northwest portion of the unit.

Community Council Area

None

Existing Land Use Plans

- Matanuska-Susitna Borough *Recreational Trails Plan* (2016).
- Matanuska-Susitna Borough *Parks, Recreation and Open Space Plan* (2001).

Existing Land Use Classifications

Resource Management and Watershed Lands

Summary of Resources and Uses

Agriculture and Grazing

A review of soil capability classification data, published by the USDA, Natural Resources Conservation Service (<http://websoilsurvey.ncrs.usda.gov/app/>), indicates that there are lands suitable for agricultural development or grazing within the unit.

See the *Soils* maps 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 until 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 Planning Division indicates that there is a strong likelihood that other cultural and historic sites may lay within or close to the unit.

Additional fieldwork 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 was reportedly nesting and raising young in the marsh at the southern end of Yensus Lake in 2009.

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 forest land 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 boundary 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 close to 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 USDA, Natural Resources Conservation Service (<http://websoilsurvey.nrcs.usda.gov/app/>), indicates that there are no known lands with rock, sand, or gravel resources within the unit. Additional field investigations are required to determine if there are commercial quantities of earth materials.

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 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
<i>Primary</i>		
Resource Management	Resource Management Lands	Timber and fire wood sales are permitted, excluding land designated as Water Resources. Material sales are permitted.
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*.
<i>Secondary</i>		
None		

*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 *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, 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 (see definition in *Definitions/Glossary* at the end of this chapter or in Volume III) shall be protected with a 100-foot buffer .

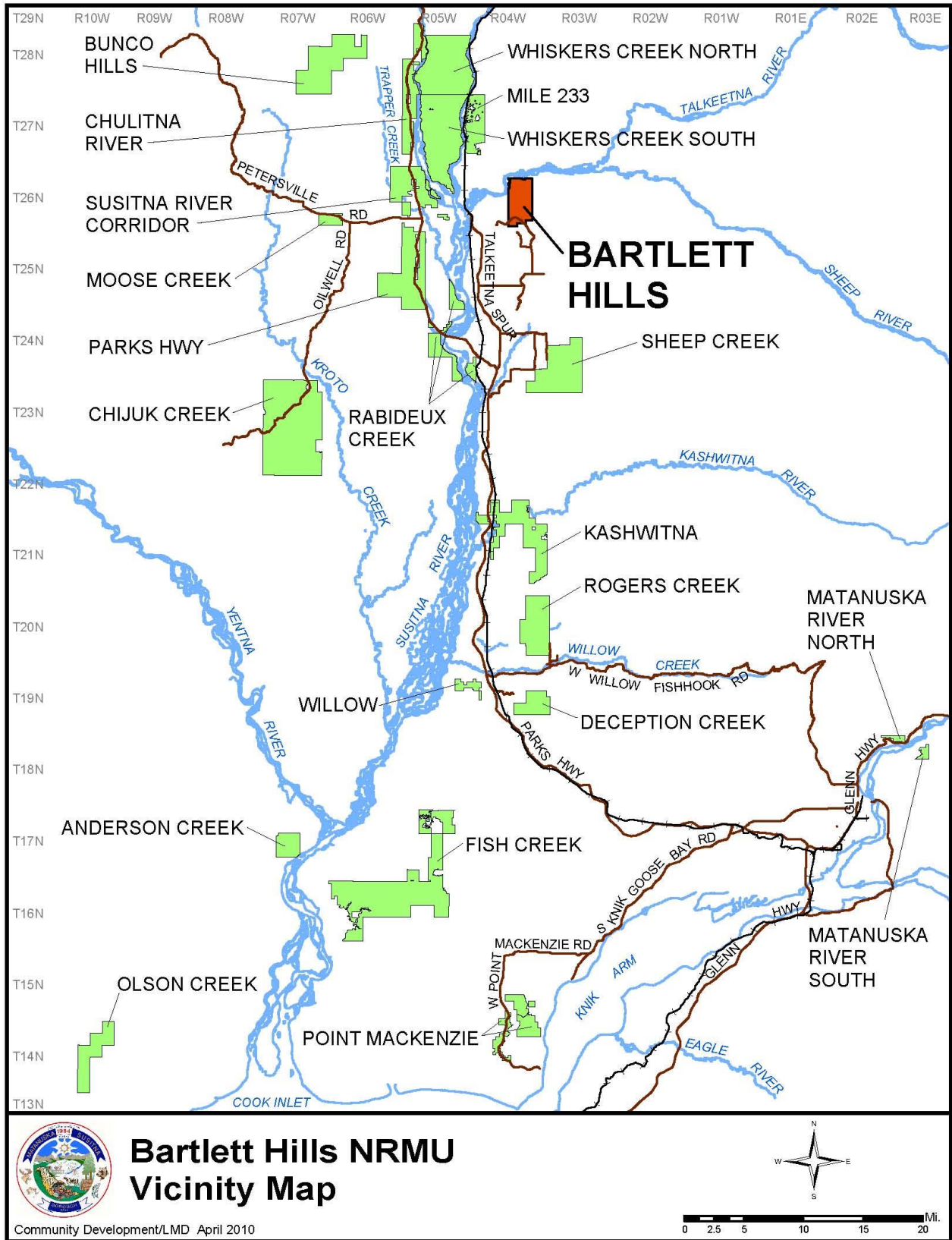
The buffer shall not allow disturbance of the wetland area, but some uses may be allowed. For example, wintertime recreational use is allowed when waterfowl are not present and the ground is sufficiently frozen and snow cover exists to protect the natural vegetation.

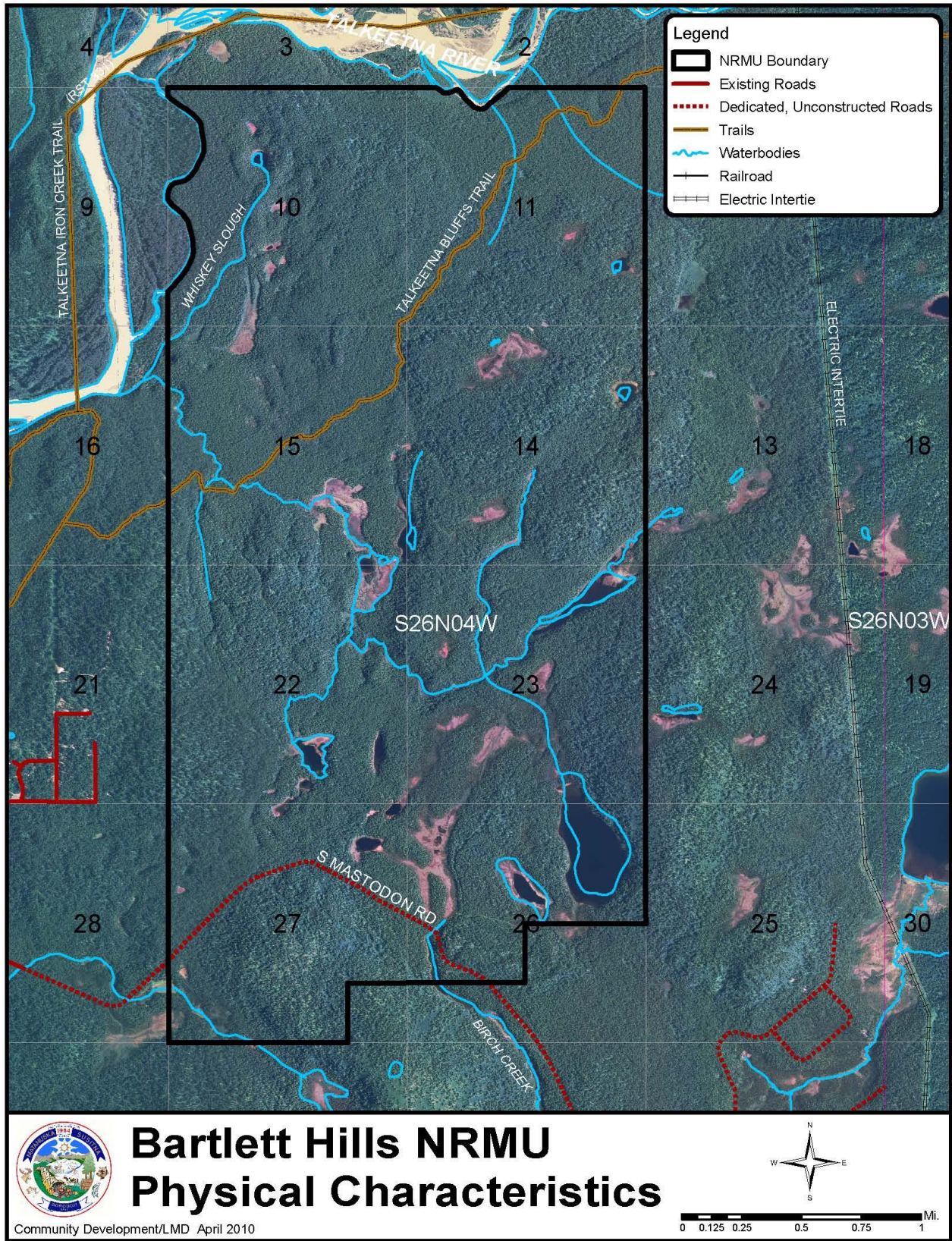
See *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section for waterbodies that shall have buffers and wetlands with a Special Management Zone.

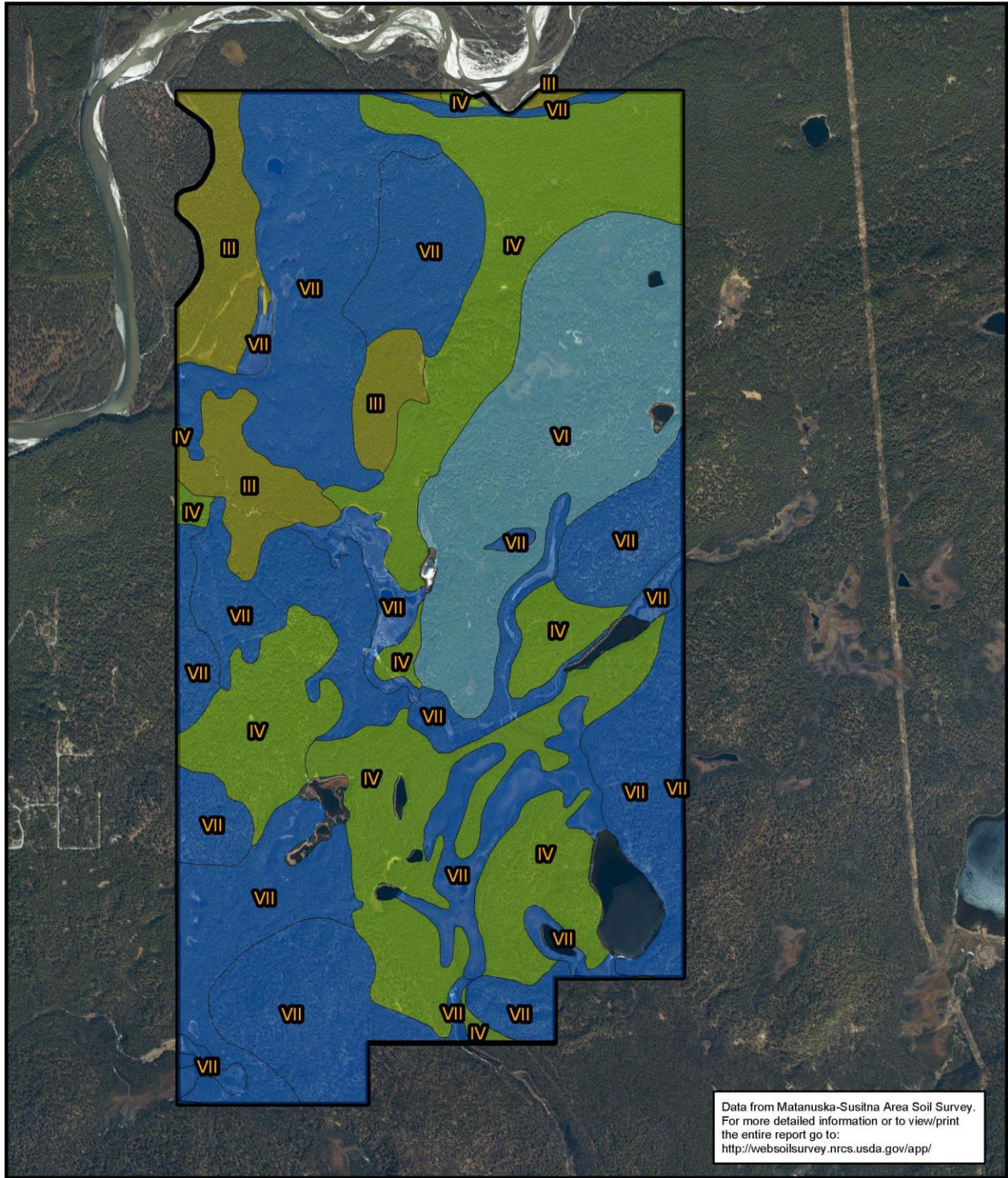
Also, see Volume I, Chapter 2, *Buffers and Special Management Zones* for additional information.

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.

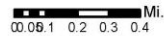


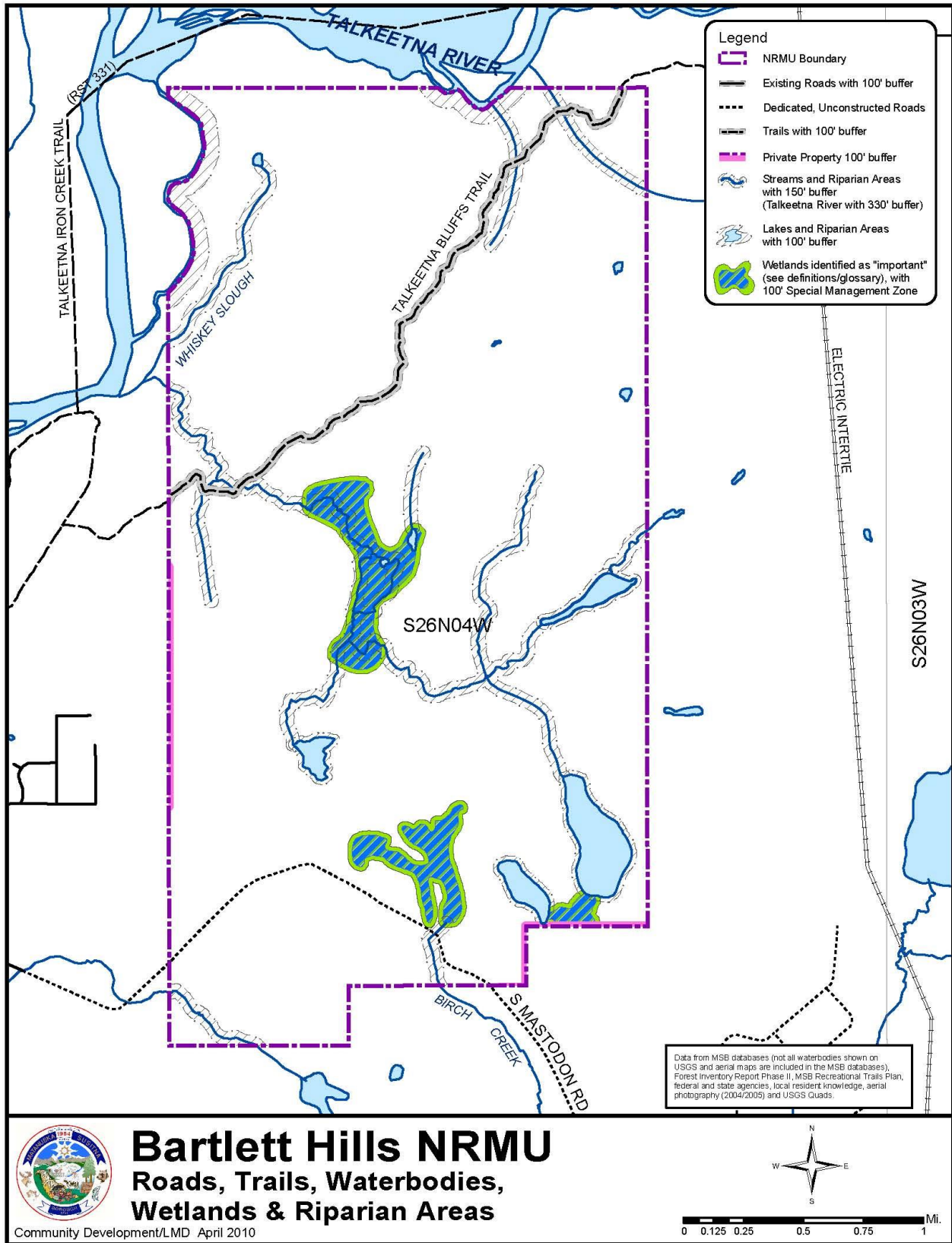


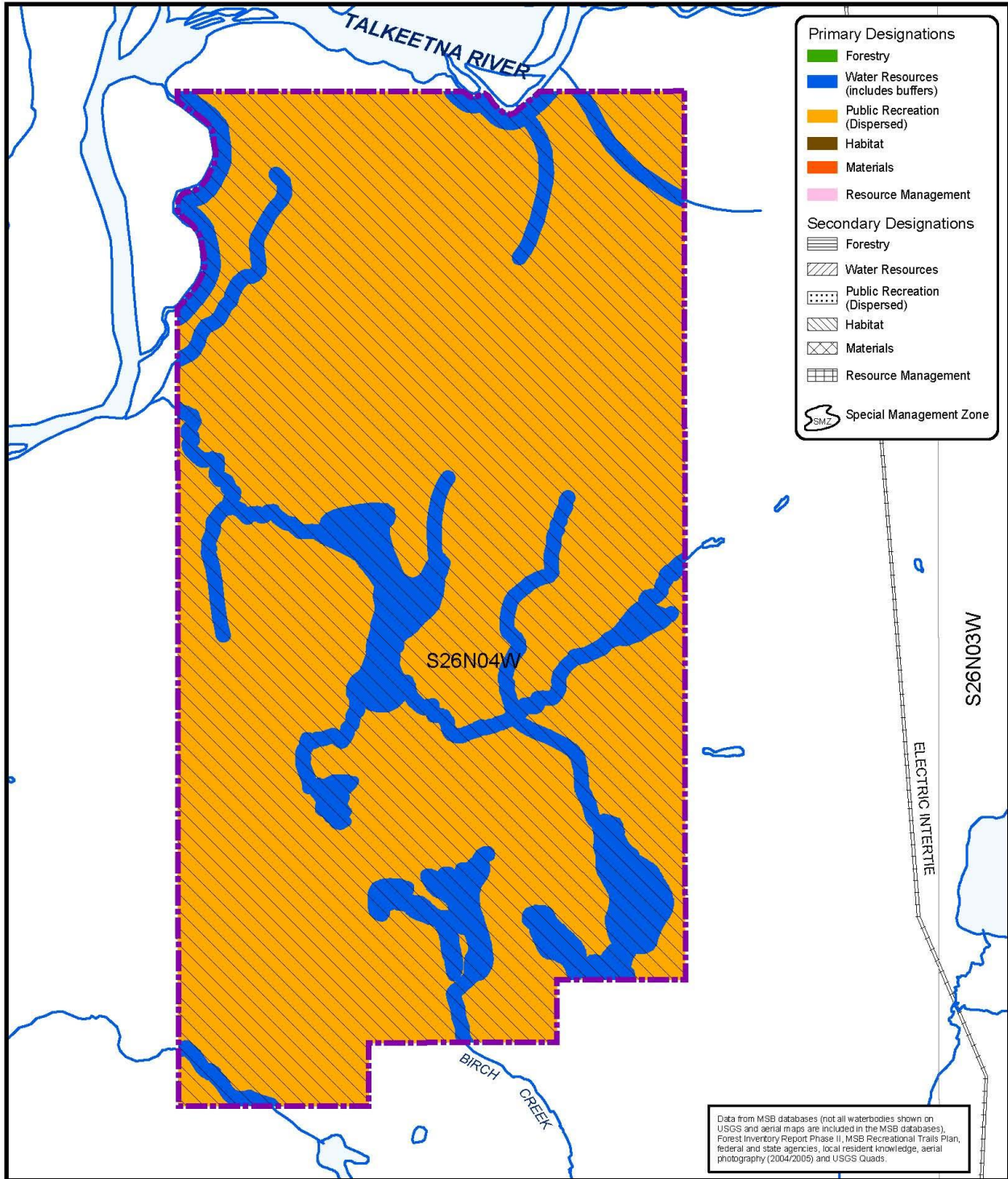


Bartlett Hills NRMU Soils

Community Development/LMD December 2018

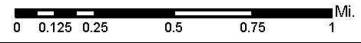






Bartlett Hills NRMU Land Use Designations

Community Development/LMD April 2010



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

Talkeetna Community Council

Existing Land Use Plans

- Matanuska-Susitna Borough *Recreational Trails Plan* (2016).
- Matanuska-Susitna Borough *Parks, Recreation and Open Space Plan* (2001).
- 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

Public Recreation and Watershed Lands

Summary of Resources and Uses

Agriculture and Grazing

A review of soil capability classifications, published by the USDA, Natural Resources Conservation Service (<http://websoilsurvey.ncrs.usda.gov/app/>), indicates that there are lands suitable for agricultural development or grazing within the unit.

See the *Soils* maps 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, 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 to 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 4,255 acres (88% of the unit) of Commercial Forest Land.

See *Commercial 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 that would attract significant numbers of tourists 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 USDA, Natural Resources Conservation Service (<http://websoilsurvey.nrcs.usda.gov/app/>), indicates that there are no known lands with commercial quantities of rock, sand, or gravel resources within the unit. Additional field investigation is required to determine if there are commercial quantities of earth materials.

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
<i>Primary</i>		
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. 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*.
<i>Secondary</i>		
Habitat		Entire unit

*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 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 riparian areas will be protected through the use of undisturbed natural vegetation buffers.

All wetlands (see definition in *Definitions/Glossary* at the end of this chapter or in Volume III) shall be protected with a 100-foot buffer. The buffer shall not allow disturbance of the wetland area, but some uses may be allowed. For example, wintertime 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 should 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.

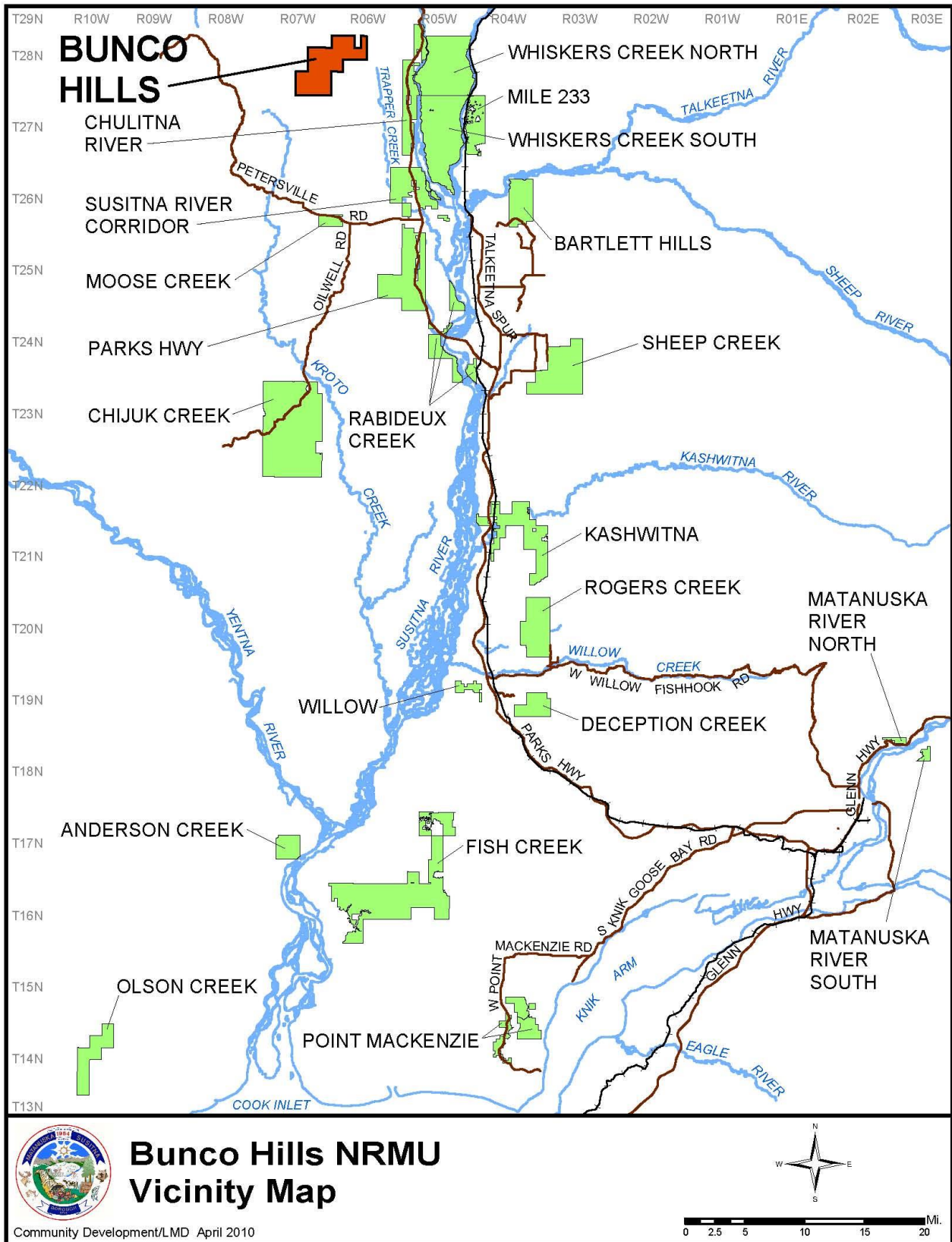
Also, see Volume I, Chapter 2, *Buffers and Special Management Zones* for more information.

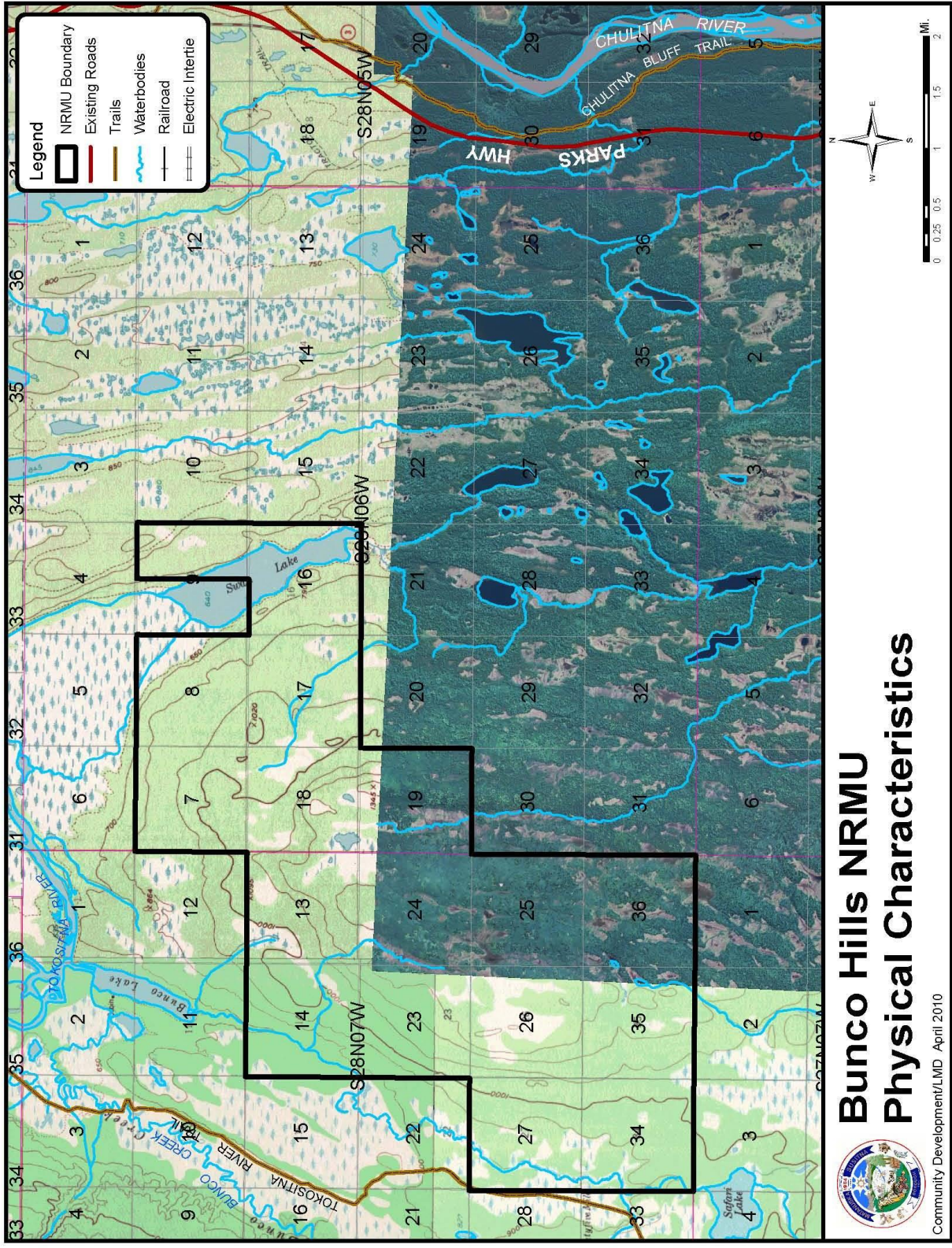
Forest Trust

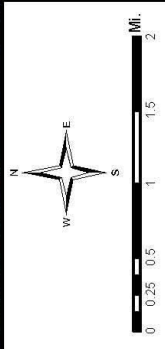
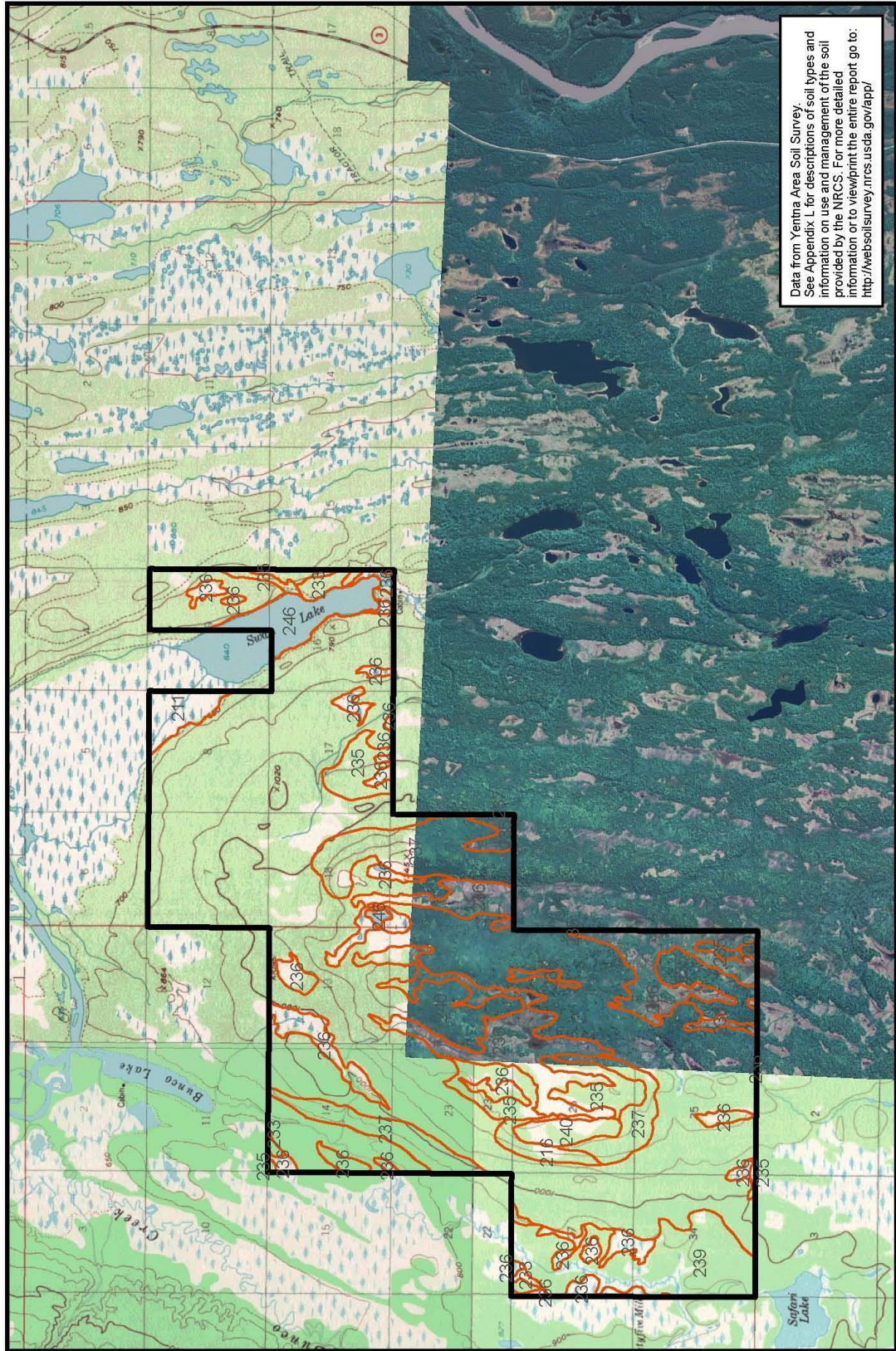
Because there will not be any timber harvest in the unit, the unit shall not be designated as a “forest trust” to be managed by a local board as stated in the Talkeetna Comprehensive Plan. However, the Talkeetna Community Council, or a committee or non-profit organization endorsed by the Community Council 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



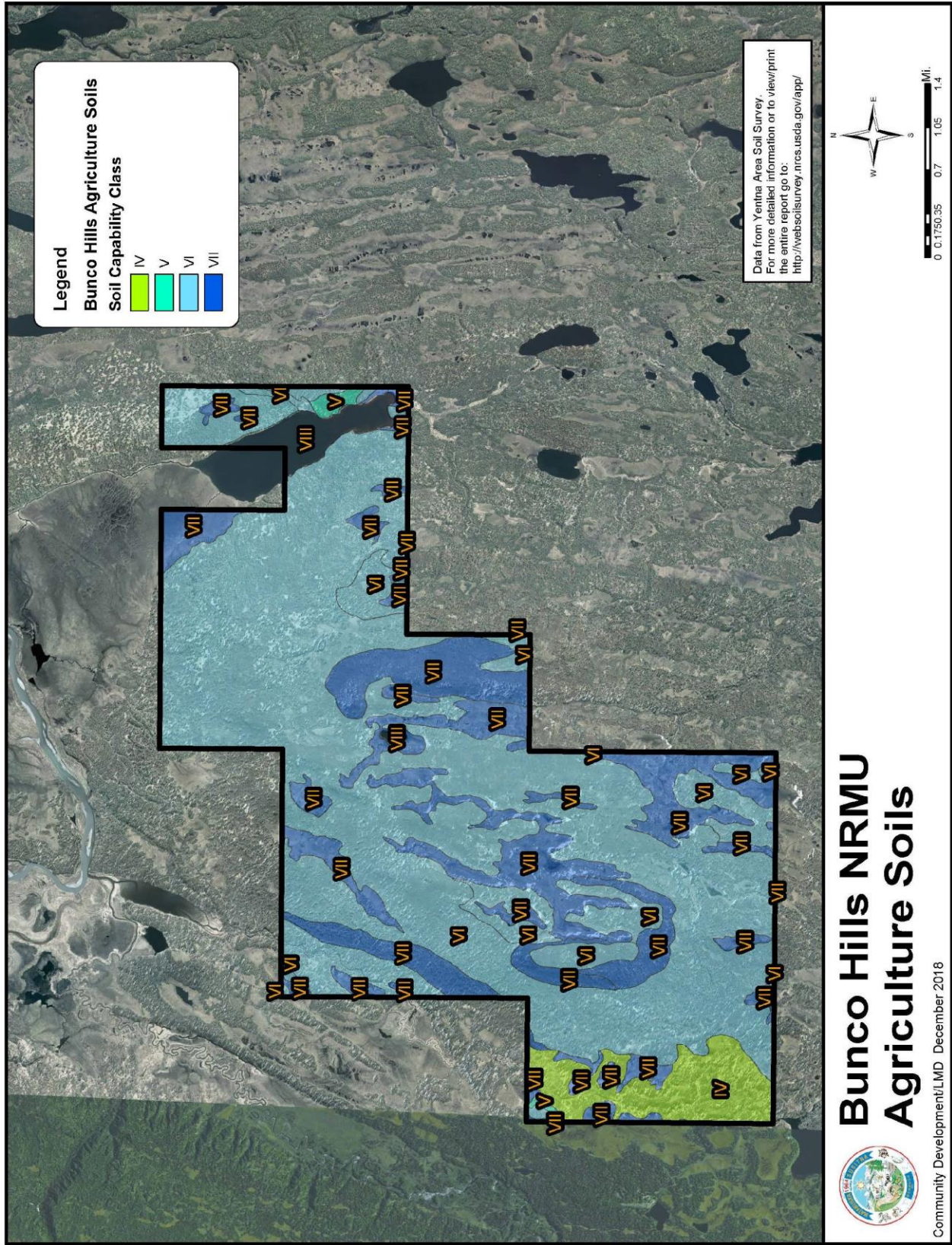


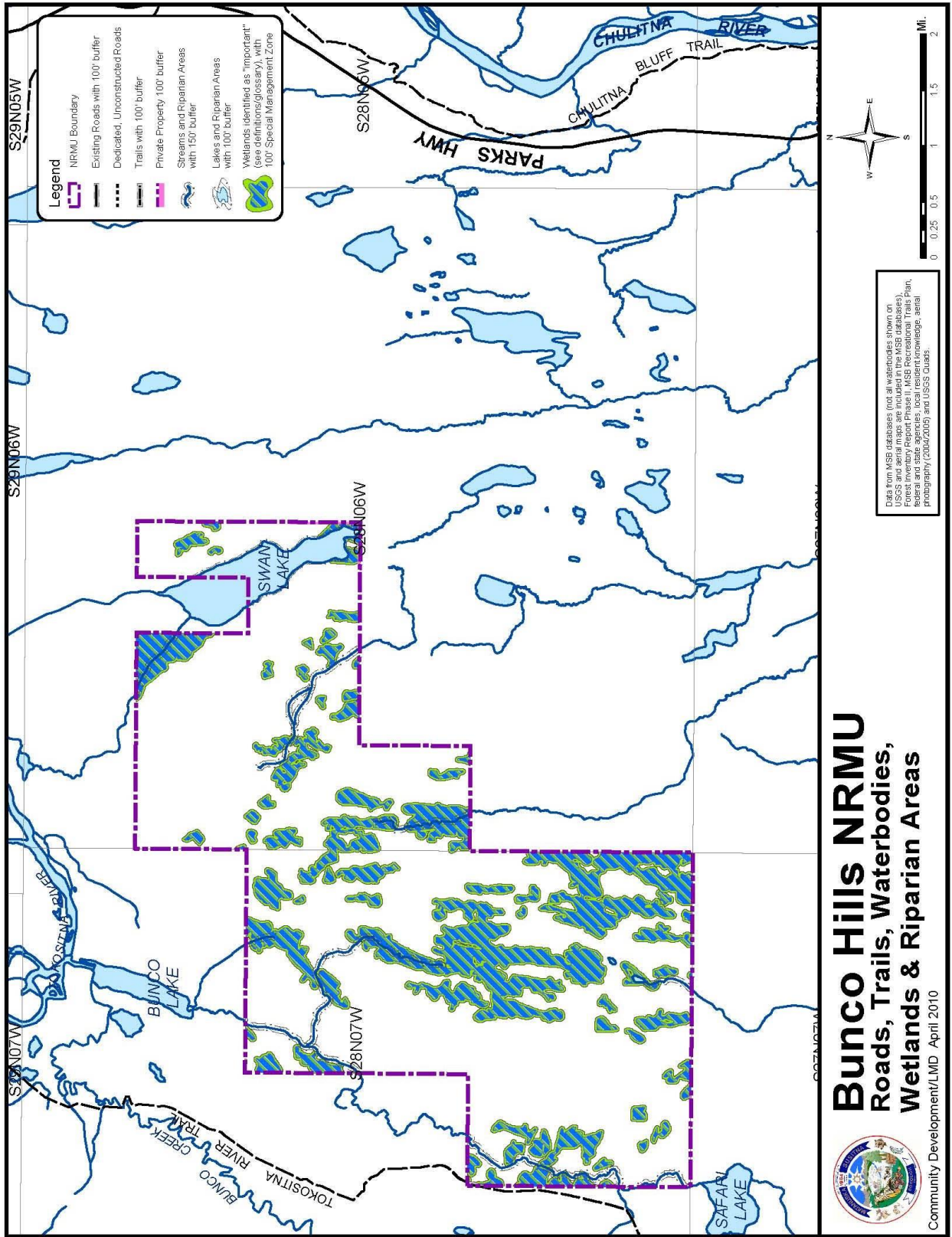


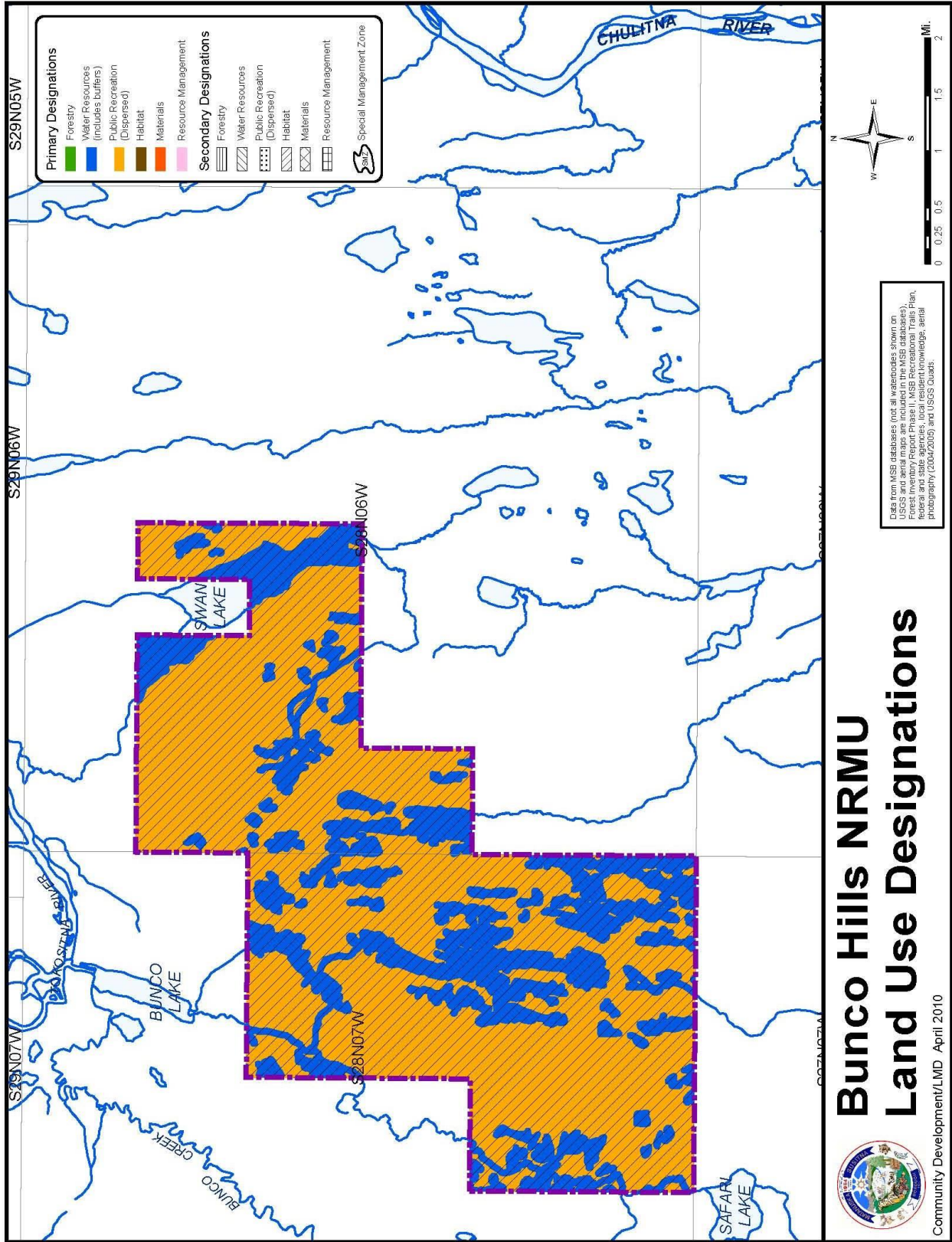
Bunco Hills NRMU Soils



Community Development/LMD April 2010







Bunco Hills NRMU Land Use Designations



Community Development/LMD April 2010

BUNCO HILLS

Natural Resource Management Unit

General Information:

The Bunco Hills Natural Resource Management Unit totals about 10,450 acres and is located approximately five to seven miles west of the Parks Highway and approximately 10 miles north and east of the Petersville Road. Bunco Lake is one 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 is located approximately 10-miles to the northeast.

The physical characteristics of the area are 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 bedrock.

Borough Tax Maps

Petersville 2, 3, 14, and 15

Current Land Use

Various general dispersed public recreation activities. The area is a major wintertime recreation destination popular with snowmachiners.

Surrounding Land Use

The surrounding land is owned by the state with some scattered parcels of private land surrounding the unit that 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

- Matanuska-Susitna Borough, *Recreational Trails Plan* (2016).
- Matanuska-Susitna Borough, Parks, *Recreation and Open Space Plan* (2001).

Existing Land Use Classifications

Public Recreation and Watershed Lands

Summary of Resources and Uses

Agriculture and Grazing

A review of soil capability classifications, published by the USDA, Natural Resources Conservation Service (<http://websoilsurvey.nrcs.usda.gov/app/>), indicates that there are lands suitable for agricultural development or grazing within the unit.

Also, see the *Soils* maps 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 streams 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 fieldwork 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 conducted in 2007 found some commercial quality timber in the unit. However, the area has very limited potential for any commercial forestry uses because of the unit's 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 unit's location, it is on one of the flight seeing flight lines to and from Denali National Park and Preserve, specifically the Denali 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.

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 USDA, Natural Resources Conservation Service (<http://websoilsurvey.nrcs.usda.gov/app/>), does not indicate commercial quantities of rock, sand, or gravel resources within the unit. Shallow bedrock could present a usable source for earth materials. Additional field investigation is required to determine if usable volumes of earth materials are present.

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, and 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
<i>Primary</i>		
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.
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.*
<i>Secondary</i>		
Habitat		Entire unit. Important wildlife habitat areas are also protected with the (primary) water resources designation.

*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 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 shall be protected through the use of undisturbed natural vegetation buffers.

All wetlands (see definition in *Definitions/Glossary* at the end of this chapter or in Volume III) shall be protected with a 100-foot buffer. The buffer shall not allow disturbance of the wetland area, but some uses may be allowed. For example, wintertime 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, wetland with a Special Management Zone, waterbodies and trails with buffers.

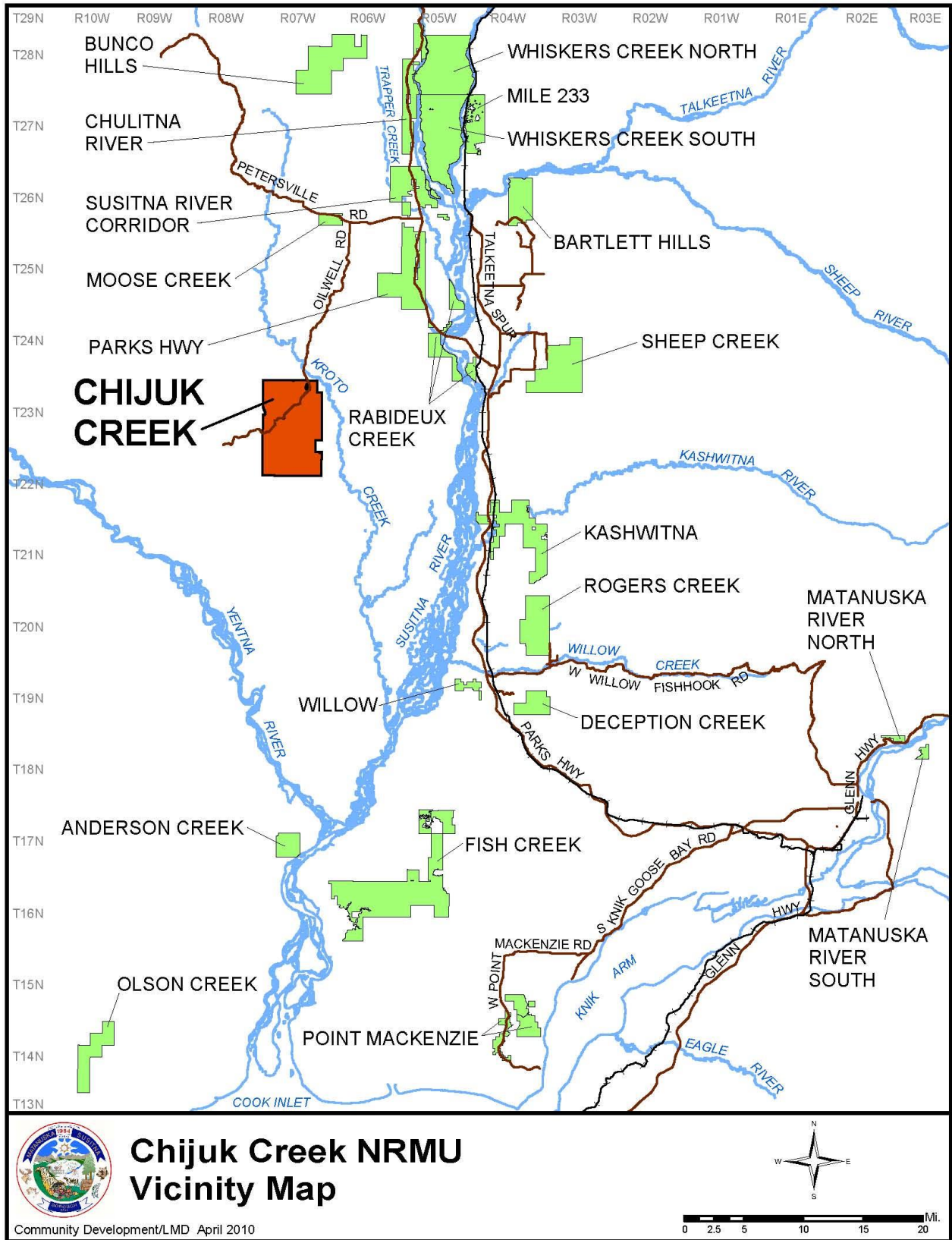
Also, see Volume I, Chapter 2, *Buffers and Special Management Zones*, for additional information.

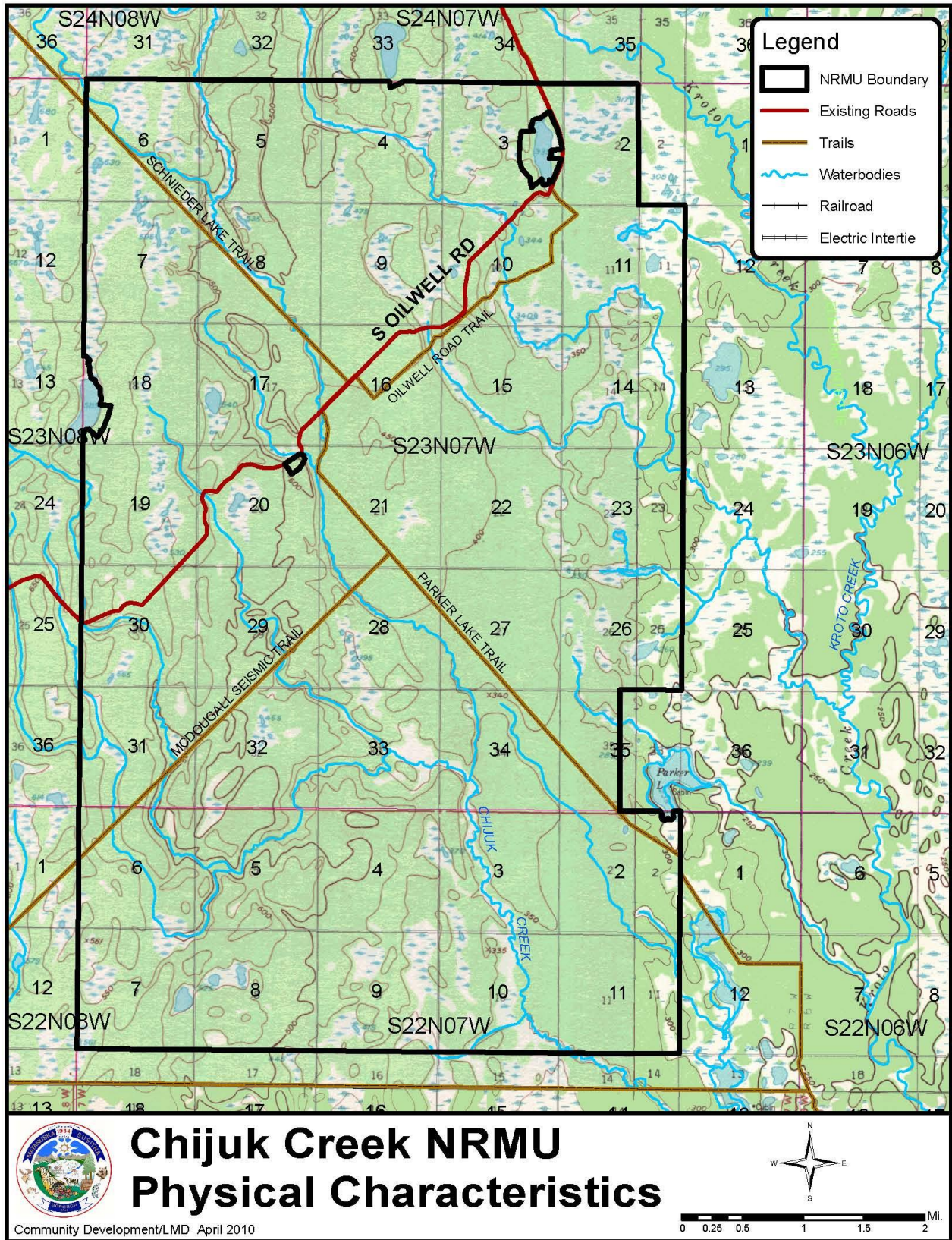
Other Uses

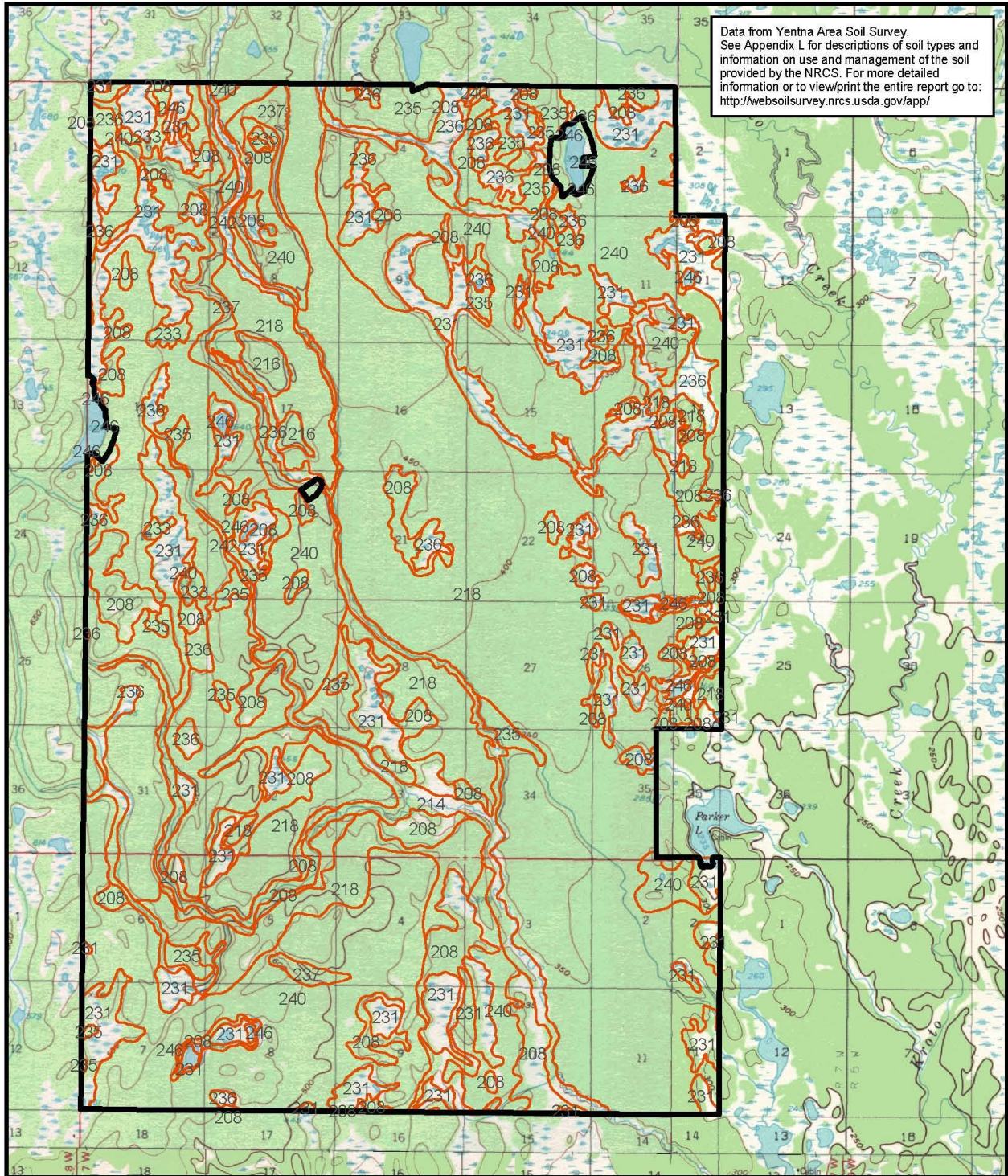
No additional unit-specific guidelines are needed for this unit. See Volume I, Chapters 2 and 3 for area-wide guidelines that apply to all Natural Resource Management Units.

Other Recommendations

Because of the unit's 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.







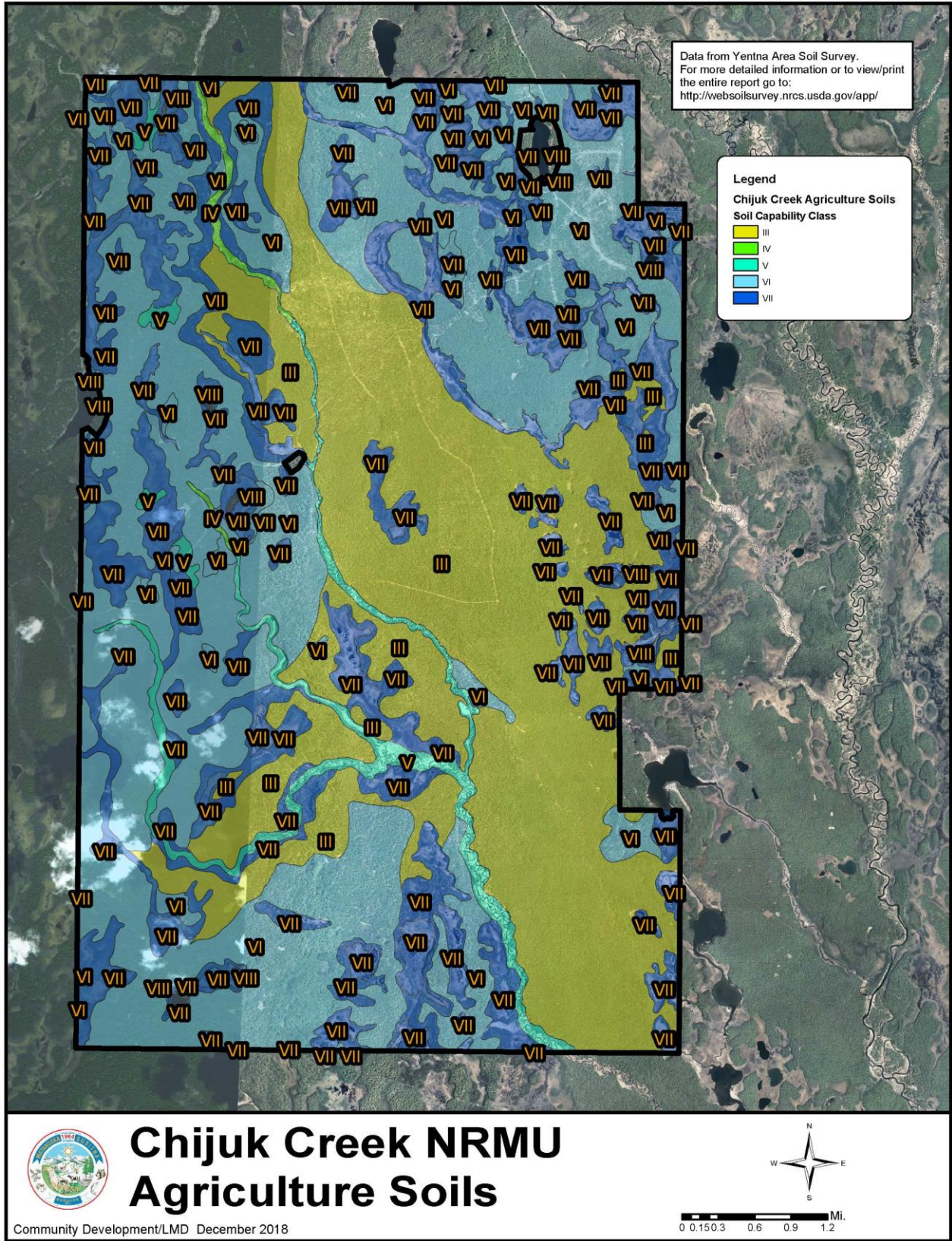
Data from Yentna Area Soil Survey.
 See Appendix L for descriptions of soil types and
 information on use and management of the soil
 provided by the NRCS. For more detailed
 information or to view/print the entire report go to:
<http://websoilsurvey.nrcs.usda.gov/app/>

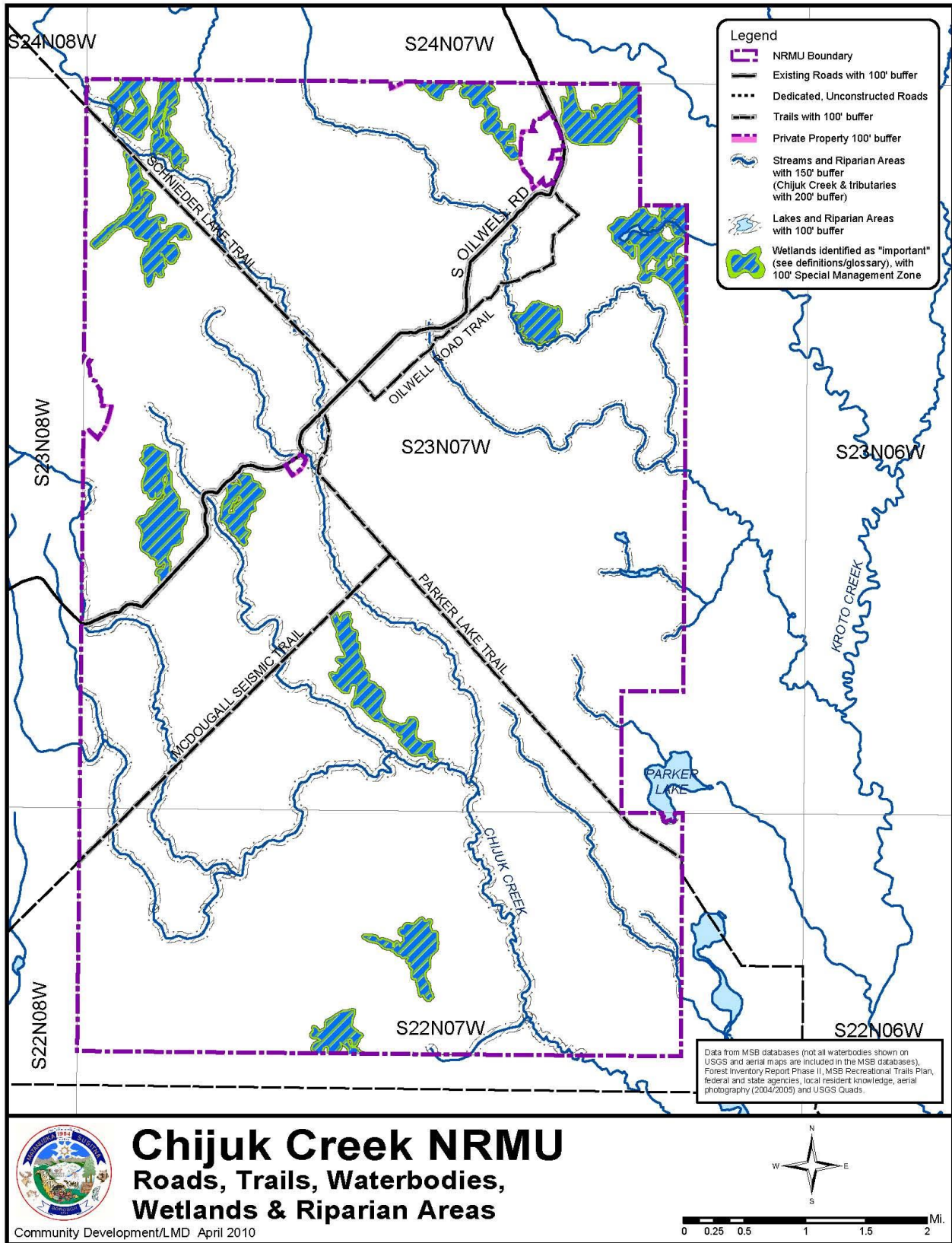


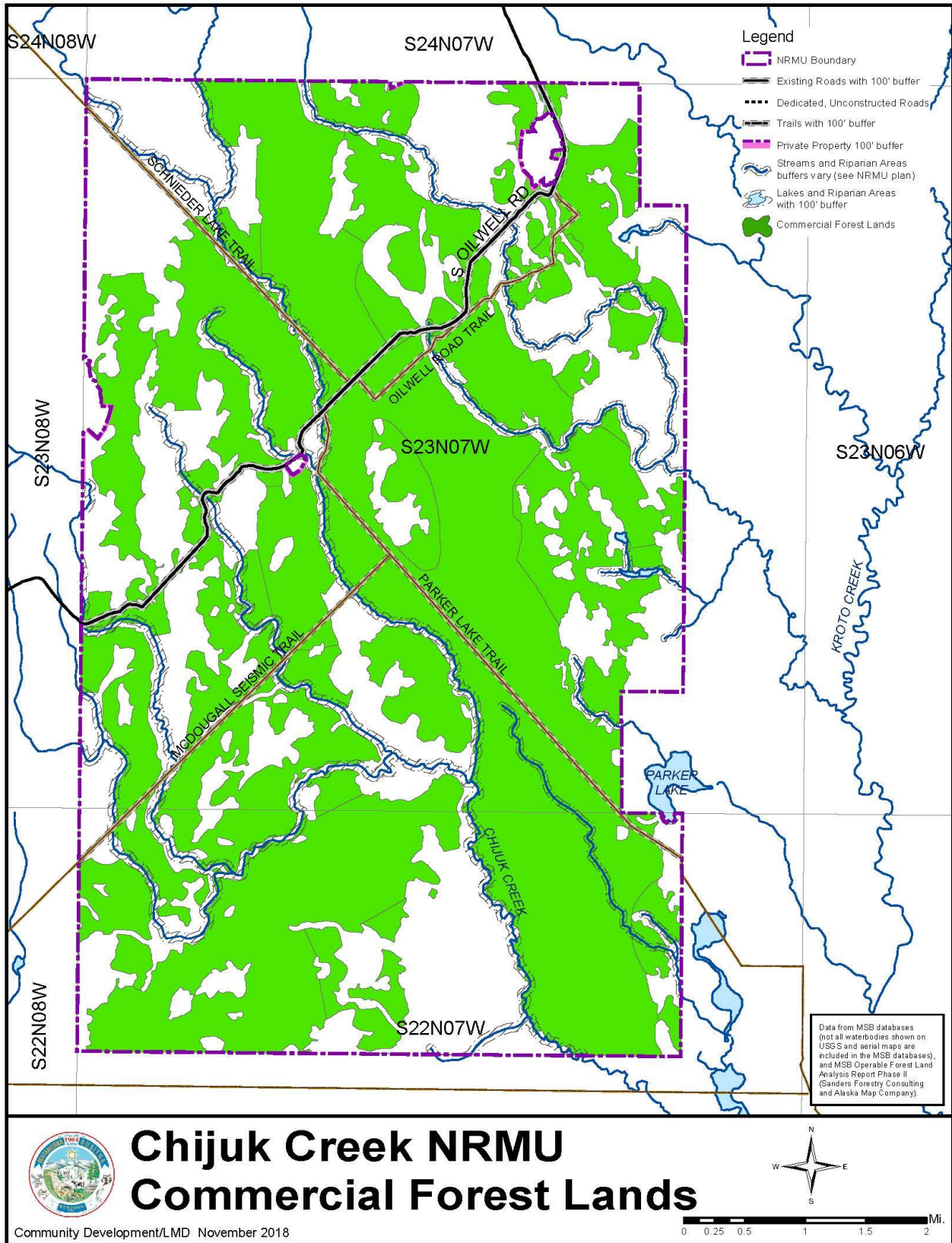
Chijuk Creek NRMU Soils

Community Development/LMD April 2010



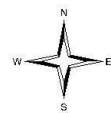


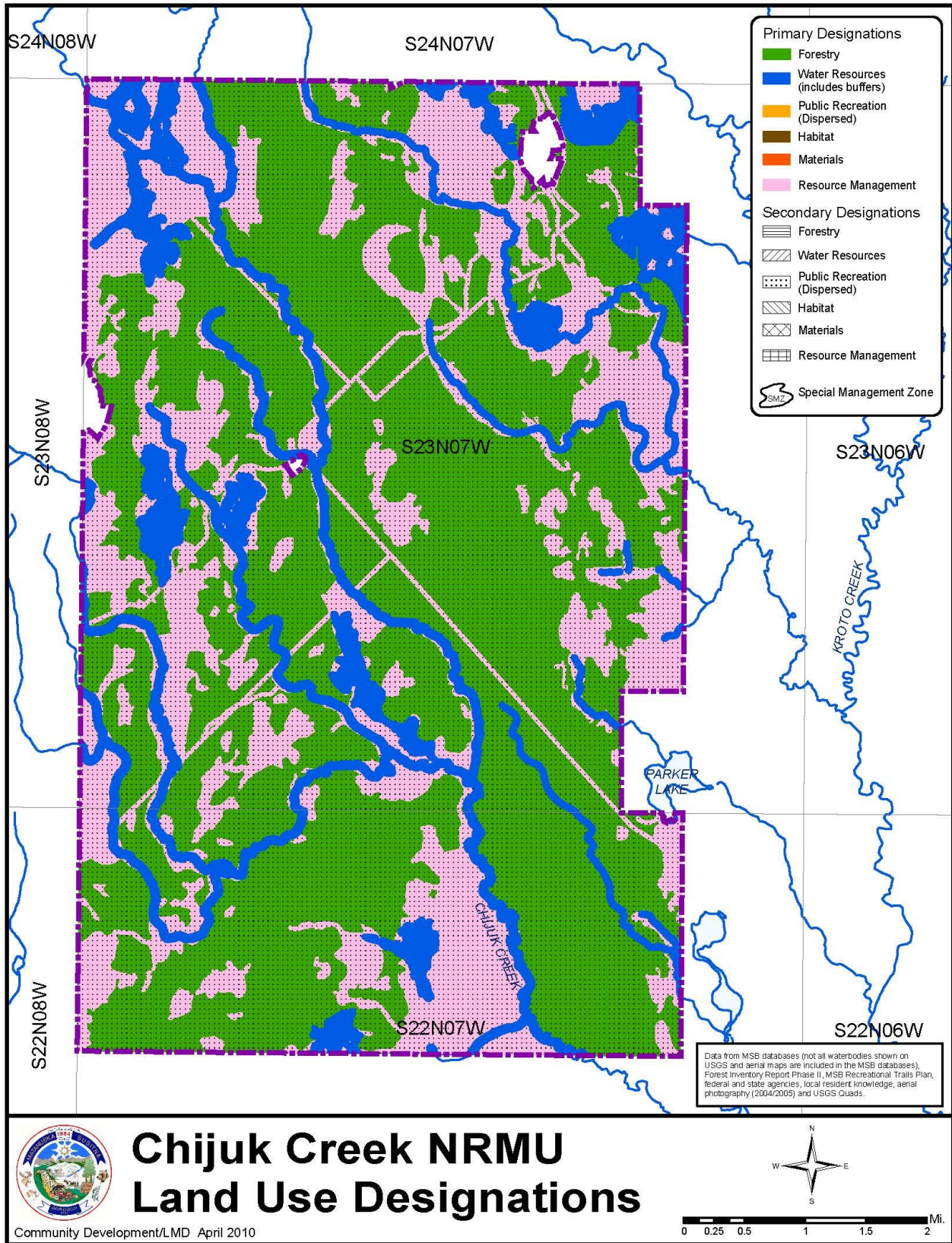




Chijuk Creek NRMU Commercial Forest Lands

Community Development/LMD November 2018





CHIJKUK 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 that 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 north 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

- Matanuska-Susitna Borough, *Recreational Trails Plan* (2016).
- Matanuska-Susitna Borough, *Parks, Recreation and Open Space Plan* (2001).

Existing Land Use Classification

Forest Management, Resource Management and Watershed Lands

Summary of Resources and Uses

Agriculture and Grazing

A review of soil capability classifications, published by the USDA, Natural Resources Conservation Service (<http://websoilsurvey.nrcs.usda.gov/app/>), indicates that there are lands suitable for agricultural development or grazing within the unit.

See *Soils* maps 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 fieldwork 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 nesting area, 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 17,413 acres (70% of the unit) of Commercial Forest Land .

Also, see *Commercial 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, ATVs, 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. Additional field investigations are required to determine if commercial quantities of earth materials 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. This unit includes one of the largest contiguous blocks of soils suitable for agriculture and should be managed to protect the long-term agricultural capability of the unit.

Land Use Designations

Chjuk Creek		
Designation	Classification	Management Intent
<i>Primary</i>		
Forestry	Forest Management Lands	Only those areas determined to be commercial 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.
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.*
<i>Secondary</i>		
Agriculture		Protect the portion of the unit underlain by Class III and IV soils so that its agricultural capability is not degraded in the long-term.
Public Recreation-Dispersed		Entire unit

*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 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, rivers, and riparian areas will be protected through the use of undisturbed natural vegetation buffers.

Chjuk 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 (see definition in *Definitions/Glossary* at the end of this chapter or in Volume III) shall be protected with a 100-foot buffer. The buffer shall not allow disturbance of the wetland area, but

some uses may be allowed. For example, wintertime 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

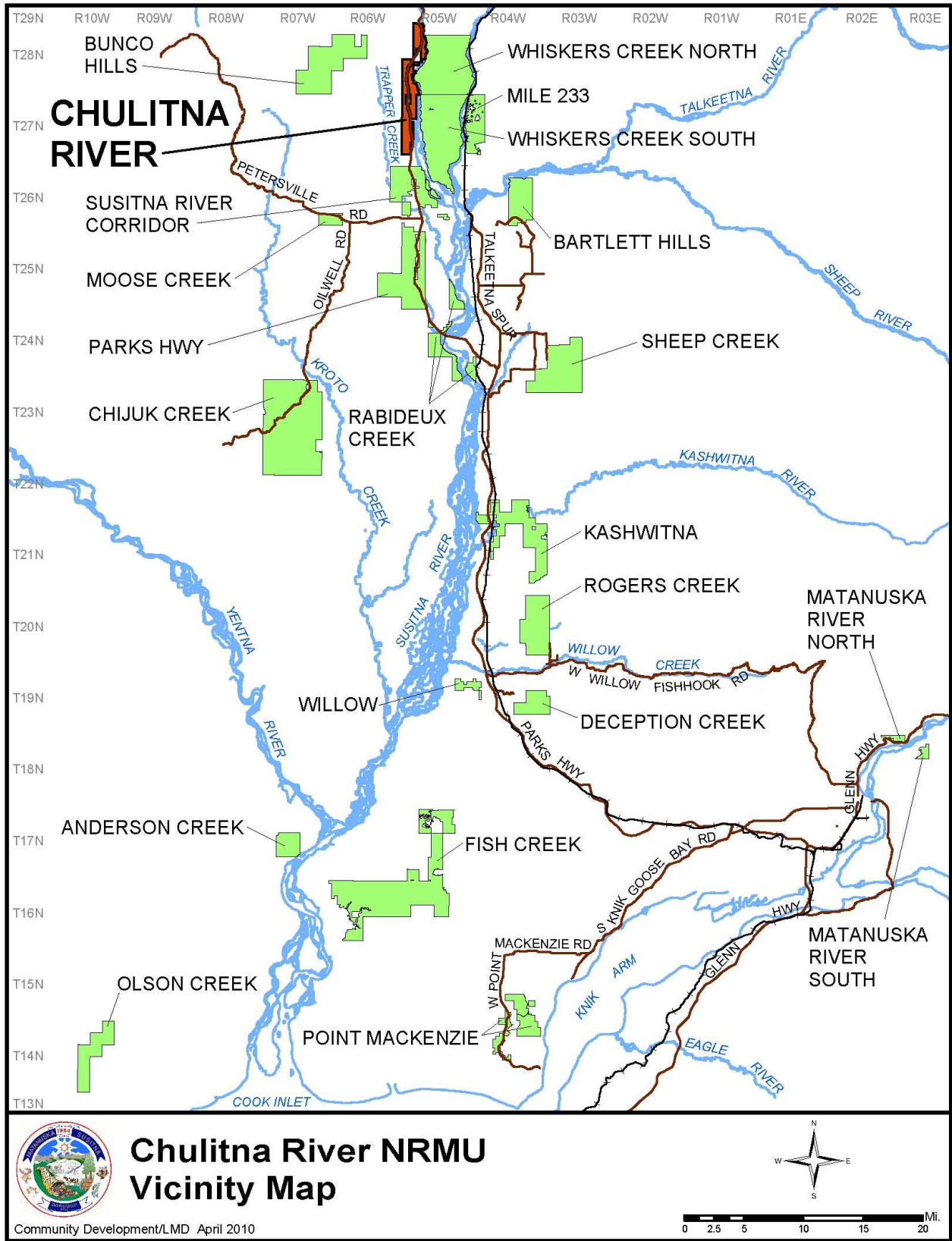
This unit contains the highest quantity and value birch and white spruce within all the Natural Resource Management Units with the best potential for economic return to the borough and the harvester in the form of value added and some pulp products. The area is fairly remote and does not have any other outstanding natural resource values, although a variety of multiple use activities including dispersed public recreation occurs in the unit.

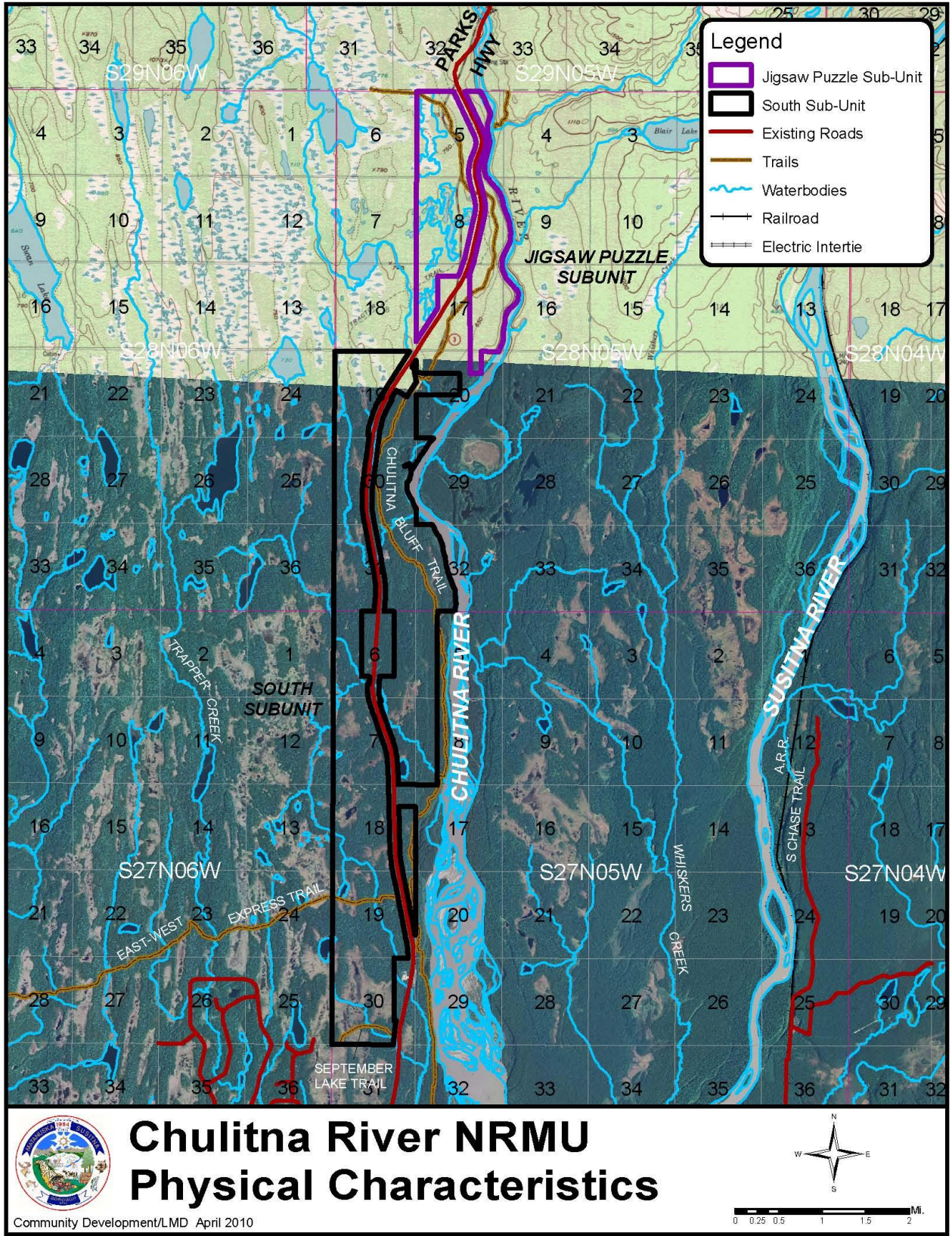
Timber harvests should occur in this unit in order to develop a multi-aged forest and healthy forest as soon as practical. Any type of timber harvest technique and timber harvest unit size may be utilized on those lands designated and classified for forest management. Harvest unit layout should be coordinated with the Alaska Department of Fish and Game to enhance wildlife habitat where practical and feasible.

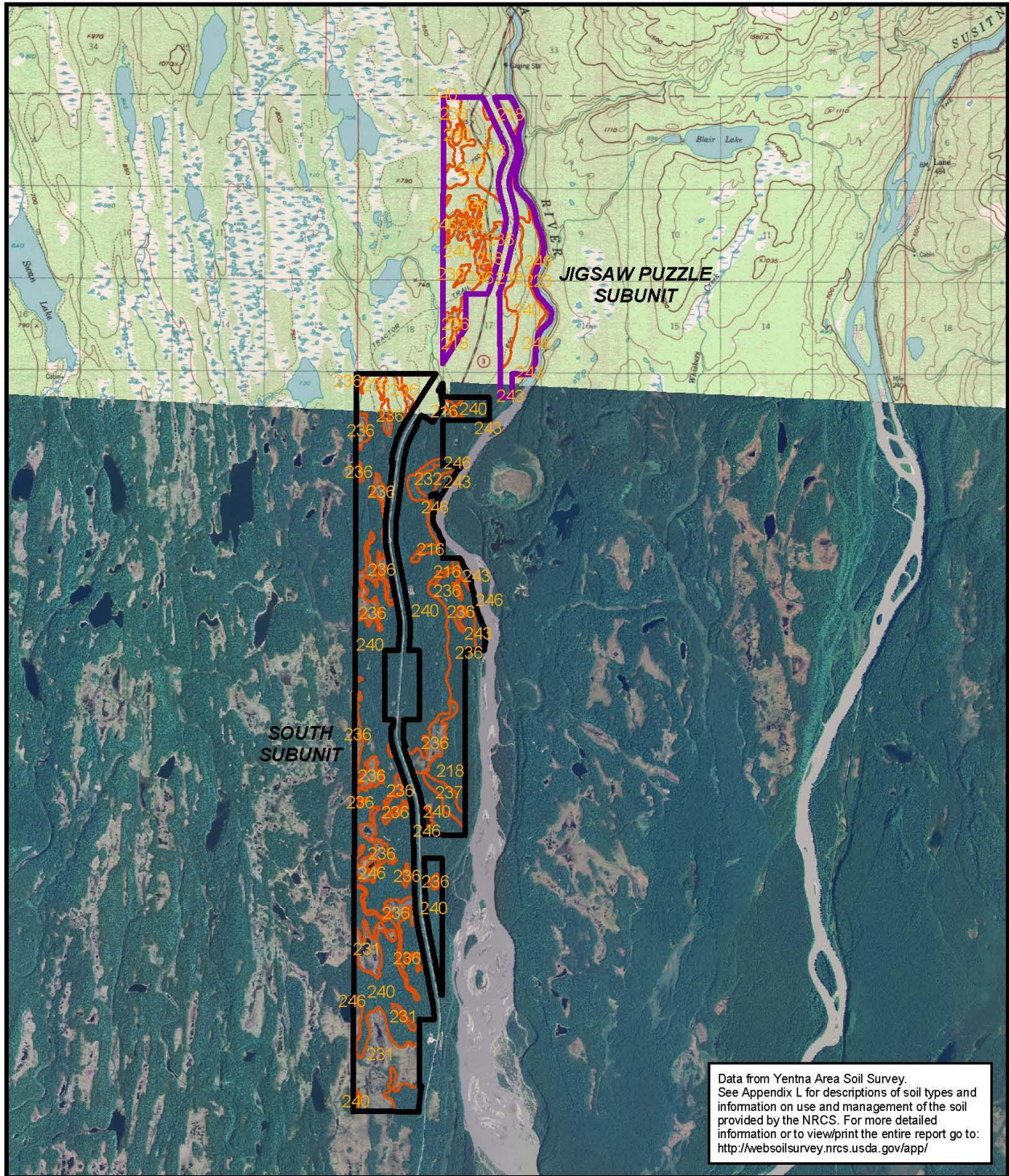
Harvest units and timber harvest activities shall also recognize the areas recreational activities.

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.

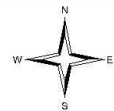


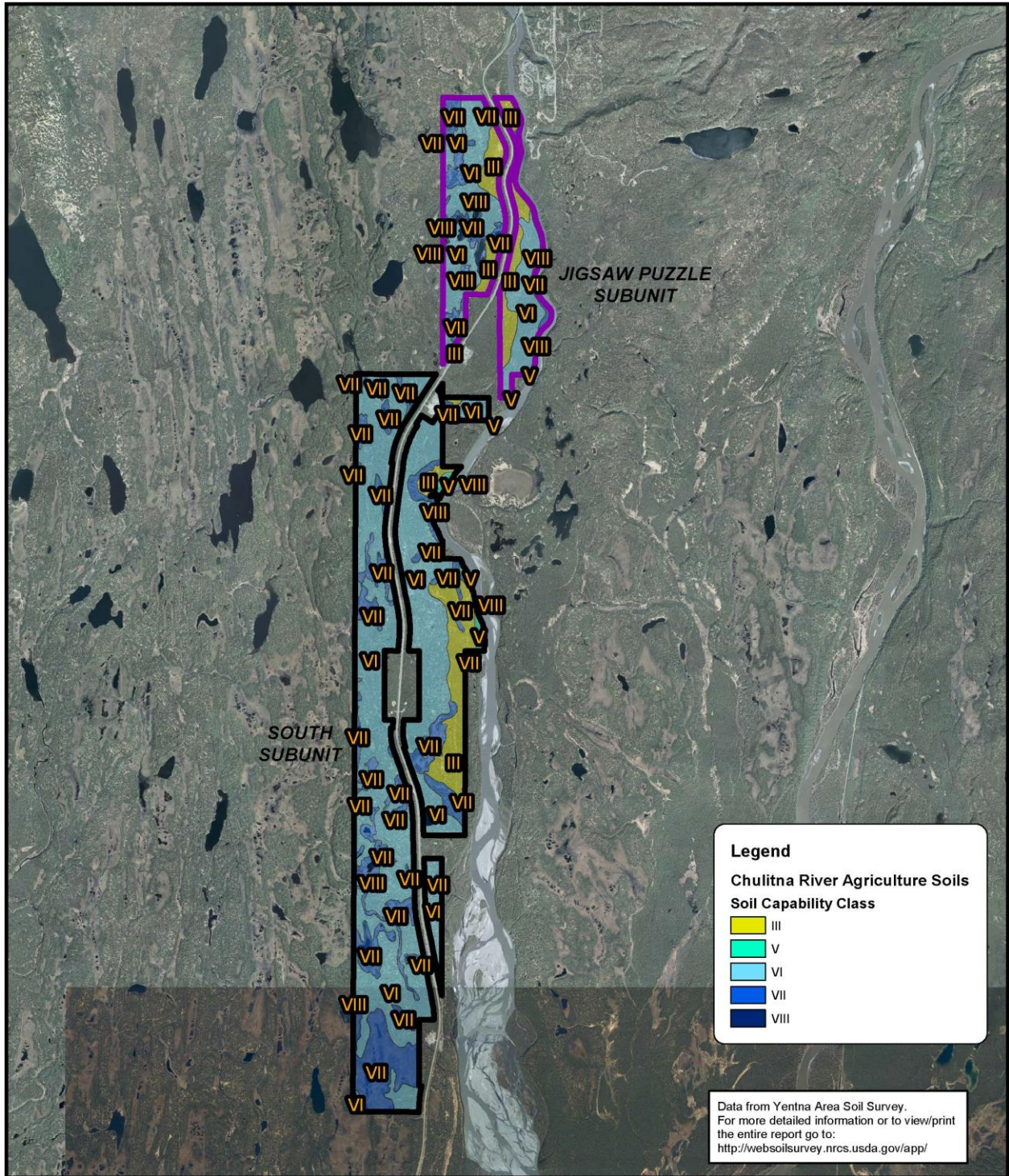




Chulitna River NRMU Soils

Community Development/LMD April 2010

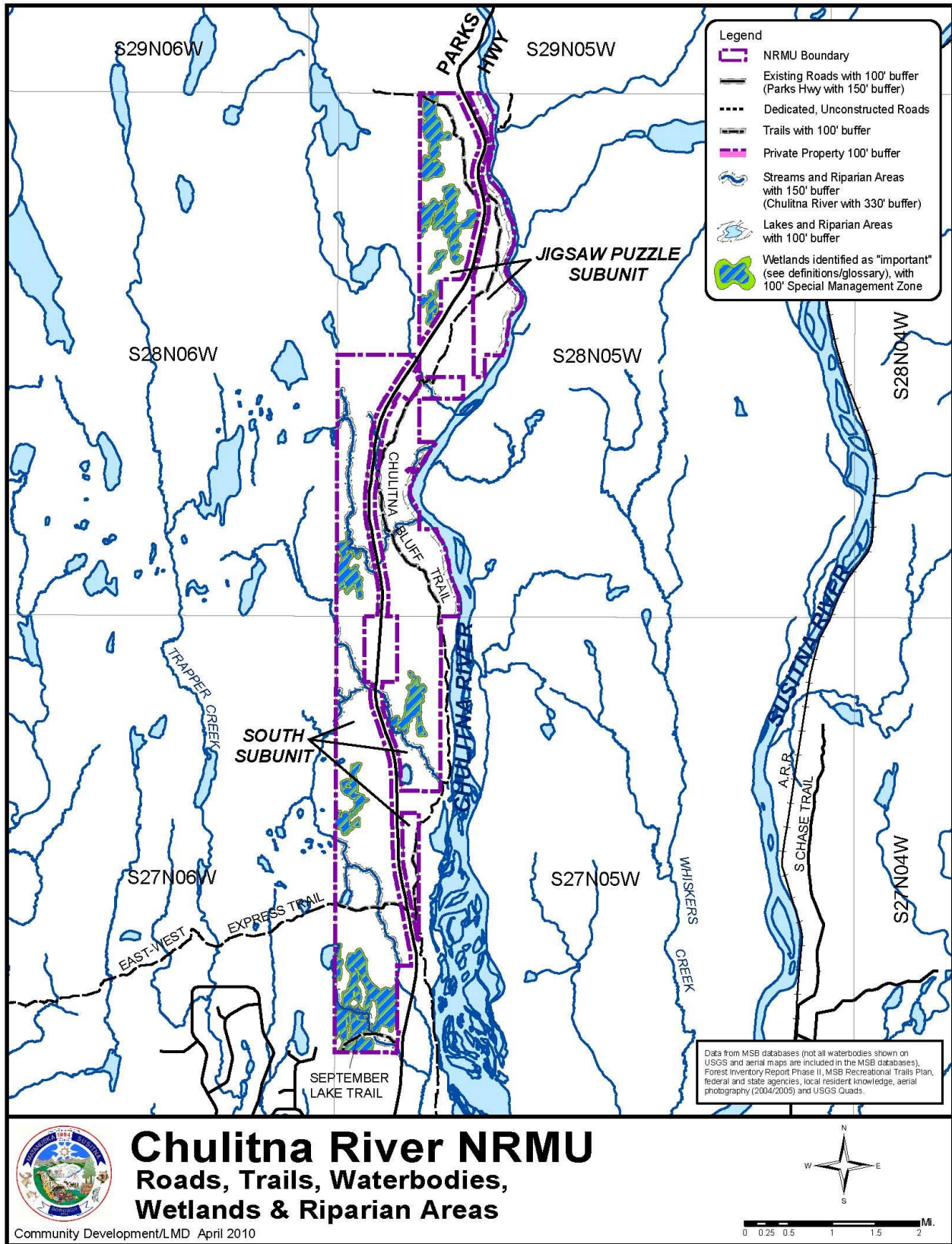


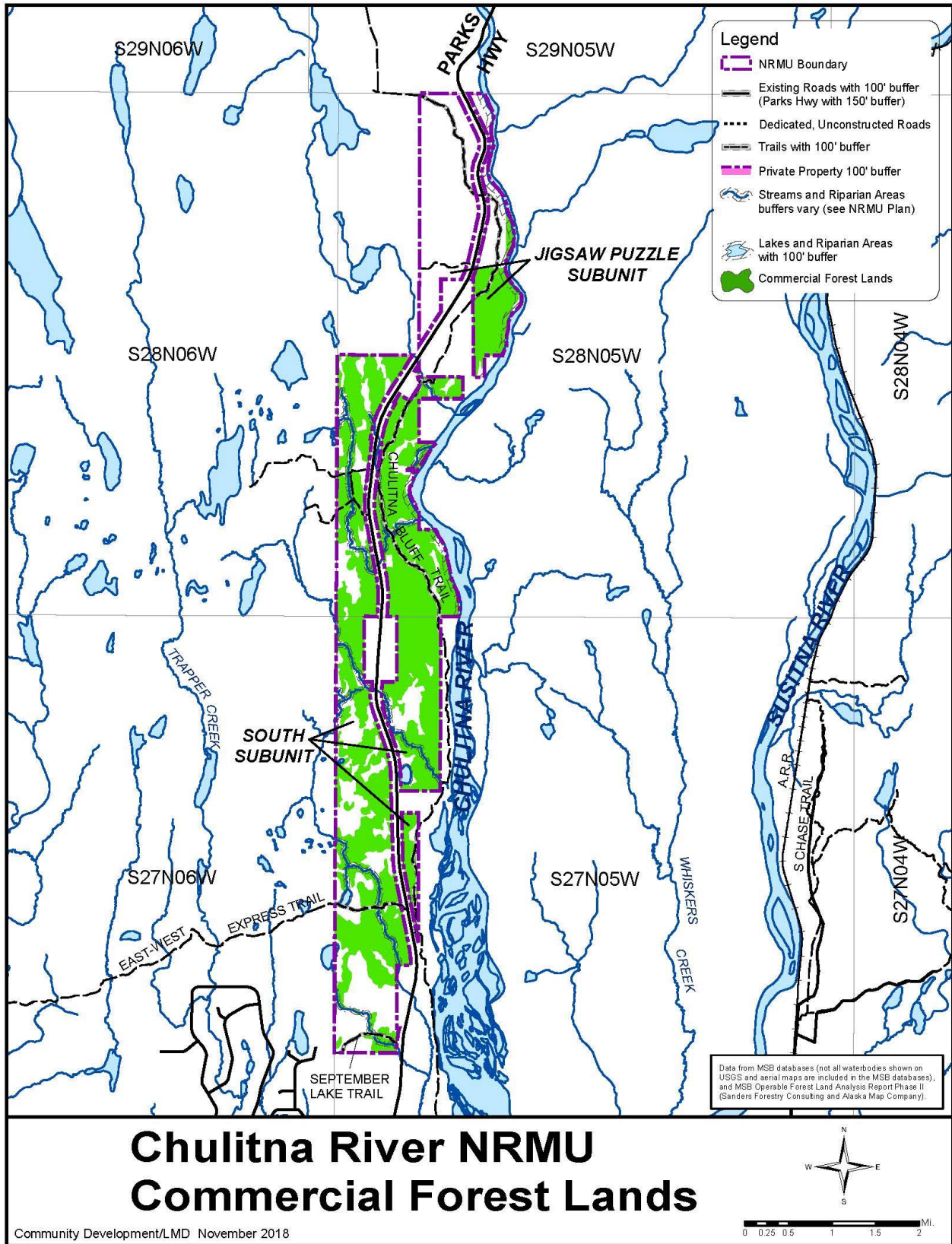


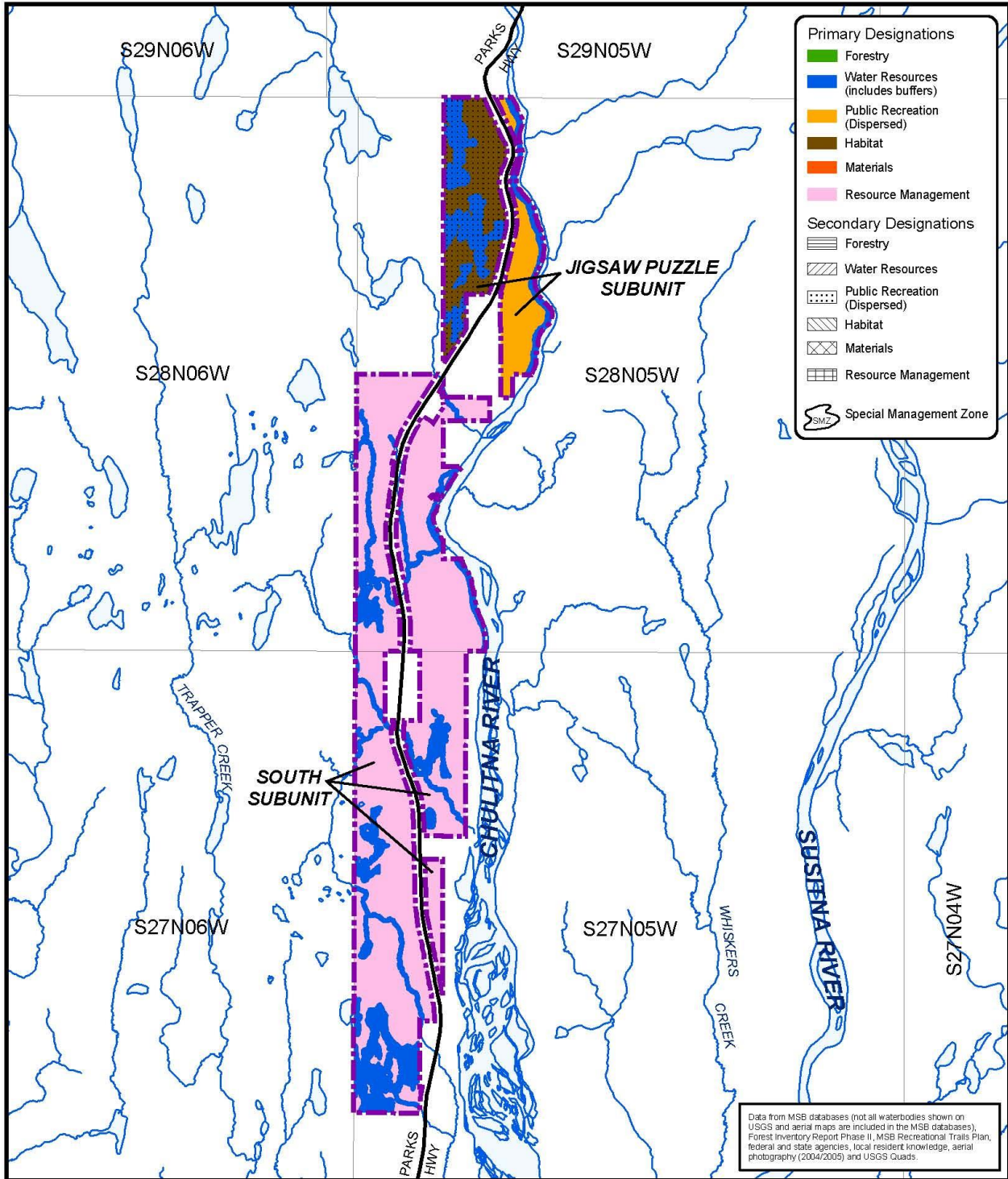
Chulitna River NRMU Agriculture Soils

Community Development/LMD December 2018



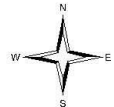






Chulitna River NRMU Land Use Designations

Community Development/LMD April 2010



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

- Matanuska-Susitna Borough, Recreational Trails Plan (2016).
- Matanuska-Susitna Borough, Parks, Recreation and Open Space Plan (2001).
- National Park Service, South Denali Implementation Plan and EIS (2006).

A Scenic Highways Plan was 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

Jigsaw Puzzle Lakes subunit – Public Recreation and Watershed Lands

Chulitna River South subunit – Resource Management and Watershed Lands

Summary of Resources and Uses

Agriculture and Grazing

A review of soil capability classifications, published by the USDA, Natural Resources Conservation Service (<http://websoilsurvey.nrcs.usda.gov/app/>), indicates that there are lands suitable for agricultural development or grazing within the unit.

See the Soils maps 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 paramount 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 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. The majority of the Commercial Forest Land is located in the South subunit.

Also, see the Commercial 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).

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 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 scenic values, which exist throughout the region. Because of the unit's location, it is on one of the flight seeing flight lines to and from Denali National Park and Preserve, especially in the Denali 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 *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 trailhead/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 1970s or early 1980s. 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 are in the *Recreational Trails Plan*, and have not been found to be trails of local significance. The trails are important, however, to property owners accessing their property in the Swan Lakes Alaska Subdivision as well as on Bunco Lake.

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. This is exhibited by the gravel pits located on either side of the Parks Highway as it traverses 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 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 area’s 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
<i>Primary</i>		
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
<i>Primary</i>		
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.
<i>Secondary</i>		
Public Recreation		Entire subunit west of Parks Highway. Public recreation may be restricted wintertime use only.
Chulitna River – South subunit		
Designation	Classification	Management Intent
<i>Primary</i>		
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 commercial 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*.
<i>Secondary</i>		
None		

* 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 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 riparian areas will be protected through the use of undisturbed natural vegetation buffers.

All wetlands (see definition in Definitions/Glossary at the end of this chapter or in Volume III) shall be protected with a 100-foot buffer . For example, wintertime 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, roads, and trails with buffers.

Also, see Volume I, Chapter 2, Buffers and Special Management Zones, for additional information.

Forest Management

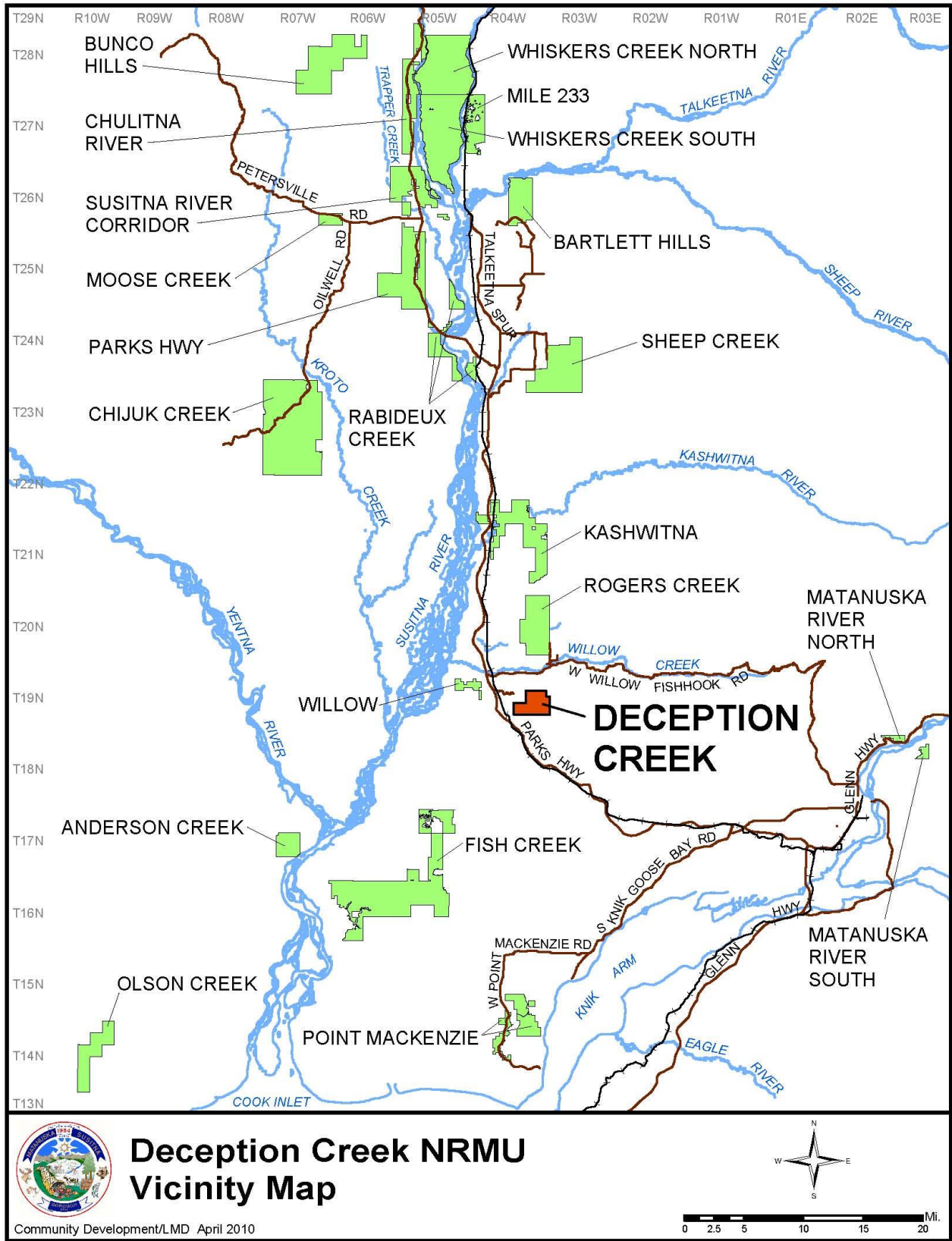
Timber harvest in the South subunit is permitted when it does not significantly reduce the areas recreational, watershed, and scenic values. There shall be no timber harvesting, including personal use, in the Jigsaw Puzzle subunit.

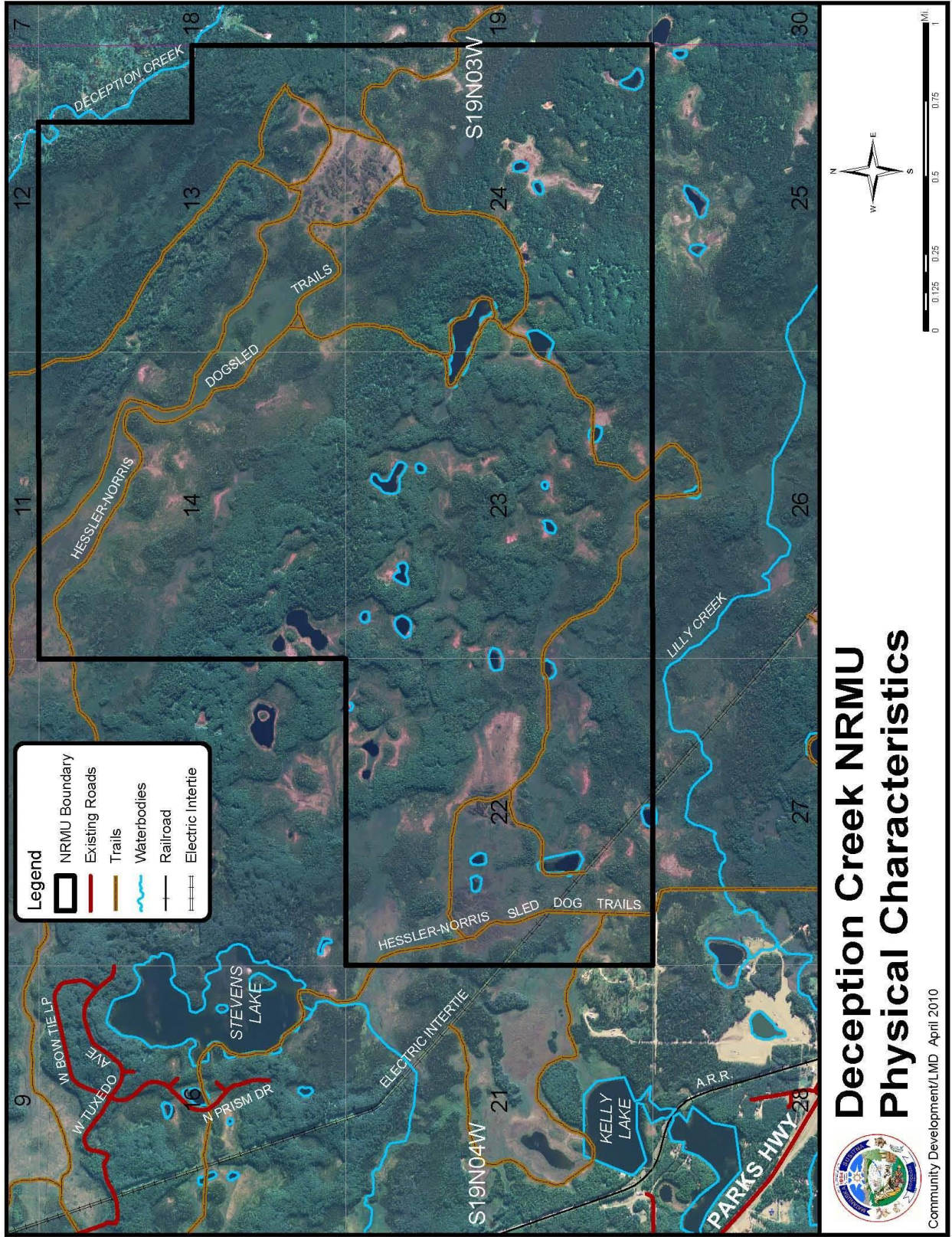
Timber harvest shall be small in volume in the amount harvested per year. Besides not significantly reducing the areas recreational, watershed and scenic values, small and limited harvest areas are

necessary so that winter moose habitat areas are not created that would draw moose into the Parks Highway corridor.

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.

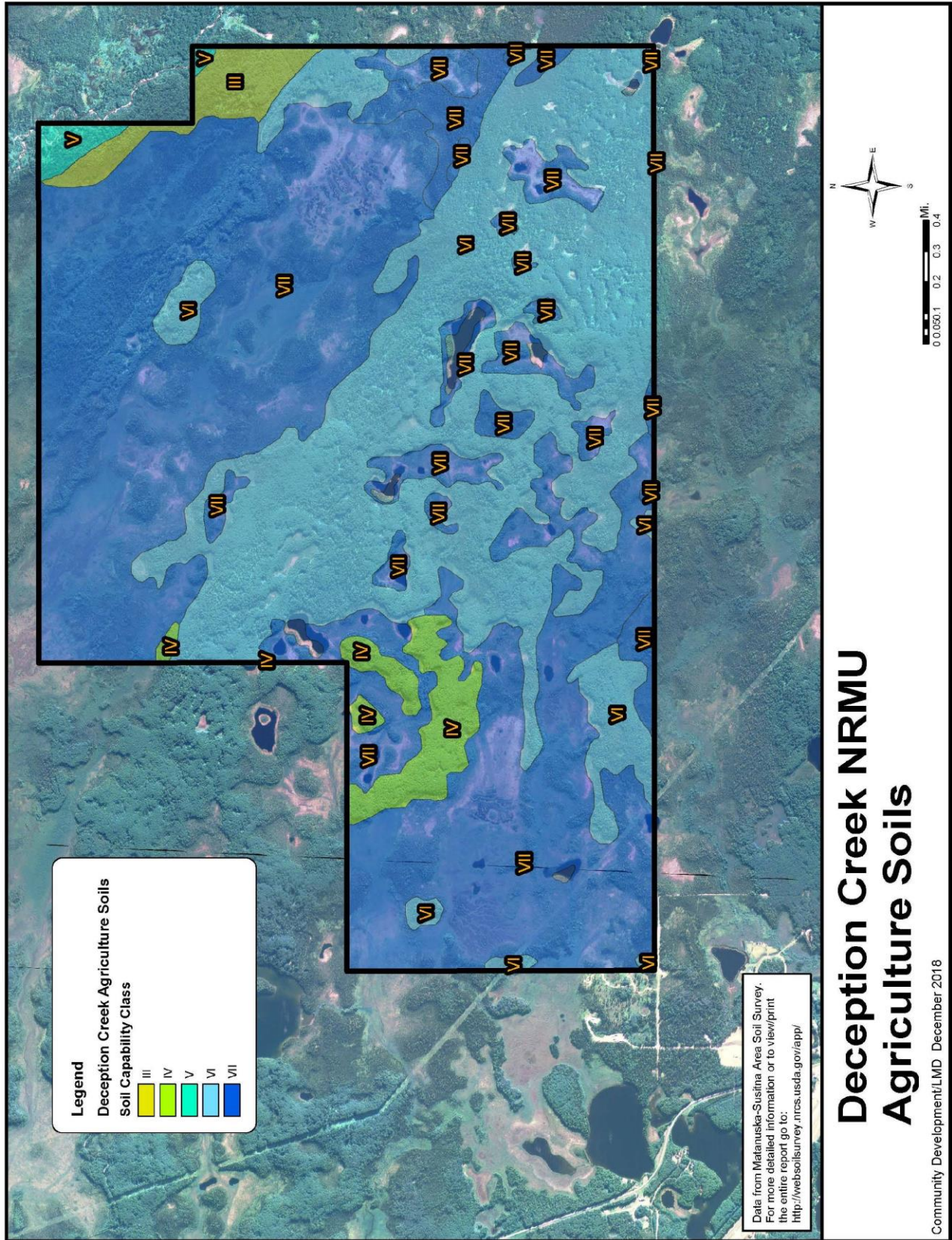


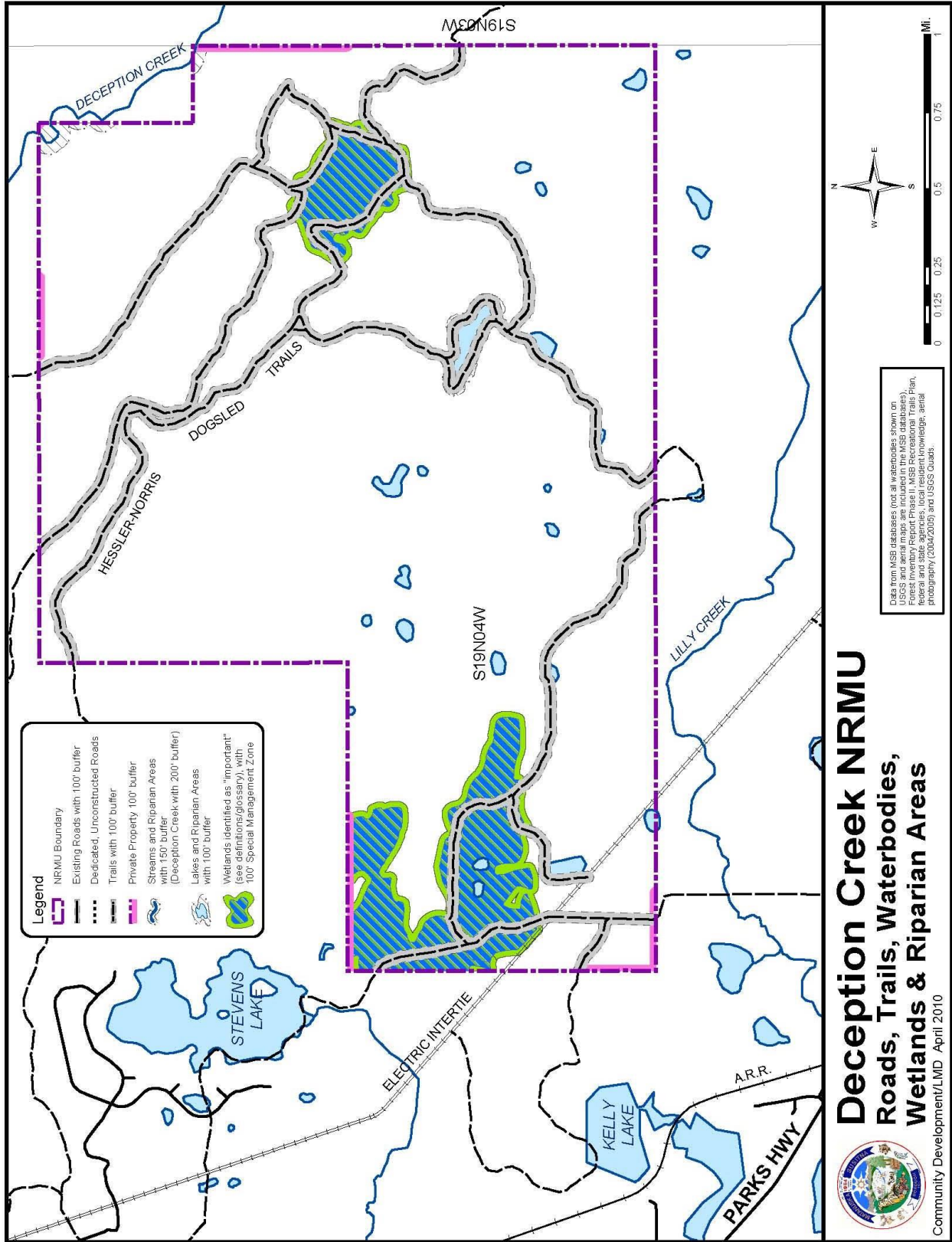


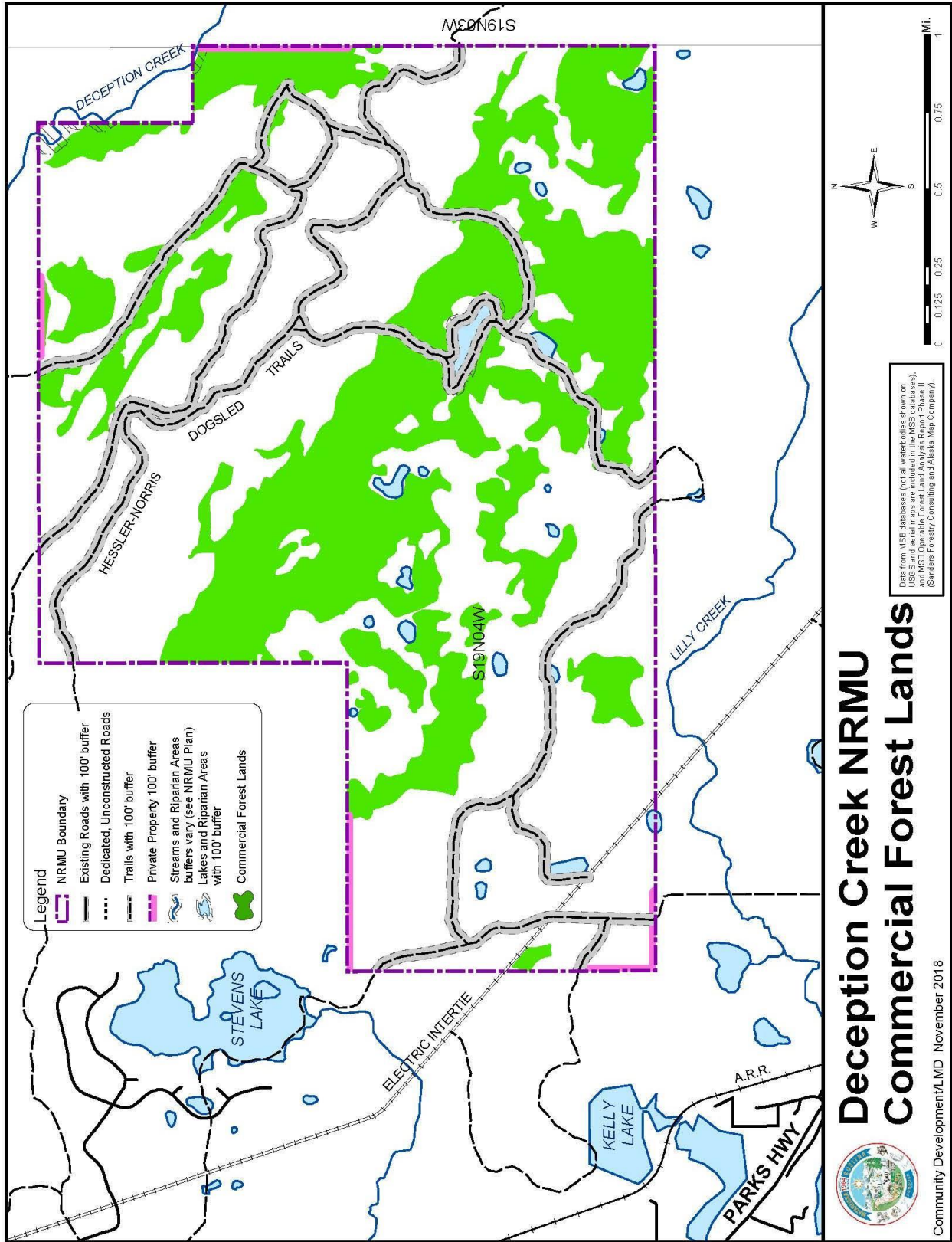
Deception Creek NRMU Physical Characteristics



Community Development/LMD April 2010



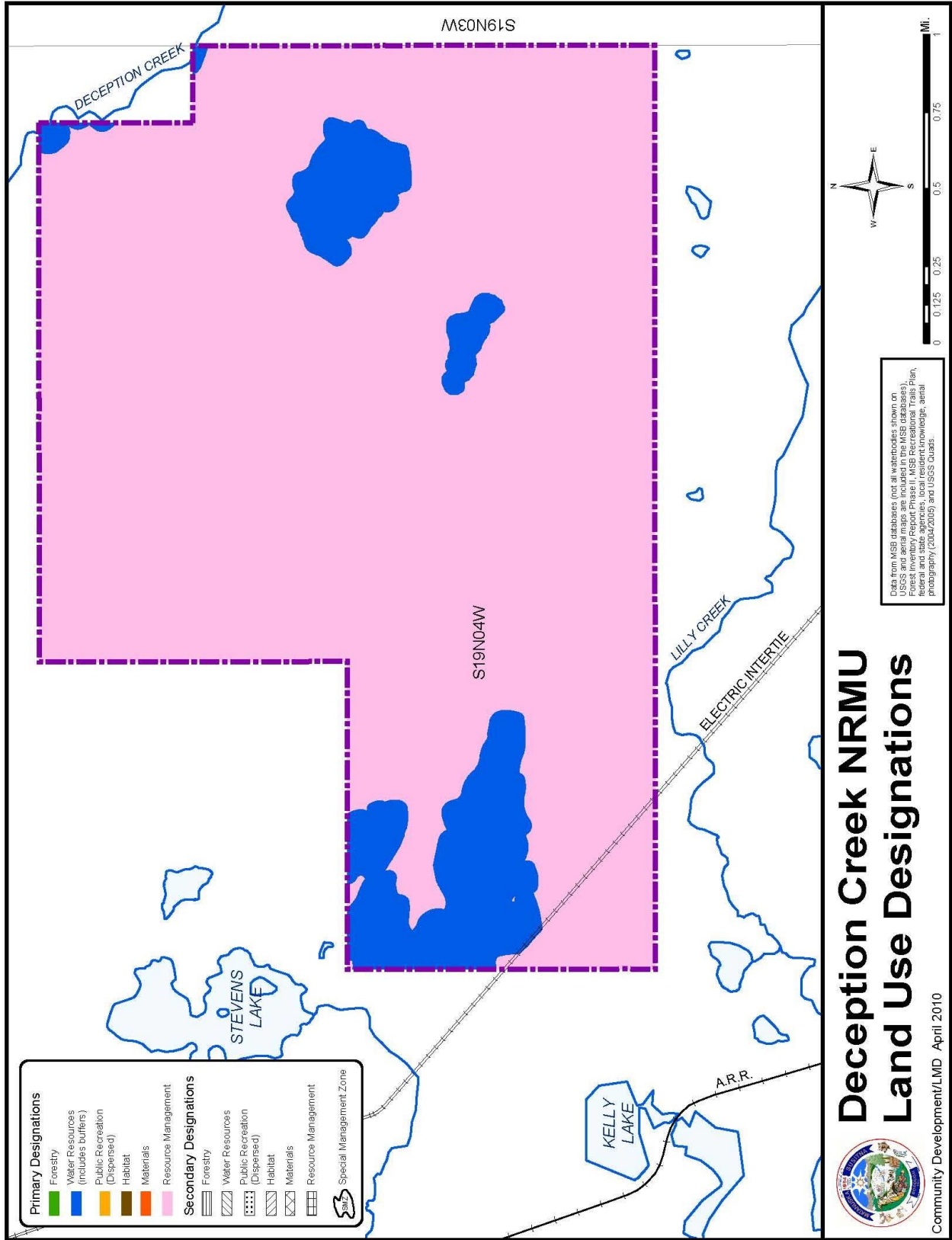




Deception Creek NRMU Commercial Forest Lands



Community Development/LMD November 2018



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 $\frac{3}{4}$ of a mile east of the Alaska Railroad and one mile east of the Parks Highway. Willow Creek and the Willow Fishhook Road are located approximately four 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 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. Numerous dog-mushing trails 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:

- Matanuska-Susitna Borough, Recreational Trails Plan (2016).
- Matanuska-Susitna Borough Parks, Recreation and Open Space Plan (2001).
- Willow Area Community Comprehensive Plan (2013).

Existing Land Use Classifications

Resource Management and Watershed Lands

Summary of Resources and Uses

Agriculture and Grazing

A review of soil capability classifications, published by the USDA, Natural Resources Conservation Service (<http://websoilsurvey.nrcs.usda.gov/app/>), indicates that there are lands suitable for agricultural development or grazing within the unit.

See the Soils maps 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 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.

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.

Also, see Commercial Forest Lands map at the beginning of this section.

Private Property

There is no private property within the unit.

Public Recreation and Tourism

Year round 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 Haessler-Norris Dogsled Trail System traverses extensively throughout the unit. This trail system is recognized in the MSB Recreational Trail Plan (2016).

The Willow Area Community Organization has adopted the Willow Winter and Summer Trails Plans that document 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.nrcs.usda.gov/app/>) does not indicate 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
<i>Primary</i>		
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 commercial 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*.
<i>Secondary</i>		
None		

* 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 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 riparian areas will be protected through the use of undisturbed natural vegetation buffers.

All wetlands (see definition in *Definitions/Glossary* in Volume III) shall be protected with a 100-foot buffer. The buffer shall not allow disturbance of the wetland area, but some uses may be allowed. For example, wintertime 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.

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.

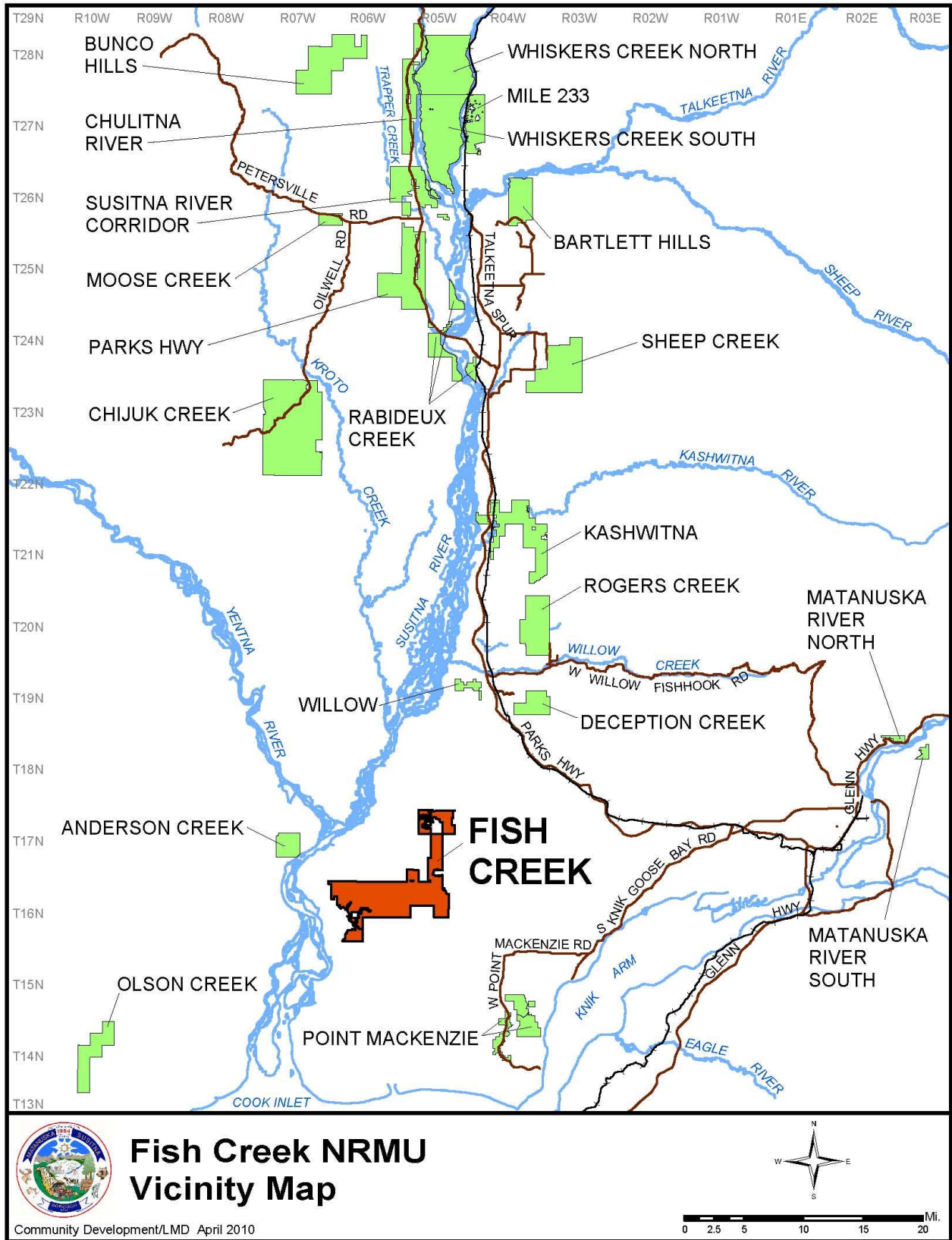
Forest Management

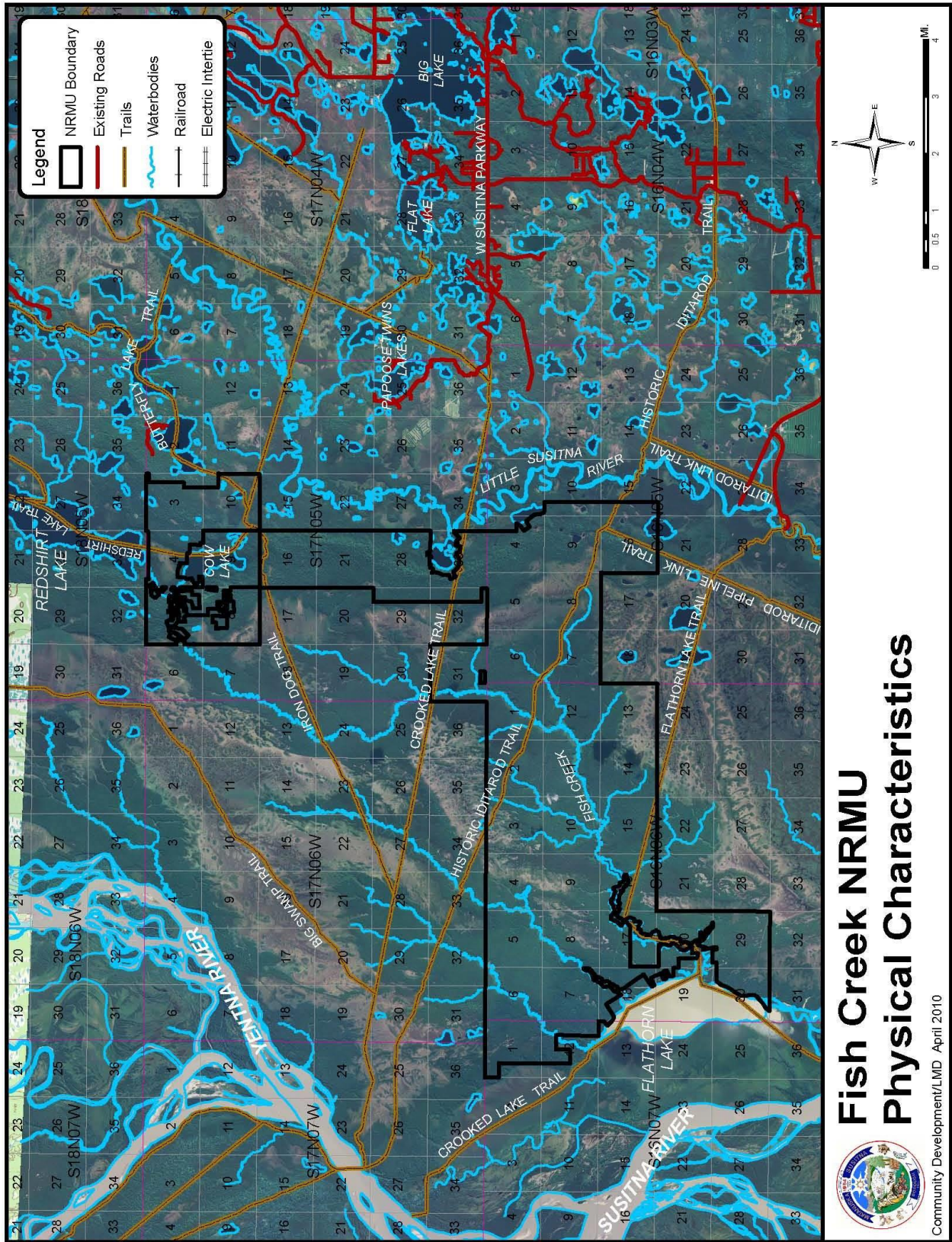
Timber harvests are permitted when and where it does not significantly reduce the areas recreational activities. Timber harvest shall be managed for improving forest health, wildlife habitat, and providing forest products utilizing professionally accepted practices. Examples include firewood, sawlogs 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.

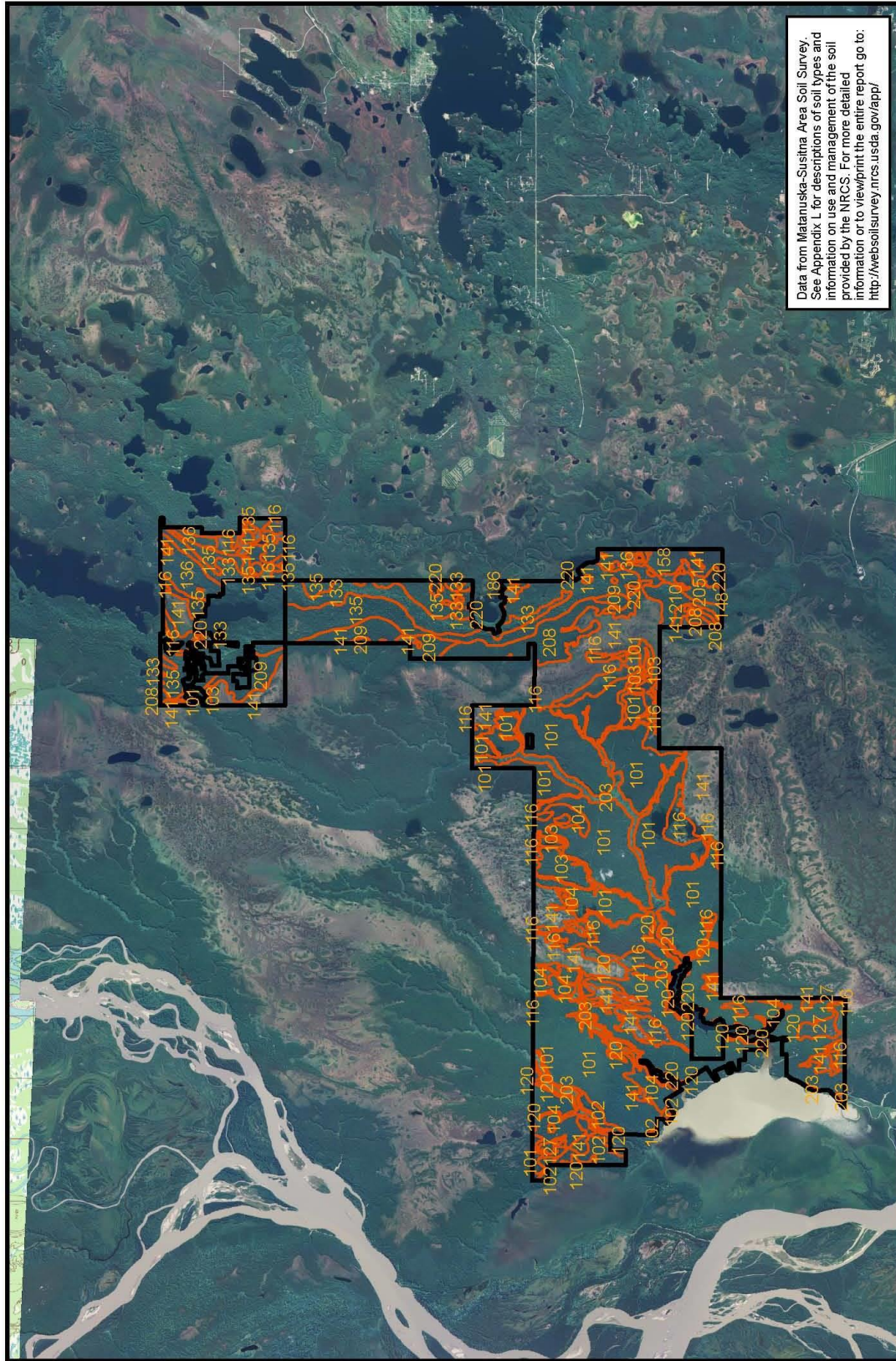




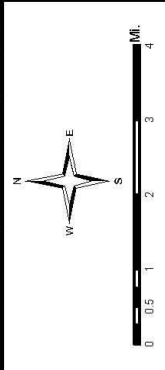
Fish Creek NRMU Physical Characteristics



Community Development/LMD April 2010



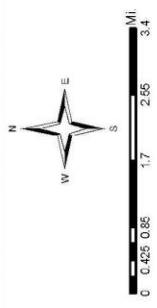
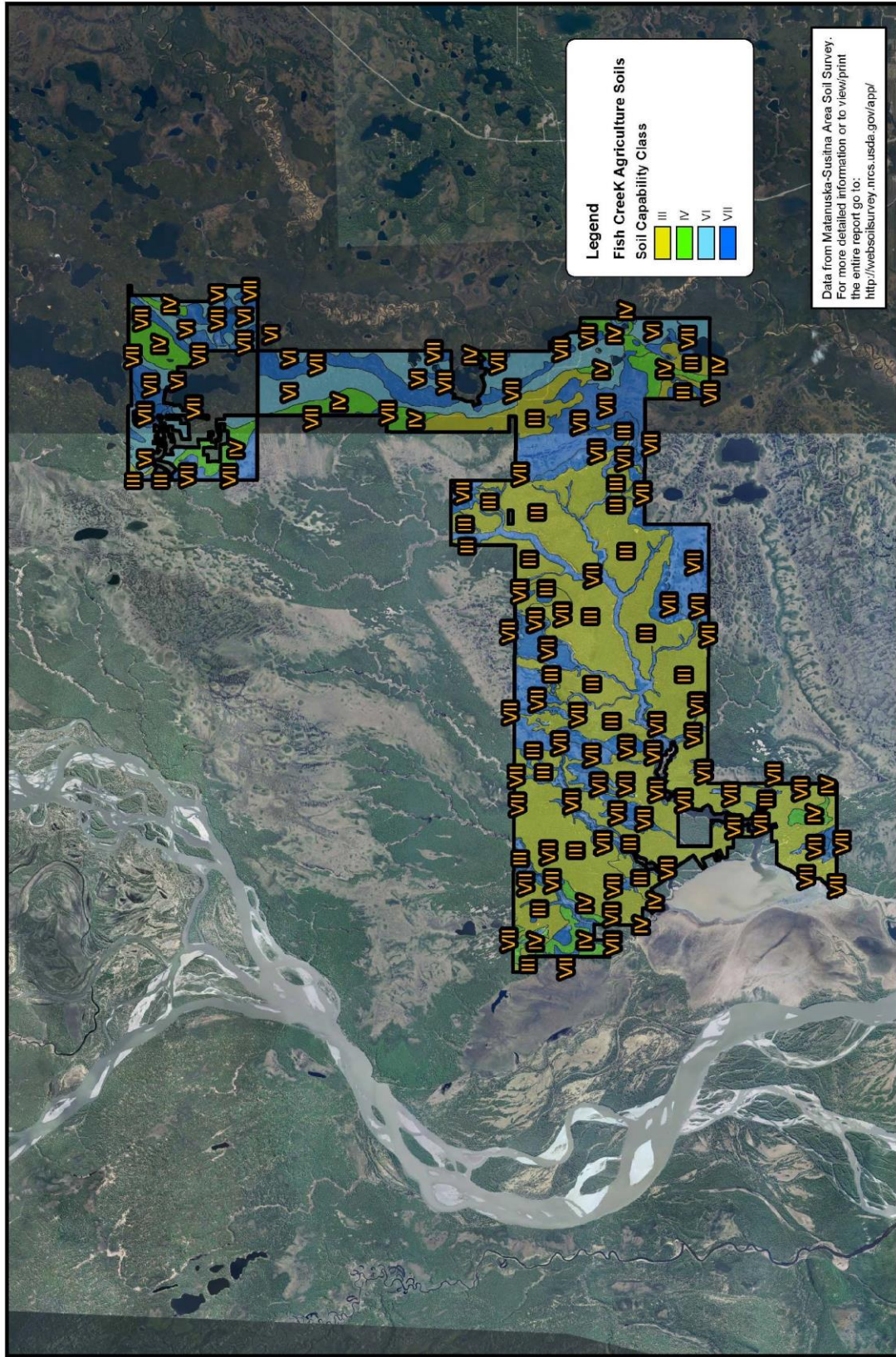
Data from Matanuska-Susitna Area Soil Survey. See Appendix L for descriptions of soil types and information on use and management of the soil provided by the NRCS. For more detailed information or to view/print the entire report go to: <http://weboilsurvey.nrcs.usda.gov/app/>



Fish Creek NRMU Soils



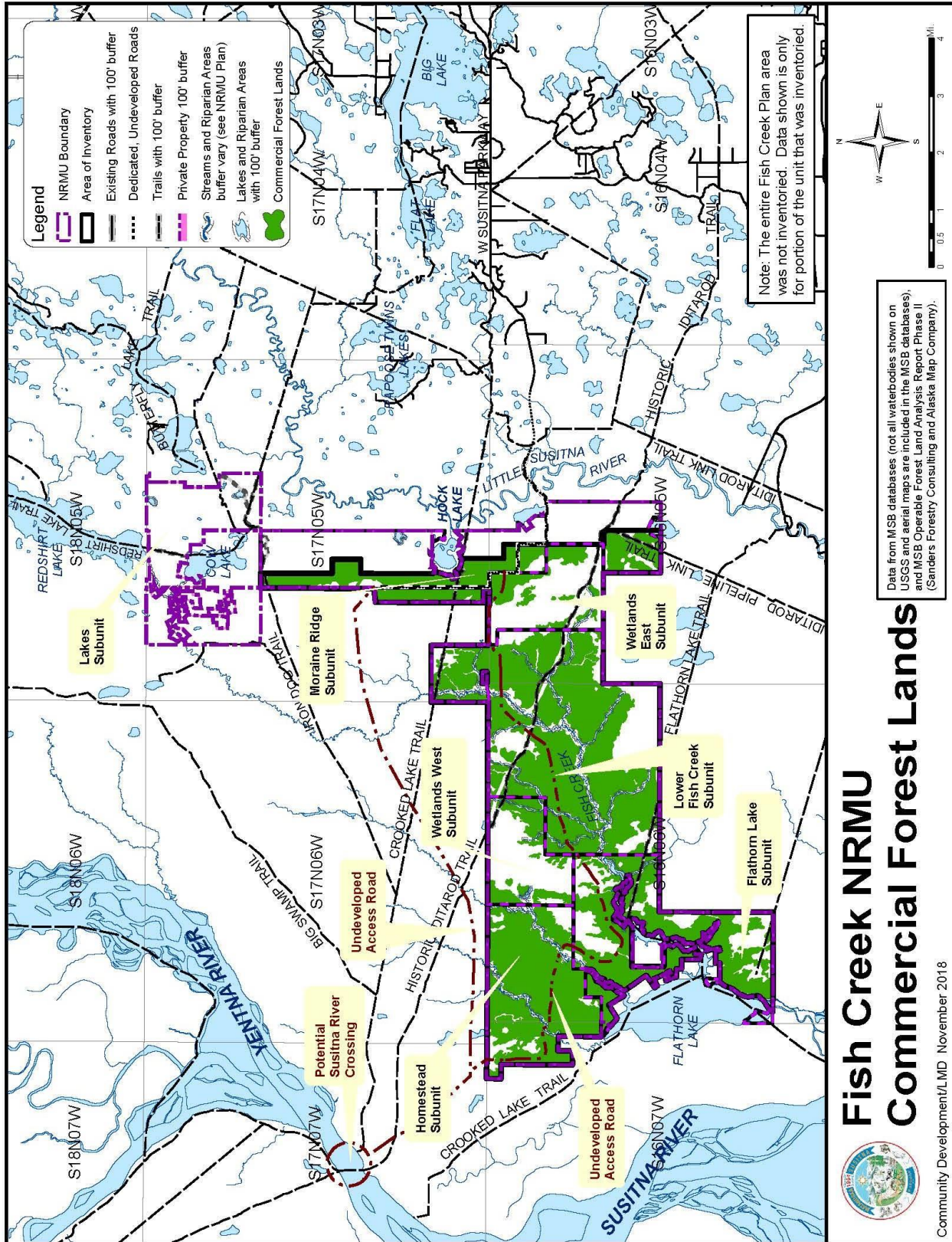
Community Development/LMD April 2010

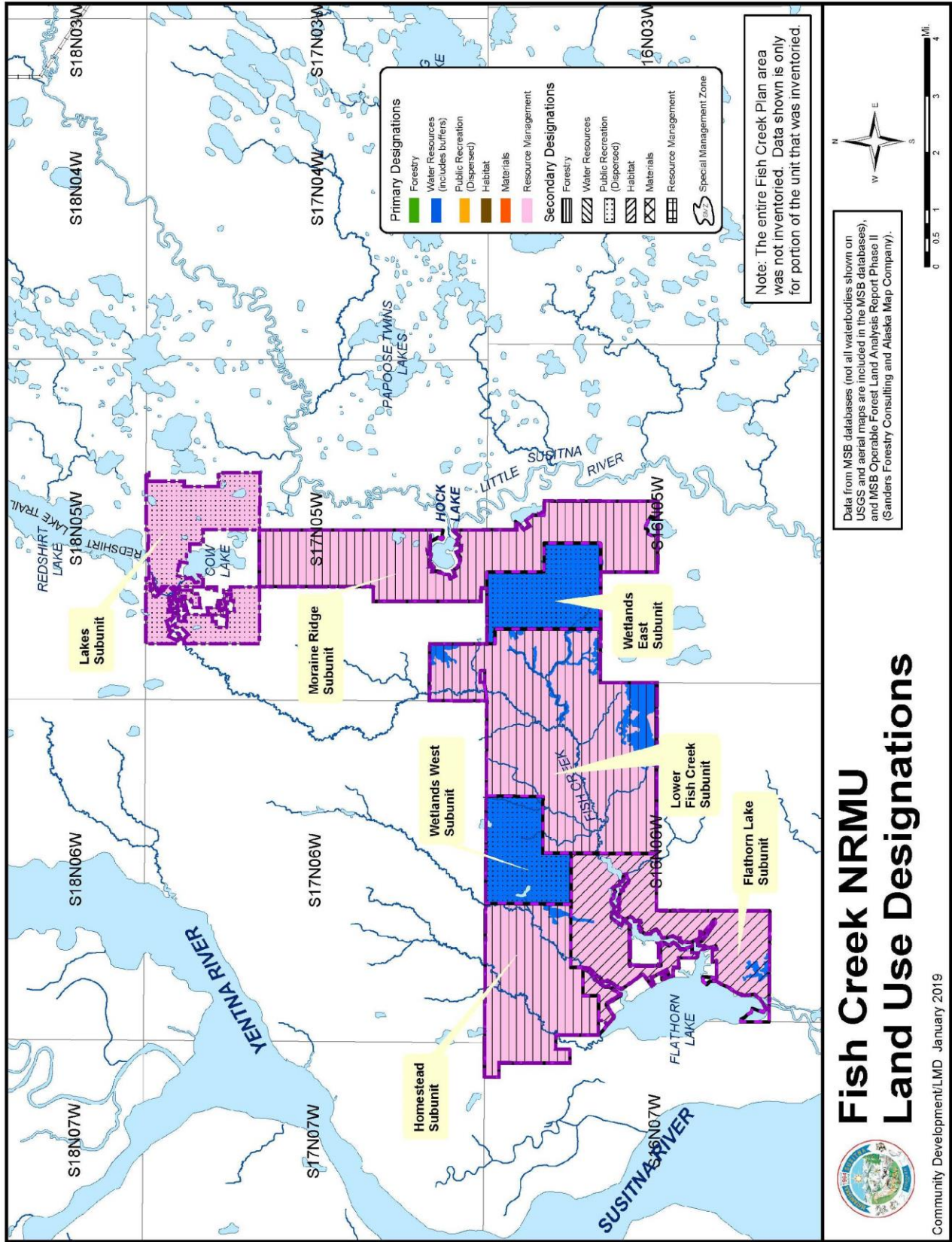


Fish Creek NRMU Agriculture Soils



Community Development/LMD December 2018





Fish Creek NRMU Land Use Designations



Community Development/LMD January 2019

FISH CREEK

Natural Resource Management Unit

General Information

The Fish Creek Natural Resource Management Unit includes approximately 25,358 acres of Borough-owned land bordered on the north by the Nancy Lake State Recreation Area, on the south by the Susitna Flats State Game Refuge, on the east by the Little Susitna State Recreation River and on the west by the Flathorn Lake area. The unit is divided into six subunits: Flathorn Lake, Homestead Creek, Lakes, Lower Fish Creek, Moraine Ridge, and Wetlands – East and West. The following table lists the size of each subunit:

<i>subunit Name</i>	<i>Acreage</i>
Flathorn Lake	3,438
Homestead Creek	2,978
Lakes	4,466
Lower Fish Creek	6,915
Moraine Ridge	4,413
Wetlands – East and West	3,121

The Flathorn Lake subunit is bounded on the west by Flathorn Lake, and lies within the Susitna Lowlands. The subunit is generally flat with some rolling terrain. The subunit has large areas of well drained soils as well as wetlands with poorly drained soils.

The Homestead Creek subunit includes land along the north-western edge of the Fish Creek Management Unit, just east of the big Susitna River, north of the Flathorn Lake subunit. Homestead Creek flows through the largely level, forested area into the northern shore of Flathorn Lake. Large wetlands surrounding this unit are the sources of Homestead Creek and Unnamed Creek as well as their smaller tributaries.

The Lakes subunit is located adjacent to the southwestern boundary of the Nancy Lakes State Recreation Area, bordering Red Shirt Lake as well as the Little Susitna State Recreation Area. This subunit abuts the north boundary of the Moraine Ridge subunit.

Lower Fish Creek subunit borders the Susitna Flats State Game Refuge to the south. The subunit includes large swathes of land suitable for sustainable timber harvest, agriculture, and residential development.

The Moraine Ridge subunit lies along the western bank of the Little Susitna River and includes the undulating terrain associated with its namesake as the unit follows a low moraine running north-south. This ridge extends the length of the subunit.

The Wetlands East-West subunit includes a majority of the contiguous wetlands within the Fish Creek Unit. This subunit is comprised of two separate blocks of wetlands that both lie between the Moraine and the Lower Fish Creek subunits. The subunit is comprised of large branching wetlands

along the lateral drainages of Fish Creek. The wetlands provide important hydrologic functions and fish habitat. Most wetlands within this subunit are included in the Su-Knik Wetland Mitigation Bank.

Borough Tax Maps

FH 17, FH 18, FH 19, FH 20, FH 21, FH 29, LS 05, LS 06, LS 11, LS 12, LS13

Current Land Use

General dispersed public recreation. The distance to the unit from the road system and lack of any all-season trails limit the current land use to fly-in and winter seasonal access. A winter forest road was developed into the Moraine Ridge subunit in 2014. There are several winter trails crossing the unit.

Surrounding Land Use

General dispersed recreation and recreation cabins on the shores of Flathorn Lake and Fish Creek. Recreation cabins have been built on private parcels with lake access

Community Council

None.

Existing Land Use Plans

- Matanuska-Susitna Borough, Recreational Trails Plan (2016).
- Matanuska-Susitna Borough Parks, Recreation and Open Space Plan (2001).
- Matanuska-Susitna Borough Fish Creek Management Plan (2010) will be replaced by this update of the NRMU Plan.

Existing Land Use Classifications

The Fish Creek subunit land classifications are listed in the table below:

Subunit Name	Classification
Flathorn Lake	Resource Management
Homestead Creek	Resource Management Forest Management Agriculture
Lakes	Resource Management Agriculture
Lower Fish Creek	Resource Management Agriculture
Moraine Ridge	Resource Management Agriculture
Wetlands – East and West	Watershed

Summary of Resources and Uses

Agriculture and Grazing

According to the previous Fish Creek Management Plan (2010), there are over 3,500 acres of Class III soils in large contiguous areas. These soils are generally regarded as the best local soils for agriculture. A review of the soil types published by the USDA, Natural Resources Conservation Service indicates there are lands suitable for agricultural development or grazing within this unit. The Lower Fish Creek subunit has by far the highest concentration of soils suitable for farming.

See the *Soils* maps and the *Commercial Forest Land* 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.

Fish and Wildlife Habitat and Resources

The area contains high value moose, black bear, brown bear and furbearer habitat. Fish Creek and its tributaries are used for spawning, rearing, and as a migration corridor for rainbow trout, Coho, sockeye, and pink salmon during the various phases of their life cycles. Fish Creek bisects this unit from the northwest corner to the southeast corner.

The unnamed creek flowing from into the north end of Flathorn Lake and Homestead Creek are listed in the Alaska Anadromous Waters Catalog to support sockeye salmon. Fish Creek and the Little Susitna River are listed to support Coho salmon, pink salmon, king salmon, and Sockeye salmon in the Alaska Anadromous Waters Catalog. An unnamed stream draining northwest out of Cow Lake is listed to support Sockeye salmon.

The lakes and streams in and around this unit, particularly Red Shirt Lake, Hock Lake, Flathorn Lake, Cow Lake, Delyndia Lake, and Butterfly Lake support a variety of fish species, and many people use area lakes for fishing. The lakes and streams connected to Delyndia and Butterfly Lakes provide habitat for Little Susitna River Coho salmon.

There are no known commercial hunting or fishing camps in the unit.

Forest Resources

According to the Borough's recent timber inventory, portions of this unit have a relatively high volume of timber per acre and commercial acreages. Hilly terrain would increase timber-related road building and operations costs.

Private Property

There are two private parcels within the exterior boundary of the Lower Fish Lake subunit that are not included in the unit. Privately held tracts exist along the eastern boundary of the Flathorn Lake subunit as well as in the middle of the subunit amounting to approximately 300 acres in about 40 private parcels. Several of these parcels have private cabins or homes, primarily used on a seasonal

basis. There is an abundance of five-acre private parcels west of Cow Lake and along the southern half of the shoreline of Red Shirt Lake adjacent to the Lakes subunit boundary. Many of these parcels are within the subunit boundaries although this plan update does not apply to them.

Public Recreation and Tourism

Dispersed public recreation occurs primarily in the winter when the unit is accessible, consisting mainly of passing through the area while snow machining or mushing. The primary recreational uses include bird watching, dog mushing, snow shoeing, skiing, snow machining, fishing, trapping, and hunting. Many recreation activities are concentrated along the lakes in and adjacent to the unit. Recreation occurs year-round in the Flathorn Lake and Homestead Creek subunits, mainly for fishing in the summer, hunting in the fall, and snow machining and mushing in the winter.

Roads and Trails

There is currently no all season road access to this unit. Several seismic lines running through the area are used for ATV access in the summer. Informal winter trails including the seismic lines cross through the area and are used by snow machines, mushers, and skiers. There are several trail easements that pass through the unit. One is the Iditarod National Historic Trail route, which is no longer used for the race itself. The current route - the Iditarod Race Trail - crosses the unit north of the Iditarod Historic Trail. The Iron Dog Trail, Red Shirt Lake Trail, Cow Lake Trail, Butterfly Lake Trail, Winter Tractor Trail, Trail 6, Flathorn Lake Trails, Steve's Trail, and the Crooked Lake Trail are nearby.

In addition to these trails, the Alaska Department of Transportation (ADOT) has reserved an easement for the Chuitna Right-of-Way (ADL 57588). This was reserved over 30 years ago as part of a Statewide long-range transportation planning effort; there are no plans to develop this right-of-way. This unit is on the route of the proposed West Mat-Su Access Project. This route is proposed to cross the Little Susitna River from the Big Lake area to provide access into the Fish Creek Management Unit. (See more detailed description regarding possible road routes in Chapter 1).

Alaska Division of Forestry constructed a winter forest road in 2014 into the Moraine Ridge subunit. The winter forest road utilizes an ice bridge over the Little Susitna River. The winter road begins at the end of West Susitna Parkway.

Rocks, Sand, and Gravel

The soil type maps produced by the USDA, Natural Resources Conservation Service do not indicate the presence of suitable earth materials for construction. The Moraine Ridge subunit is likely to have commercial quantities of earth materials suitable for building roads. A field inventory is needed to determine if commercial quantities of sand and gravel are available.

Unit Management Intent

Lower Fish Creek subunit

The primary designations for land within the Lower Fish Creek subunit is resource management and agriculture. Residential land sales should be located in the unit in a manner that is compatible with future agricultural uses.

When access is developed to the Fish Creek area across the Little Susitna River. This unit provides the closest area with soils appropriate for potential agricultural development. Until that time, the area will be managed for forestry, public recreation, and wildlife habitat.

Timber harvest is allowed in this subunit. However, because of the nearer-term potential for agricultural and residential land sales, the harvest must be designed consistent with the eventual agricultural or residential land use.

A large wetland area in the southeast corner of the subunit, abutting the Susitna Flats State Game Refuge should be retained in public ownership and managed for its wildlife habitat and water resource values.

Flathorn Lake subunit

The primary management intent for the Flathorn Lake subunit is resource management and agriculture. A limited number of additional residential lots may be offered for sale, in waterfront locations and some backlot areas with access easements to the water. Roads are not required prior to sales. Easements for roads should be retained. Lands in this subunit should be retained for trails, public facilities, lake access and other civic uses.

Homestead Creek subunit

This subunit should be managed to maximize its resource potential while protecting the recreational values and potential future agricultural and residential uses.

Lakes subunit

This subunit should be managed to maximize its resource potential while protecting the recreational values and potential future agricultural and residential uses.

Moraine Ridge

This subunit has great potential for timber and earth material harvest. The subunit should be managed in the short term to provide for timber harvest and sand and gravel extraction in an attempt to accelerate the future agricultural and residential land sales. The previous Fish Creek Management Plan called for a town site. The possibility of a future town site should be considered when laying out any land sales or other long-term commitment of land. At least 80 contiguous acres of high-quality land in close proximity to future land sales should be retained for public facilities. Additional contiguous land should be retained for an interconnected series of natural open spaces to serve the future residents and current wildlife. This may require substantially higher survey costs to delineate the trail and wildlife corridors.

Land Use Designations

Fish Creek – Lower Fish Creek subunit		
Designation	Classification	Management Intent
<i>Primary</i>		
Resource Management	Resource Management	Maximize resource potential while protecting the future agricultural capability.
Agriculture	Agriculture	Protect agricultural potential.
<i>Secondary</i>		
Forestry		Harvested in a manner that is compatible with eventual agricultural use.
Public Recreation		Protect existing recreation uses to the extent practical.
Fish Creek – Flathorn Lake subunit		
Designation	Classification	Management Intent
<i>Primary</i>		
Resource Management	Resource Management	Maximize revenue potential while protecting the future agricultural potential
Agriculture		Keep available for future agricultural use.
<i>Secondary</i>		
Wildlife		
Fish Creek – Homestead Creek subunit		
Designation	Classification	Management Intent
<i>Primary</i>		
Resource Management	Resource Management	Available for timber management and timber harvest. Option for future agriculture or settlement will be retained.
Forestry	Forest	
Agriculture	Agriculture	Any area supporting timber harvest shall be available in the future for agriculture.
<i>Secondary</i>		
None.		
Fish Creek – Lakes subunit		
Designation	Classification	Management Intent
<i>Primary</i>		
Resource Management	Resource Management	Available for forest management, timber harvest, and material extraction. Recognize and manage for the unit's recreational uses.
Agriculture	Agriculture	Any area supporting timber harvest shall be available in the future for agriculture.
<i>Secondary</i>		
None.		
Fish Creek – Moraine Ridge subunit		
Designation	Classification	Management Intent
<i>Primary</i>		
Resource Management	Resource Management	Maximize revenue potential while developing transportation network to support future development

Fish Creek – Moraine Ridge subunit		
Designation	Classification	Management Intent
<i>Primary</i>		
Agriculture	Agriculture	Reserve Class III soils for future agricultural uses.
Forestry		Timber harvest to support future development of the subunit.
<i>Secondary</i>		
Wildlife Habitat		Corridors for wildlife between settlement areas.
Public & Community Service Uses		Space reserved for possible future uses.
Fish Creek – Wetlands East and West		
Designation	Classification	Management Intent
<i>Primary</i>		
Watershed Protection	Watershed Lands	Protect wetlands, forming into headwaters to area streams.
Wildlife Habitat		
<i>Secondary</i>		
Public Recreation		Largely limited to winter use.

Management Guidelines

Resource Management

Resource extraction activities should be tailored to support future development of this unit. Sufficient earth materials within the Moraine Ridge subunit should be reserved for development of the transportation network required in the unit.

Settlement

Specific sites for land sales may be identified through a more detailed review of the unit's physical characteristics, and final decisions on the locations of roads, and the system of open spaces.

Wetland areas along the south and west edge of Flathorn Lake should be retained in public ownership and managed for fish and wildlife habitat and water resources.

Adequate lake front public access and recreation sites on lakes in this unit should be retained in public ownership during land sale design to provide for public use of the lakes and the adjacent lands.

Trail System

Trail connections needed include winter routes linking the area to the north and east (Towards Willow and Big Lake), and trails to recreation destinations including routes heading south and west. To the extent feasible, summer trails should be identified and reserved. Such trails require locations where continued use will not cause damage to wetlands.

Public Recreation

As part of the more detailed planning for land sales, specific areas may be identified and retained for trails, public recreation, open space, and wildlife.

Fish and Wildlife Habitat

Management guidelines for fish and wildlife include the requirement for clustering development, stream buffers, and other guidelines in Volume I. The requirement for clustering development will result in several trail corridors and east – west corridors to allow the passage of wildlife between this unit, the Little Susitna State Recreation River, and other public open space lands to the north, west, and southwest.

Forest Management

Timber harvest shall be managed to improve forest health and wildlife habitat and to reduce fire danger.

Agriculture

All areas suitable for timber harvest shall be deemed suitable for future agriculture and should be managed for that future use.

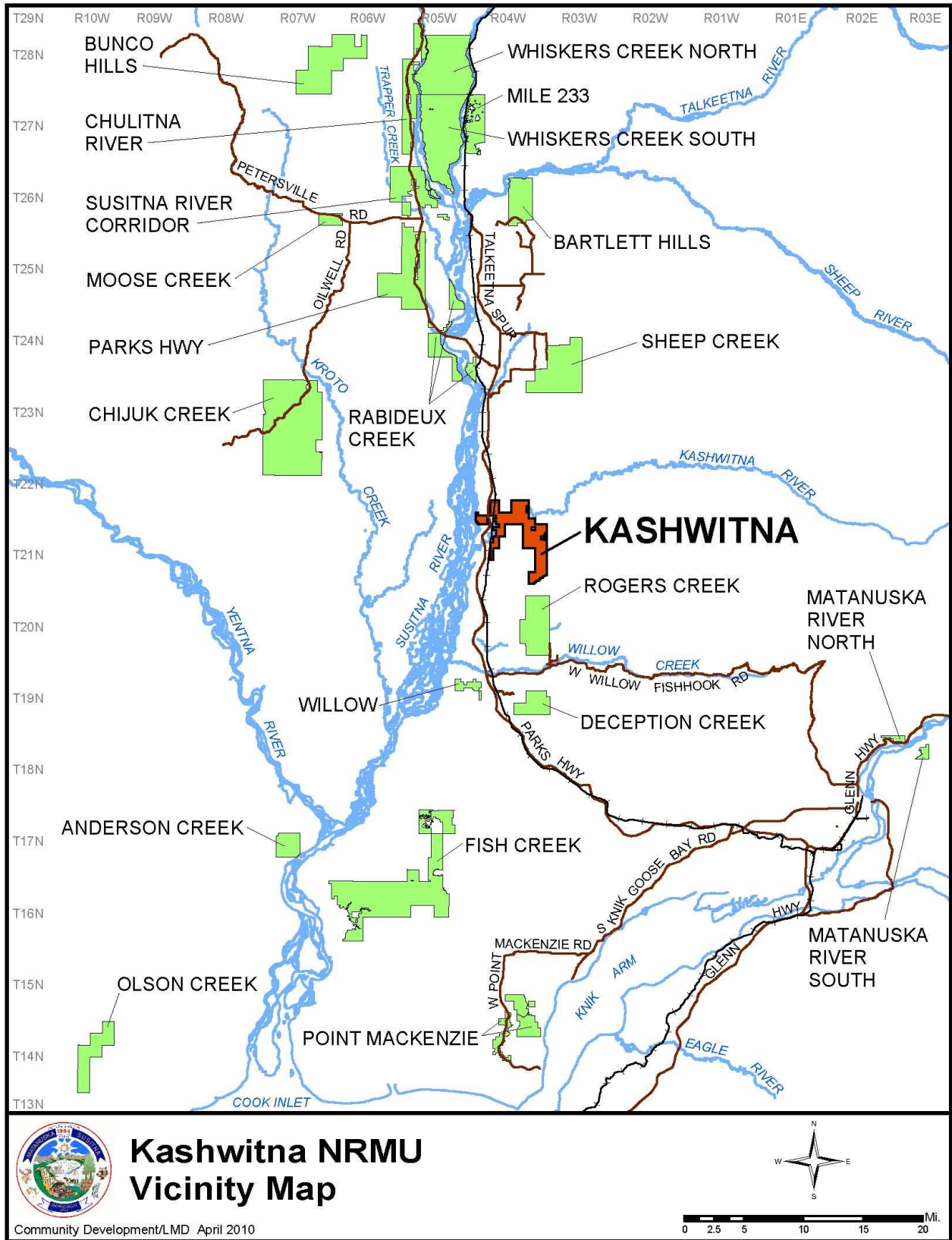
Buffers and Special Management Zones

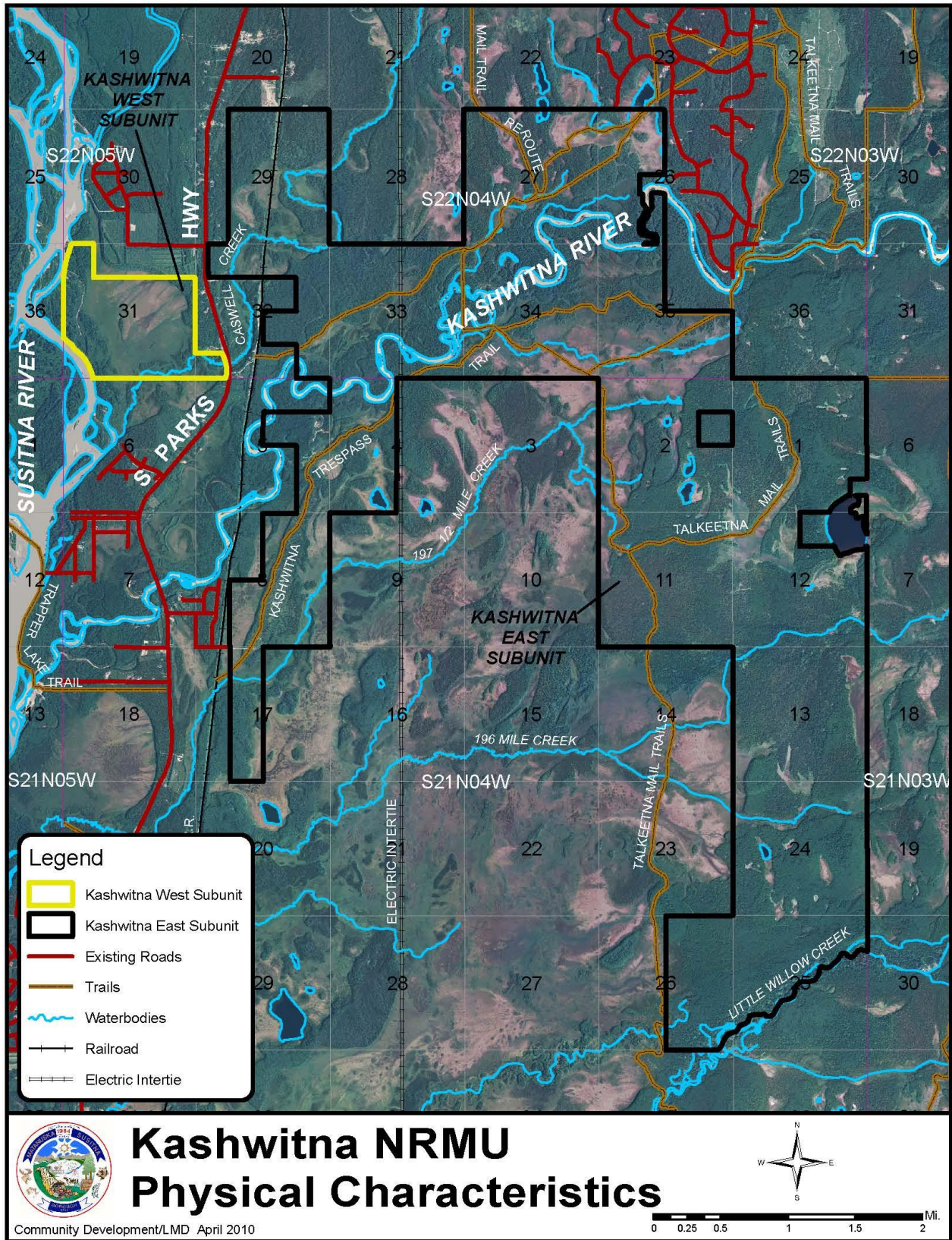
All flowing waterbodies, including lakes that are part of a flowing water system (i.e., connected to a stream), streams, rivers, and riparian areas will be protected through the use of undisturbed natural vegetation buffers as determined by the Borough.

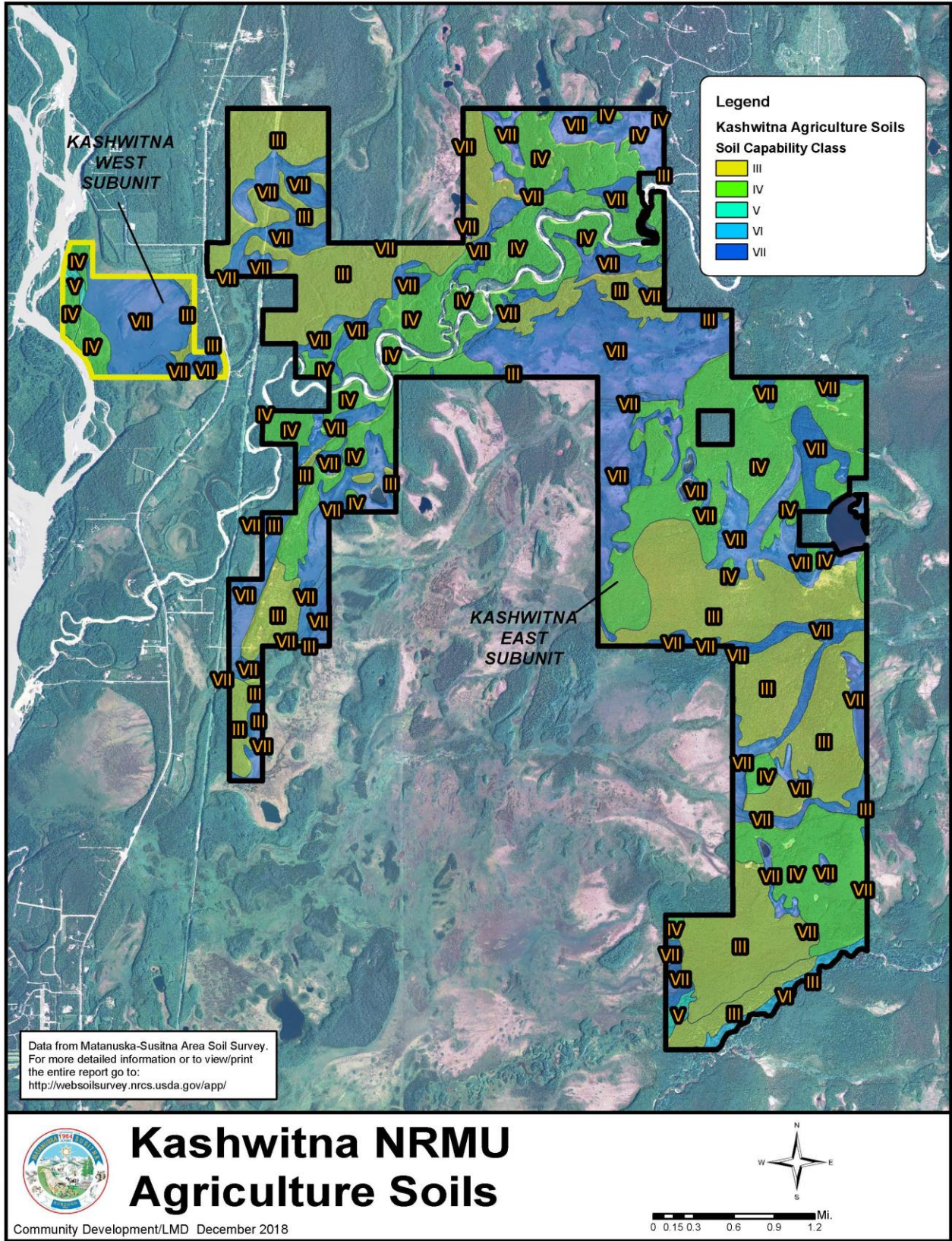
All wetlands (see definition in *Definitions/Glossary* in Volume III) should be protected with a 100-foot buffer. The buffer shall not allow disturbance of the wetland area, but some uses may be allowed. For example, wintertime recreational use is allowed when no waterfowl are present and sufficient snow covers exists to minimize harm to the vegetation and soils.

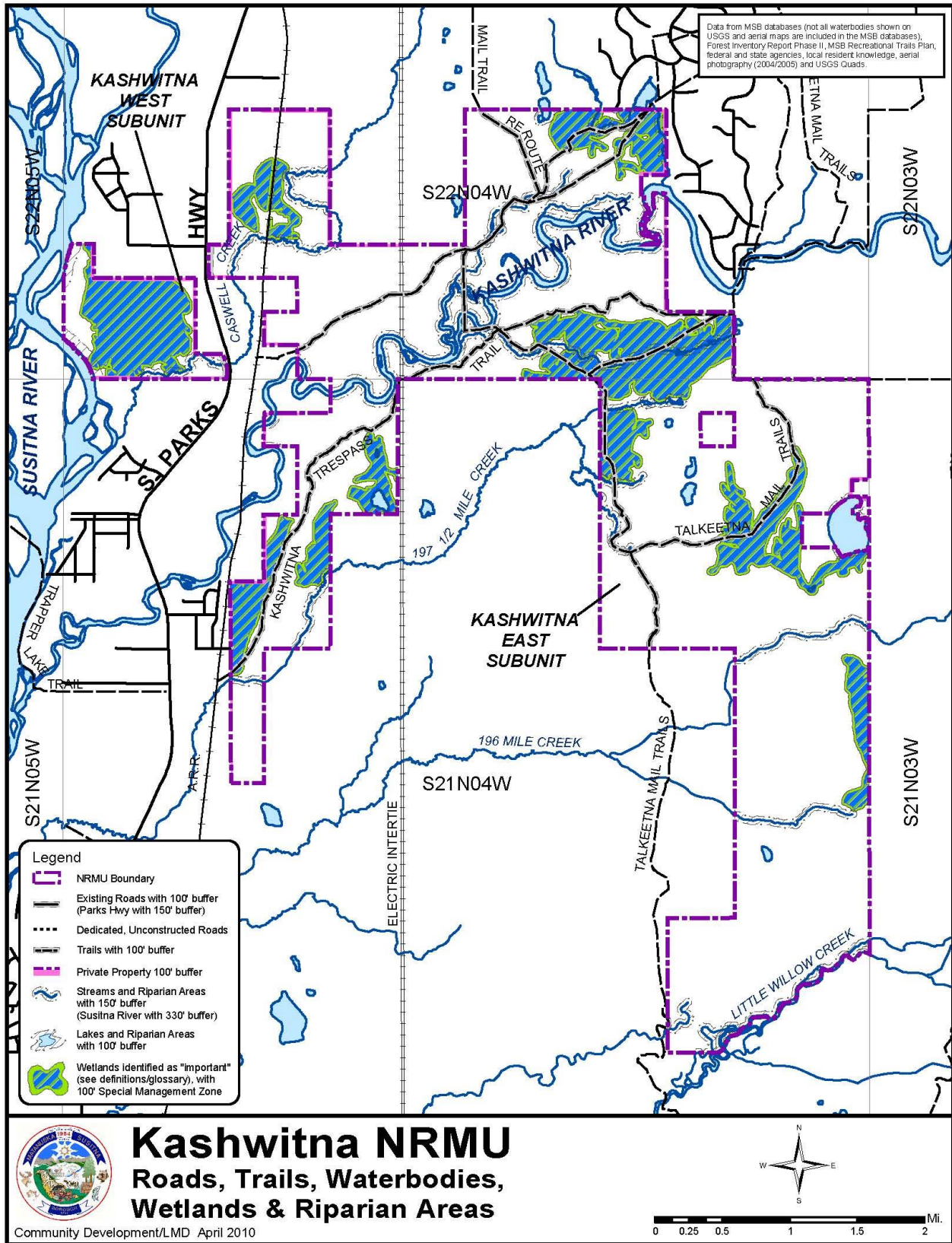
Other Uses

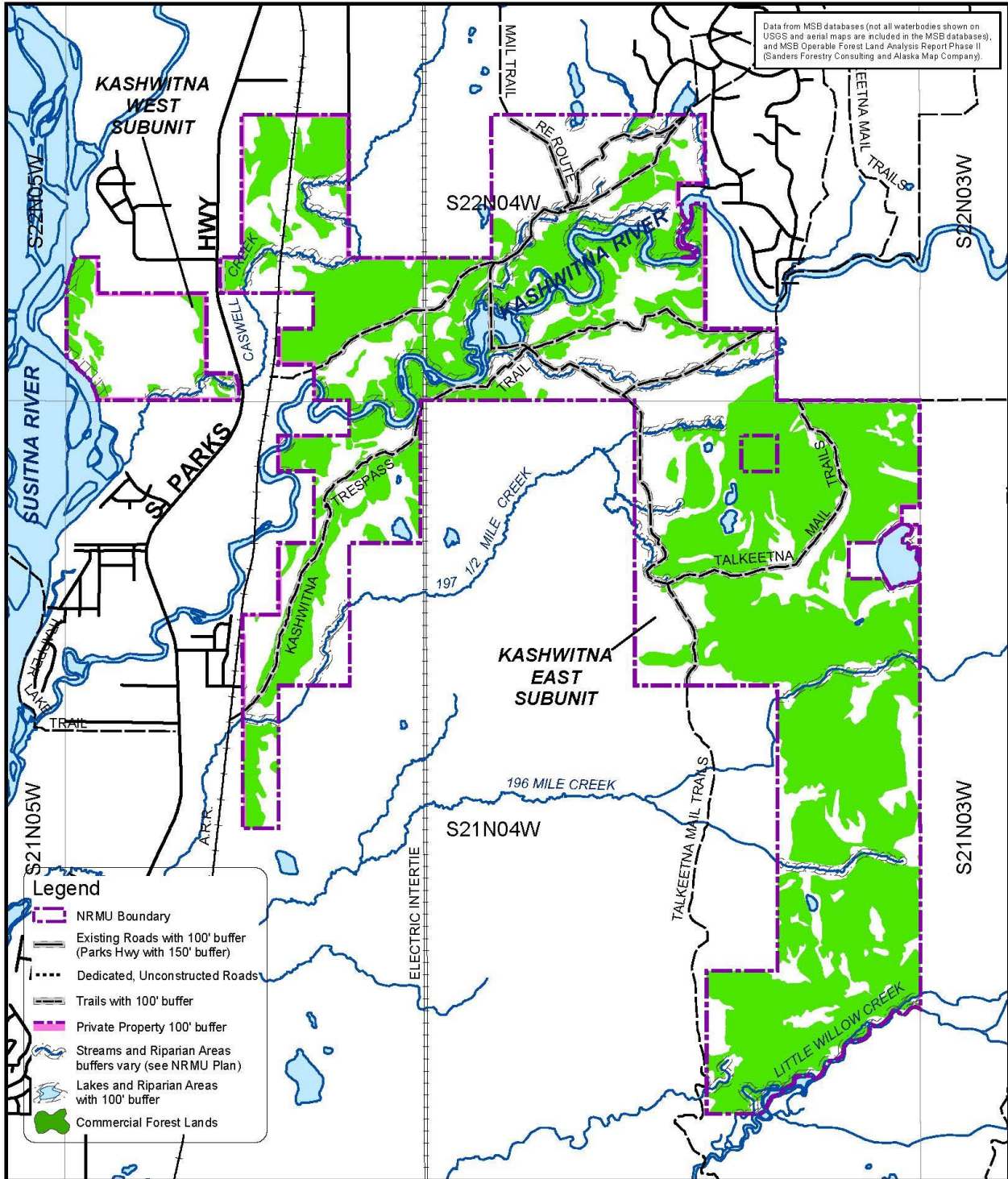
No additional unit-specific guidelines are needed for this unit. See Volume I, Chapters 2 and 3 for area-wide guidelines that apply to all Natural Resource Management Units.











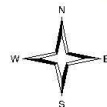
Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases), and MSB Operable Forest Land Analysis Report Phase II (Sanders Forestry Consulting and Alaska Map Company)

- 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 buffers vary (see NRMU Plan)
 - Lakes and Riparian Areas with 100' buffer
 - Commercial Forest Lands



Kashwitna NRMU Commercial Forest Lands

Community Development/LMD November 2018



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 eight 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 unit 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

Much of the adjoining land is owned by the State of Alaska. Timber harvests have taken place on these lands and general dispersed recreational use occurs. Seasonal dwellings have been built off an old timber road near the northwestern boundary. A subdivision of recreation cabins has developed adjacent to the northern boundary of the unit, south of the Kashwitna River.

Community Council Areas

Susitna Community Council and Willow Area Community Organization

Existing Land Use Plans

- Matanuska-Susitna Borough, *Recreational Trails Plan* (2016).
- Matanuska-Susitna Borough, *Parks, Recreation and Open Space Plan* (2001).

A portion of the unit lies within the Susitna Community Council boundary. The 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

The Willow Area Community Organization Comprehensive Plan includes a recommendation for a portion of the land included in this unit to be set aside for a Parks Highway Bypass. The anticipated highway bypass would travel east around the Willow Airport and no longer bisect the Willow Town Center.

Existing Land Use Classifications

Resource Management, Public Recreation, and Watershed Lands.

Summary of Resources and Uses

Agriculture and Grazing

A review of soil capability classifications, published by the USDA, Natural Resources Conservation Service (<http://websoilsurvey.nrcs.usda.gov/app/>), indicates that there are lands suitable for agricultural development or grazing within the unit.

See the soils maps at the beginning of this section.

Resources and Heritage Sites

A historic railroad trestle bridge is situated 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.

Also, see Commercial 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 is 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 streams 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 lies north of the trail.

See the Roads, Trails, Waterbodies, Wetlands and Riparian Area 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 small, informal gravel pits within the unit. Further investigations are required to determine if commercial quantities of earth materials are available.

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 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 protect water resources and encourage continued recreational uses of the area, while meeting some wood product and earth material needs. Forest management, timber harvest and material extraction shall be permitted activities.

Land Use Designations

Kashwitna West		
Designation	Classification	Management Intent
<i>Primary</i>		
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*.
<i>Secondary</i>		
None		

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 commercial 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*.
Secondary		
None		

*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 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, rivers, and riparian areas will be protected through the use of undisturbed natural vegetation buffers.

All wetlands (see definition in *Definitions/Glossary* at the end of this chapter or in Volume III) shall be protected with a 100-foot buffer. The buffer shall not allow disturbance of the wetland area, but some uses may be allowed. For example, wintertime 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 and 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.

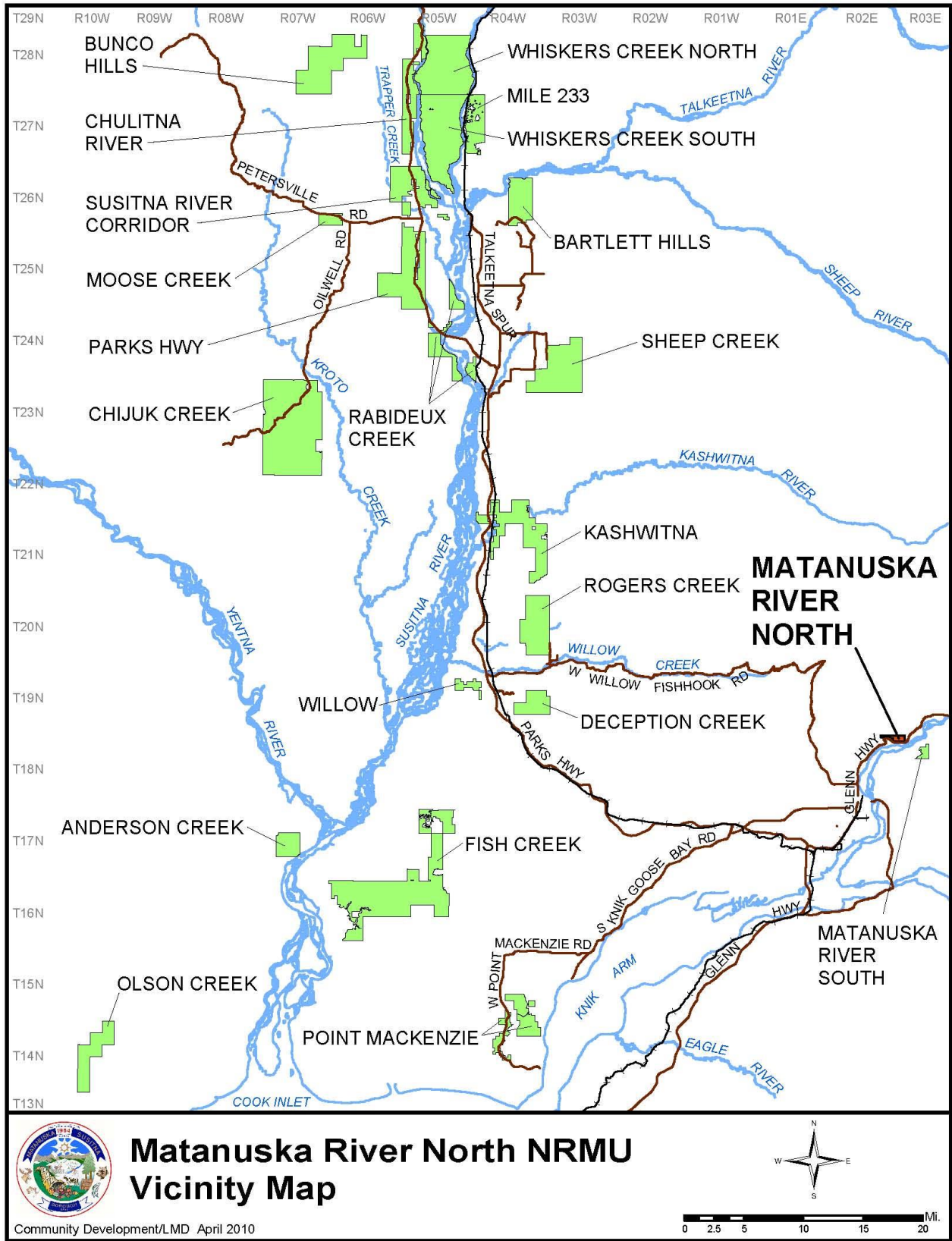
Forest Management

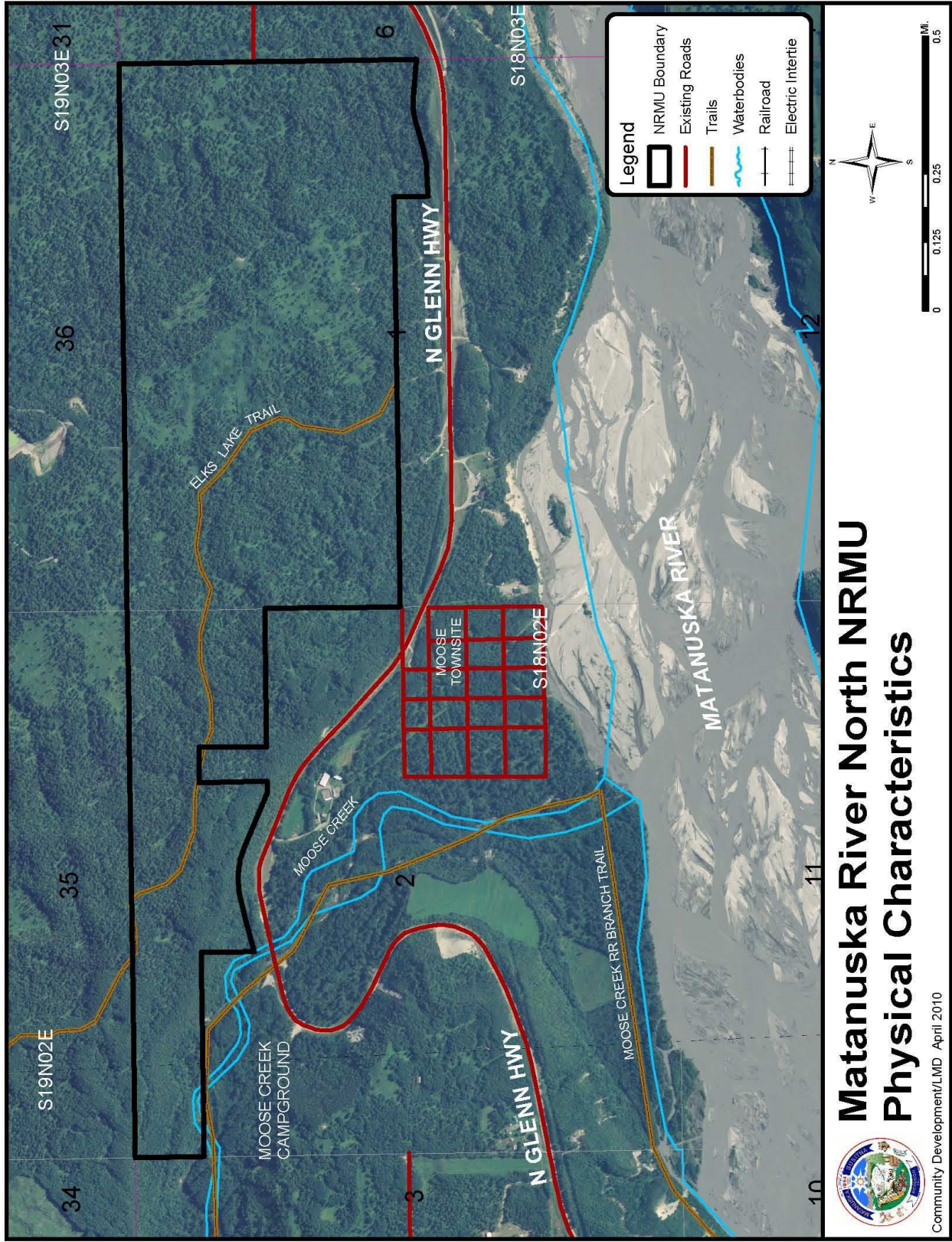
Timber harvest is a permitted activity in only the eastern subunit. Any timber harvest shall not significantly reduce the area's recreational values. Timber harvest shall be managed for improving forest health and providing forest products utilizing professionally accepted practices. Examples include 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 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.

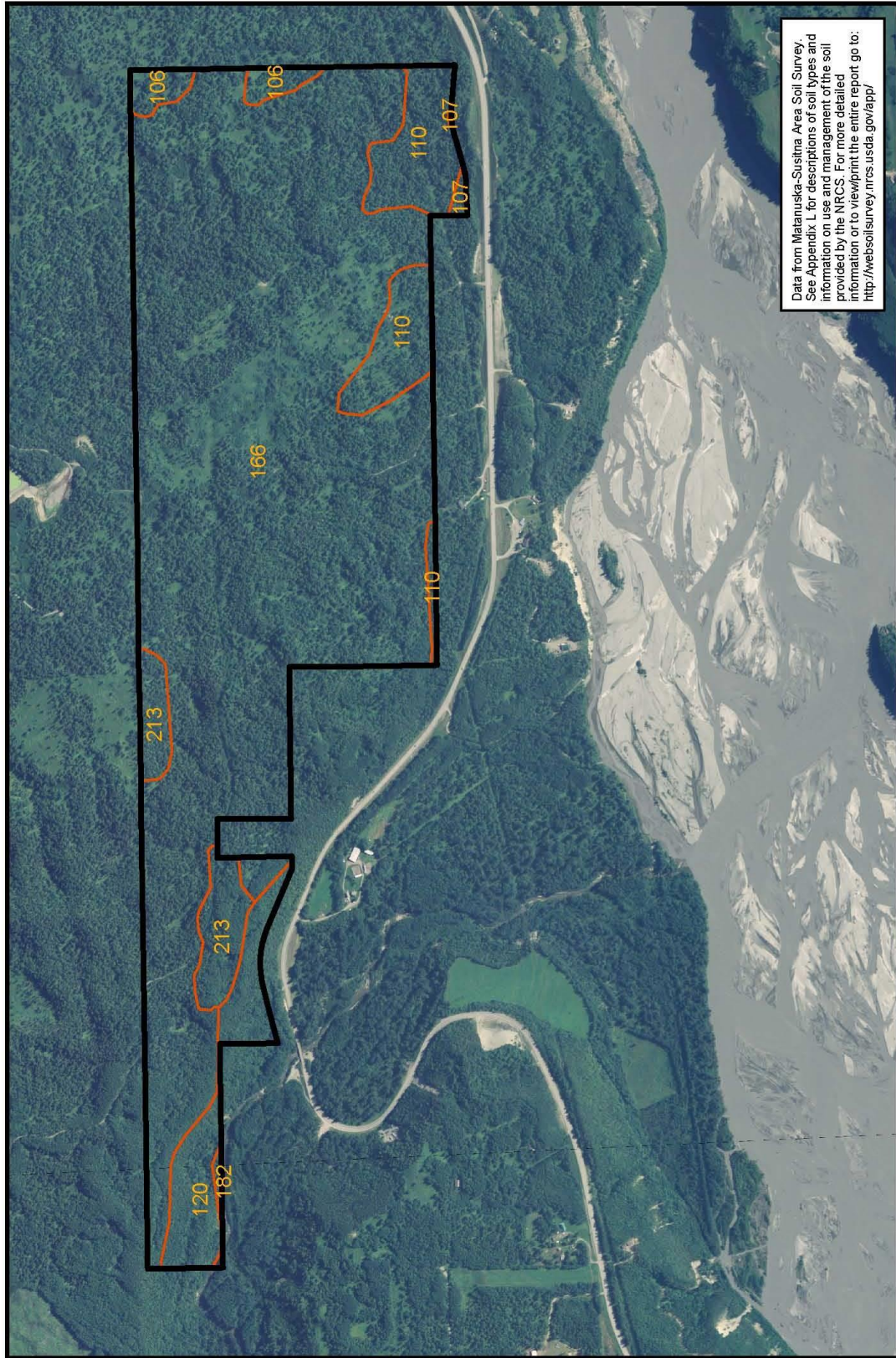




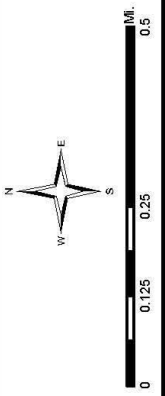
Matanuska River North NRMU Physical Characteristics



Community Development/LMD / April 2010



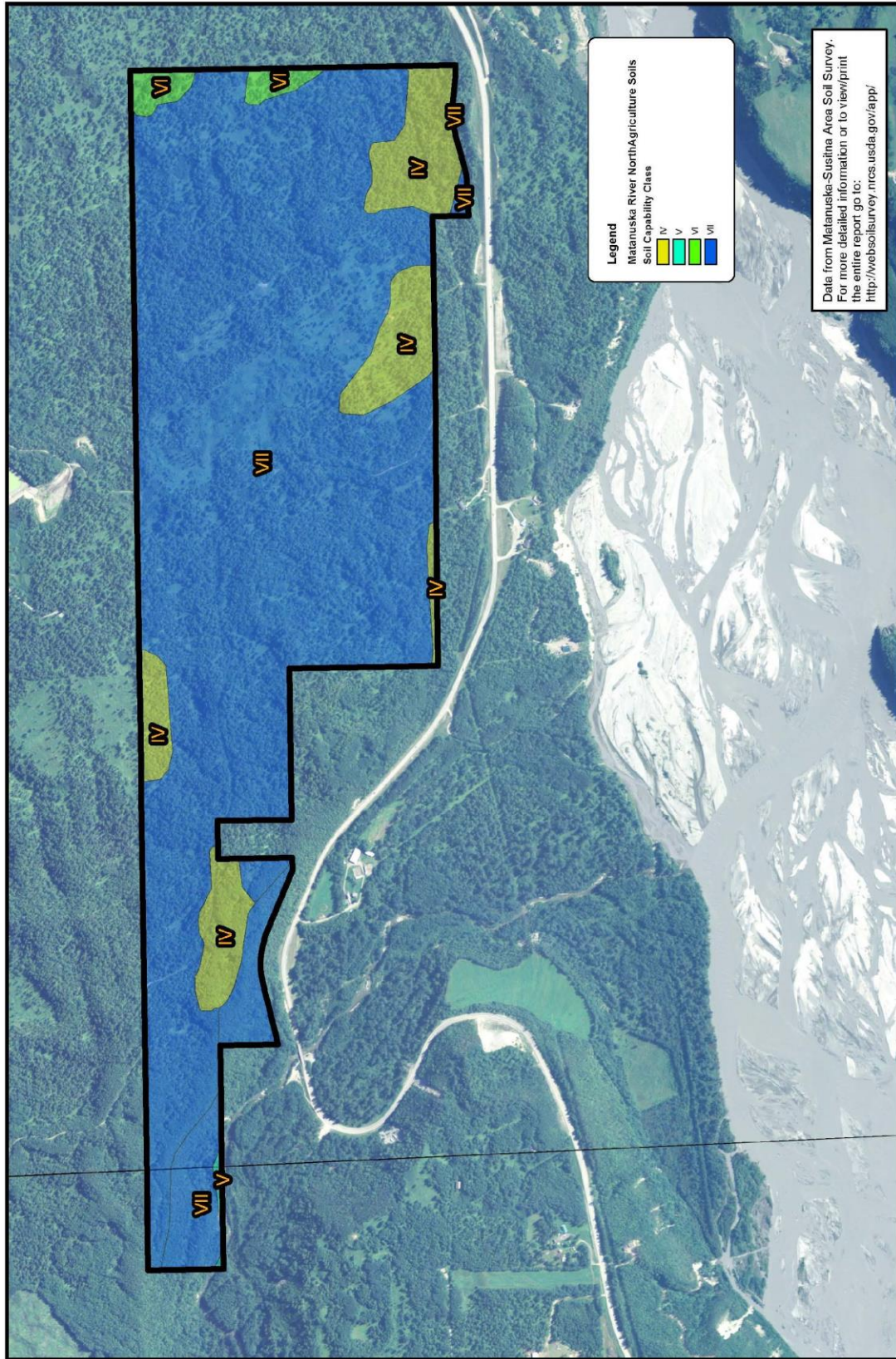
Data from Matanuska-Susitna Area Soil Survey. See Appendix L for descriptions of soil types and information on use and management of the soil provided by the NRCS. For more detailed information or to view/print the entire report go to: <http://websoil.nrcs.usda.gov/app/>



Matanuska River North NRMU Soils



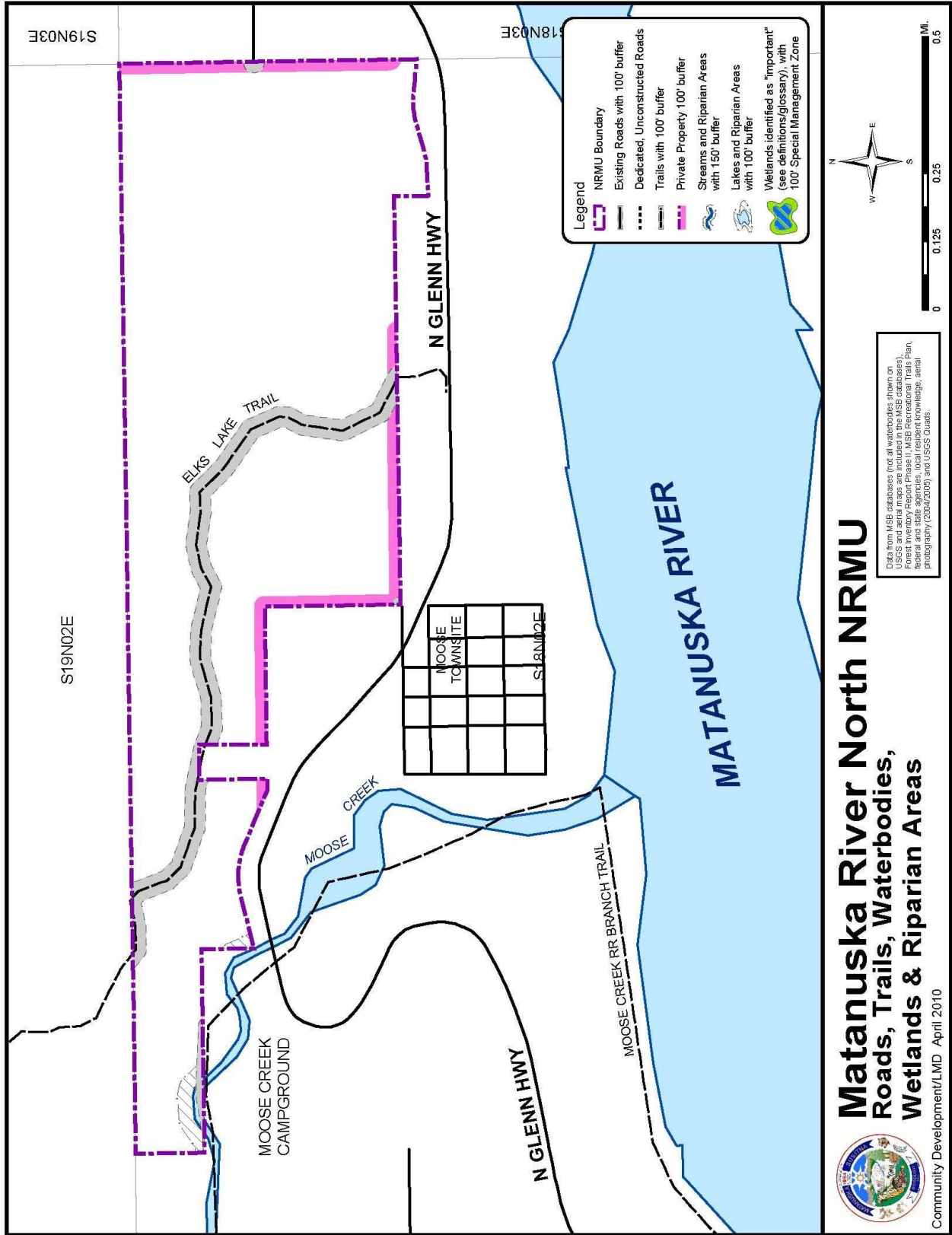
Community Development/LMD April 2010

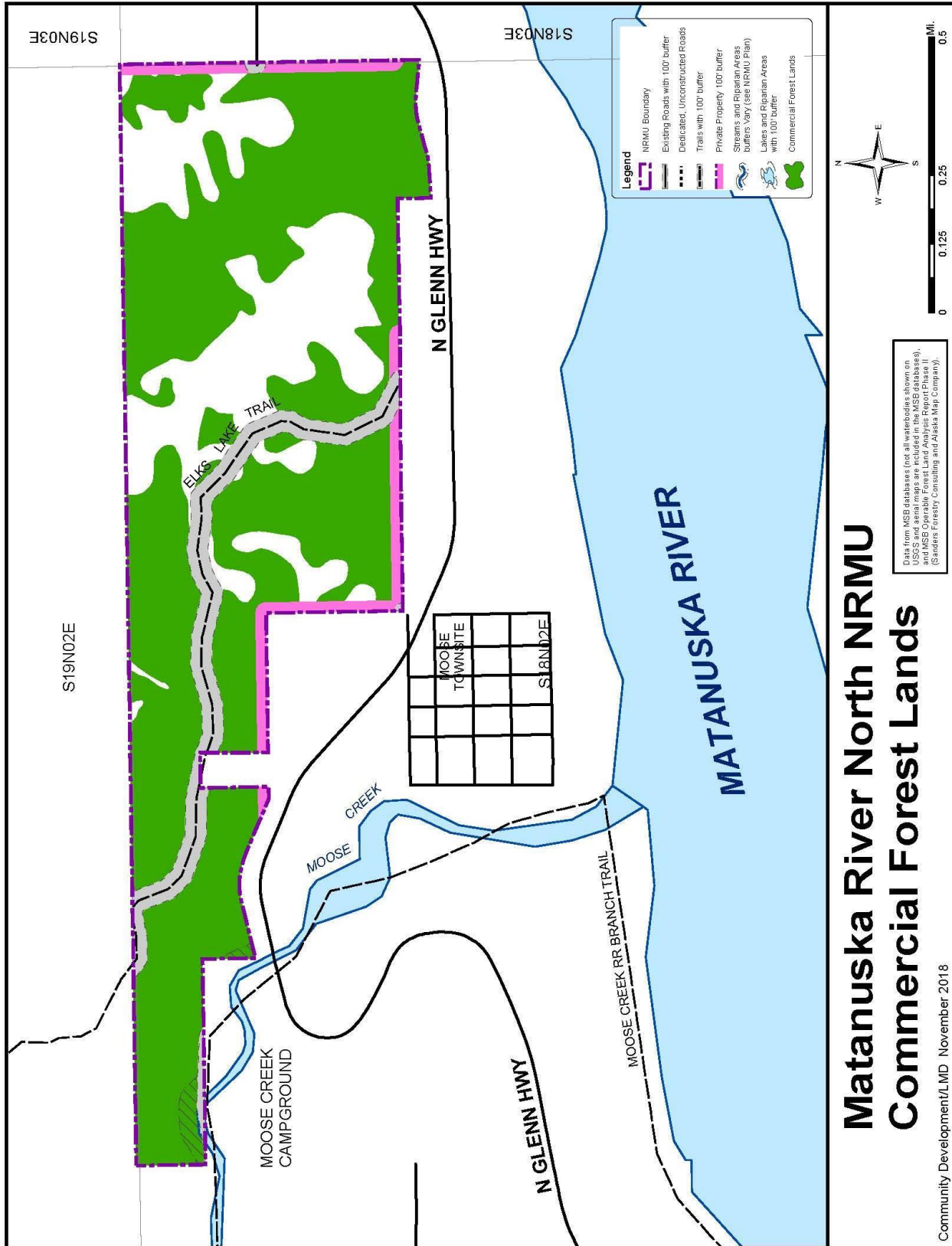


Matanuska River North NRMU Agriculture Soils



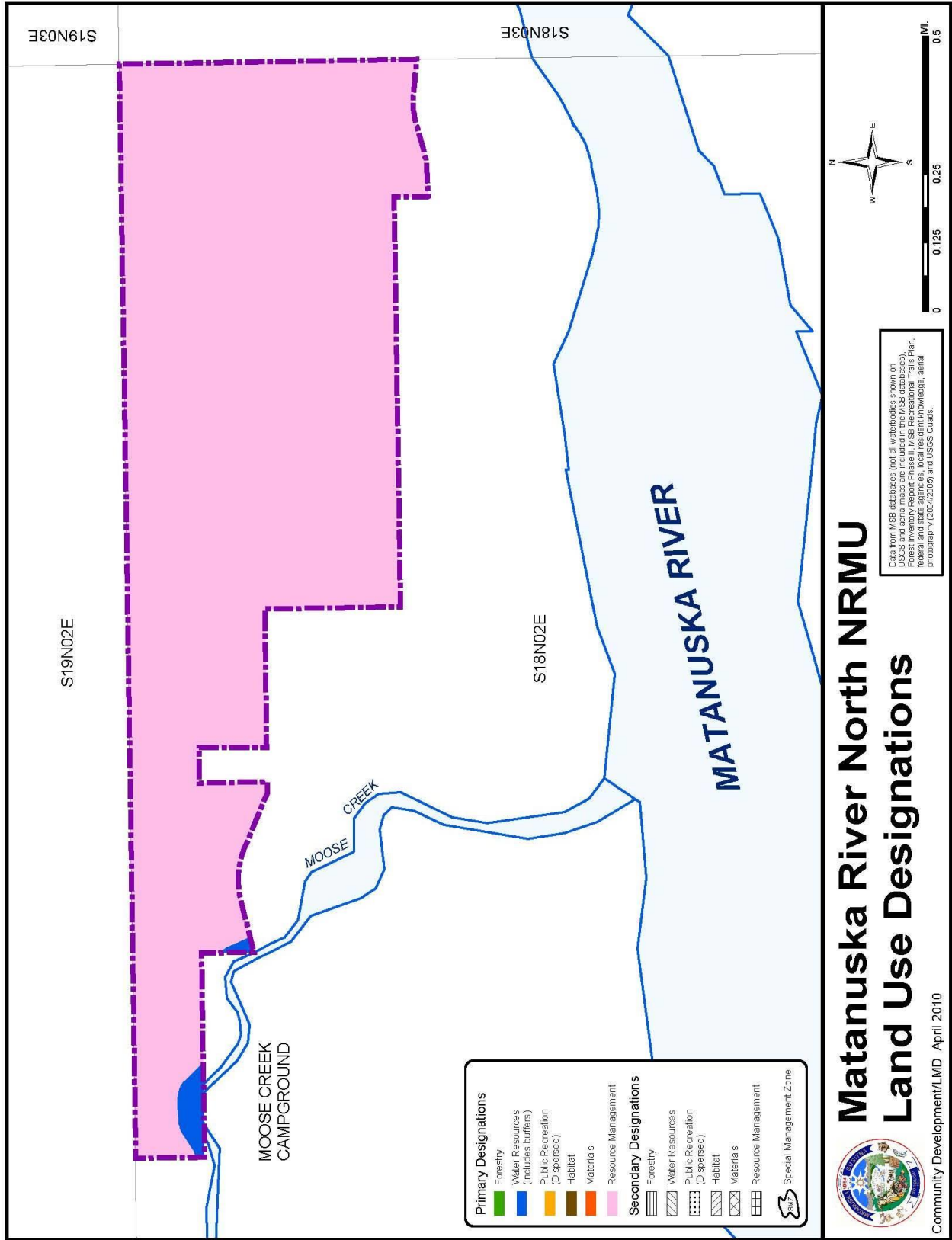
Community Development/LMD December 2018





Matanuska River North NRMU Commercial Forest Lands

Community Development/LMD November 2018



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 has 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 various dispersed recreational uses.

Community Council Area

Sutton/Alpine Community Council

Existing Land Use Plans

- Matanuska-Susitna Borough, *Recreational Trails Plan* (2016).
- Matanuska-Susitna Borough, *Parks, Recreation and Open Space Plan* (2001).

Existing Land Use Classifications

Resource Management and Watershed Lands

Summary of Resources and Uses

Agriculture and Grazing

A review of soil capability classifications, published by the USDA, Natural Resources Conservation Service (<http://websoilsurvey.ncrs.usda.gov/app/>), indicates that there are lands suitable for agricultural development or grazing within the unit.

See the *Soils* maps 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 western portion of the unit) and in other locations along Moose Creek near 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 Mine, 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 nesting area, 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 occurs in the western portion of the unit. Moose Creek successfully underwent significant habitat improvements to restore salmon habitat. 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) are Commercial Forest Land, some of which has been partially harvested.

Also, see *Commercial 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. A dedicated road corridor is under lease to Usibelli Coal Mine. The lease expires in June 2035. 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.

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. Additional field investigation is required to determine if commercial quantities of earth materials exists in this unit.

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 Commercial Forest Land areas, and protect and improve any important wildlife habitat areas. Because of the unit's 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
<i>Primary</i>		
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 commercial 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*.
<i>Secondary</i>		
None		

*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 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 with an undisturbed natural vegetation buffer.

The Elks Creek Trail shall be buffered.

Where the unit adjoins private property, the private property shall be protected with 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.

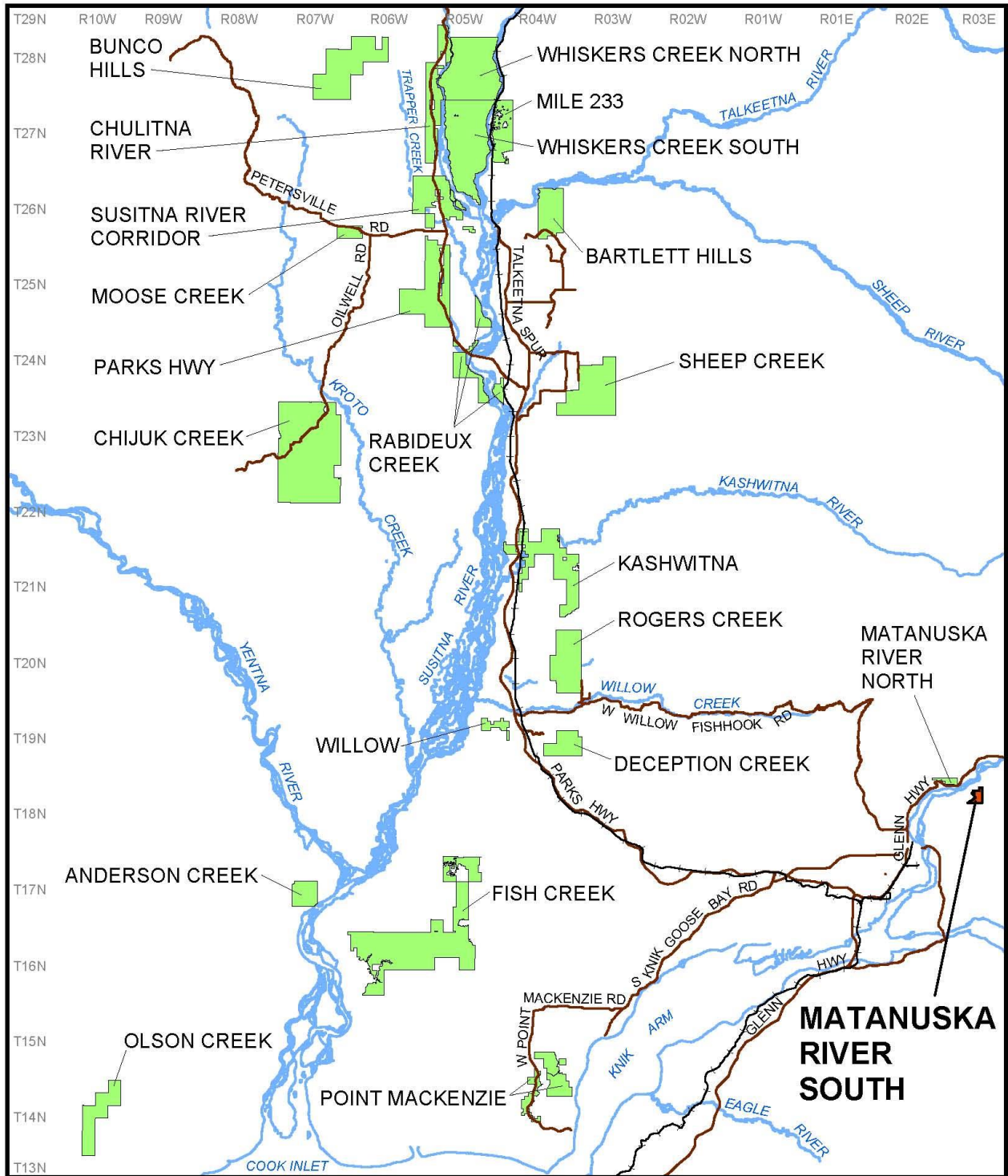
Forest Management

Timber harvests are a permitted use if it does not significantly reduce the area's other values. .

Other Uses

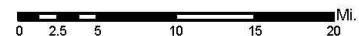
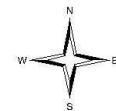
Given the unit's small size (445 acres), close proximity to the community of Sutton, particularly the Sutton Elementary School, its proximity to the Matanuska Valley Moose Range and Moose Creek, this unit could be designated as a Special Management Area for the purpose of establishing a Forest Education and Improvement Study Area. (See Volume I, Chapter 3; *Forest Education and Improvement Study Area(s)* for additional information.)

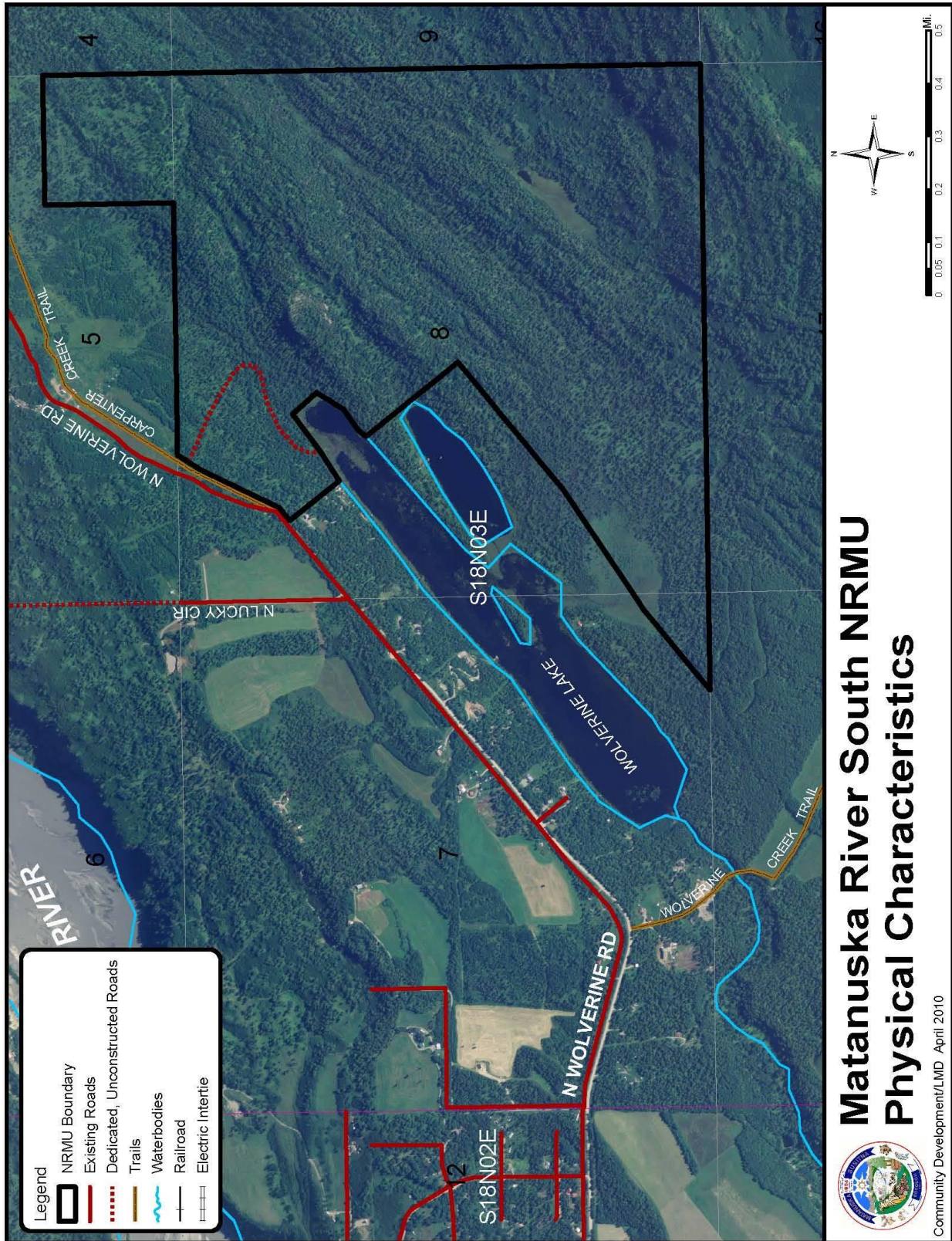
No additional unit-specific guidelines are needed for this unit. See Volume I, Chapters 2 and 3 for area-wide guidelines that apply to all Natural Resource Management Units.

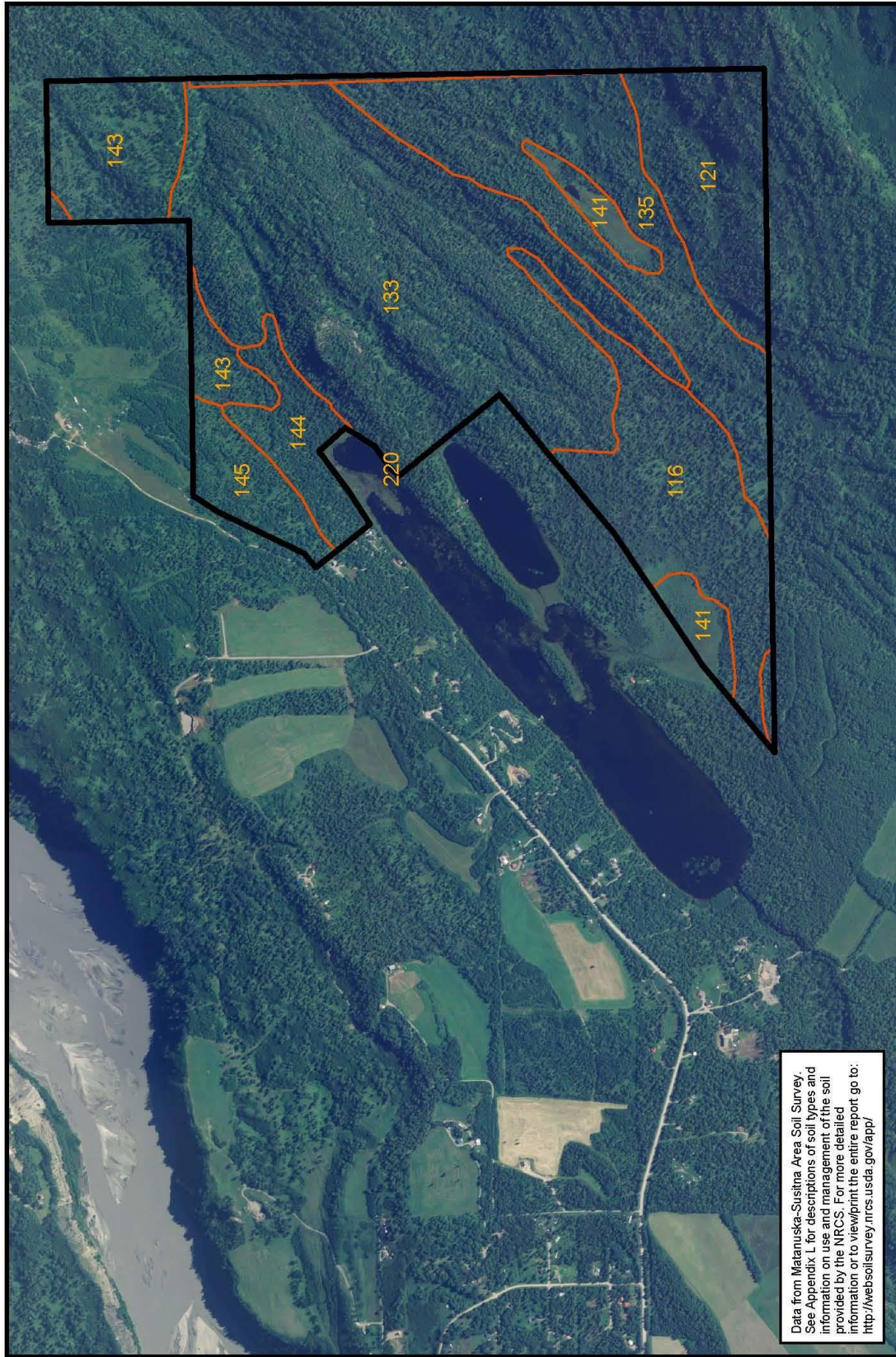


Matanuska River South NRMU Vicinity Map

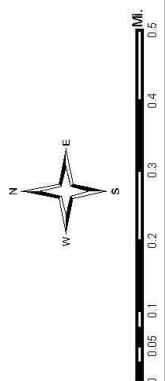
Community Development/LMD April 2010







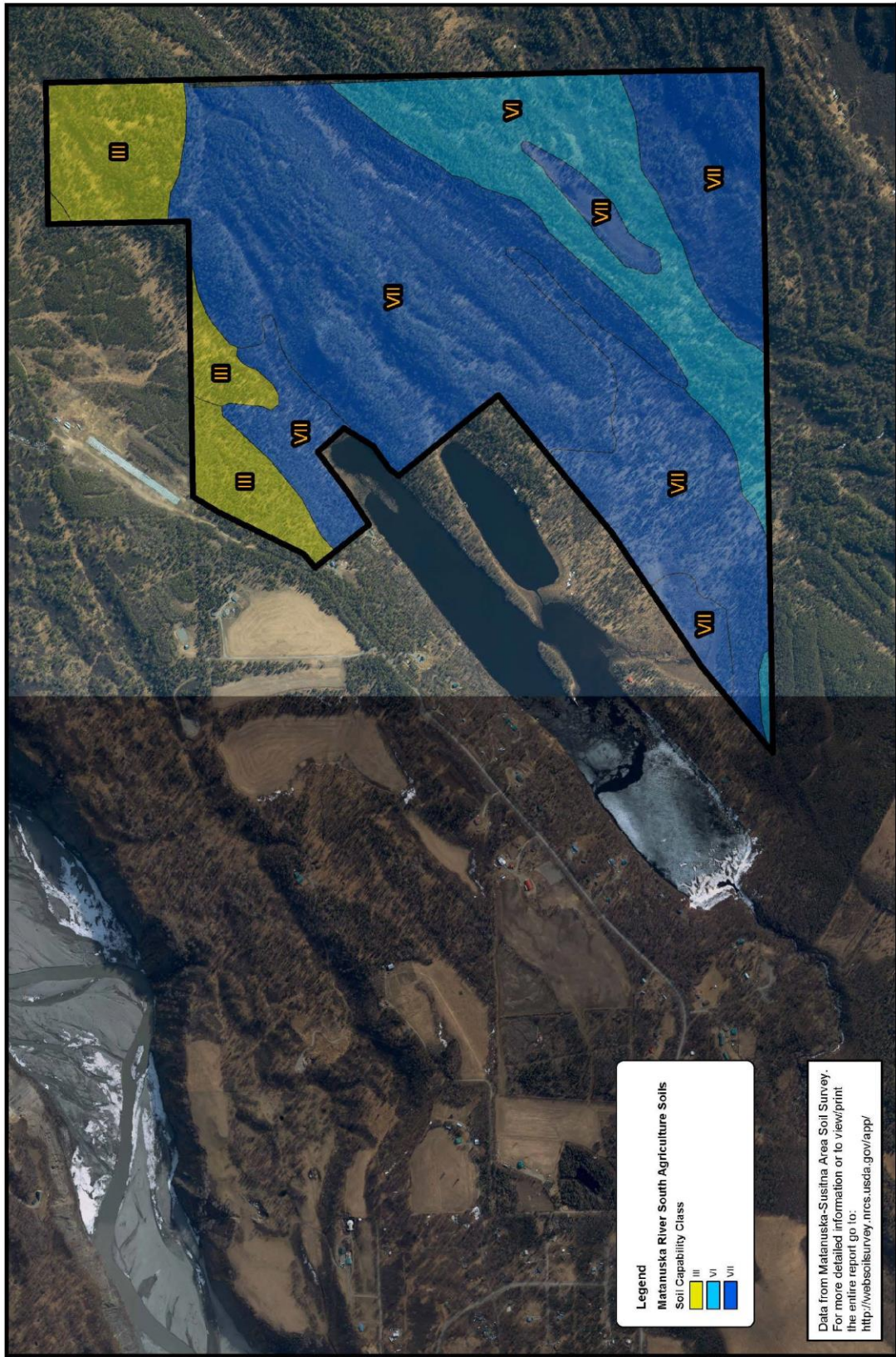
Data from Matanuska-Susitna Area Soil Survey. See Appendix L for descriptions of soil types and information on use and management of the soil provided by the NRCS. For more detailed information or to view/print the entire report go to: <http://websoilsurvey.nrcs.usda.gov/app/>



Matanuska River South NRMU Soils



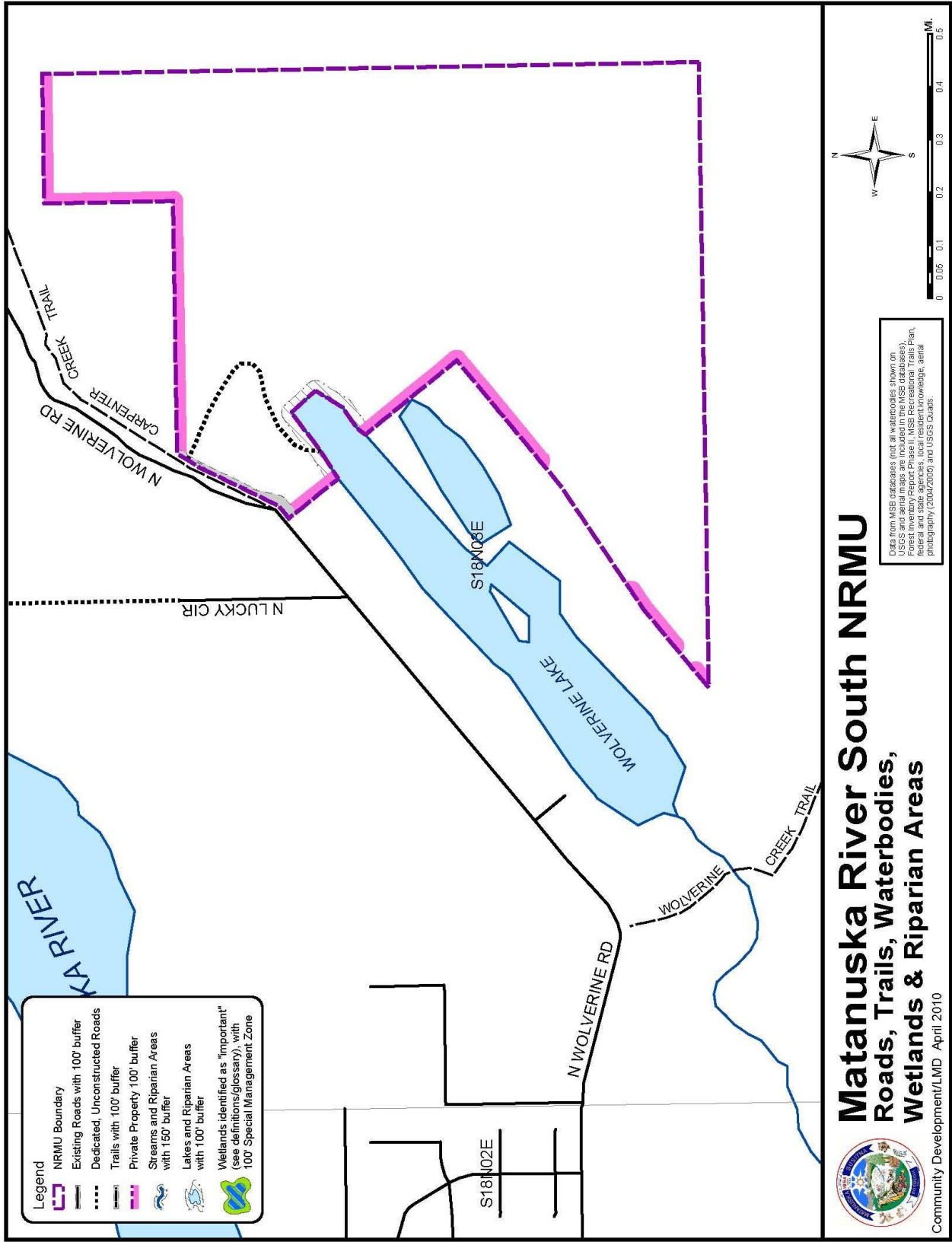
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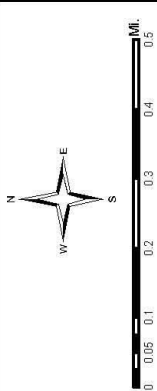
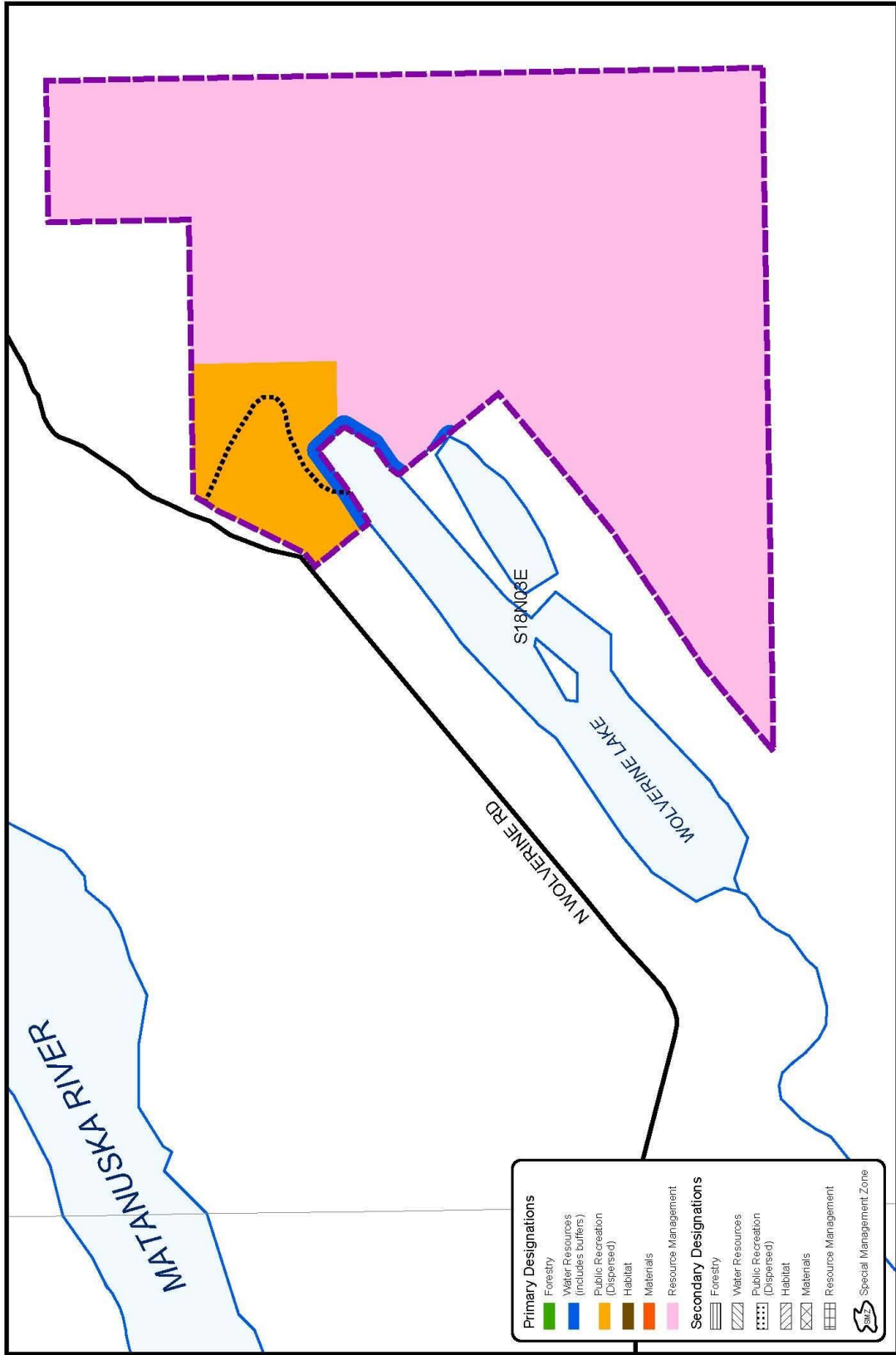


Matanuska River South NRMU Agriculture Soils



Community Development/LMD December 2018





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 (2004/2009) and USGS Quads.

Matanuska River South NRMU Land Use Designations



Community Development/LMD April 2010

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 six 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 have not been any recent timber harvests. 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

- *Matanuska-Susitna Borough, Recreational Trails Plan* (2016).
- *Matanuska-Susitna Borough, Parks, Recreation and Open Space Plan* (2001)
- *Wolverine Lake Management Plan* (2004).
- *Lazy Mountain 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.

Existing Land Use Classifications

Majority is Resource Management Lands (approximately 500 acres), and part is Public Recreation Lands (approximately 40 acres) with Watershed Lands on the wetlands and streams.

The public recreation lands are located adjacent to Wolverine Lake.

Summary of Resources and Uses

Agriculture and Grazing

There are some agricultural uses in the general area. A review of the soil capability classifications , published by the USDA, Natural Resources Conservation Service (<http://websoilsurvey.nrcs.usda.gov/app/>), indicates that there are lands suitable for agricultural development or grazing within the unit.

See the *Soils* maps 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 fieldwork 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. Songbirds, raptors, grouse, eagles, waterfowl 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.

There are no known fish or hunting 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 forest land present in the unit is economically unfeasible.

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. A pioneer road has been constructed to access a private farm adjacent to the unit. An informal parking area exists along the western boundary of the unit used to access Wolverine Lake.

There is primitive trail constructed within a 30-foot wide public use easement from the 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.

Visual reconnaissance and a preliminary material investigation indicate the presence of a substantial quantity of rock that may be suitable for use as riprap and armor rock. Additional field investigation is required to determine if commercial quantities are present on site.

Also, see the *Soils* map at the beginning of this section.

Unit Management Intent

The management intent for the Public Recreation Lands within 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 remainder of the unit should be managed to maximize its revenue potential while minimizing any negative effects on the public recreation activities near the lake. This management intent is consistent with the Lazy Mountain Comprehensive Plan.

Land Use Designations

Matanuska River South		
Designation	Classification	Management Intent
<i>Primary</i>		
Public Recreation - Dispersed	Public Recreation Lands	The 40-acre parcel currently designated and classified as public recreation shall remain as public recreation land (Section 8, Parcel B10 T. 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*.
<i>Secondary</i>		
None	None	

*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 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

That portion of Wolverine Lake that is within the unit, including any associated riparian and wetland areas shall be protected with 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 from 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 by buffers or placed in a Special Management Zone, as appropriate.

Materials

Material sites may be developed outside of water resource areas with sufficient quantities for commercial use. Material extraction may be limited to certain times of the year and hours of operation in recognition of local resident's lifestyles.

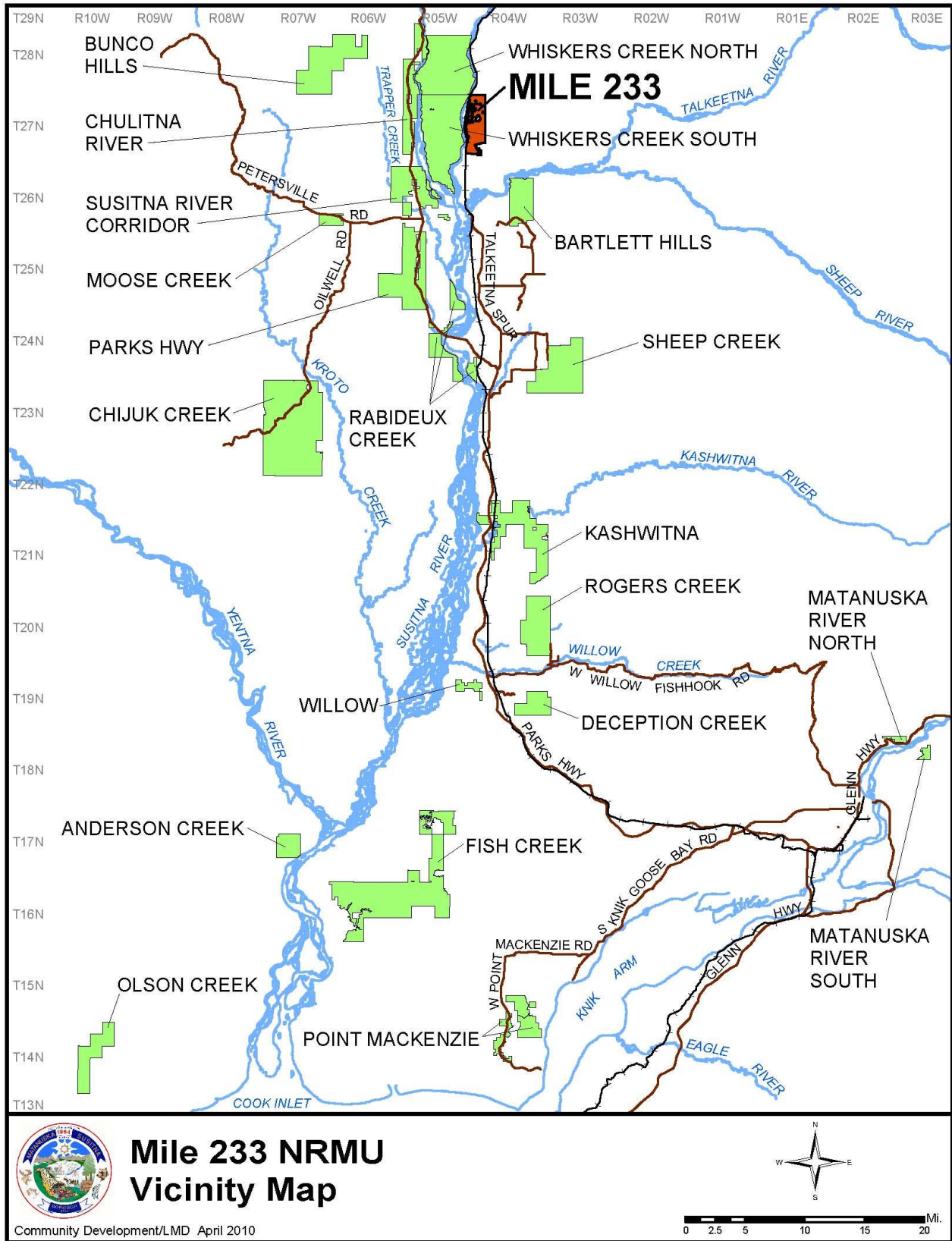
The Alaska Department of Fish and Game will require Fish Habitat Permits, accompanied by detailed project plans, prior to any planned resource extraction project adjacent to anadromous or resident waterbodies.

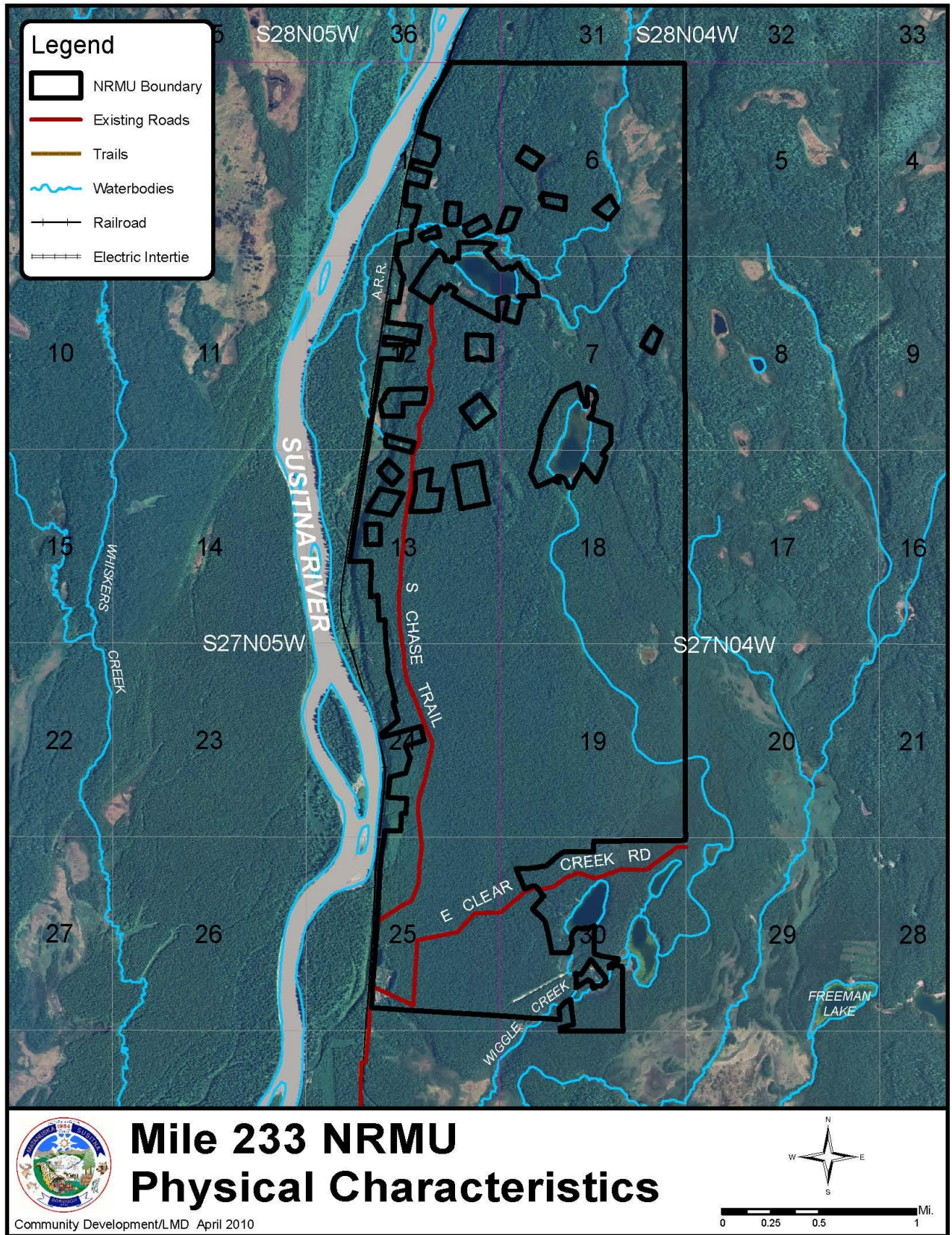
See *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section for waterbodies that shall have buffers, wetlands with a Special Management Zone, roads, and trails with buffers.

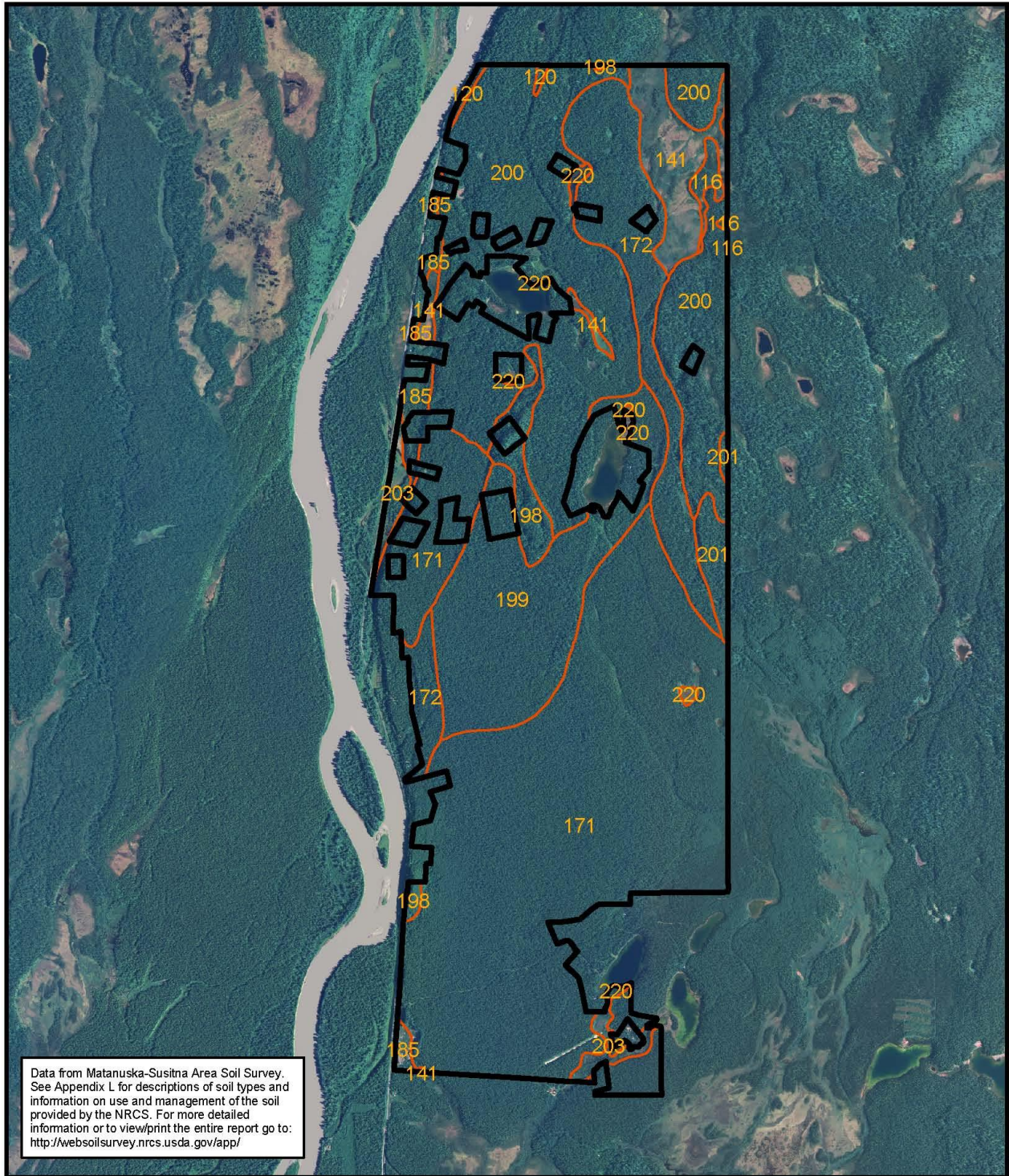
Also, see Volume I, Chapter 2, *Buffers and Special Management Zones* for additional information.

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.





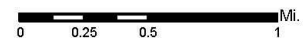
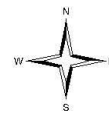


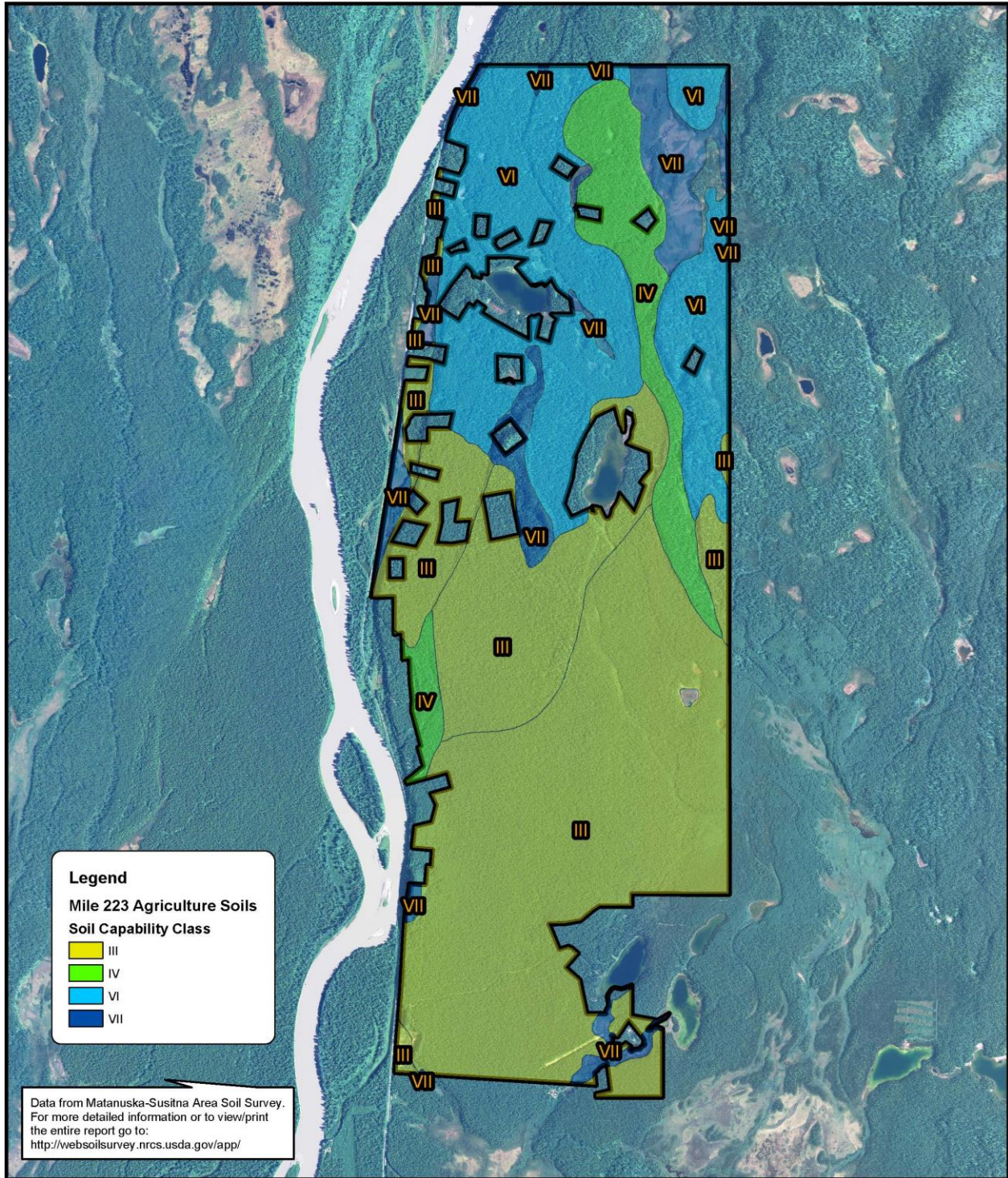
Data from Matanuska-Susitna Area Soil Survey.
 See Appendix L for descriptions of soil types and
 information on use and management of the soil
 provided by the NRCS. For more detailed
 information or to view/print the entire report go to:
<http://websoilsurvey.nrcs.usda.gov/app/>



Mile 233 NRMU Soils

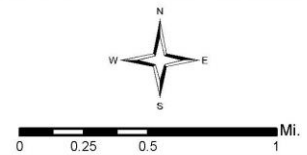
Community Development/LMD April 2010

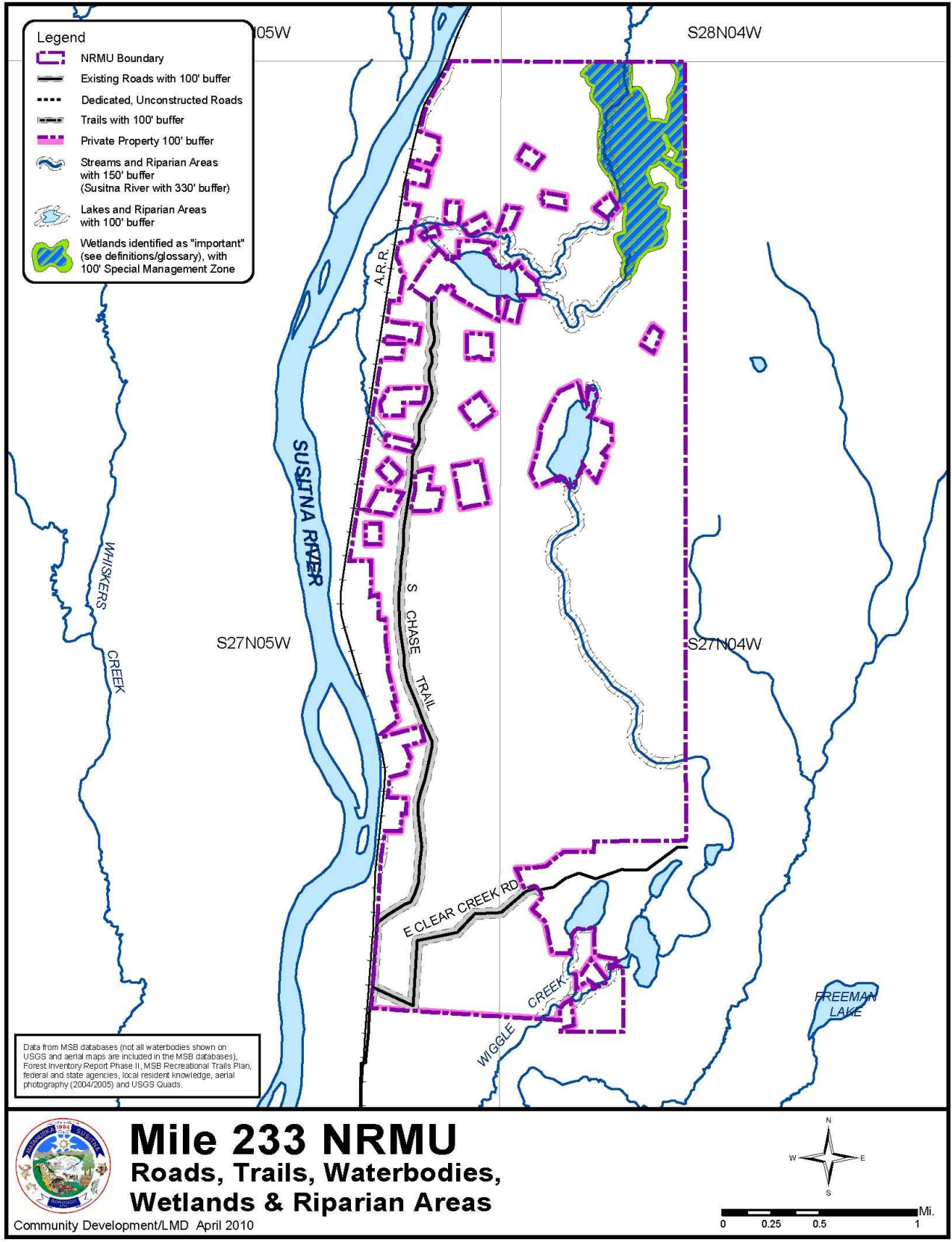


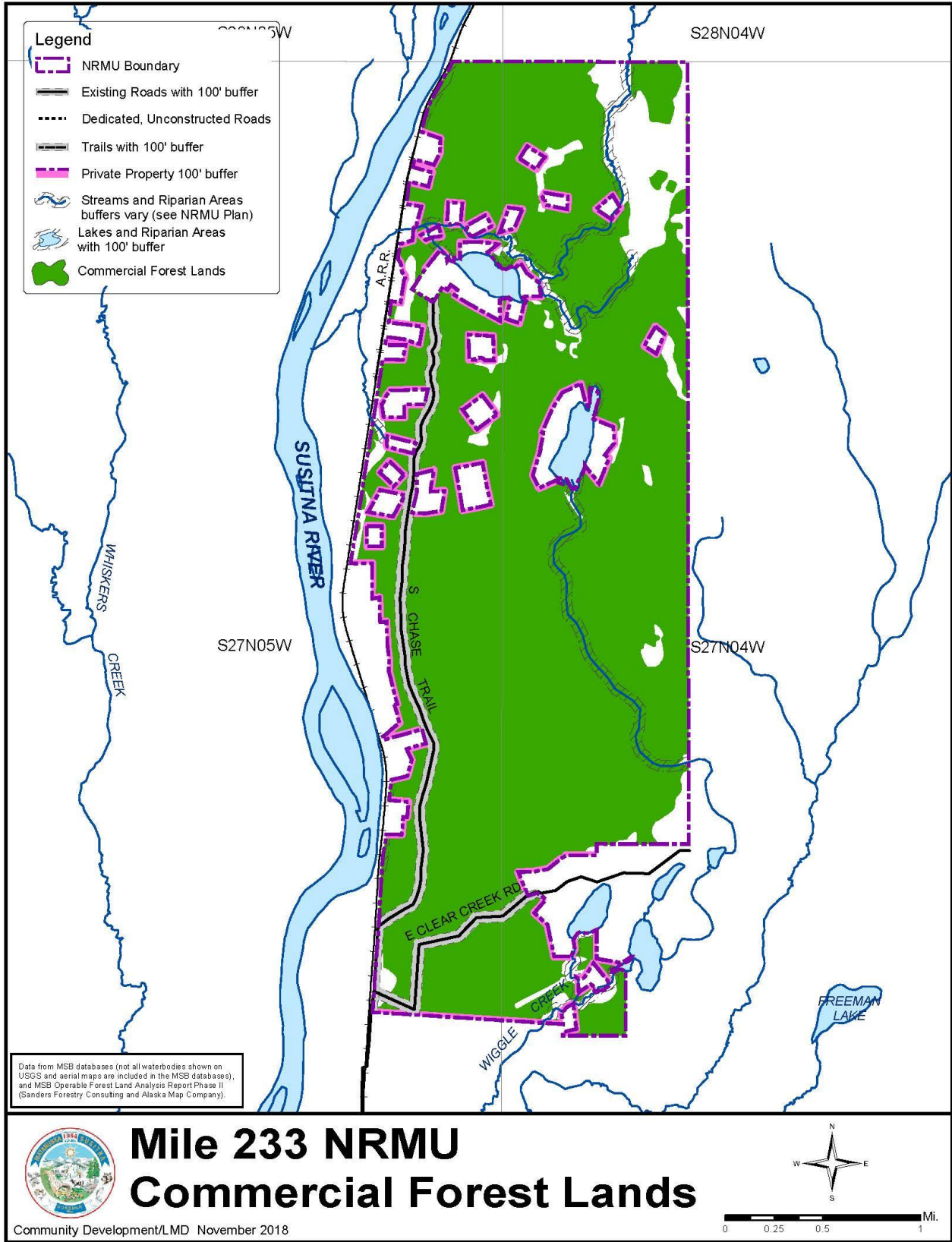


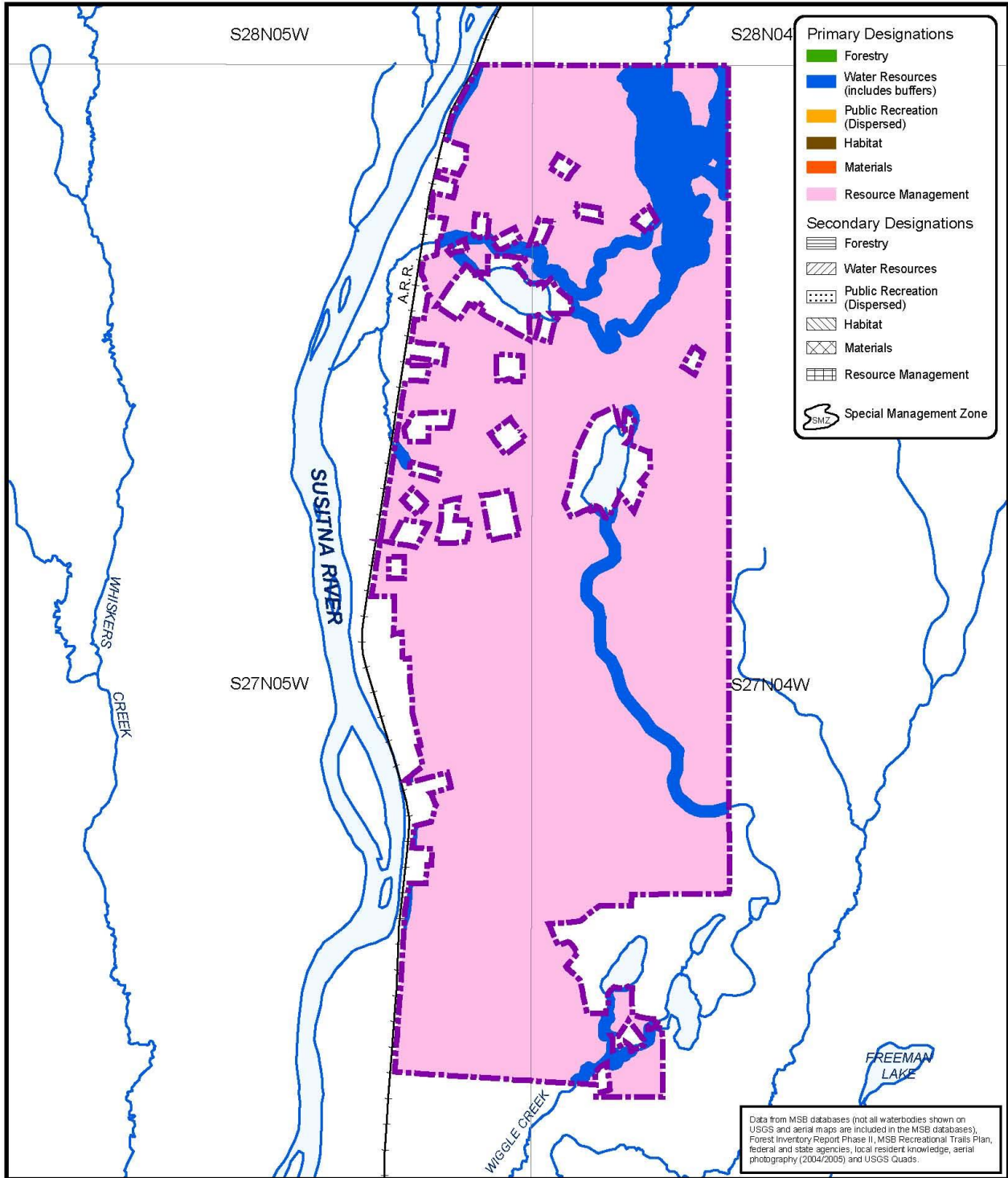
Mile 233 NRMU Agriculture Soils

Community Development/LMD December 2018







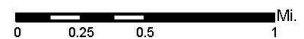
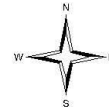


Data from MSB databases (not all waterbodies shown on USGS and aerial maps are included in the MSB databases), Forest Inventory Report Phase II, MSB Recreational Trails Plan, federal and state agencies, local resident knowledge, aerial photography (2004/2009) and USGS Quads.



Mile 233 NRMU Land Use Designations

Community Development/LMD April 2010



MILE 233

Natural Resource Management Unit

General Information

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 forest land 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 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

- Matanuska-Susitna Borough, *Recreational Trails Plan* (2016).
- Matanuska-Susitna Borough, *Parks, Recreation and Open Space Plan* (2001)
- *Chase Comprehensive Plan* (2017) 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 should 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

Resource Management and Watershed Lands

Summary of Resources and Uses

Agriculture and Grazing

A review of soil capability classifications, published by the USDA, Natural Resources Conservation Service (<http://websoilsurvey.nrcs.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 limited. Agriculture uses and development may occur to support local resident's rural lifestyles.

See the *Soils* maps 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 unit's 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 fieldwork 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 streams and in subalpine habitats. Brown bears are common seasonally in subalpine habitats. Furbearers 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 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.

Also, see *Commercial Forest Lands* map at the beginning of this section.

Local residents use the forest resources as a supply for firewood 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, especially 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 access difficulties. However, because of its location on one of the flight seeing flight lines to and from Denali National Park and Preserve, specifically the Denali 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, Back Lake Trail, Front Lake Trail, Trapline Trail, Nodwell Trail, Clear Creek Trail, and Clear Creek Road, all of which are dedicated, also access the area. The Chase Trail is serviced by a Trail Service District.

There are numerous 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 is a historic gravel extraction area within the unit from when the railroad was constructed. Locals have borrowed material from the site often enough to keep the working face largely free of

vegetation. 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 material site at Mile 232, which is the property of the Alaska Railroad Corporation. Additional field investigation is necessary to determine if there are commercial quantities of earth materials in this unit.

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
<i>Primary</i>		
Resource Management	Resource Management Lands	All upland areas, except those designated as water resources. Available for forest management and timber harvests in areas determined to be commercial forest land and where it does not significantly reduce the areas recreational activities and area resident’s rural lifestyles. Material sites should be buffered in accordance with MSB Code. 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*.
<i>Secondary</i>		
None		

*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 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 their associated riparian areas shall be protected through the use of undisturbed natural vegetation buffers.

All wetlands (see definition in *Definitions/Glossary* at the end of this chapter or in Volume III) shall be protected with a 100-foot buffer area around the wetland area. The buffer shall not allow disturbance of the wetland area, but some uses may be allowed. For example, wintertime 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 dedicated roads and trails above shall have an undisturbed natural vegetation buffer.

Where the unit adjoins private property, the private property shall be protected with an undisturbed natural vegetation buffer. These buffers may 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

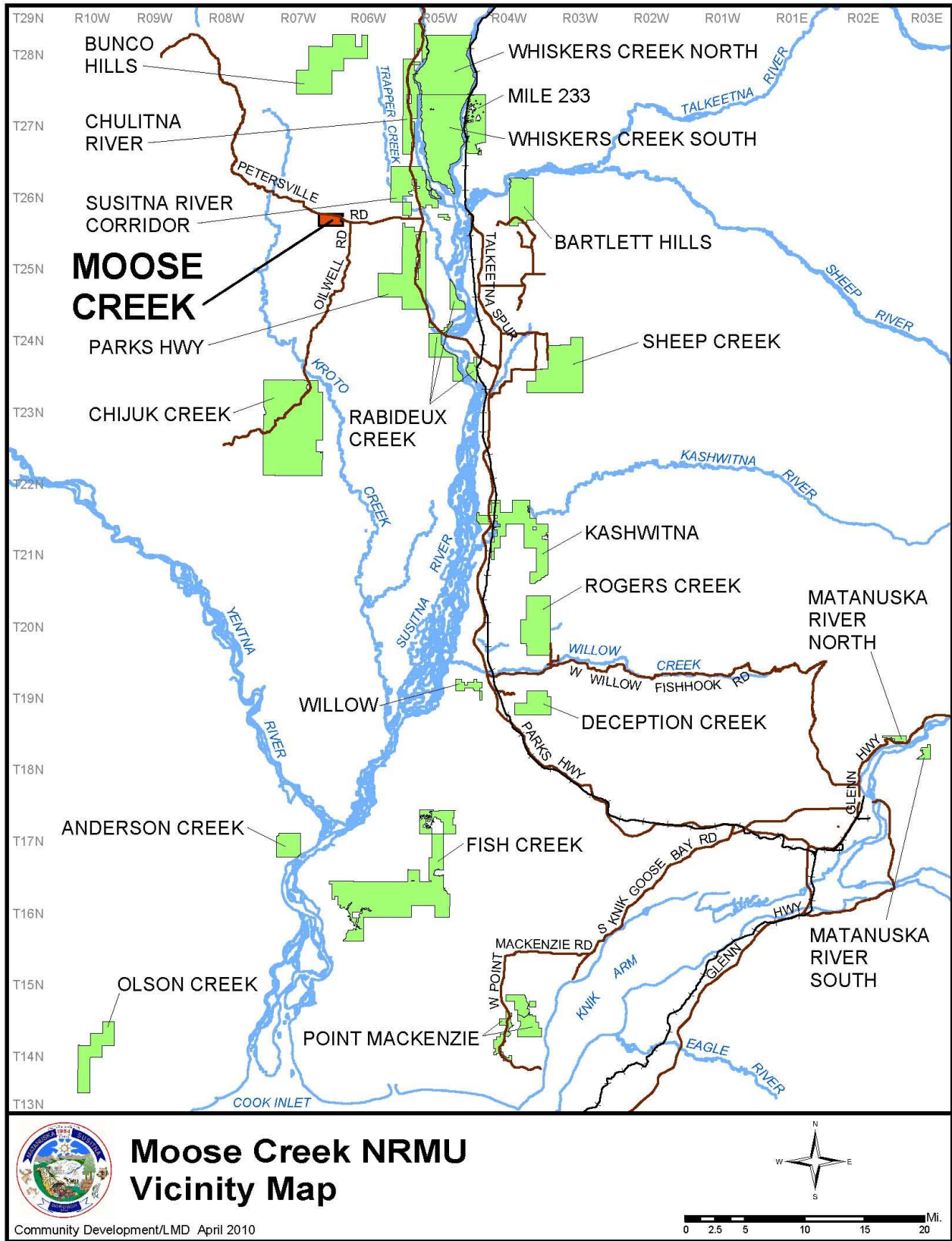
Timber harvest is a permitted use when it does not significantly reduce the local residents' rural lifestyles and the area's recreational, and scenic values. Timber harvests shall generally be small. Examples include selective cuts for specialty products, sawlogs, house logs, personal/community use and firewood harvests.

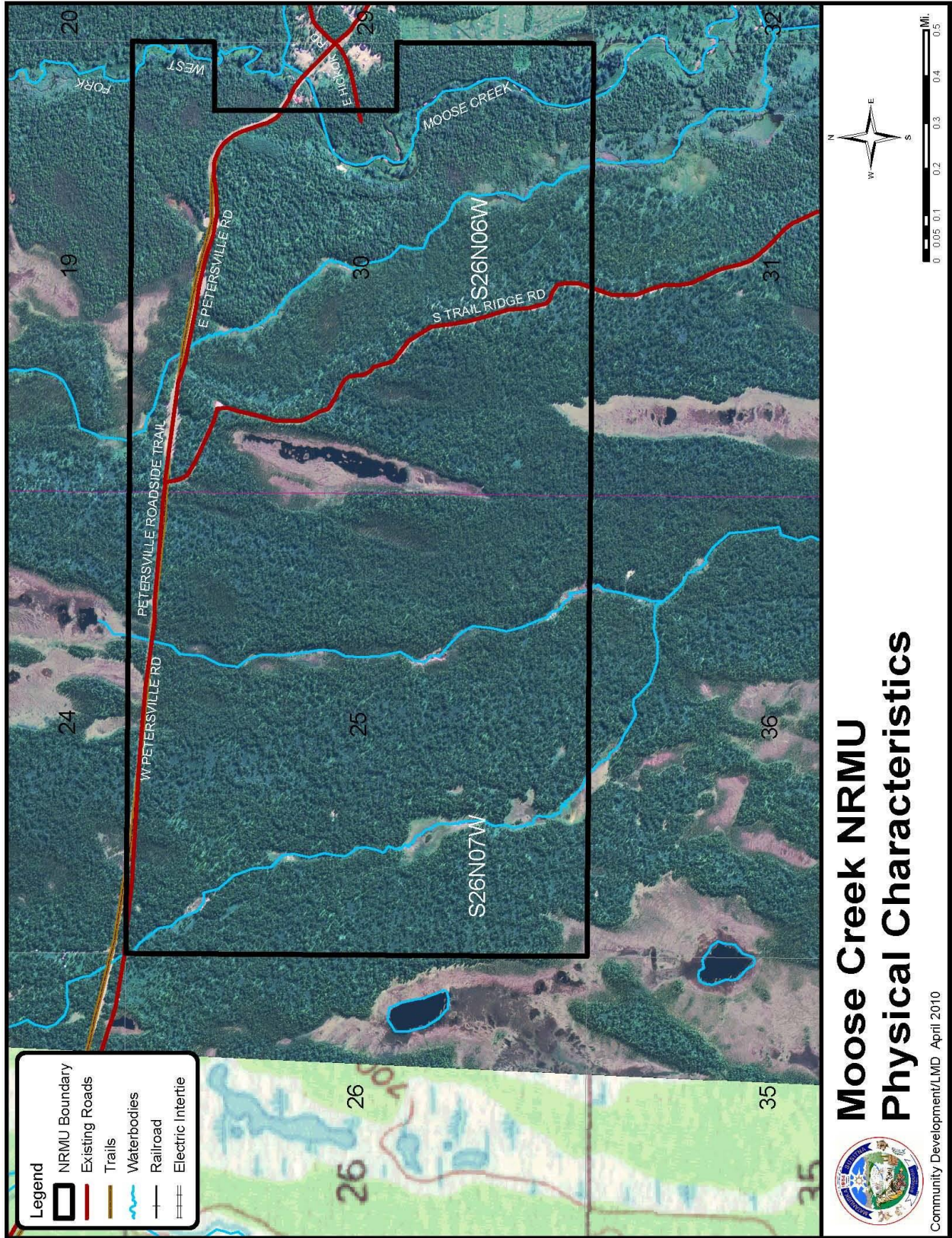
Larger size timber harvests may be held with harvest areas designed to improve wildlife habitat and/or to create winter moose habitat to reduce moose mortality along the Alaska Railroad. Location and layout of timber harvest areas should be designed to minimize negative visual impact on tourist flights 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.

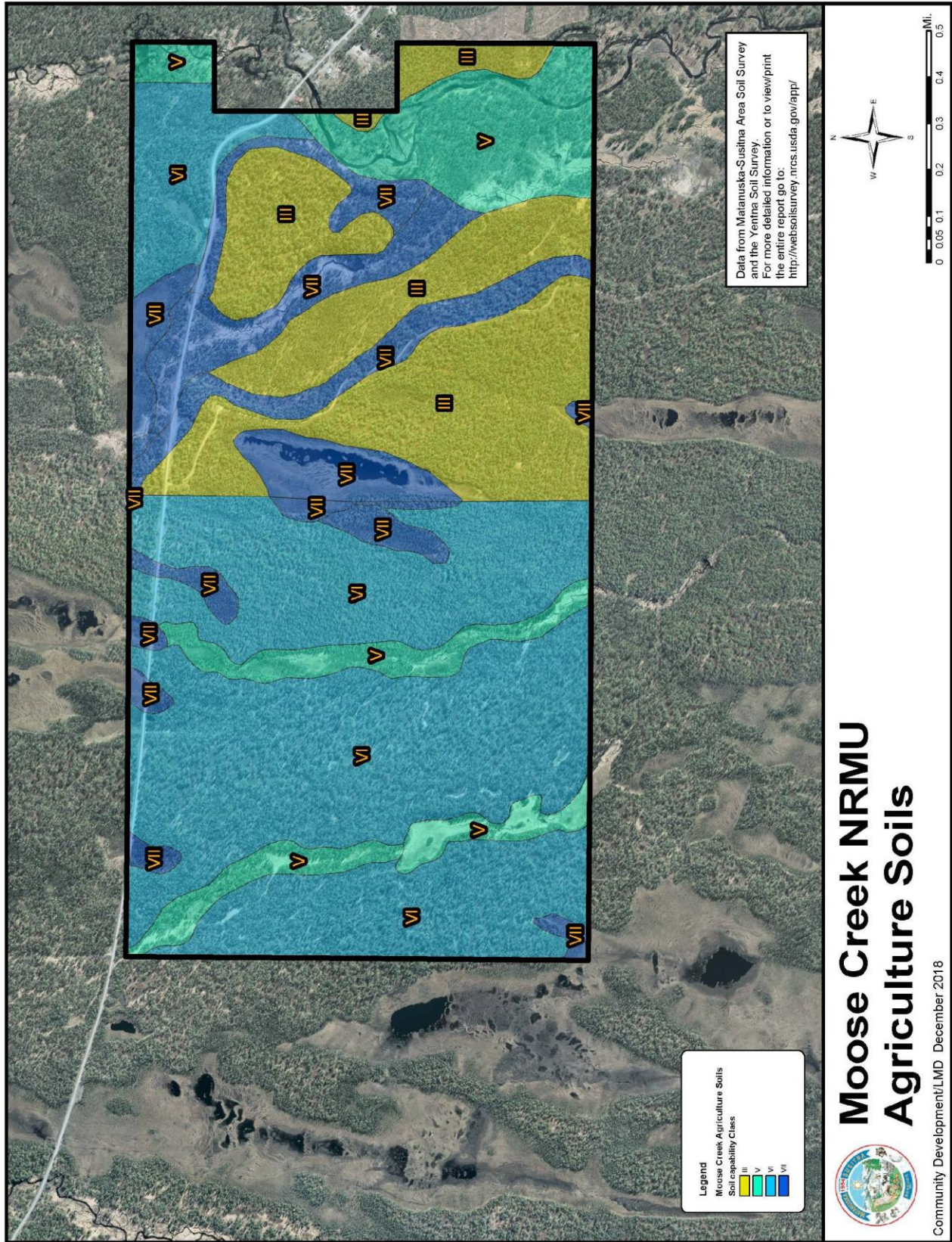


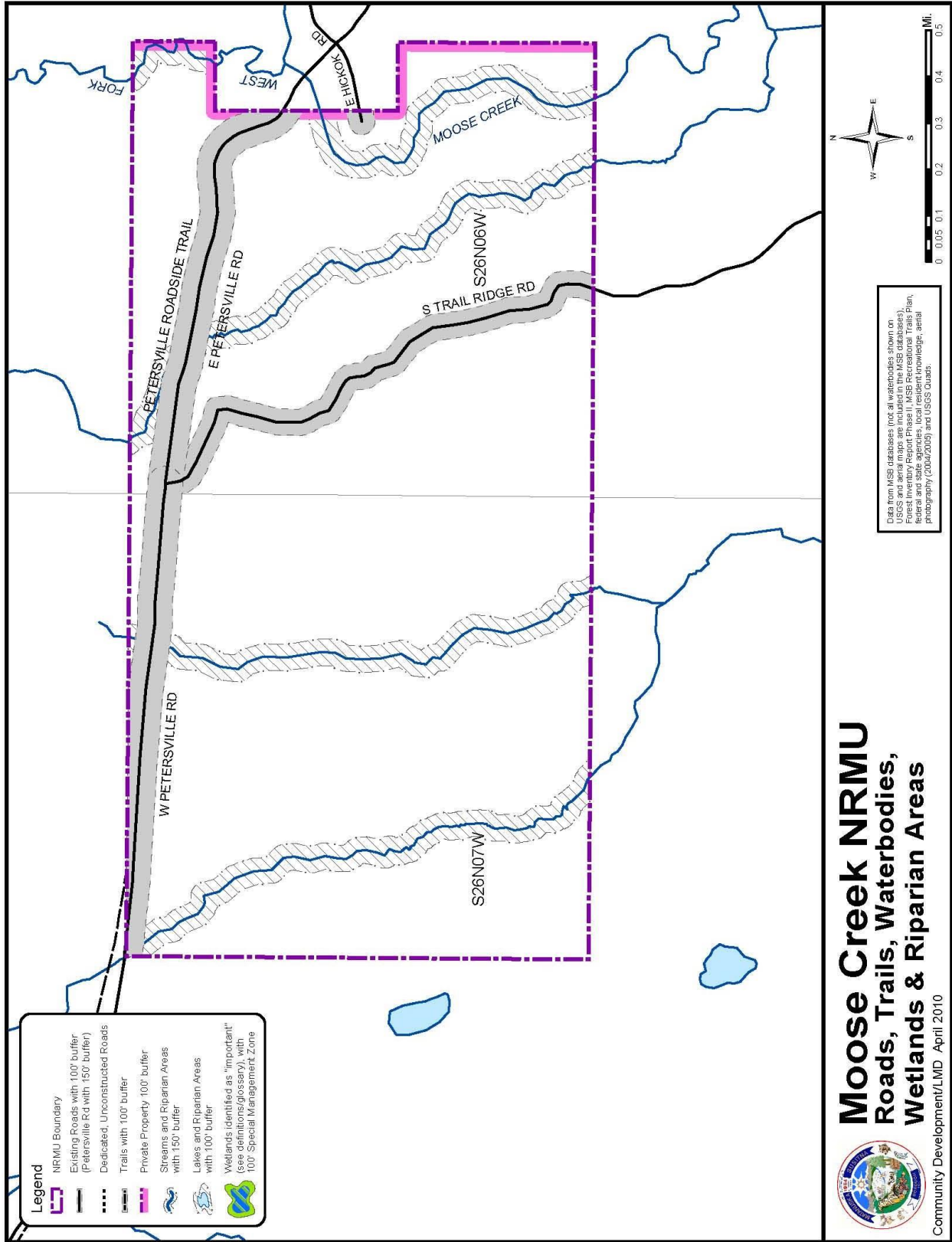


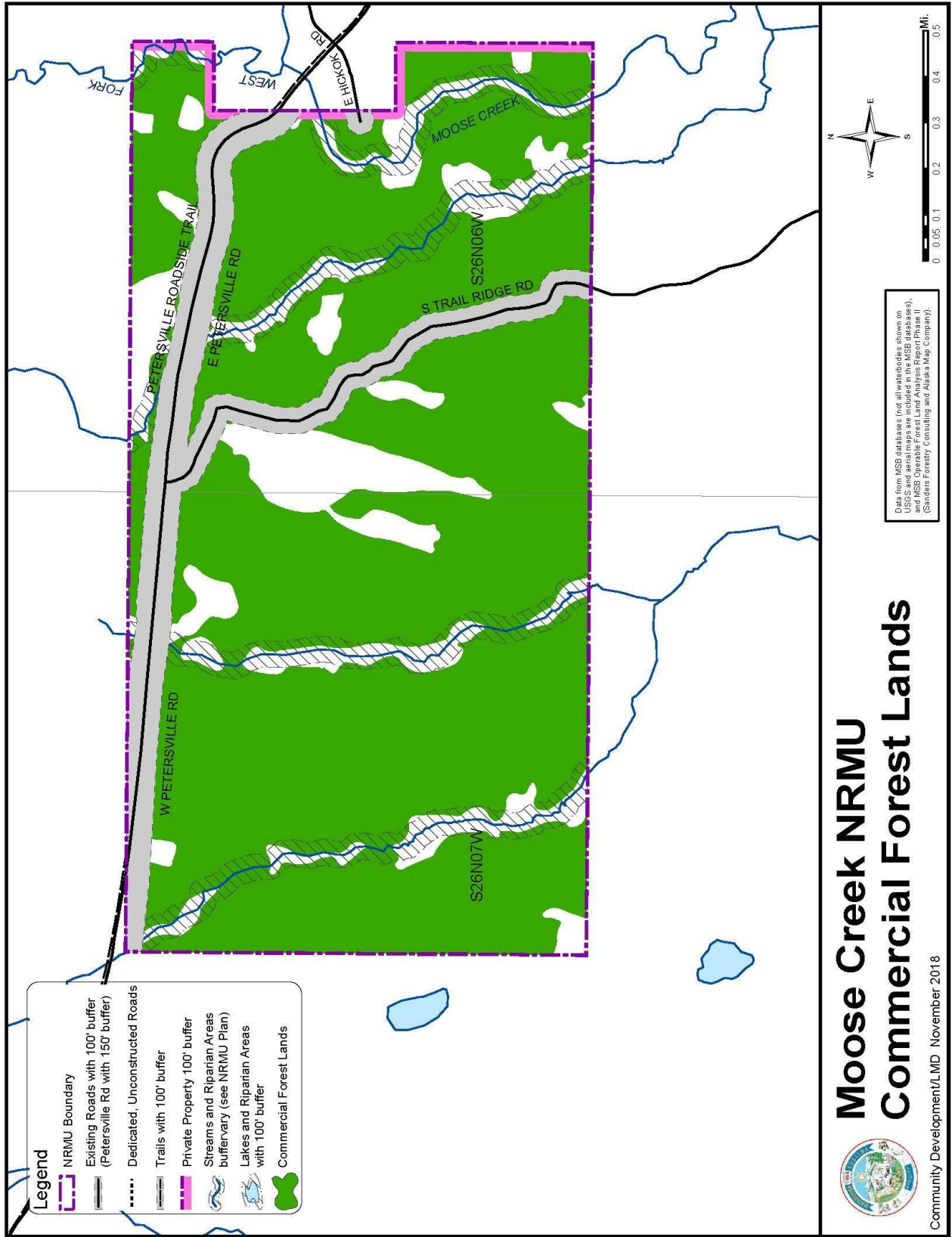
Moose Creek NRMU Physical Characteristics

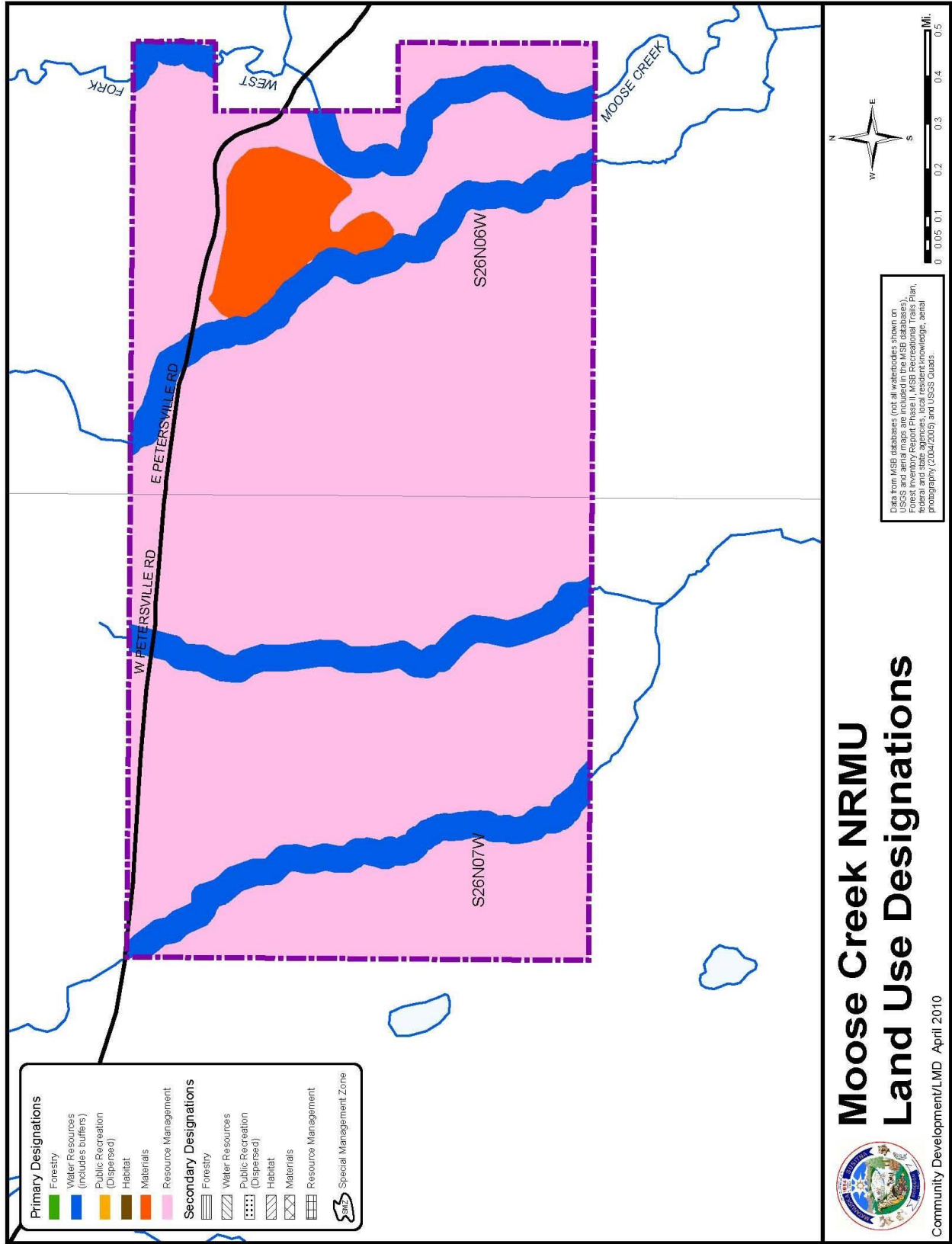


Community Development/LMD April 2010









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 eight 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 Management Plan. Various dispersed recreational uses occur on 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

- Matanuska-Susitna Borough, *Recreational Trails Plan* (20016).
- Matanuska-Susitna Borough, *Parks, Recreation and Open Space Plan* (2001).

Existing Land Use Classification

Materials, Resource Management and Watershed Lands

Summary of Resources and Uses

Agriculture and Grazing

There is a significant amount of agricultural development in the general area. A review of soil capability , published by the USDA, Natural Resources Conservation Service (<http://websoilsurvey.nrcs.usda.gov/app/>), indicates there are 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 fieldwork 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 nesting area, 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 streams 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, 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 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..

Also, see *Commercial 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 is an old gravel extraction area east of the trail ridge 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 Moose Creek Natural Resource Management Unit shall be to protect the unit's 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
<i>Primary</i>		
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 timber harvests in those areas determined to be commercial forest land. 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*.
<i>Secondary</i>		
None		

*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 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, rivers, and associated riparian areas will be protected by undisturbed natural vegetation buffers.

All wetlands (see definition in *Definitions/Glossary* in Volume III) shall be protected with a 100-foot buffer. The buffer shall not allow disturbance of the wetland area, but some uses may be allowed. For example, wintertime 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.

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. 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.

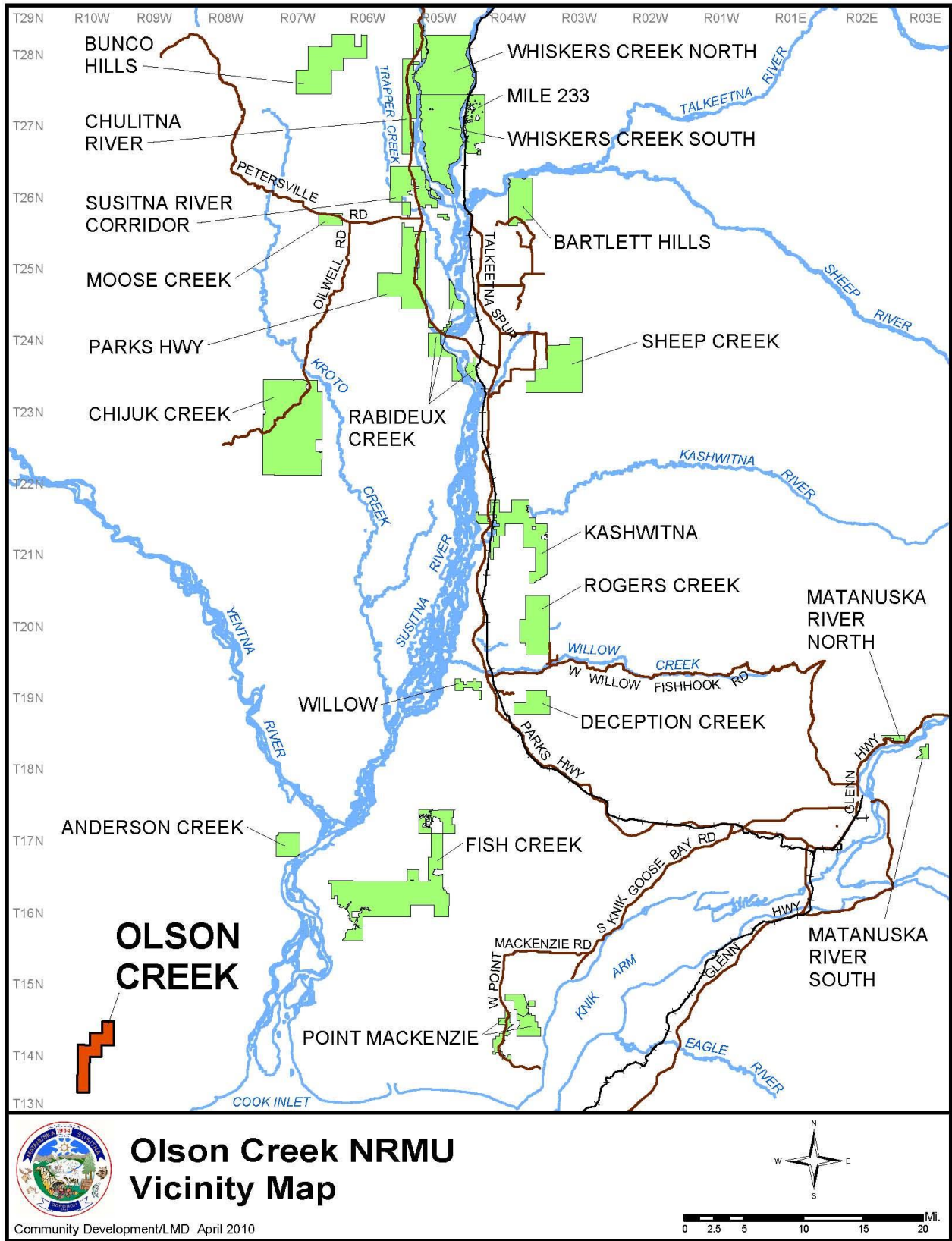
Forest Management

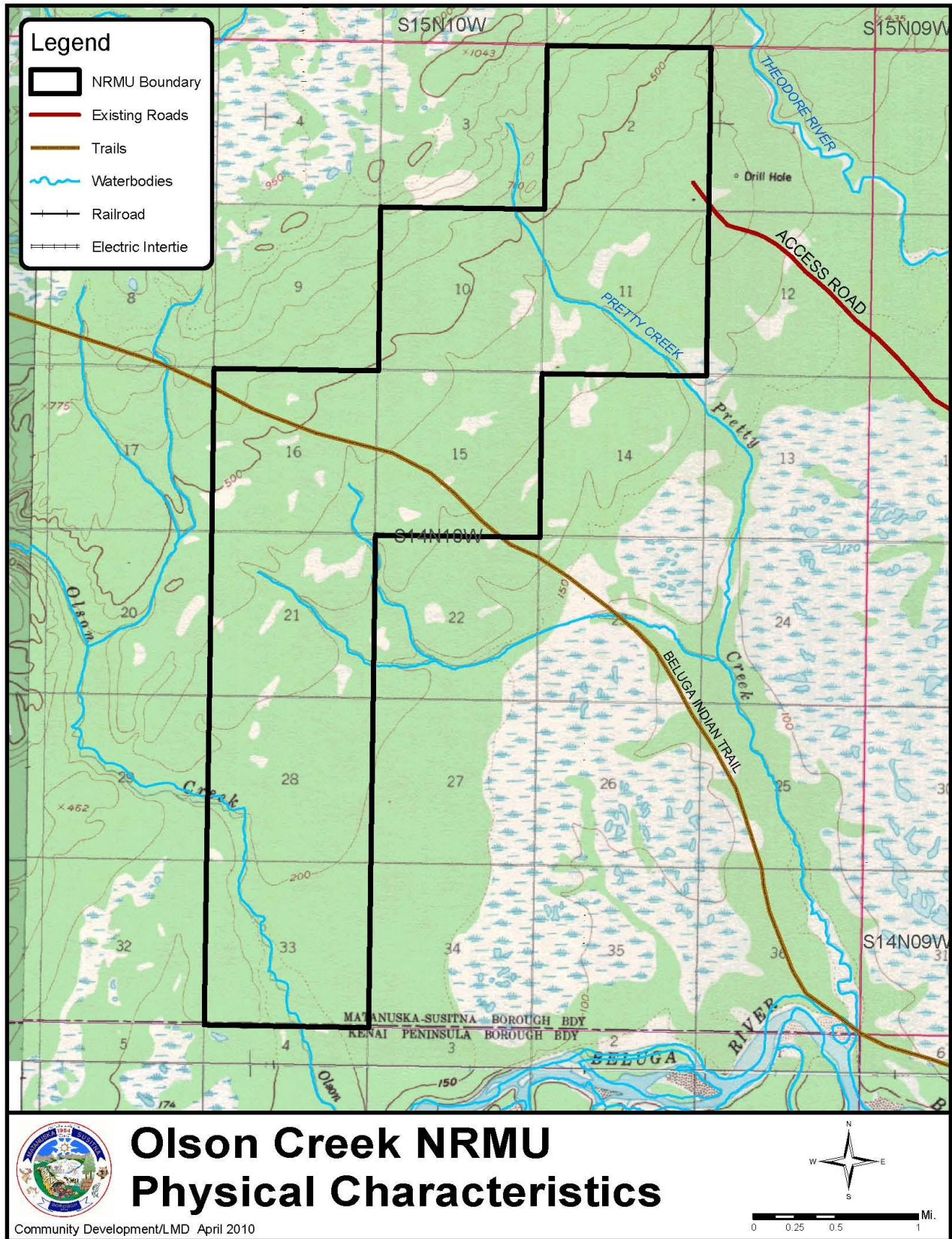
Timber harvest is permitted when it does not significantly reduce the areas recreational and habitat values and recognizes the local area resident's rural lifestyles.

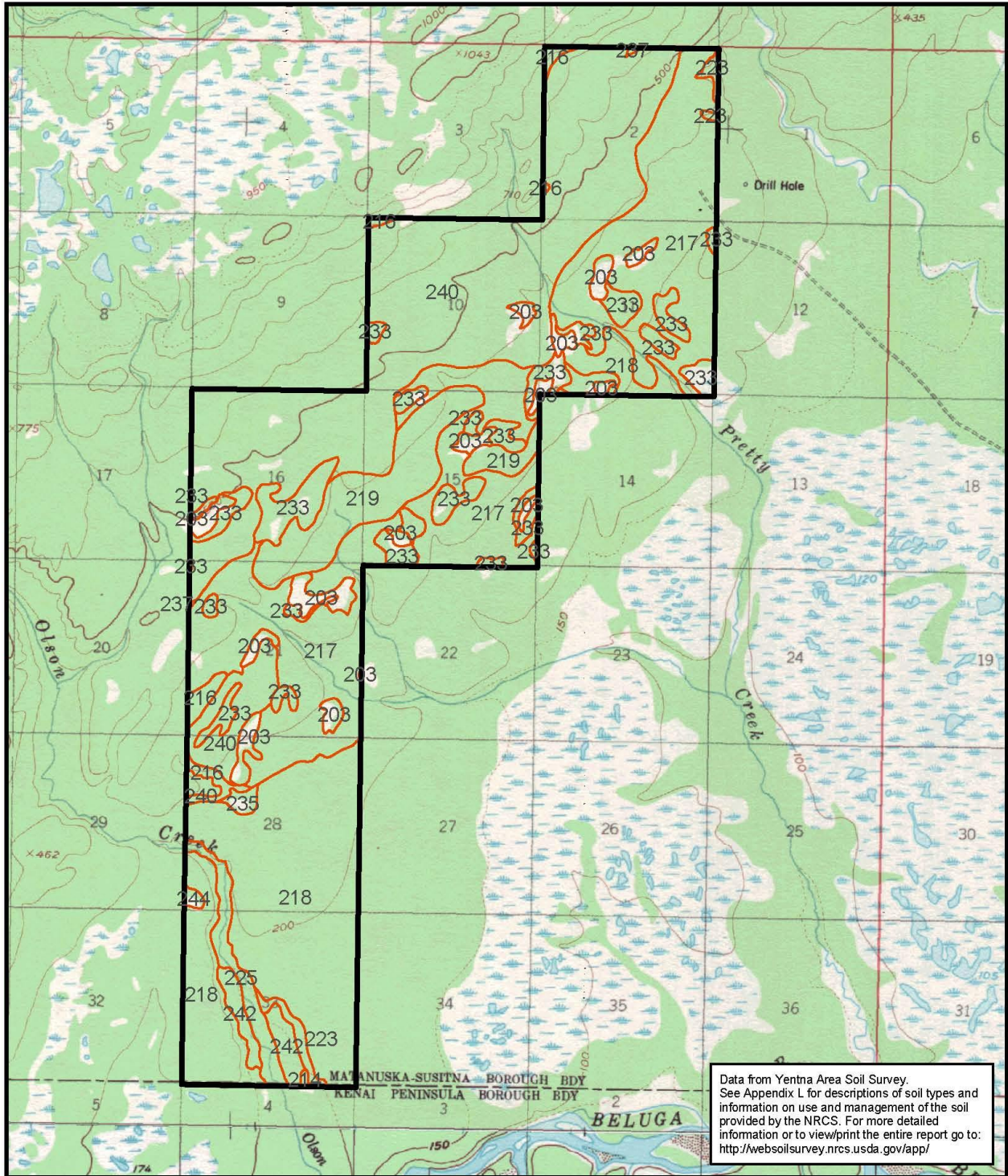
The area designated for future material (rock, sand and gravel) extraction should be the first area offered or made available for timber harvest. If material extraction is expected to commence within seven-years of the timber harvest, regeneration/reforestation shall not be required.

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.

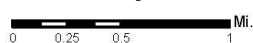
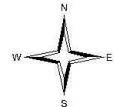


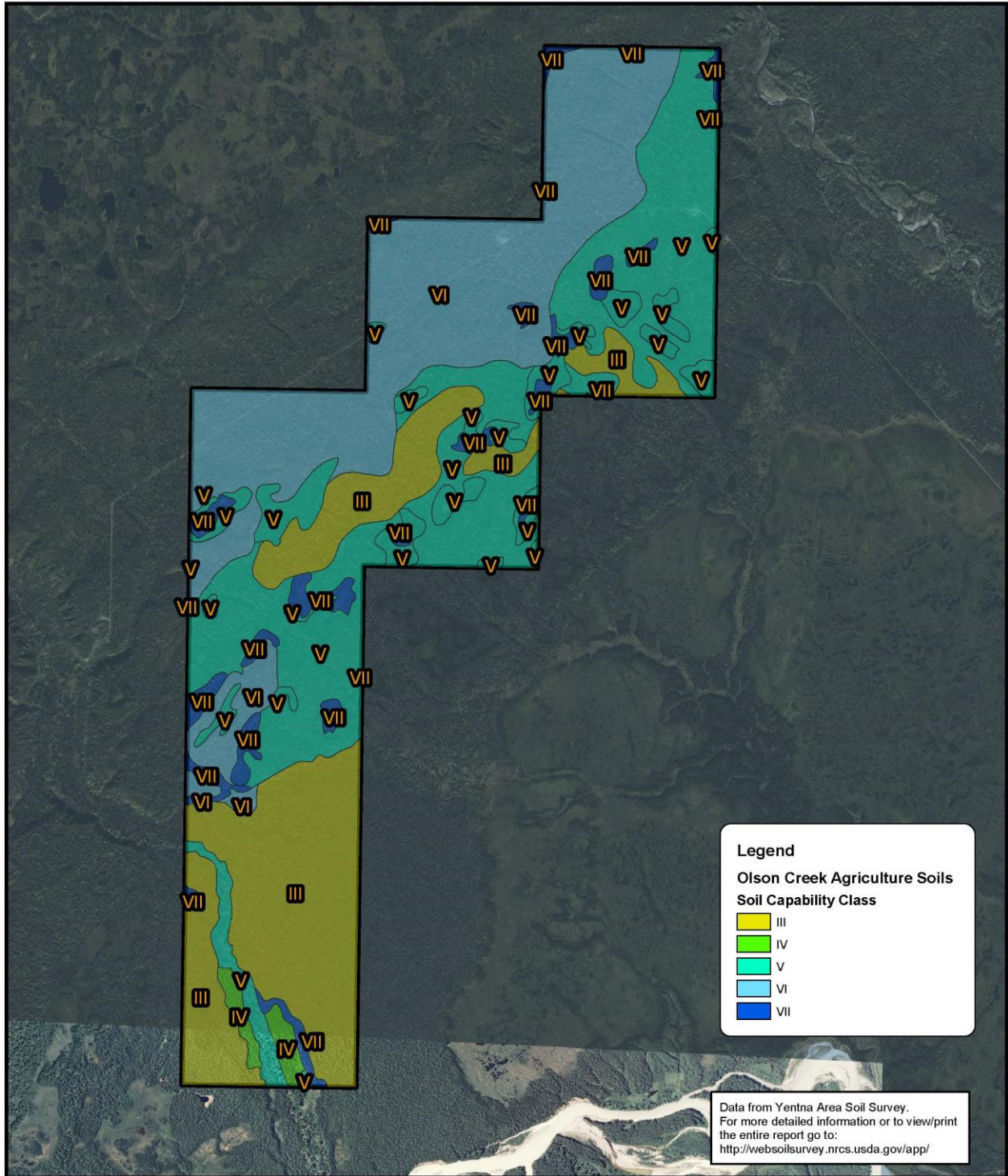




Olson Creek NRMU Soils

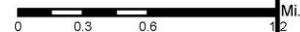
Community Development/LMD April 2010

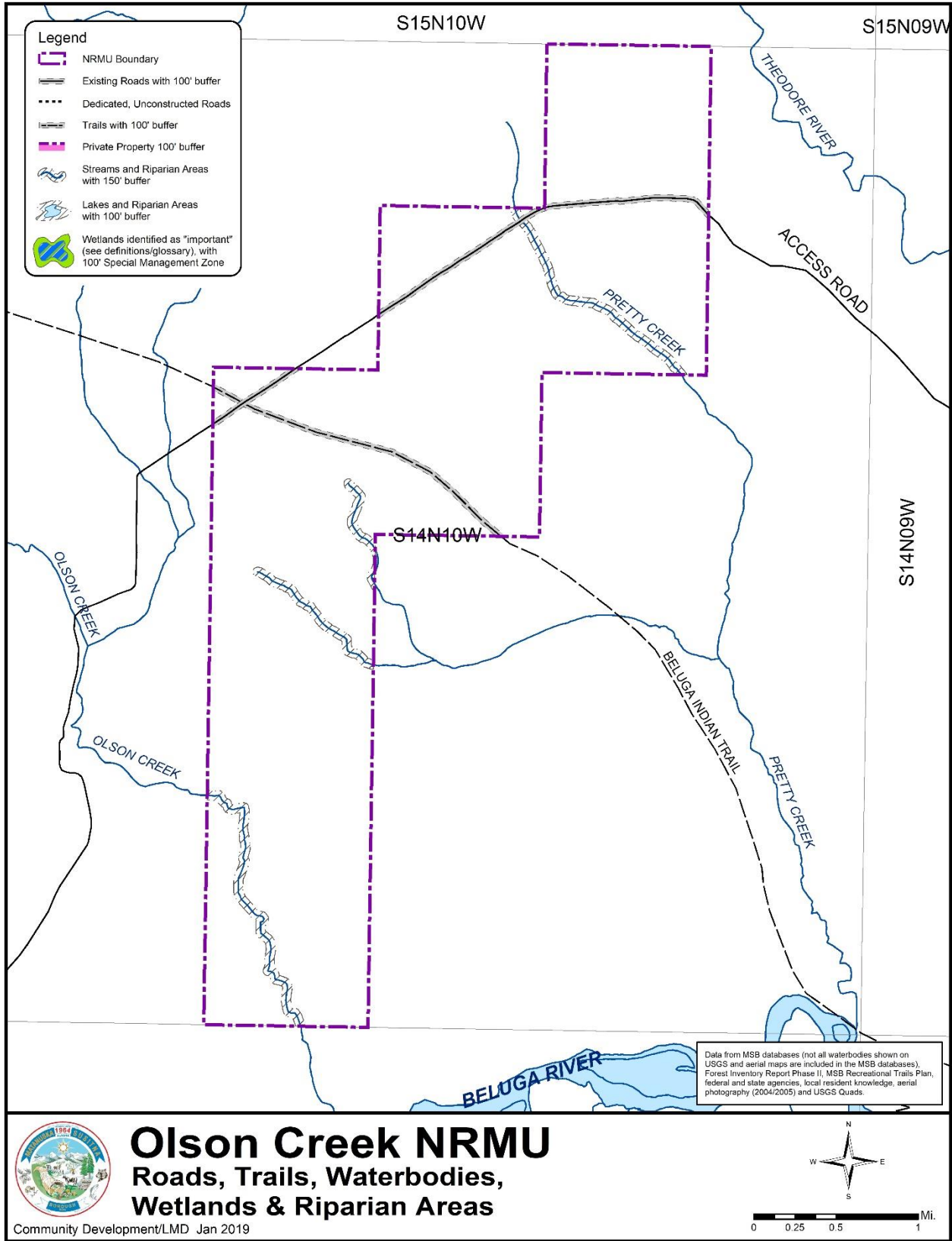


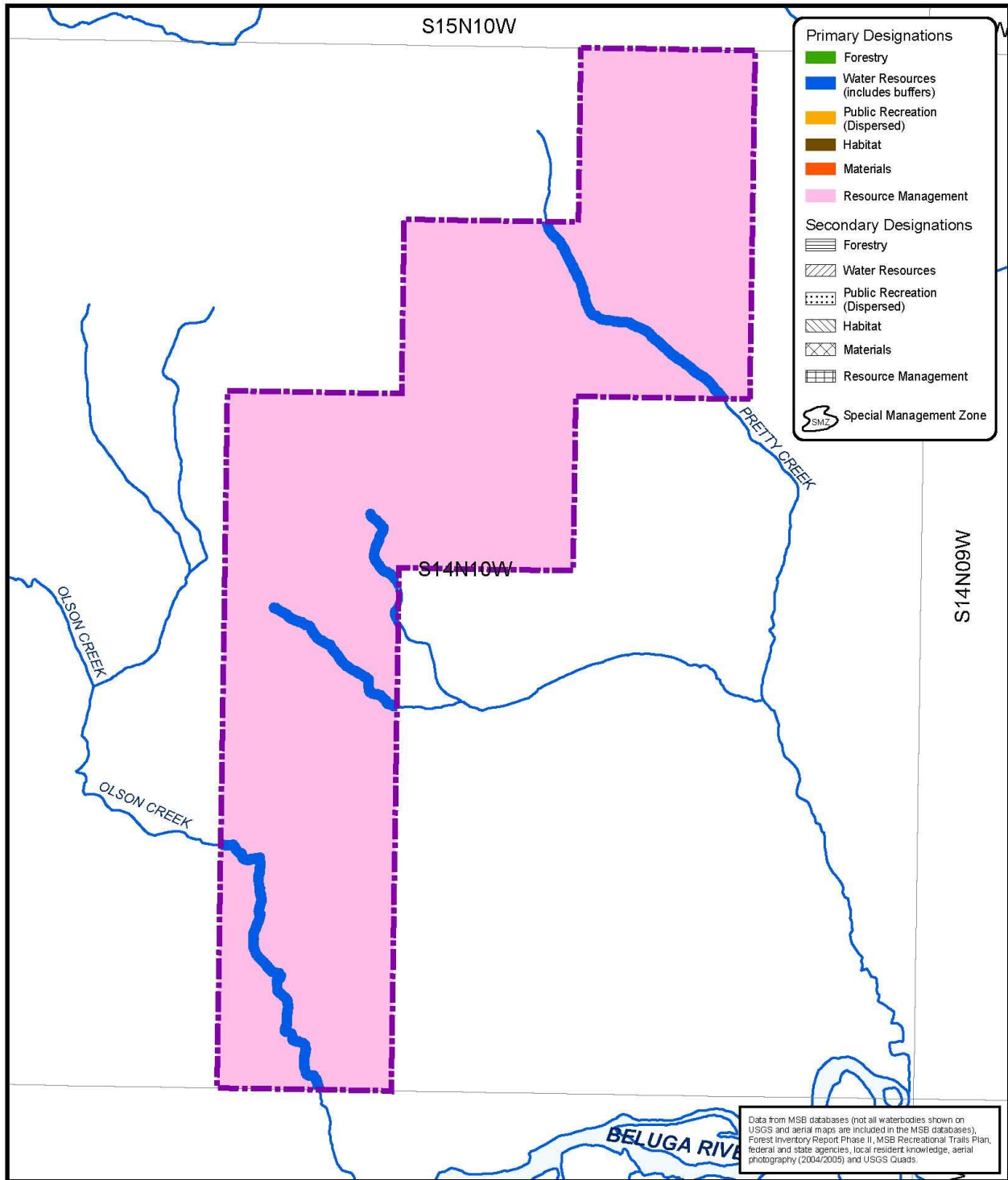


Olson Creek NRMU Agriculture Soils

Community Development/LMD Decemver 2018

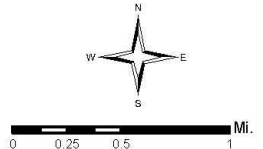






Olson Creek NRMU Land Use Designations

Community Development/LMD April 2010



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 that was considered as a location to test the feasibility of underground coal gasification. Hilcorp Alaska LLC has a State of Alaska lease (ADL 390776) within the Pretty Creek Unit for gas storage. The facility is used to store natural gas within a gas bearing formation in the subsurface.

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

None

Existing Land Use Classification

Resource Management and Watershed Lands

Summary of Resources and Uses

Agriculture and Grazing

A review of soil capability classifications, published by the USDA, Natural Resources Conservation Service (<http://websoilsurvey.nrcs.usda.gov/app/>), indicates that there are lands suitable for agricultural development or grazing within the unit.

See the *Soils* maps 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 fieldwork 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 nesting area, 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, and 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, timber harvest would be challenging due to its remote location and lack of economical transportation. Aerial reconnaissance of this area shows Olson Creek to have steep slopes with sparse timber in 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 unit, 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 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.nrcs.usda.gov/app/>) indicates that there are no rock, sand and gravel resources within the unit. Additional fieldwork is necessary to determine if commercial quantities of sand and gravel exist.

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
<i>Primary</i>		
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*.

Olson Creek		
Designation	Classification	Management Intent
<i>Secondary</i>		
None		

*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 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, rivers, and associated riparian areas will be protected through the use of undisturbed natural vegetation buffers.

All wetlands (see definition in *Volume III, Definitions/Glossary*) shall be protected with a 100-foot buffer. The buffer shall not allow disturbance of the wetland area, but some uses may be allowed. For example, wintertime 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 may be provided additional protection through the use of buffers or placed in a Special Management Zone.

Existing trails (see Roads and Trails section above) shall be buffered.

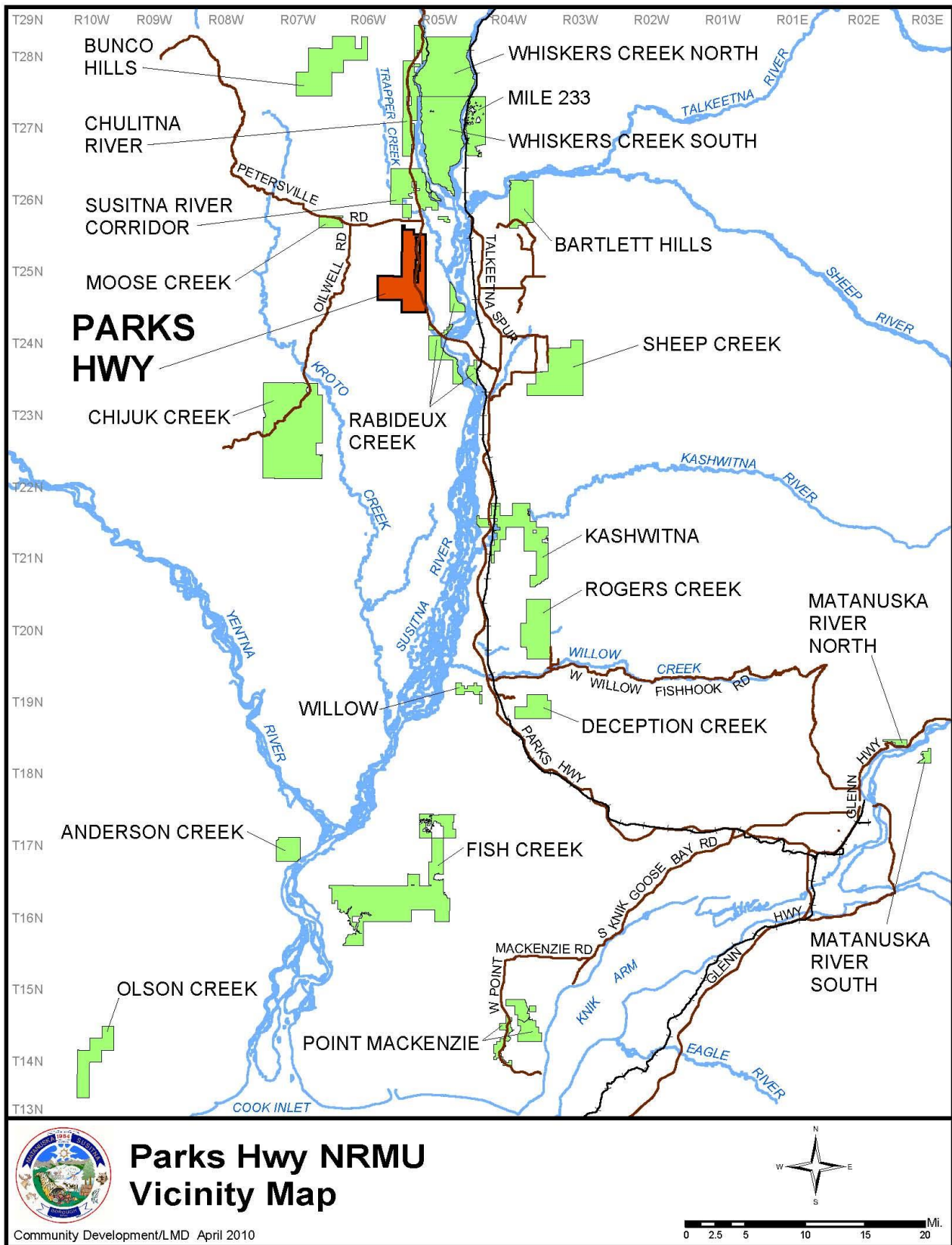
See *Roads, Trails, Waterbodies, Wetlands and Riparian Areas* map at the beginning of this section for waterbodies and trails that shall have buffers, and wetlands with a Special Management Zones. See Volume I, Chapter 2, *Buffers and Special Management Zones*, for additional information.

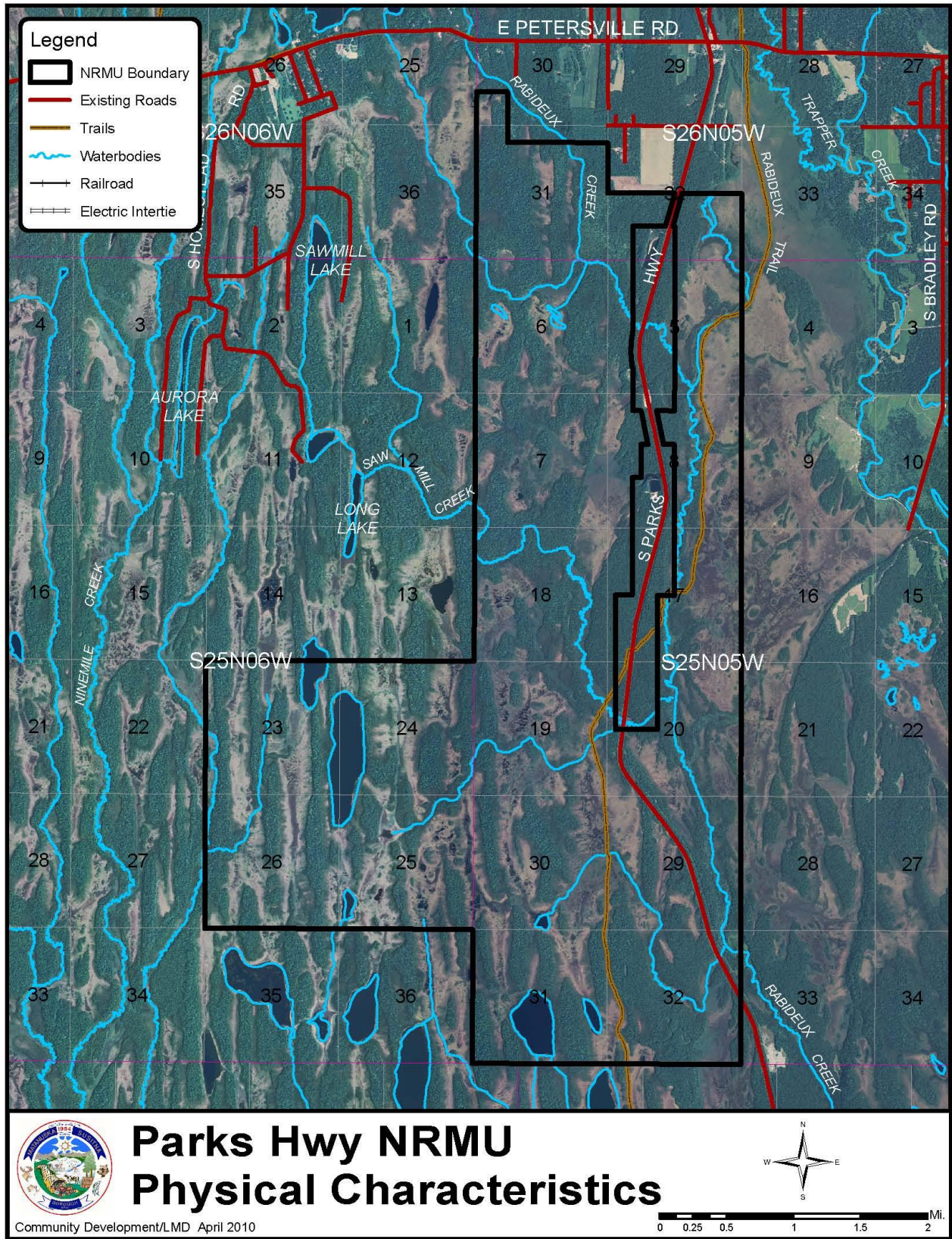
Roads

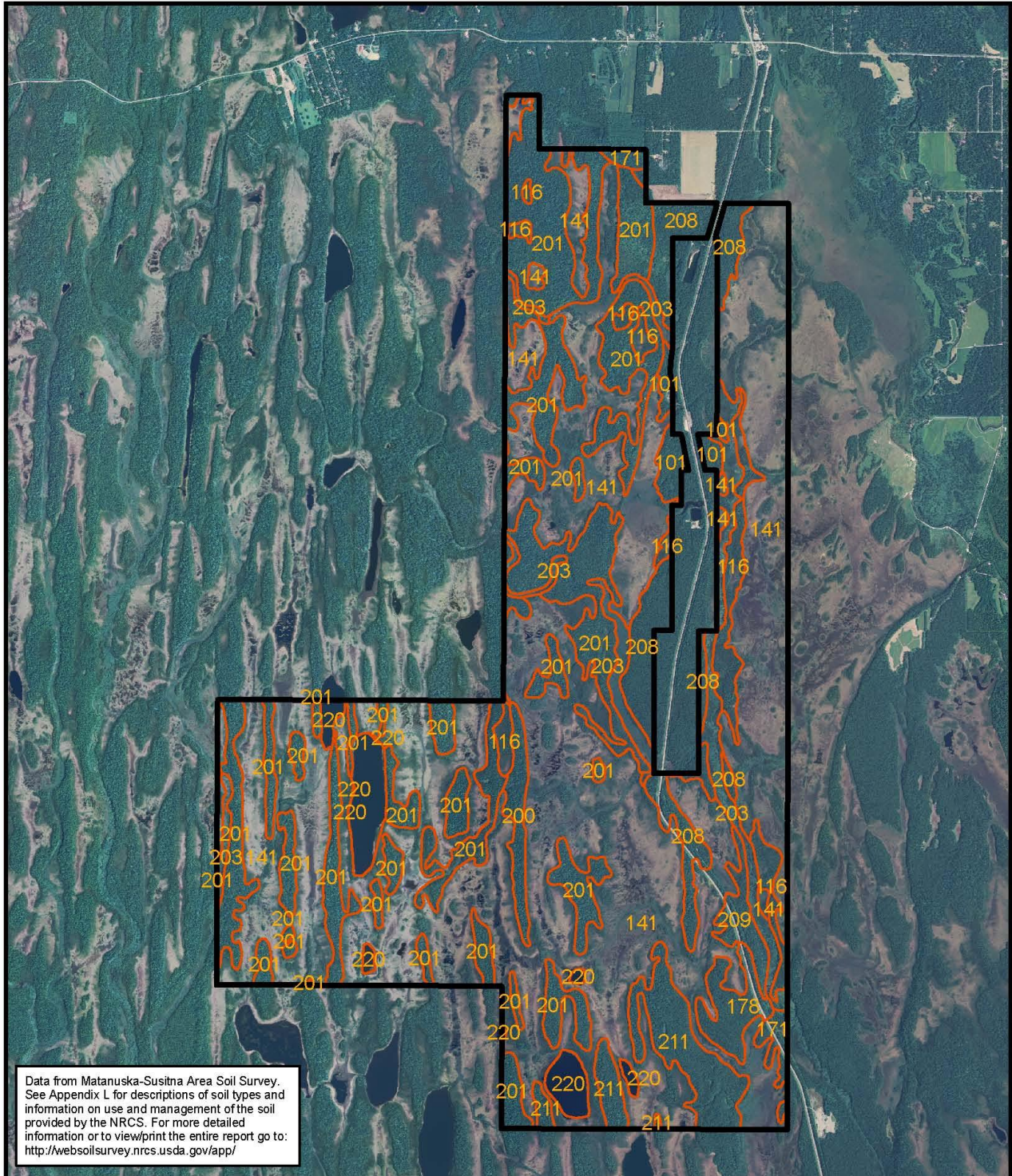
The existing roads in the unit may be used for sub-surface exploration and development. Authorization from the state and/or borough shall be required prior to any commercial use.

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.

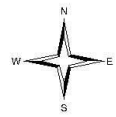


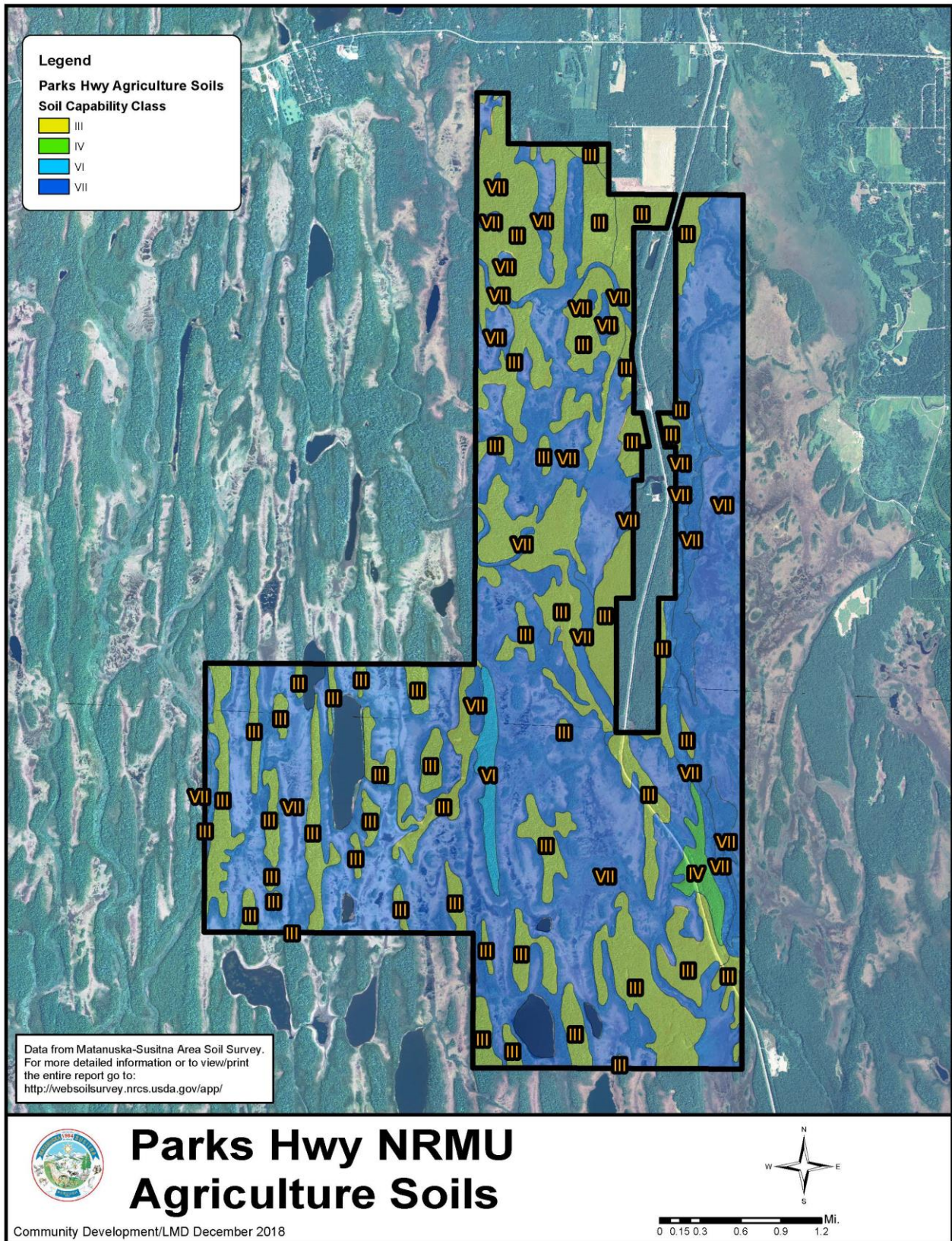


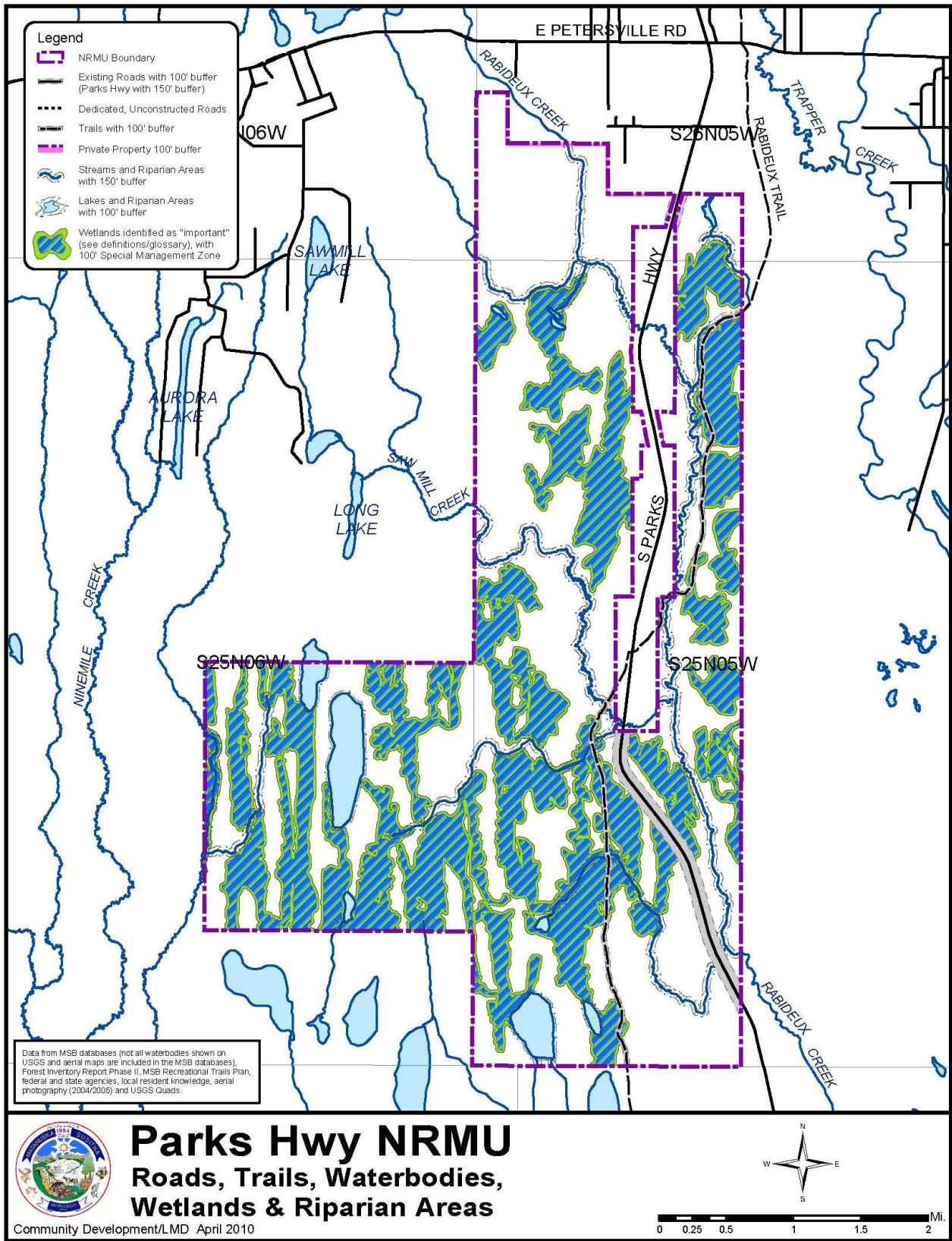


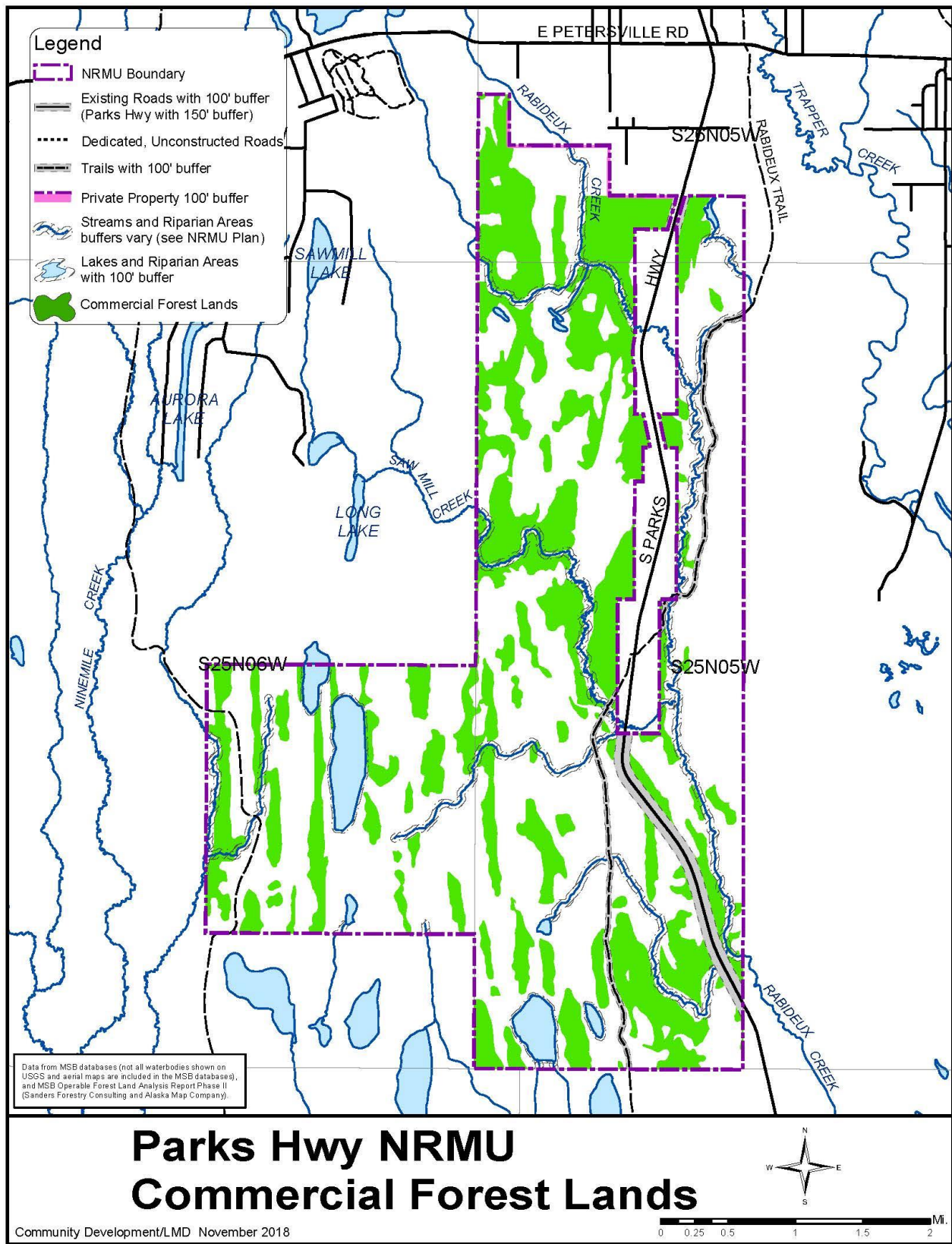
Parks Hwy NRMU Soils

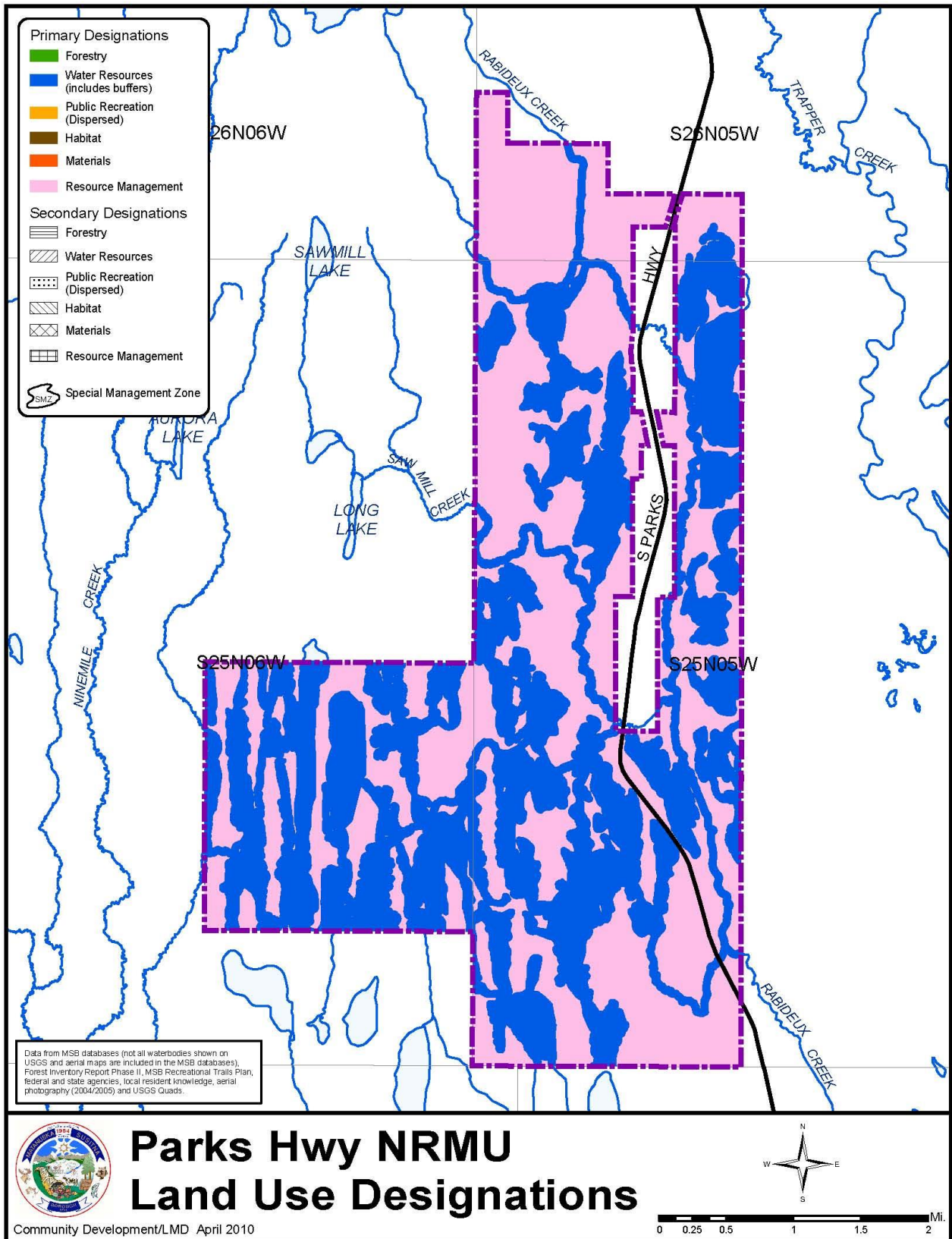
Community Development/LMD April 2010











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 one mile north of the Susitna River Bridge (Parks Highway, approximately Milepost 107) and ending about two miles south of the Petersville Road (Parks Highway Milepost 113). The unit extends on either side of the Parks Highway, ranging from approximately half to two 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 of 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

- Matanuska-Susitna Borough, *Recreational Trails Plan* (2016).
- Matanuska-Susitna Borough, *Parks, Recreation and Open Space Plan* (2001).

A Scenic Highways Plan was 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

Resource Management and Watershed Lands

Summary of Resources and Uses

Agriculture and Grazing

A review of soil capability classifications types, published by the USDA, Natural Resources Conservation Service (<http://websoilsurvey.nrcs.usda.gov/app/>), indicates that there are some areas suitable for agricultural development or grazing within the unit.

See the *Soils* maps 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 brothers' 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 fieldwork 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 nesting area, 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 (10,067 acres), the amount of commercial forest land 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 types are birch and spruce sawtimber greater than 80 years old.

Within the 10,067 acre unit, 3,159 acres (31% of the unit) is Commercial Forest Land.

Also, see *Commercial 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, 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 Highway 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.nrcs.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 unit’s 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
<i>Primary</i>		
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 commercial 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*.
<i>Secondary</i>		
None		

*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 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 with undisturbed natural vegetation buffers.

All wetlands (see definition in *Definitions/Glossary* in Volume III) shall be protected with a 100-foot buffer. The buffer shall not allow disturbance of the wetland area, but some uses may be allowed. For

example, wintertime 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

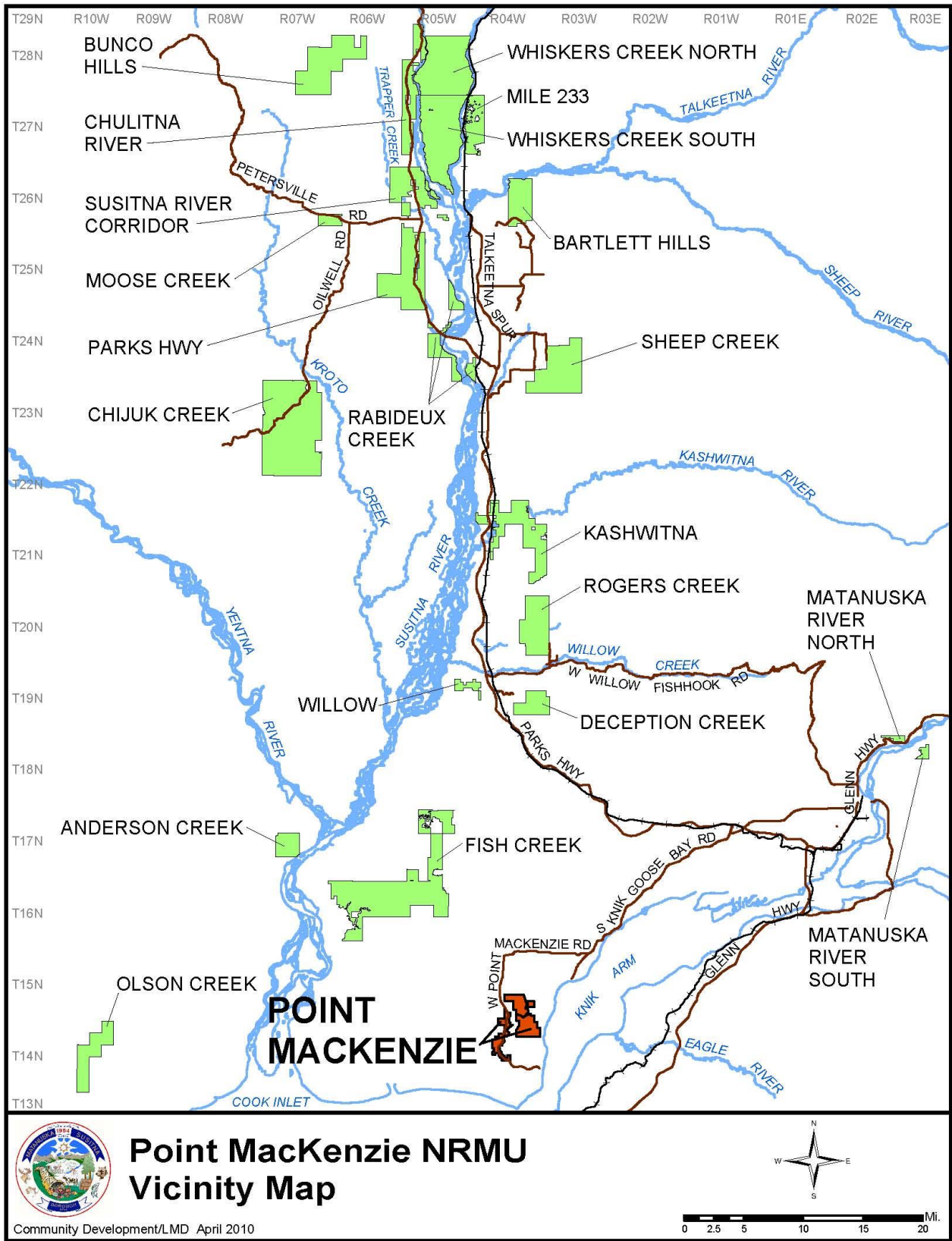
Timber harvests are a permitted use and only when it does not significantly reduce the areas recreational and scenic values, and where it does not improve moose habitat that would draw moose into the Parks Highway corridor.

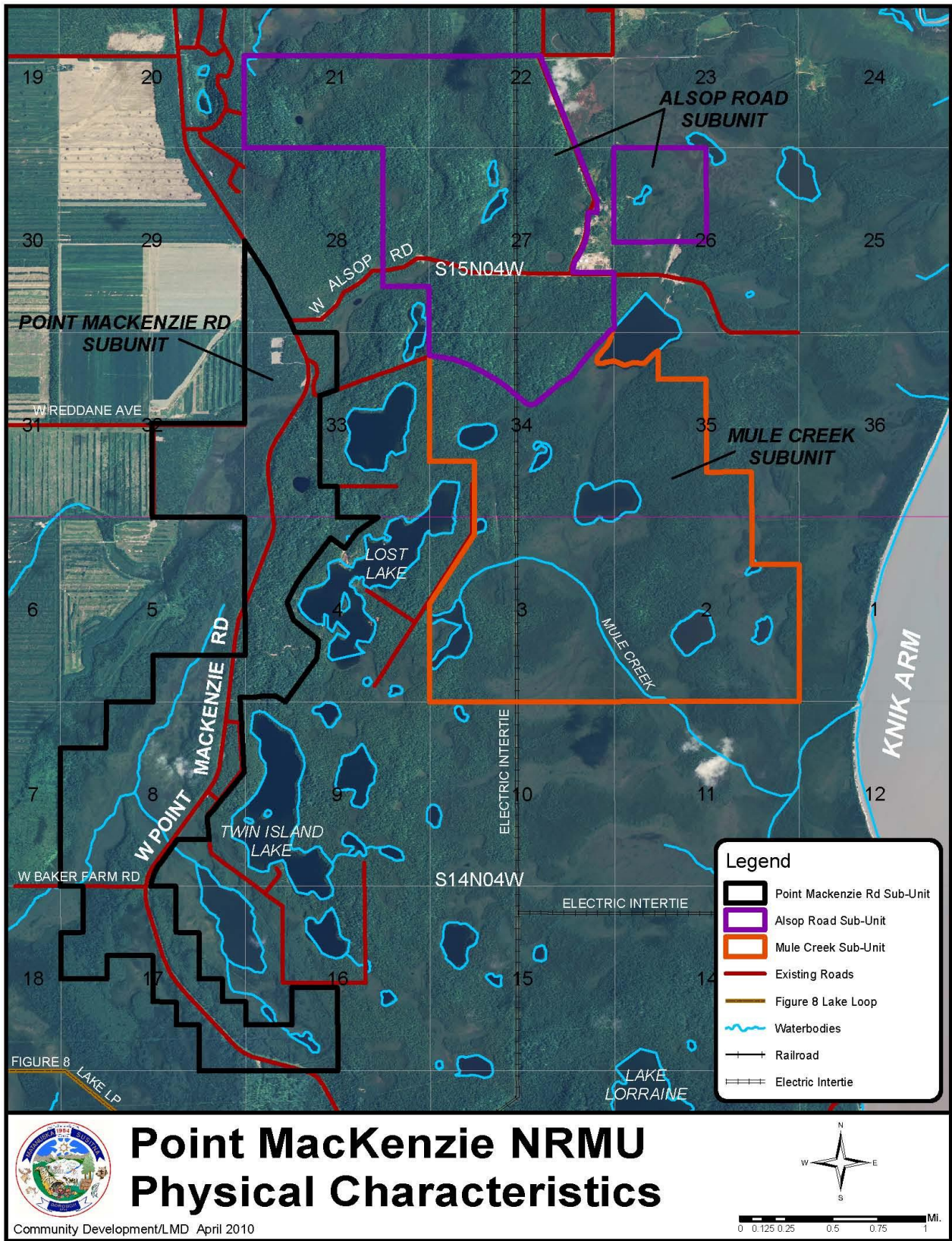
Because of the unit's highly visible location off the Parks Highway, and the abundance of wet soils and wetlands, timber harvest, except for personal use, shall be limited to the winter when the ground is sufficiently frozen and snow cover exists to avoid negative impact from heavy vehicles and equipment. 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.

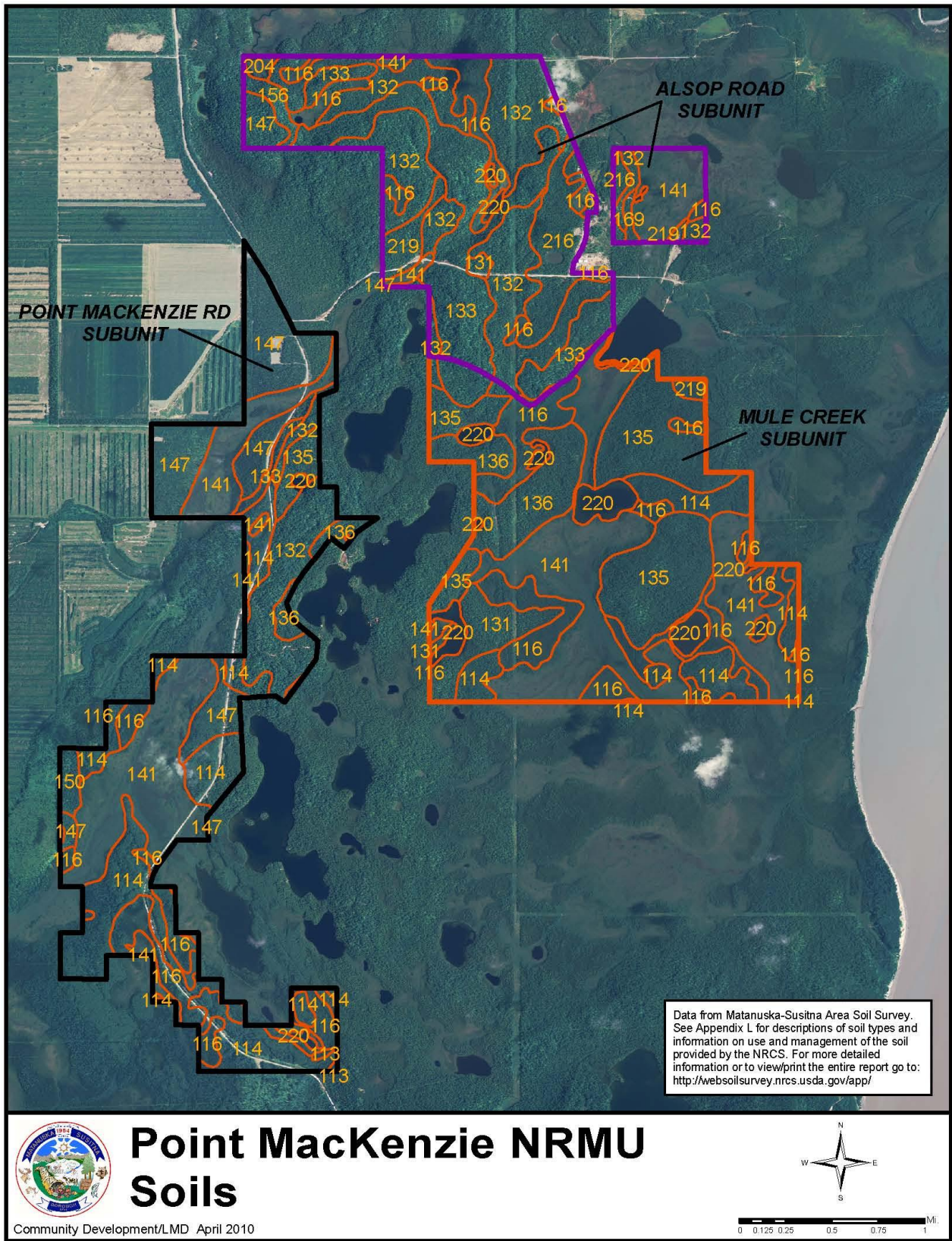
Consultation with the Alaska Department of Fish and Game on timber harvest areas and cutting units is required for all timber harvests to avoid or mitigate timber harvests in the unit that may improve moose habitat that would draw moose into the Parks Highway corridor.

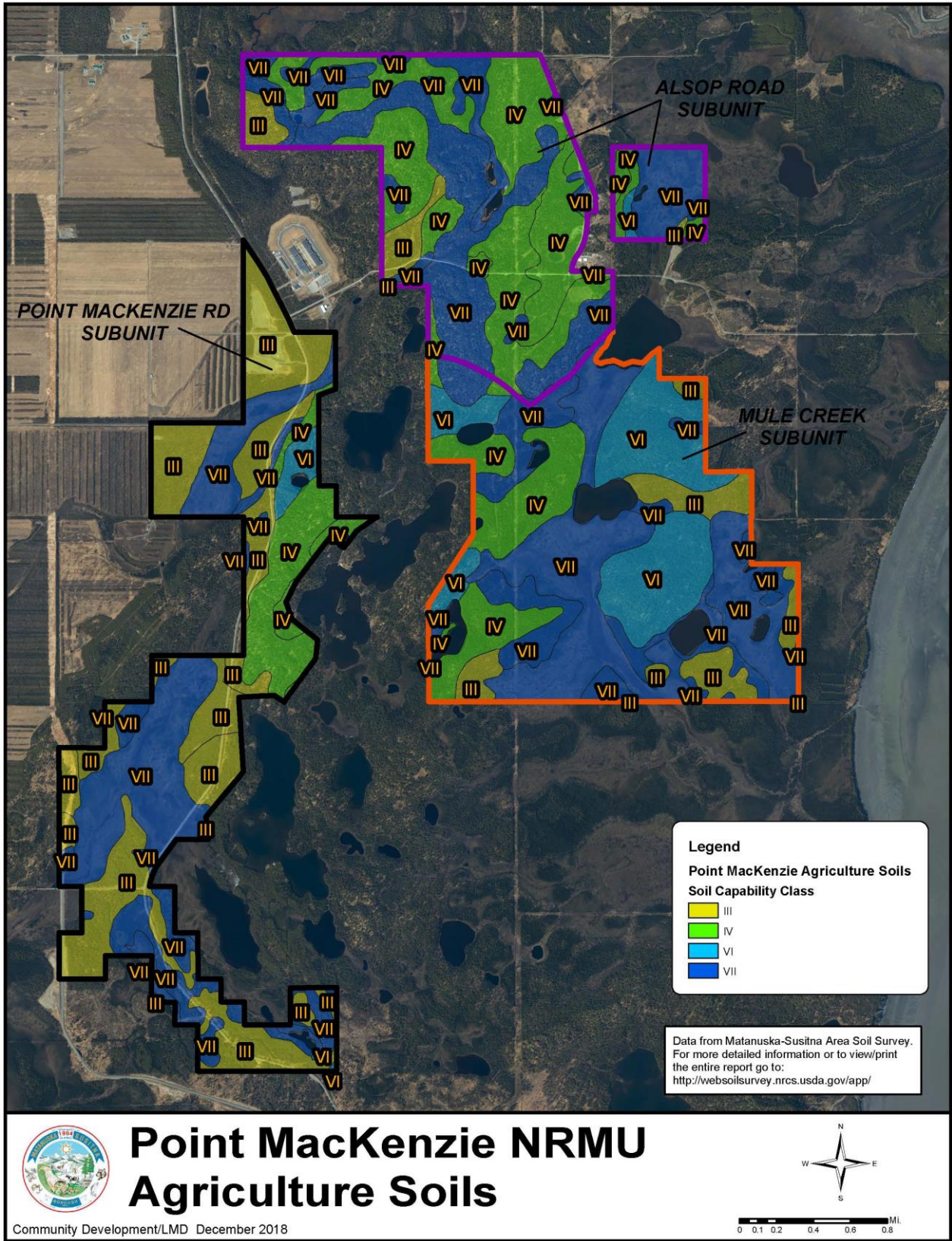
Other Uses

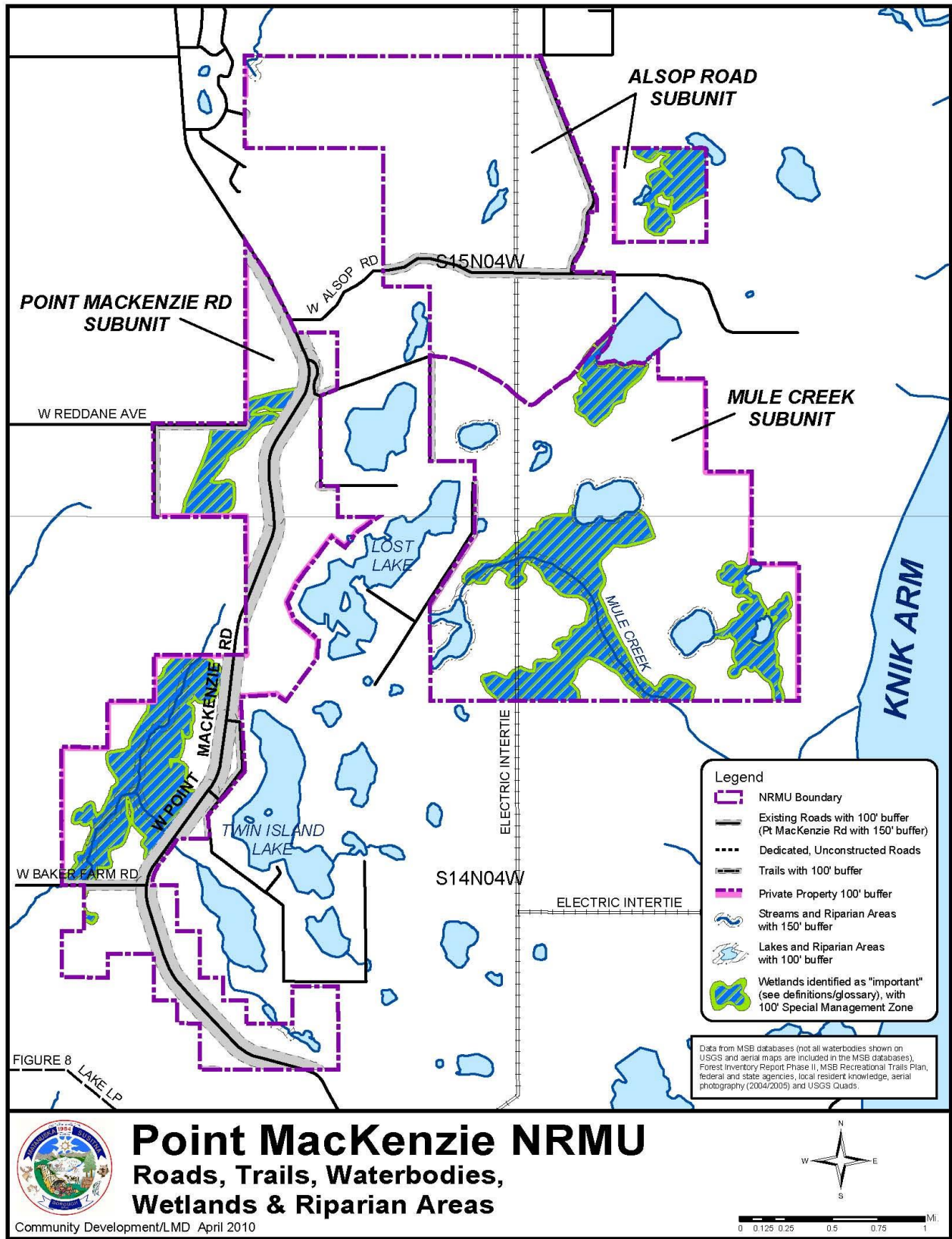
No additional unit-specific guidelines are needed for this unit. See Volume I, Chapters 2 and 3 for area-wide guidelines that apply to all Natural Resource Management Units.

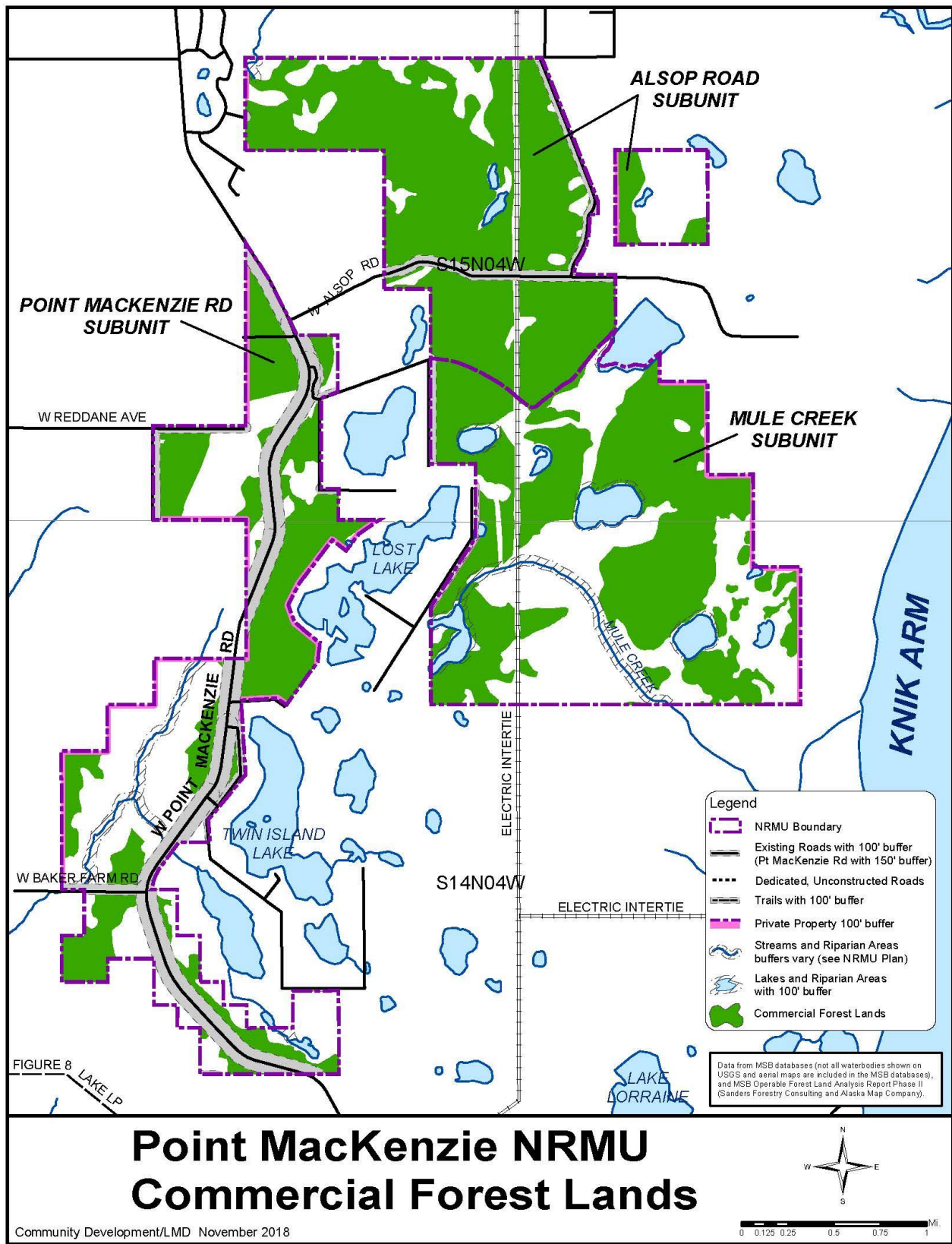


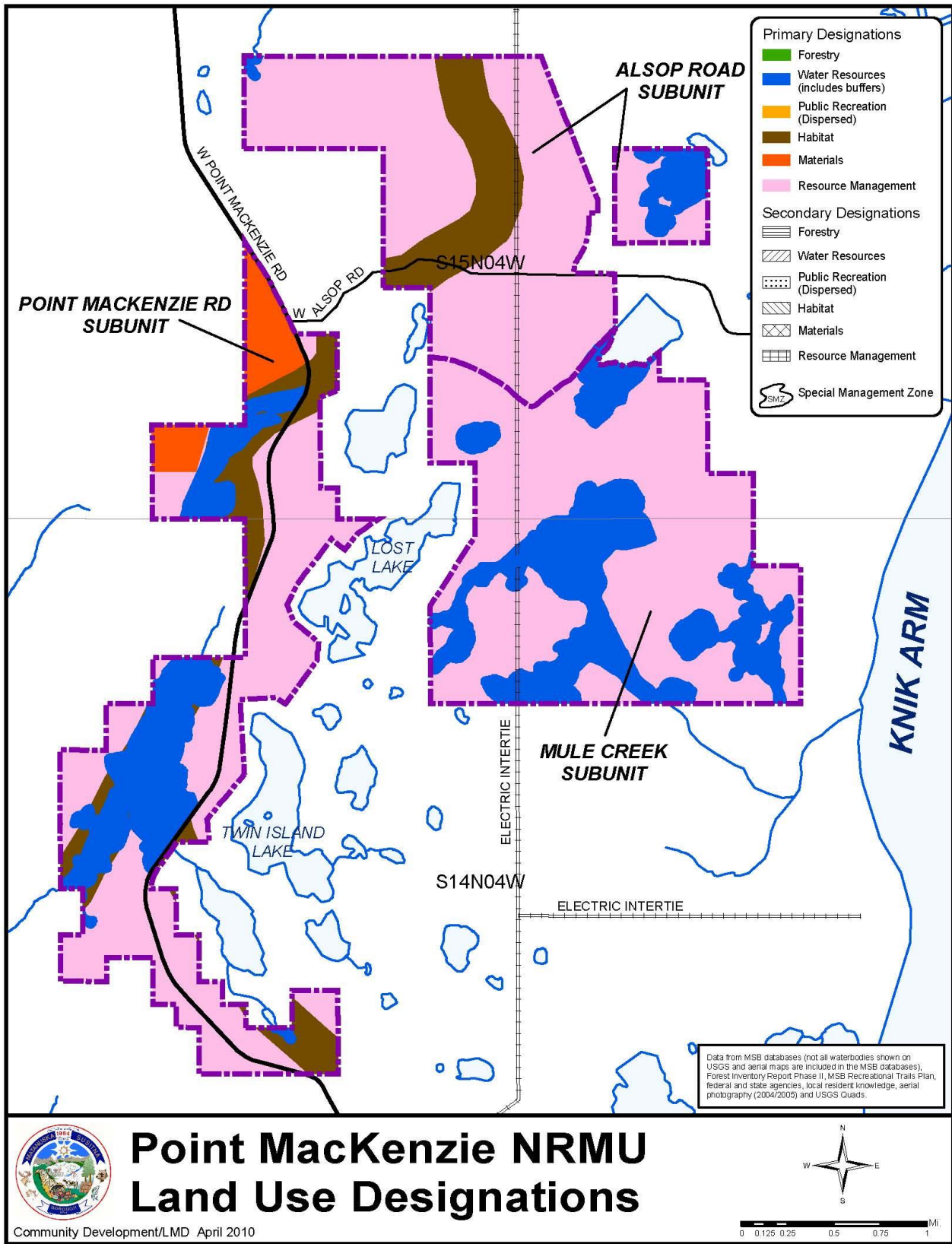












POINT MACKENZIE

Natural Resource Management Unit

General Information

The Point MacKenzie 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 divided into three subunits.

The Alsop Road subunit totals about 1,540 acres. It is comprised of two blocks of land that includes all the borough land north of Alsop Road and the land approximately half a 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 is made up of two separate 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.

Borough Tax Maps

Goose Bay 13 and 14, and Point MacKenzie 3 and 4.

Current Land Uses

The area has a variety of dispersed recreational uses. There are active personal use firewood and earth material sites as well as an active commercial use earth material site within this unit.

Surrounding Land Uses

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 Port District is classified for commercial and industrial land use. 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 Goose Creek Correctional Center 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 the Goose Creek Correctional Center, dispersed recreation occurs throughout the unit.

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

- Matanuska-Susitna Borough, *Recreational Trails Plan* (20016).
- Matanuska-Susitna Borough, *Parks, Recreation and Open Space Plan* (2001)
- Matanuska-Susitna Borough, *Point MacKenzie Community Comprehensive Plan* (2011).

Existing Land Use Classifications

Resource Management and Watershed Land

Summary of Resources and Uses

Agriculture and Grazing

A review of soil capability classifications, published by the USDA, Natural Resources Conservation Service (<http://websoilsurvey.nrcs.usda.gov/app/>), indicates that there are 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.

See the *Soils* maps 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 Railroad's main line between Anchorage and Fairbanks.

Additional fieldwork 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. Furbearers 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 have 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.

Mule Creek is a cataloged anadromous fish stream. . 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 5,198 acre unit, 3,174 acres (61% of the unit) is Commercial Forest Land.

Also, see *Commercial 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

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. Reddane Avenue was extended to connect to Point MacKenzie Road in 2018.

The Figure 8 Lake Loop Trail runs east/west off 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 undedicated 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 within the Port District have 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 extraction operations. An active material site exists at the intersection of Alsop Road and Point MacKenzie Road.

Also, see the *Soils* map at the beginning of this section.

Unit Management Intent

Alsop Road subunit

The Alsop Road subunit shall be managed to support development activities while protecting important habitat and watershed land. Development activities include, but are not limited to, such things as sewer and water facilities, public safety buildings and other public facilities, and any related commercial and

residential development. 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 are allowed on the commercial forest land. 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 on the commercial forest land. 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 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.

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
<i>Primary</i>		
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	<p>All upland areas, except those designated as water resources or habitat.</p> <p>Available for forest management and timber harvest in those areas determined to be commercial forest land.</p> <p>Material sites may be developed in areas outside of the wildlife corridor and water resource land needed to support other development in the immediate area.</p> <p>Land development, including commercial, industrial, residential and public facilities is permitted if specifically authorized by the Assembly. If approved, the land use classification shall be changed and the area removed from the subunit.</p>
Water Resources	Watershed Lands	<p>All waterbodies, riparian areas, and important wetlands, including the buffers and Special Management Zones.</p> <p>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*.</p>
<i>Secondary</i>		
None		

Point MacKenzie – Mule Creek subunit		
Designation	Classification	Management Intent
<i>Primary</i>		
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 commercial 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*.
<i>Secondary</i>		
None		
Point MacKenzie – Pt. MacKenzie Road subunit		
Designation	Classification	Management Intent
<i>Primary</i>		
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*.
<i>Secondary</i>		
None		

*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 *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 (see definition in *Definitions/Glossary* in Volume III) shall be protected with a 100-foot buffer . The buffer shall not allow disturbance of the wetland area, but some uses may be allowed. For example, wintertime recreational use is allowed once sufficient snow cover exists to not harm the natural vegetation.

When 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 with buffers or placed in a Special Management Zone, as appropriate.

The approximately quarter-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 commercial 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, utility location, and/or forest health.

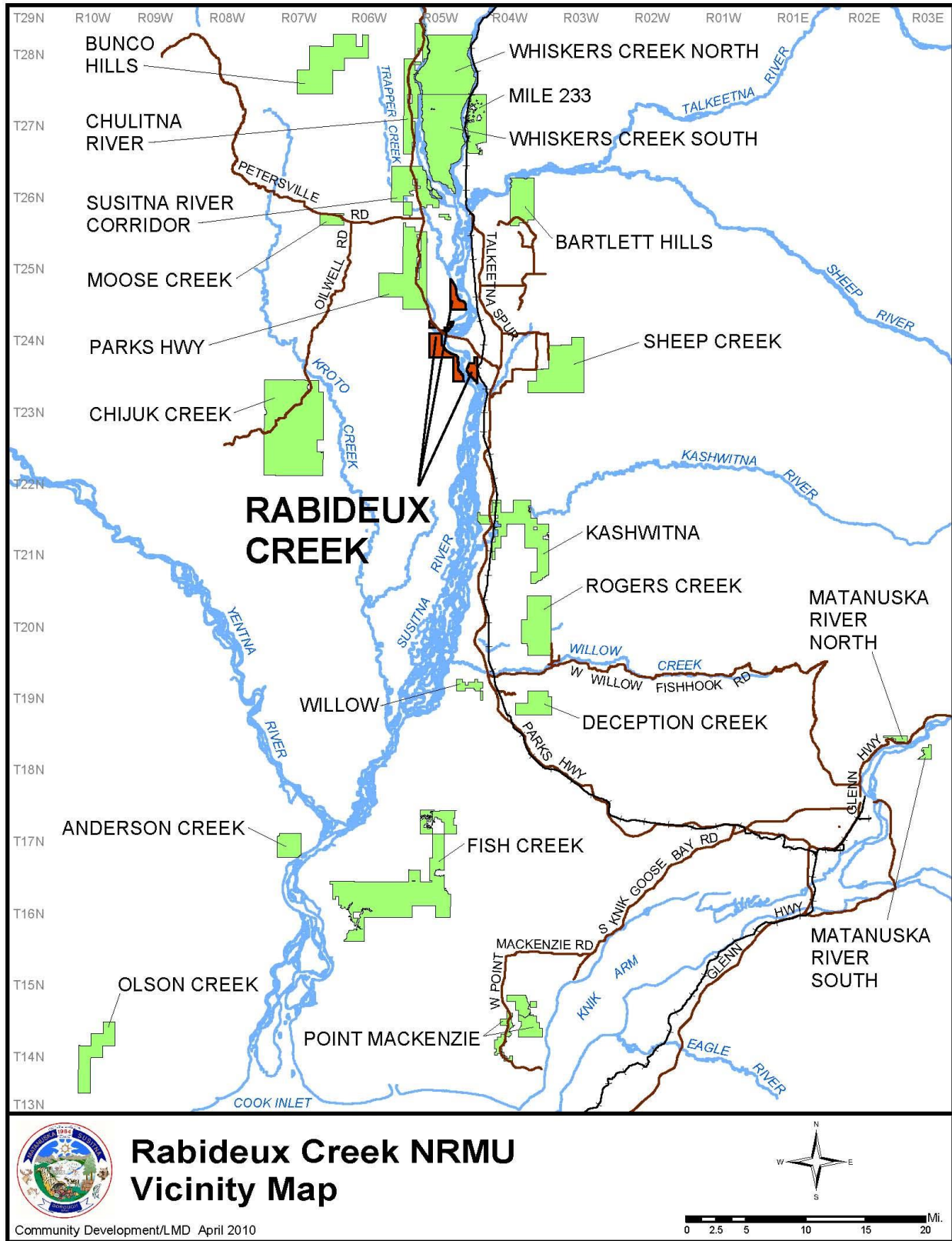
Timber harvest shall be coordinated with the Alaska Department of Fish and Game to protect and/or enhance wildlife habitat and to create appropriate winter habitat areas away from developed and areas with roads in order to reduce moose mortalities and to protect public safety.

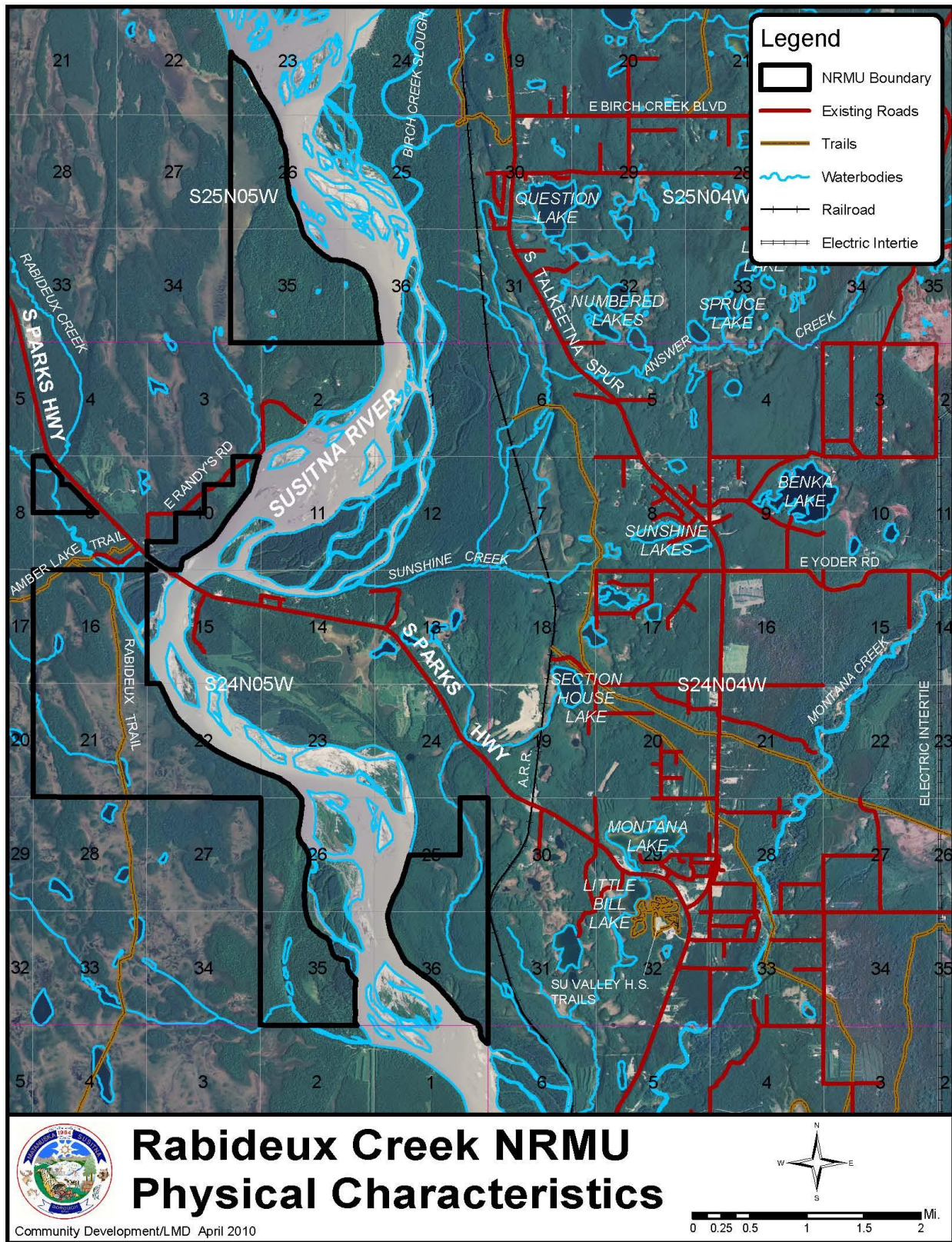
Rock, Sand and Gravel

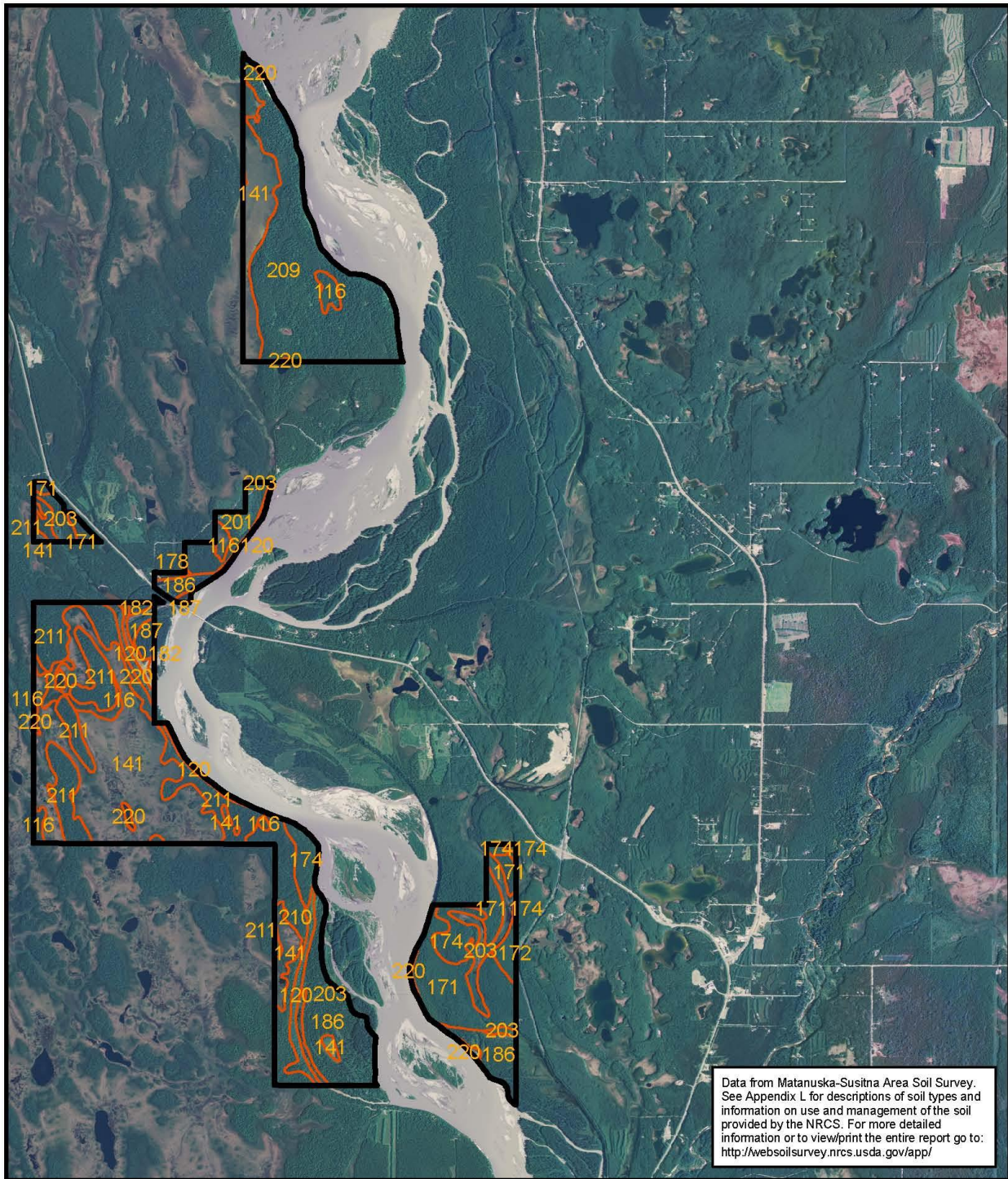
Development and extraction of rock, sand and gravel resources may occur in all three subunits, provided the use is consistent with the other primary designations for the area. All developed sites shall be conducted pursuant to State law and Borough code. See Volume I, Chapter 2, *Sand and Gravel*, for 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.

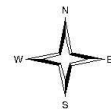


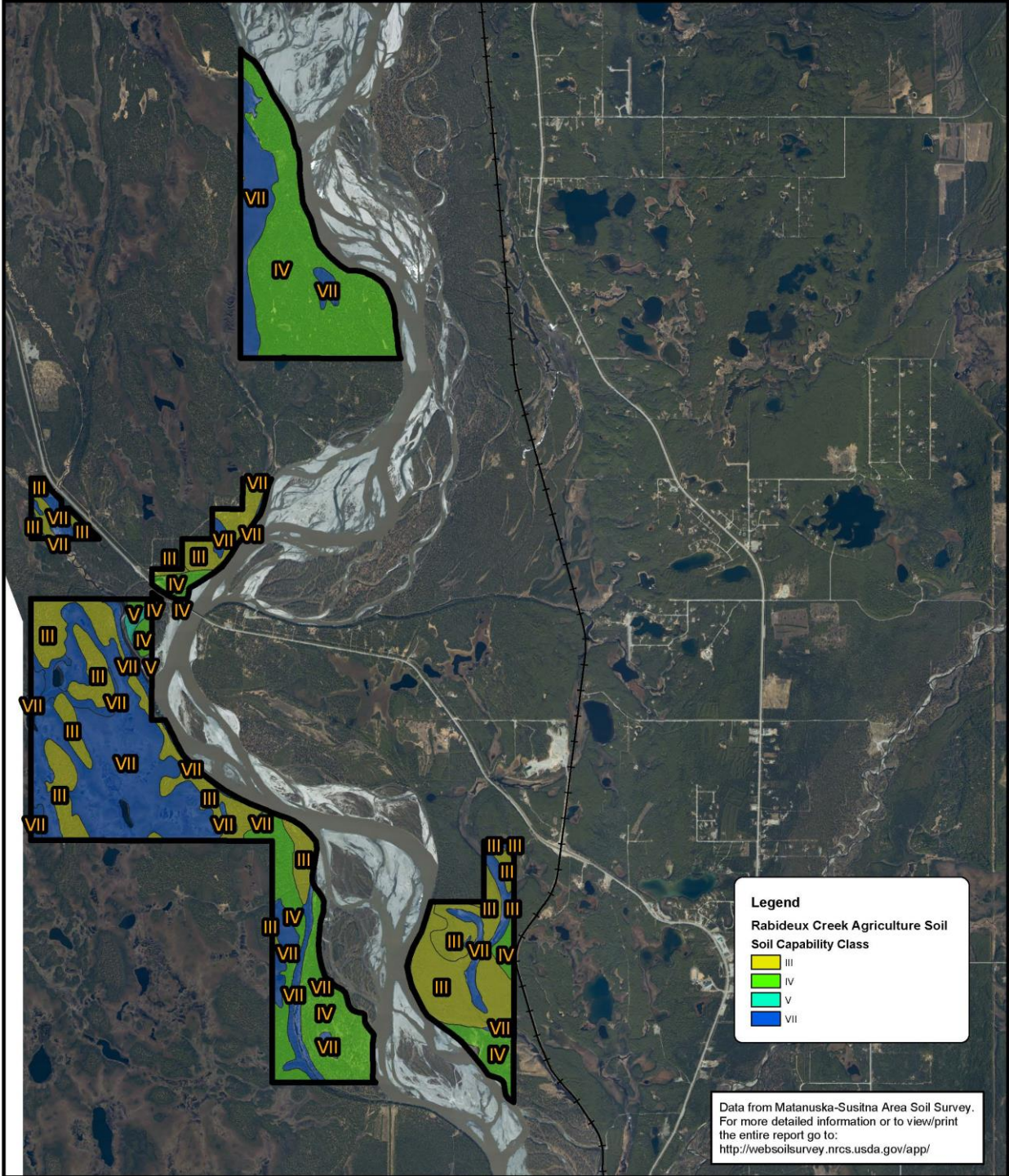




Rabideux Creek NRMU Soils

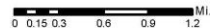
Community Development/LMD April 2010

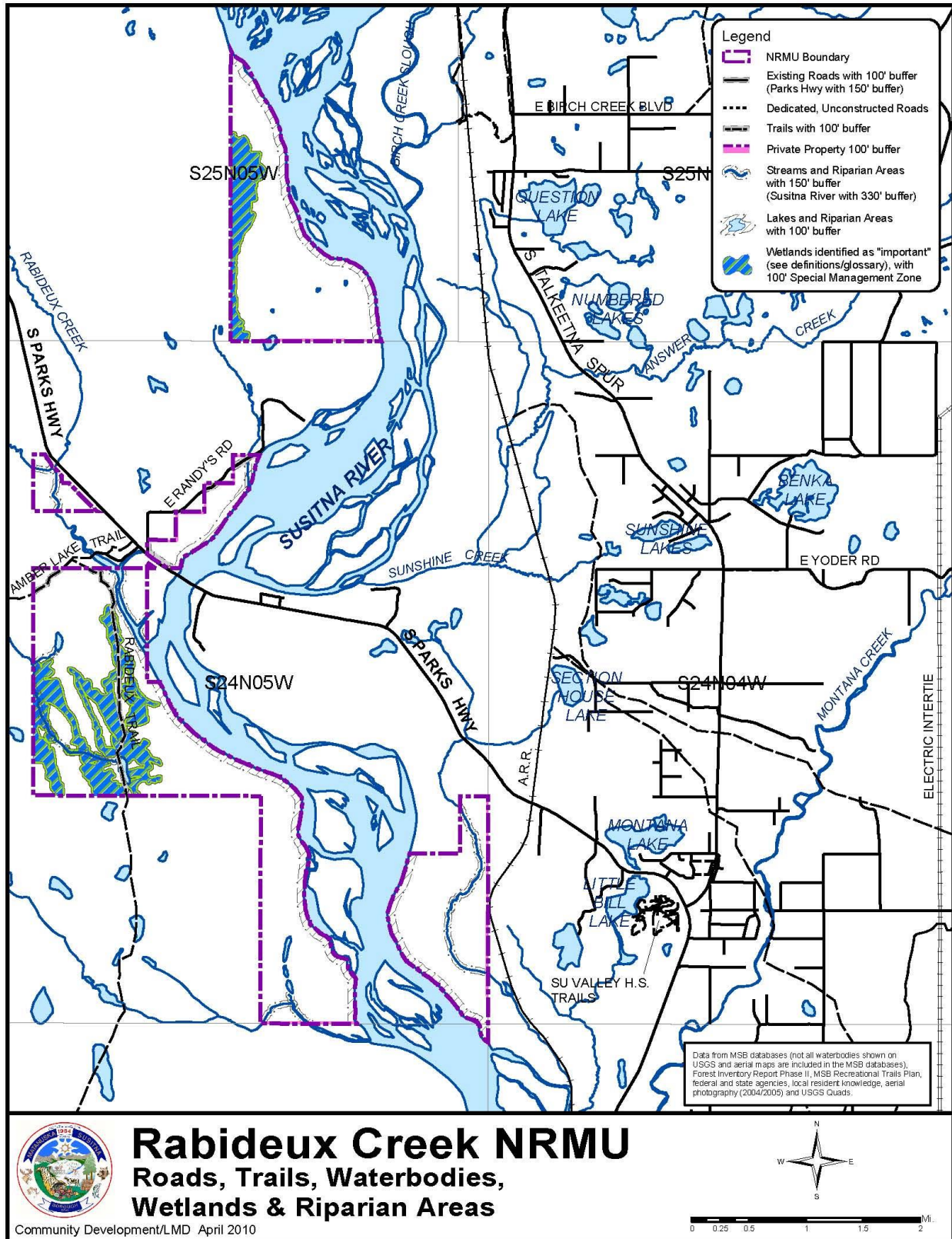




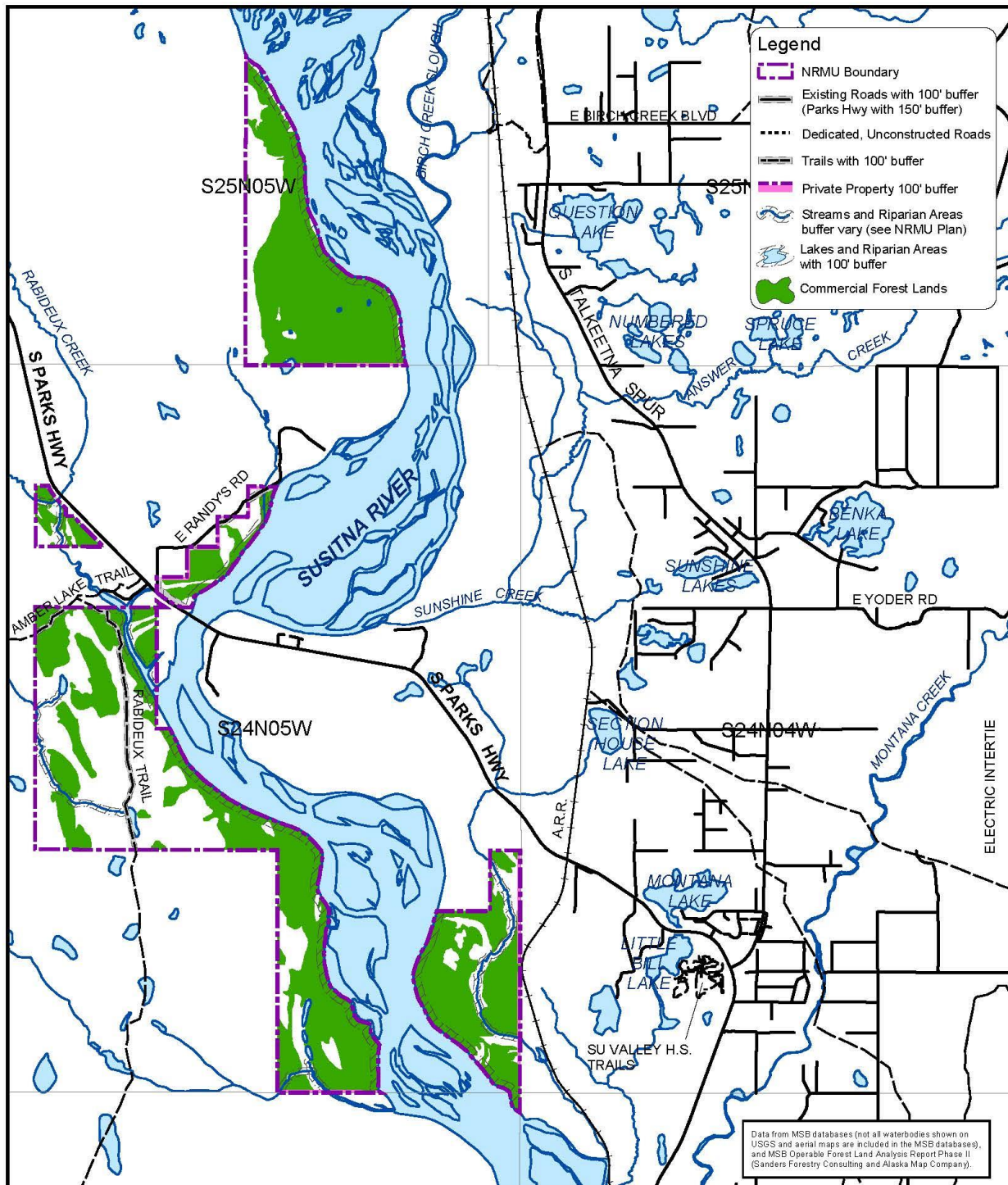
Rabideux Creek NRMU Agriculture Soils

Community Development/LMD December 2018



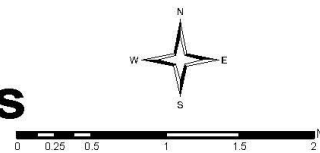


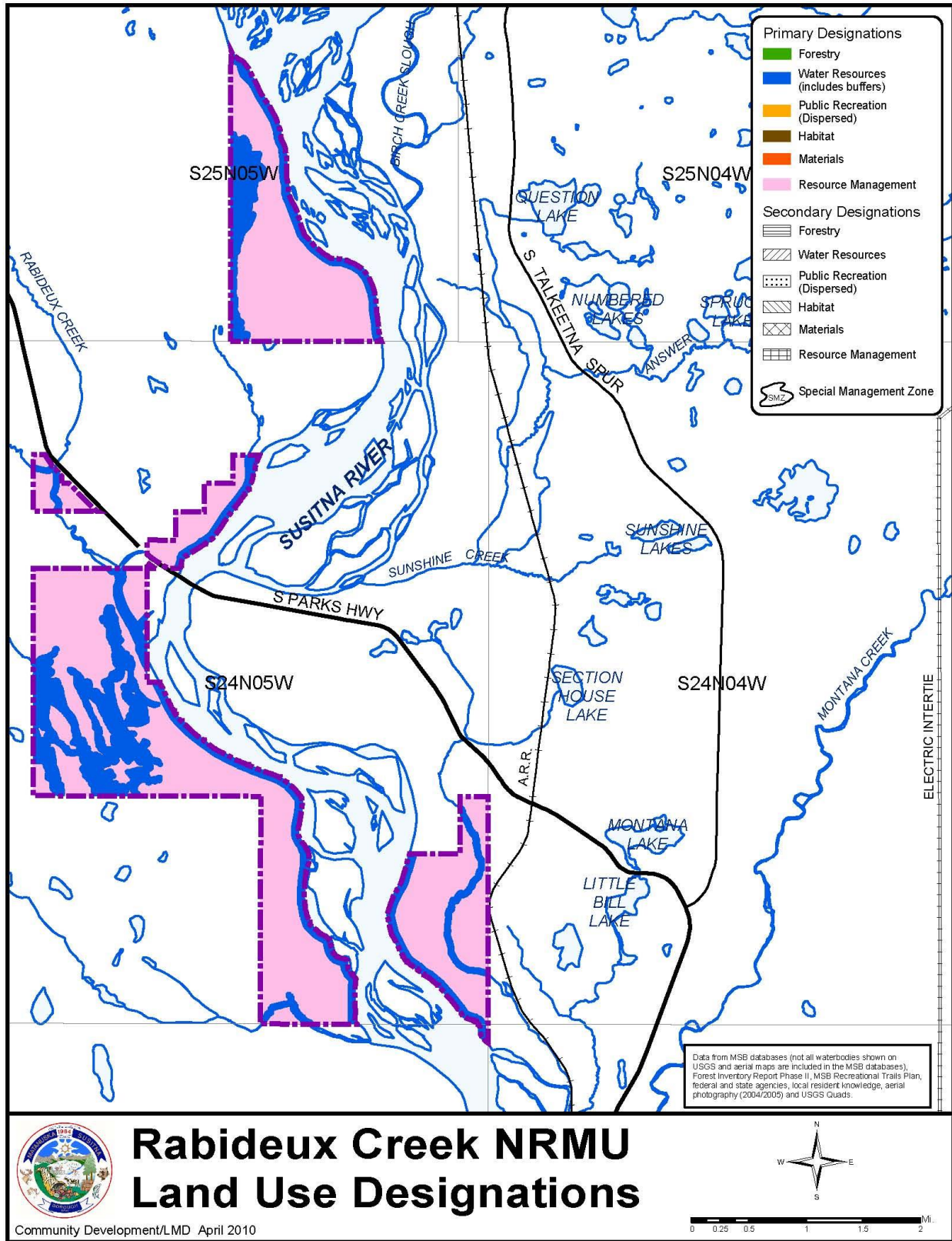
Insert Rabideux Creek Roads



Rabideux Creek NRMU Commercial Forest Lands

Community Development/LMD November 2018





Insert Rabideux Creek Lands

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 comprised 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 within 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 of the Parks Highway and east of the Susitna River, is within the Susitna 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

- Matanuska-Susitna Borough, *Recreational Trails Plan* (2016).
- Matanuska-Susitna Borough, *Parks, Recreation and Open Space Plan* (2001).
- Parks Highway Scenic Byway Corridor Partnership Plan (2008).

The *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; and
- compliance and enforcement.

Existing Land Use Classifications

Resource Management and Watershed Lands.

Summary of Resources and Uses

Agriculture and Grazing

A review of soil capability classifications, published by the USDA, Natural Resources Conservation Service (<http://websoilsurvey.nrcs.usda.gov/app/>), indicates that there are lands suitable for agricultural development or grazing within the unit.

See the *Soils* maps 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 fieldwork 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.

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, 2,692 acres (60% of the unit) is Commercial Forest Land.

Also, see *Commercial 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, 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 the western area of the unit. The Amber Lake Trail runs east/west and 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 be 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 permitted in commercial forest land areas and may take place if the harvest does not significantly reduce the recreational uses within the unit.

Because of the unit’s 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
<i>Primary</i>		
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 commercial 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 unit’s 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* .
<i>Secondary</i>		
None		

*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 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, rivers, and associated riparian areas will be protected through the use of undisturbed natural vegetation buffers.

All wetlands (see definition in *Definitions/Glossary* in Volume III) shall be protected with a 100-foot buffer. The buffer shall not allow disturbance of the wetland area, but some uses may be allowed. For example, wintertime 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 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

Timber harvests are a permitted use when it does not significantly reduce the area's recreational uses and water resource values.

Because of the unit's location along the Parks Highway and the location of the commercial 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.

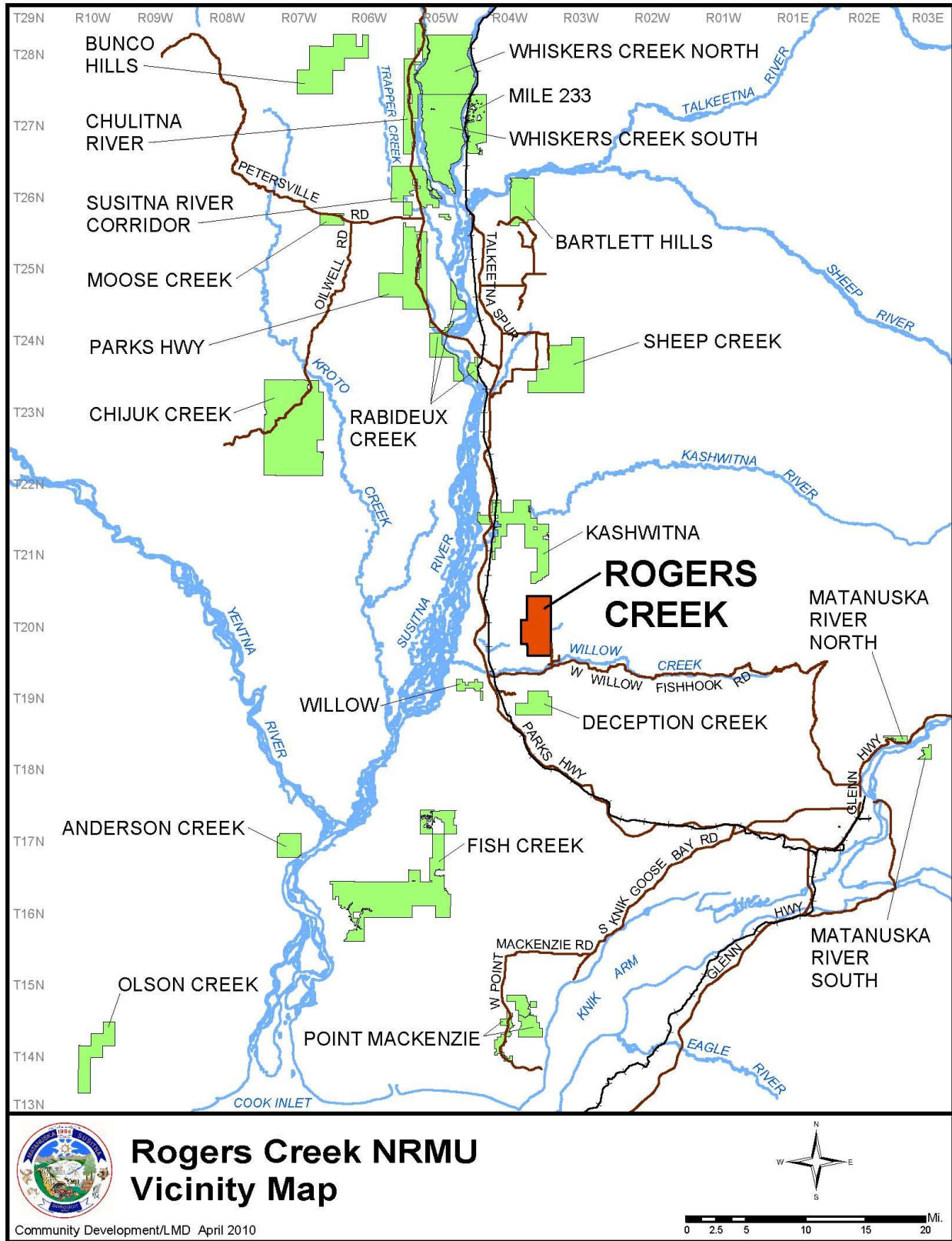
Portions of the area accessible to the Parks Highway and close to the Su Valley Middle/High School would also be suitable as a Forest Improvement Study Area (see Volume I, Chapter 3, *Forest Improvement Study Area(s)*, for more information).

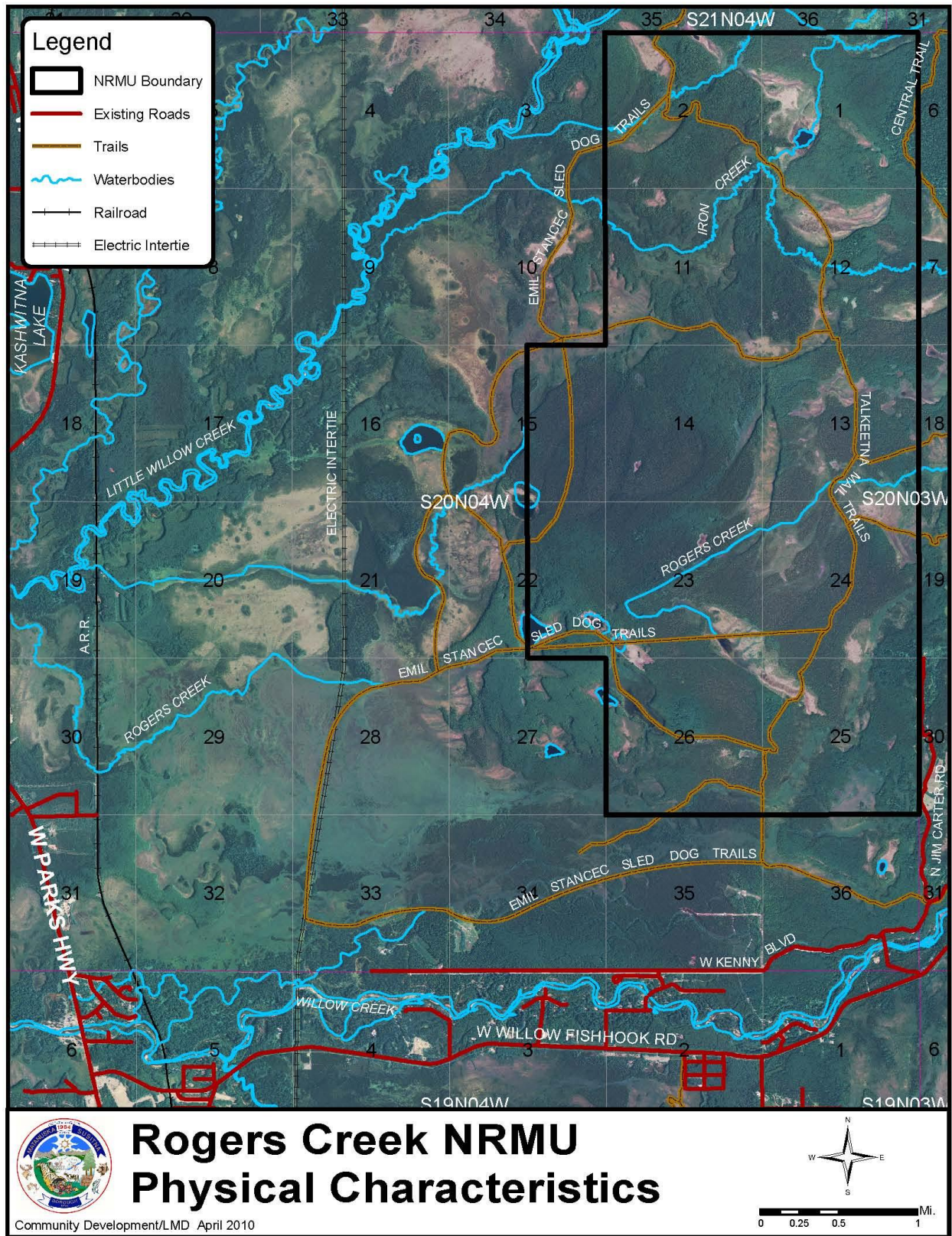
Other Uses

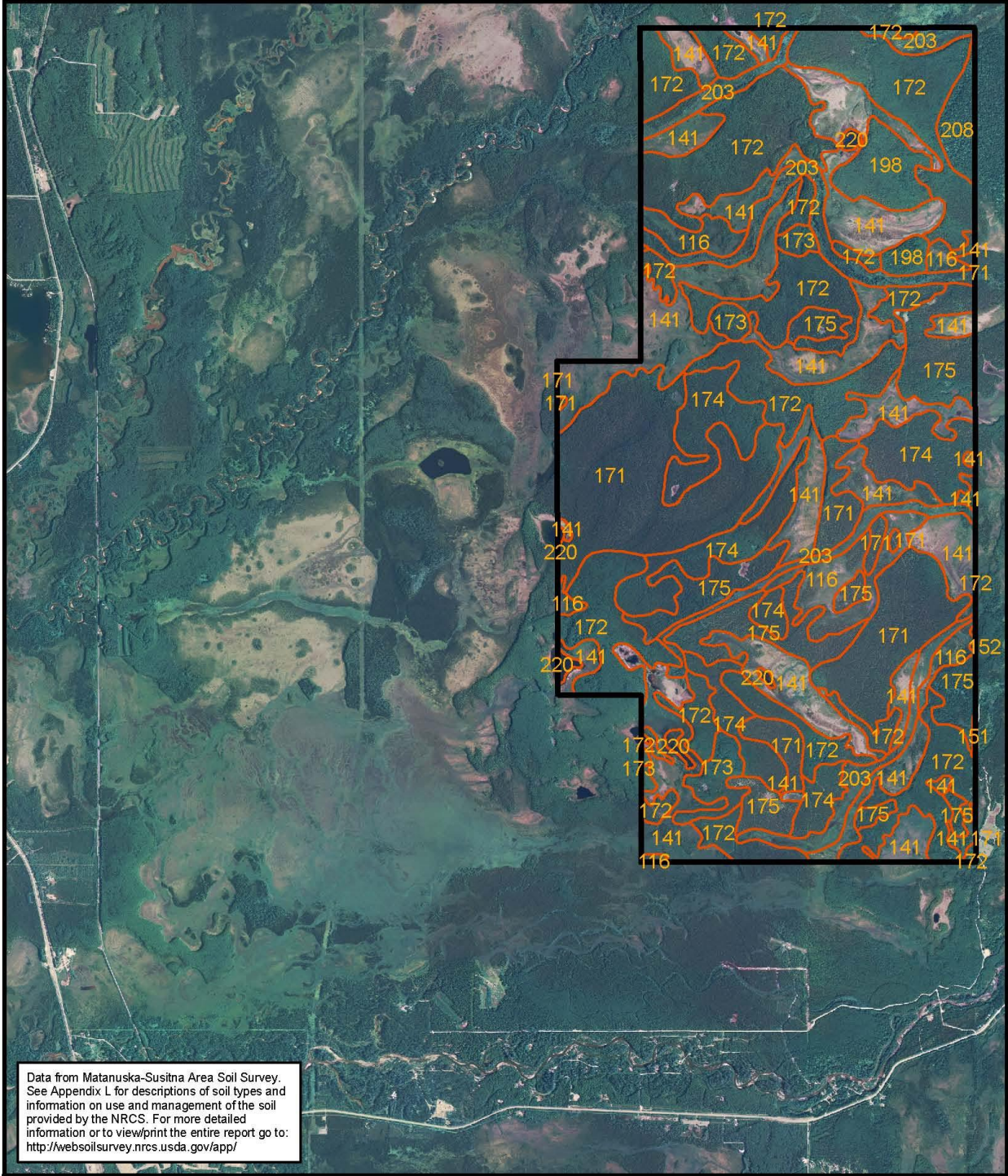
Because of the unit's close proximity to the Upper Susitna Middle/High School, this unit, particularly that portion east of the Susitna River and west of the Parks Highway could be designated as a Special Management Area for the purpose of establishing a Forest Education and Improvement Study Area.

(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.





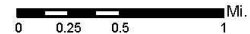
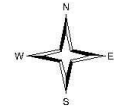


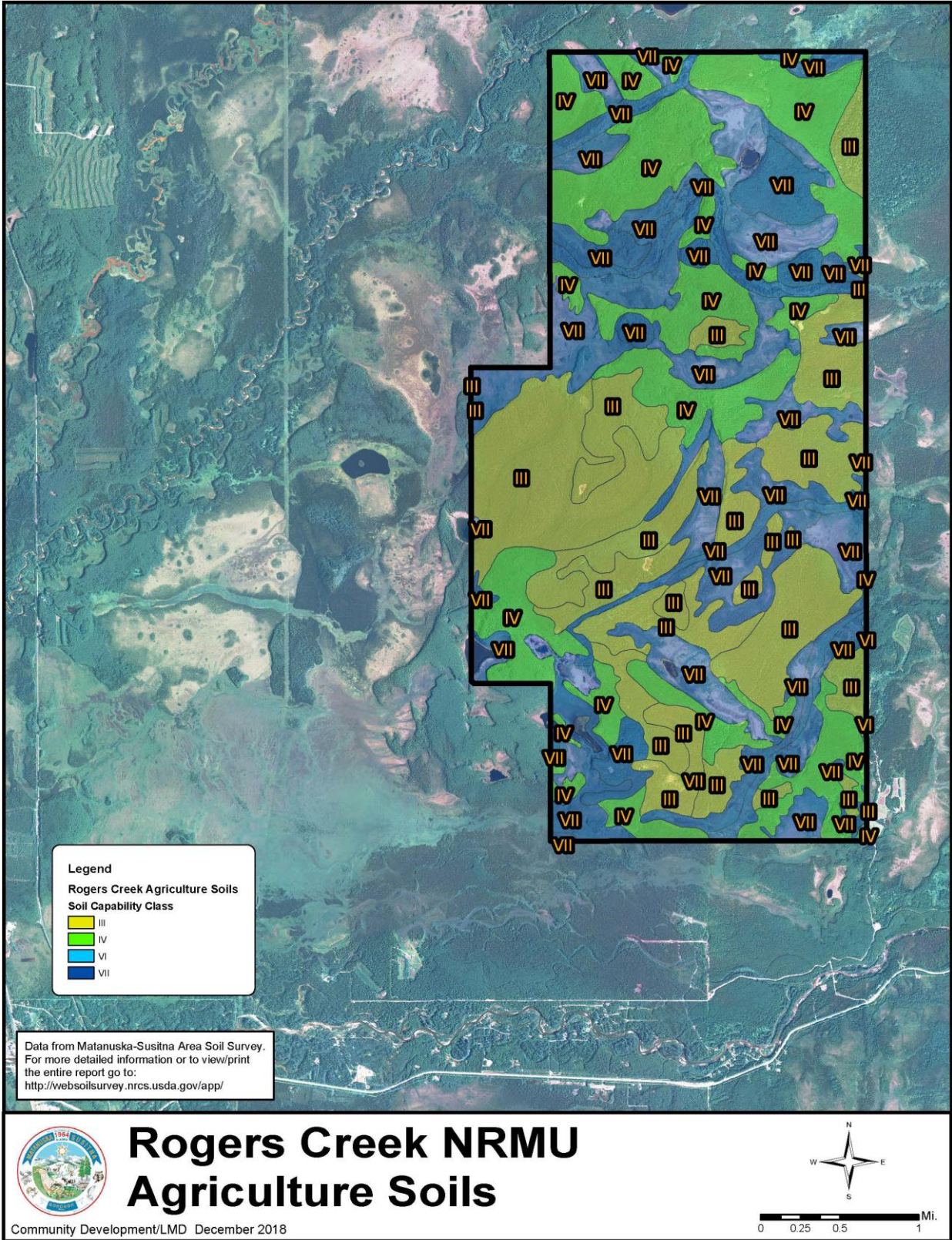
Data from Matanuska-Susitna Area Soil Survey. See Appendix L for descriptions of soil types and information on use and management of the soil provided by the NRCS. For more detailed information or to view/print the entire report go to: <http://websoilsurvey.nrcs.usda.gov/app/>

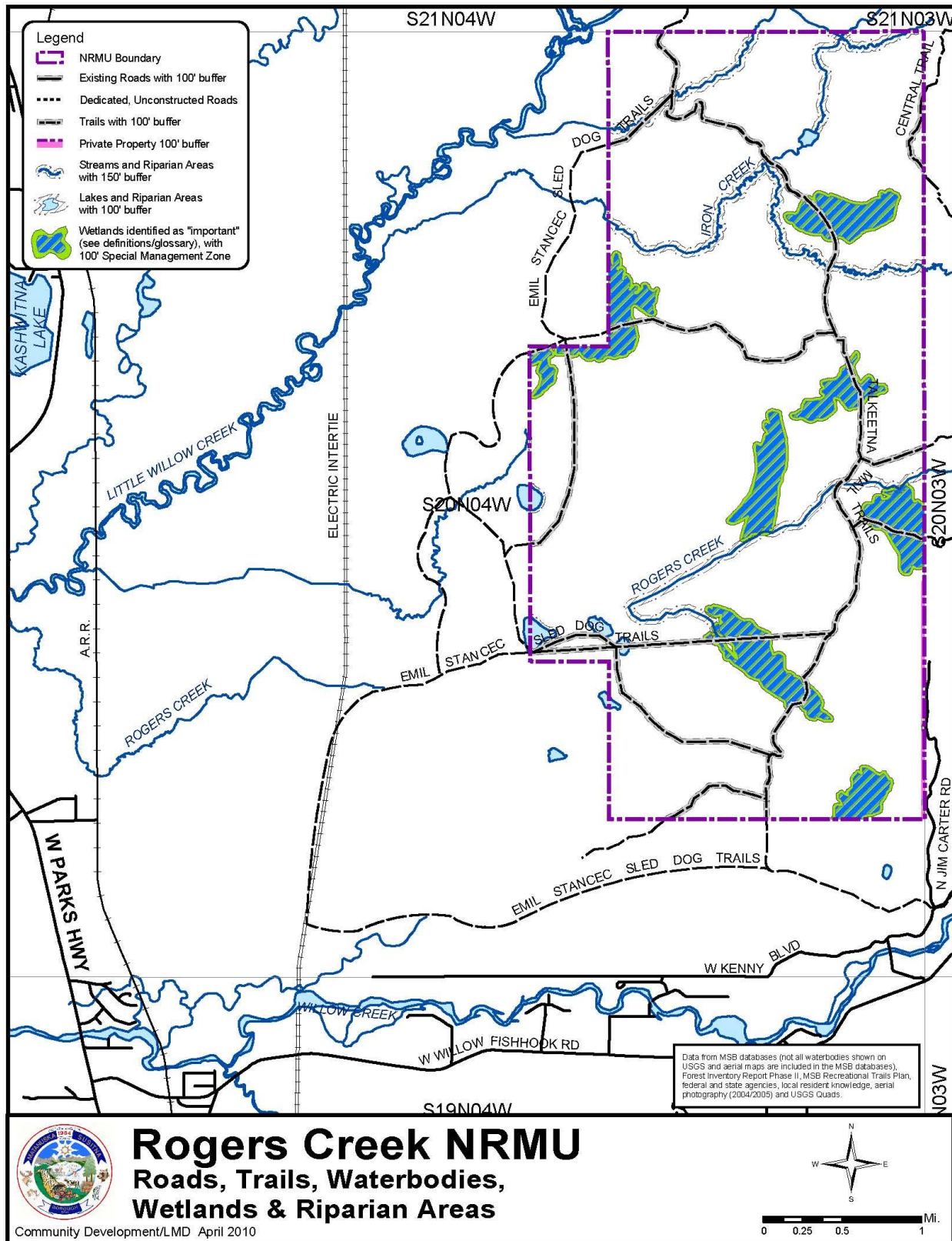


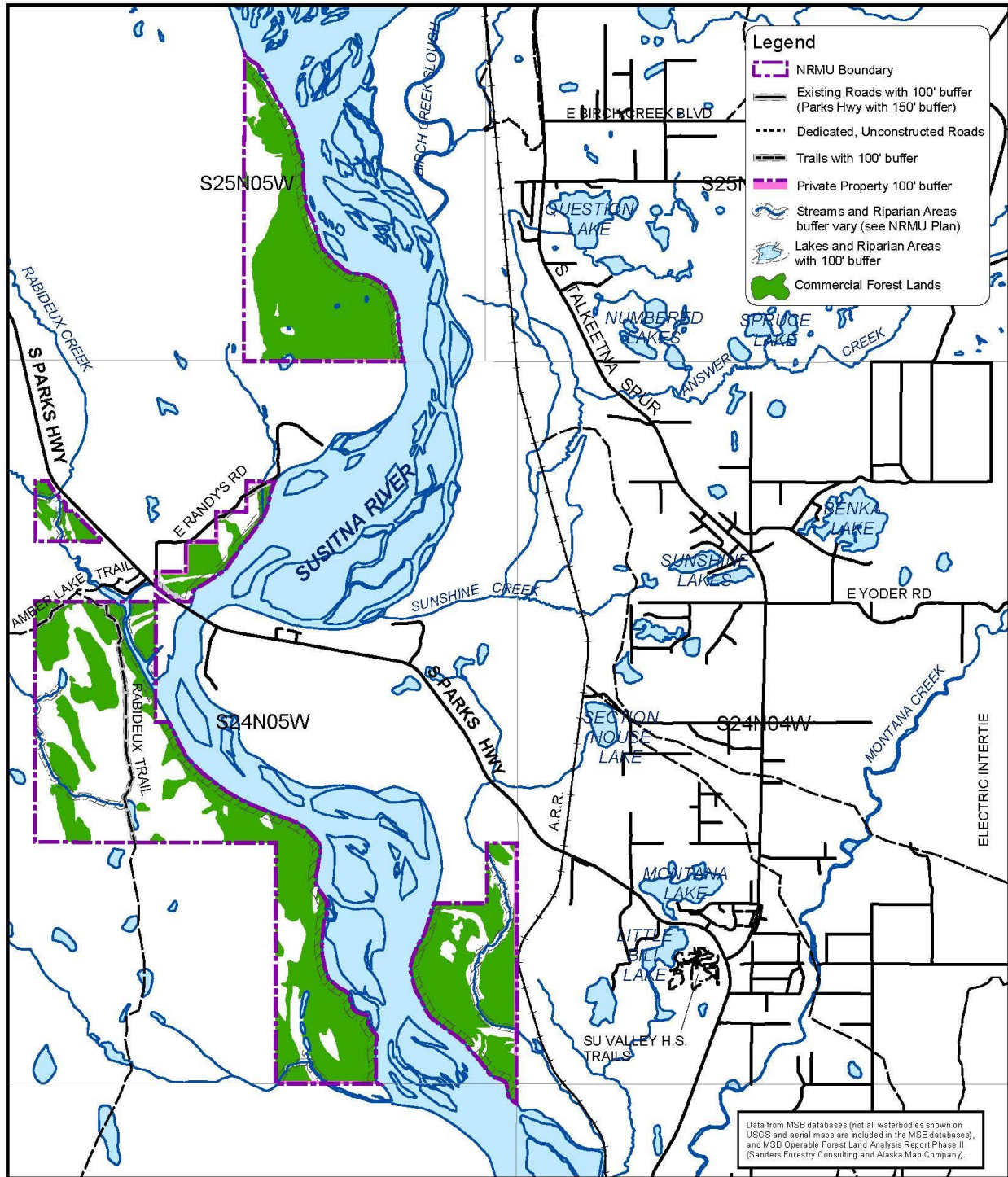
Rogers Creek NRMU Soils

Community Development/LMD April 2010



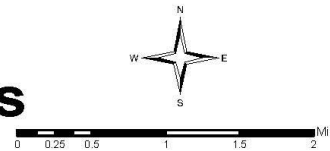


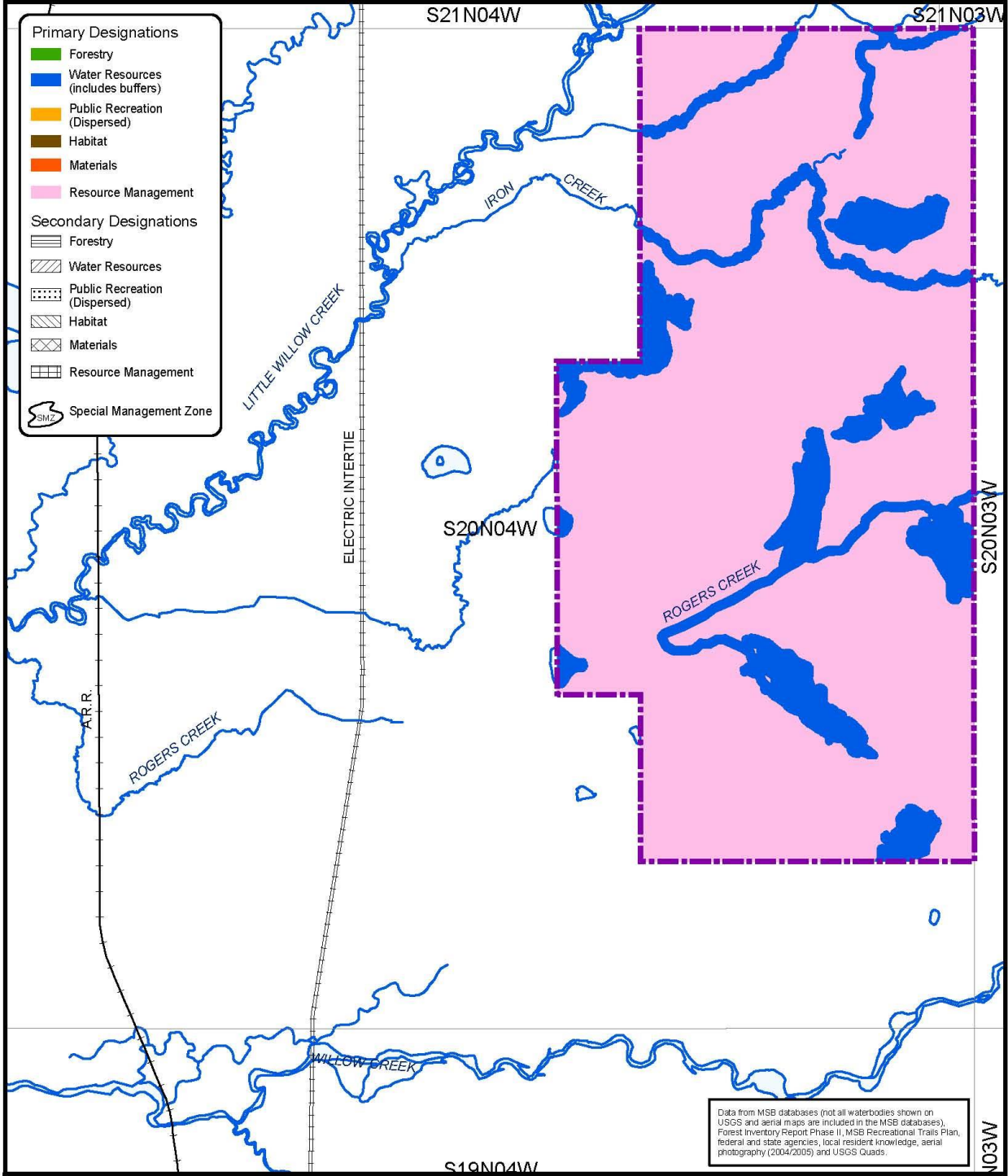




Rabideux Creek NRMU Commercial Forest Lands

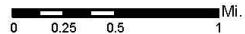
Community Development/LMD November 2018





Rogers Creek NRMU Land Use Designations

Community Development/LMD April 2010



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

- Matanuska-Susitna Borough, *Recreational Trails Plan* (2016).
- Matanuska-Susitna Borough, *Parks, Recreation and Open Space Plan* (2001).
- *Willow Comprehensive Plan* (2013) includes a recommendation for the borough to reserve land paralleling the Parks Highway for a future bypass. The highway bypass would cross the western portion of this unit.

Existing Land Use Classifications

Resource Management Lands with Watershed Lands where large wetland areas and streams occur.

Summary of Resources and Uses

Agriculture and Grazing

A review of soil capability classifications, published by the USDA, Natural Resources Conservation Service (<http://websoilsurvey.nrcs.usda.gov/app/>), indicates that there are lands suitable for agricultural development or grazing within the unit.

See the *Soils* maps 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 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 7,039 acre unit, 2,193 acres (31% of the unit) is Commercial Forest Land. Also, see *Commercial 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 Deneky Road Bridge which is off the Willow Fishhook Road 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 Summer and Winter Trail Plans*, adopted by the Willow Area Community Organization , document 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
<i>Primary</i>		
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 commercial forest land and where it does not significantly reduce the areas recreational activities. Recognize and manage for the unit’s 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 shall also be similarly designated and classified*.
<i>Secondary</i>		
None		

*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 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, rivers, and associated riparian areas will be protected through the use of undisturbed natural vegetation buffers.

All wetlands (see definition in *Definitions/Glossary* in Volume III) shall be protected with a 100 foot buffer. The buffer shall not allow disturbance of the wetland area, but some uses may be allowed. For example, wintertime 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

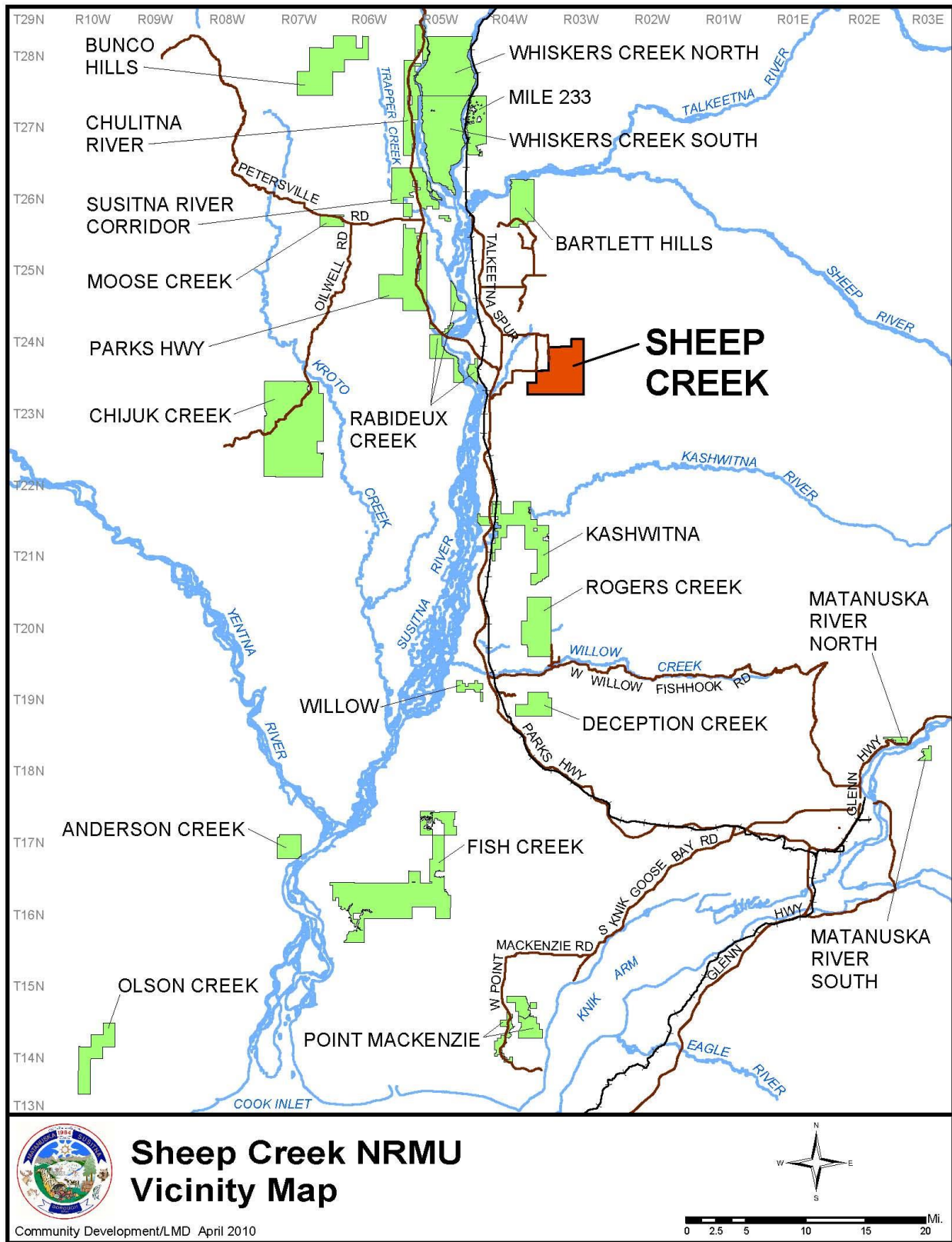
Timber harvesting is permitted when it does not significantly reduce from the unit's recreational and watershed values.

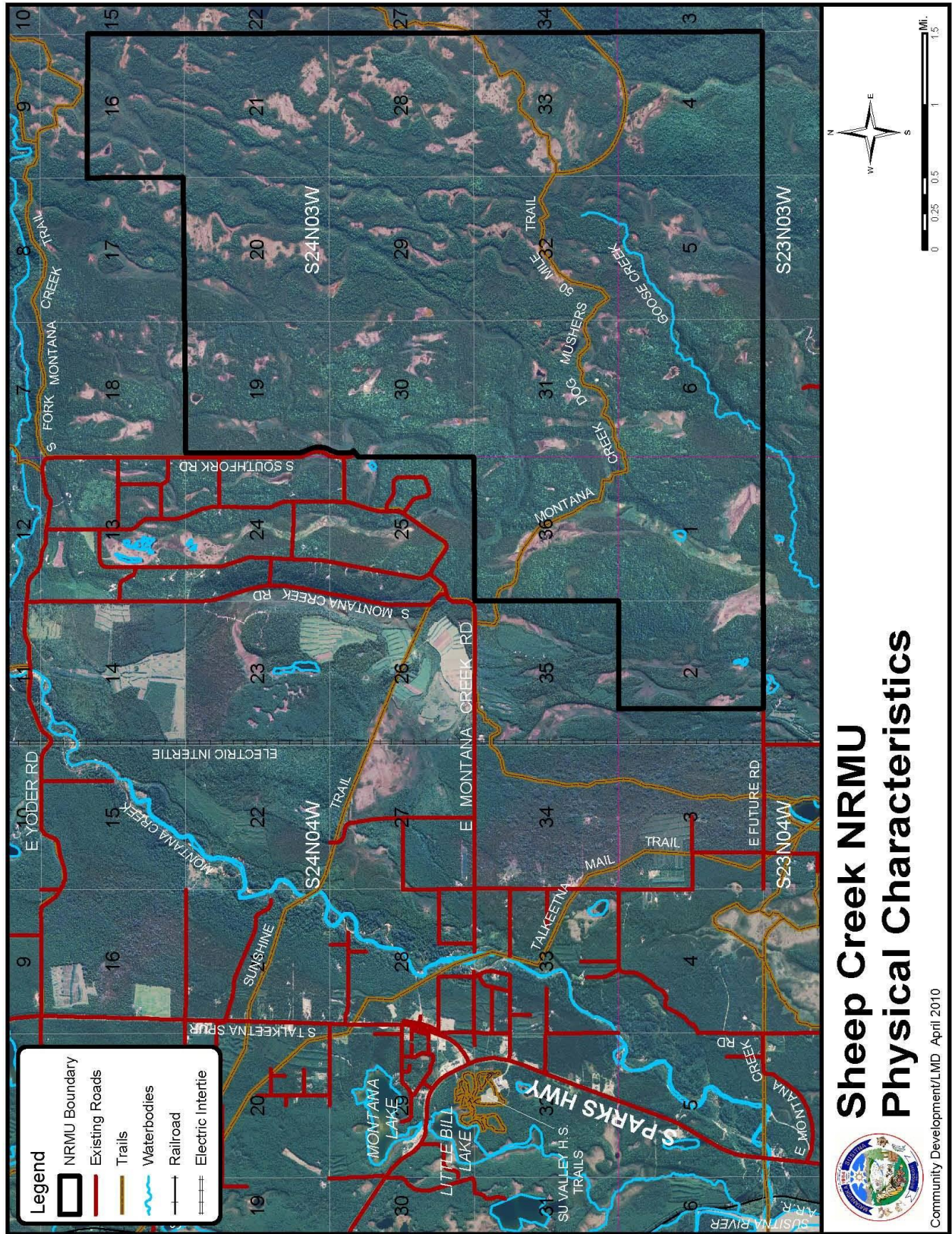
Timber harvest shall be managed for improving forest health and providing forest products utilizing professionally accepted practices.

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.

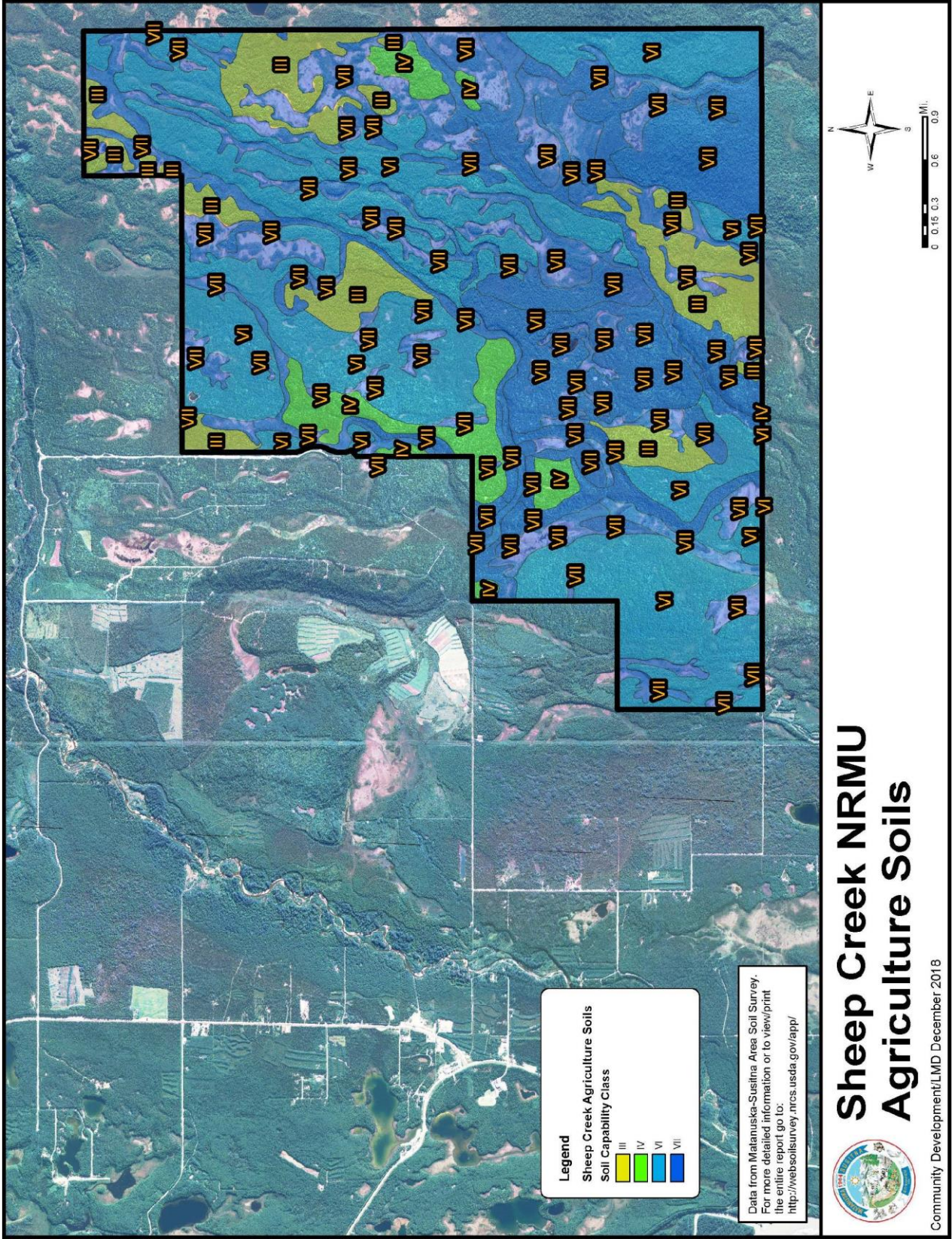


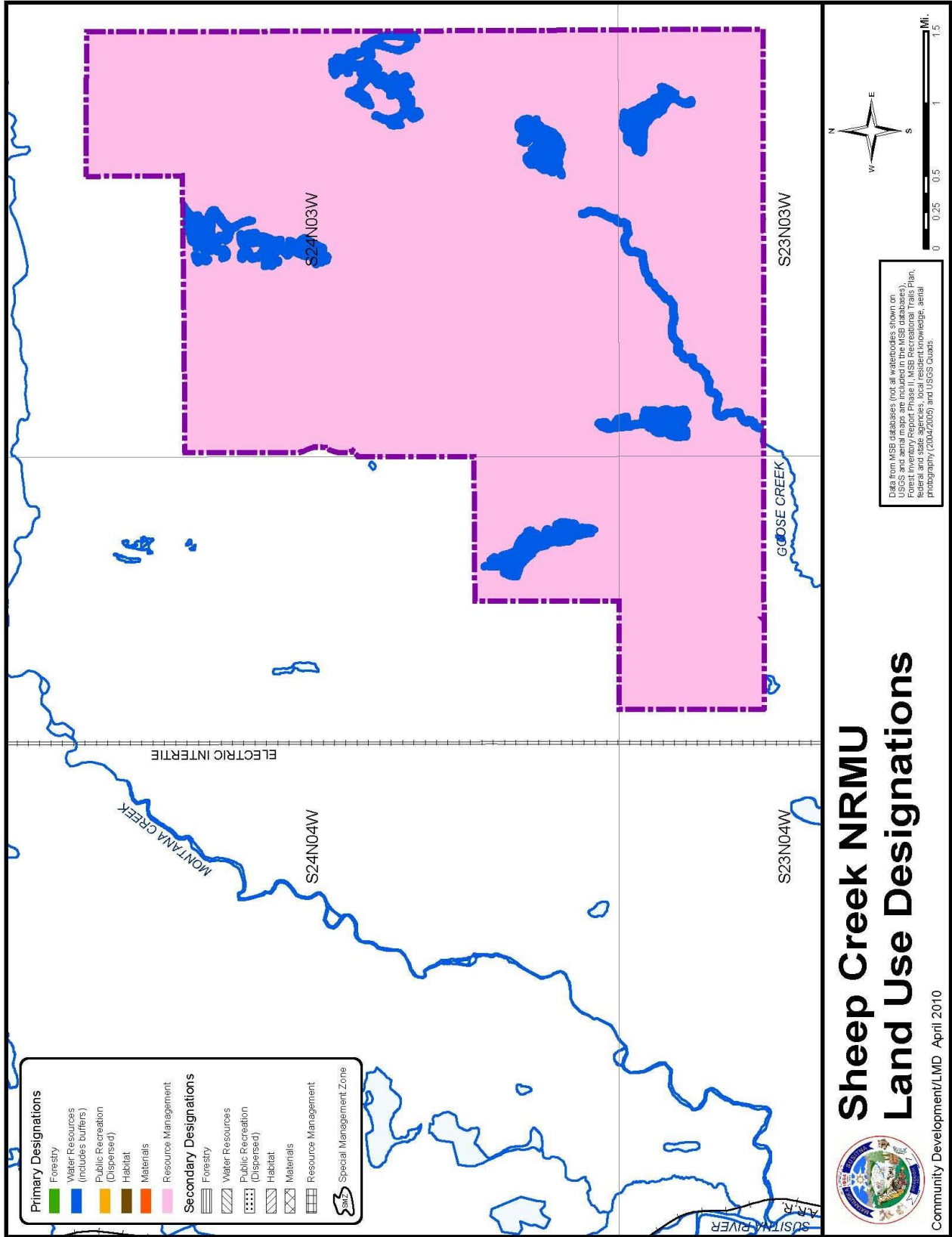


Sheep Creek NRMU Physical Characteristics



Community Development/LMD April 2010





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 ten 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 Community Council

Existing Land Use Plans

- Matanuska-Susitna Borough, *Recreational Trails Plan* (2016).
- Matanuska-Susitna Borough, *Parks, Recreation and Open Space Plan* (2001).

The *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
Resource Management and Watershed Lands

Summary of Resources and Uses

Agriculture and Grazing

A review of soil capability classifications, published by the USDA, Natural Resources Conservation Service (<http://websoilsurvey.nrcs.usda.gov/app/>), indicates that there are 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.

See the *Soils* maps 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. There is a significant amount of forest land (3,351 acres) that is isolated by rugged terrain.

Within the 9,703-acre unit, 4,924 acres (51% of the unit) is Commercial Forest Land. Also, see *Commercial Forest Lands* map at the beginning of this section.

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 ATVs.

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 Musers 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
<i>Primary</i>		
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 commercial 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*.
<i>Secondary</i>		
None		

*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 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 (see definition in *Definitions/Glossary* in Volume III) shall be protected with a 100-foot buffer. The buffer shall not allow disturbance of the wetland area, but some uses may be allowed. For example, wintertime 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 Musers 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

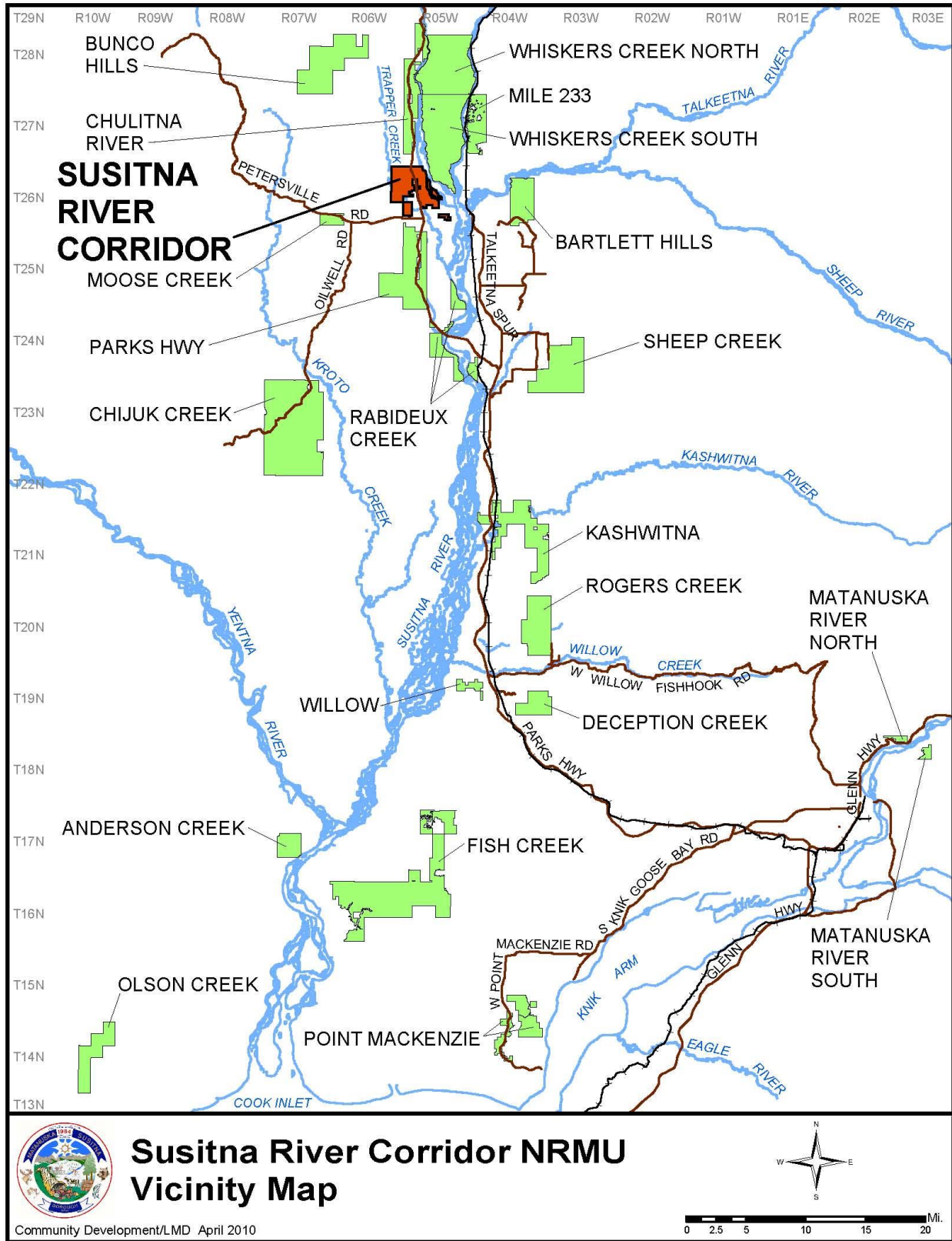
Timber harvesting is an authorized use. Timber harvests, harvest units and cutting areas shall protect the water resource values and not significantly reduce the areas recreational opportunities.

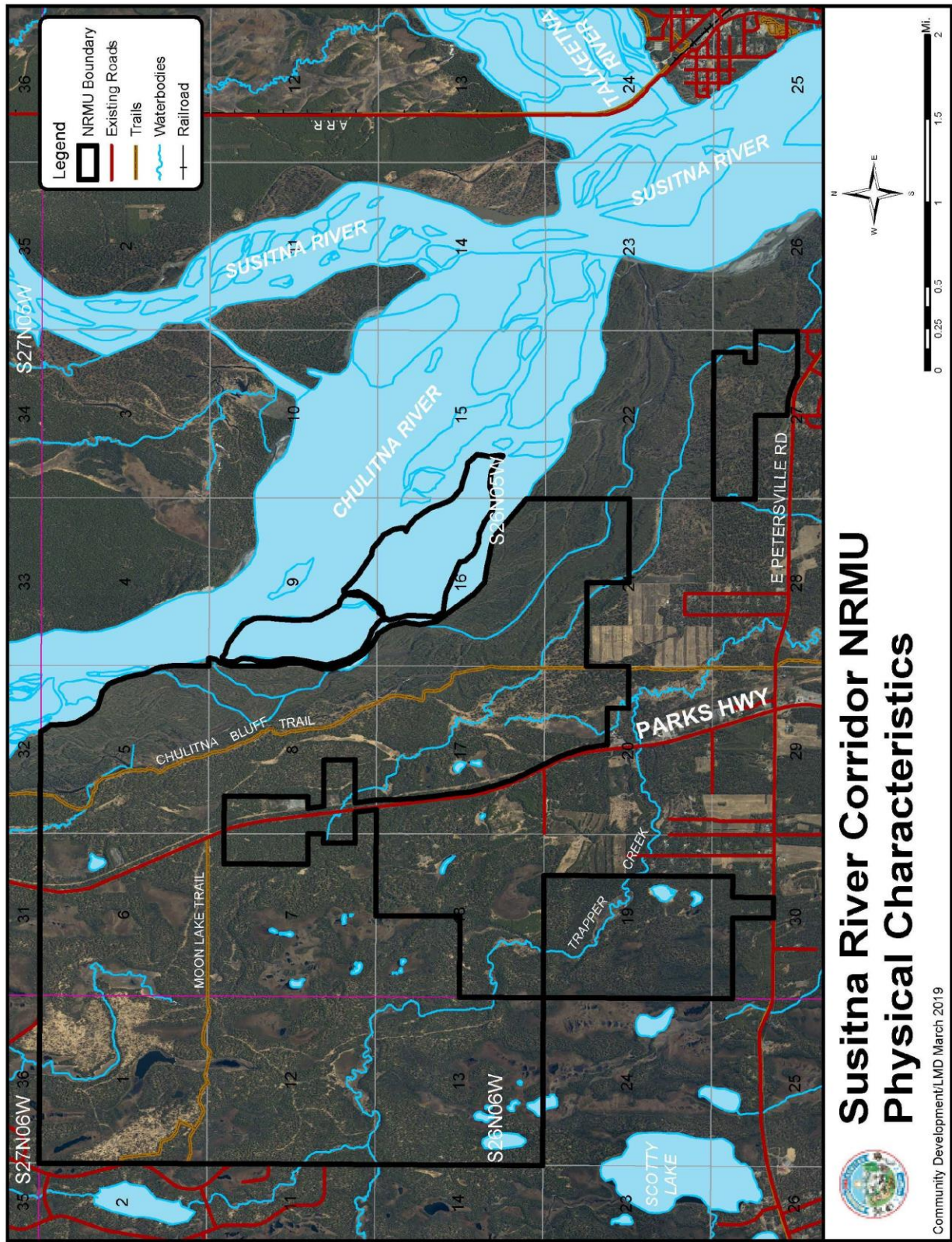
Timber harvests shall only be held after consultation with the Alaska Department of Fish and Game. Harvest units should be laid out to improve wildlife habitat, especially winter habitat for moose to reduce transportation related fatalities in the area and improve public safety.

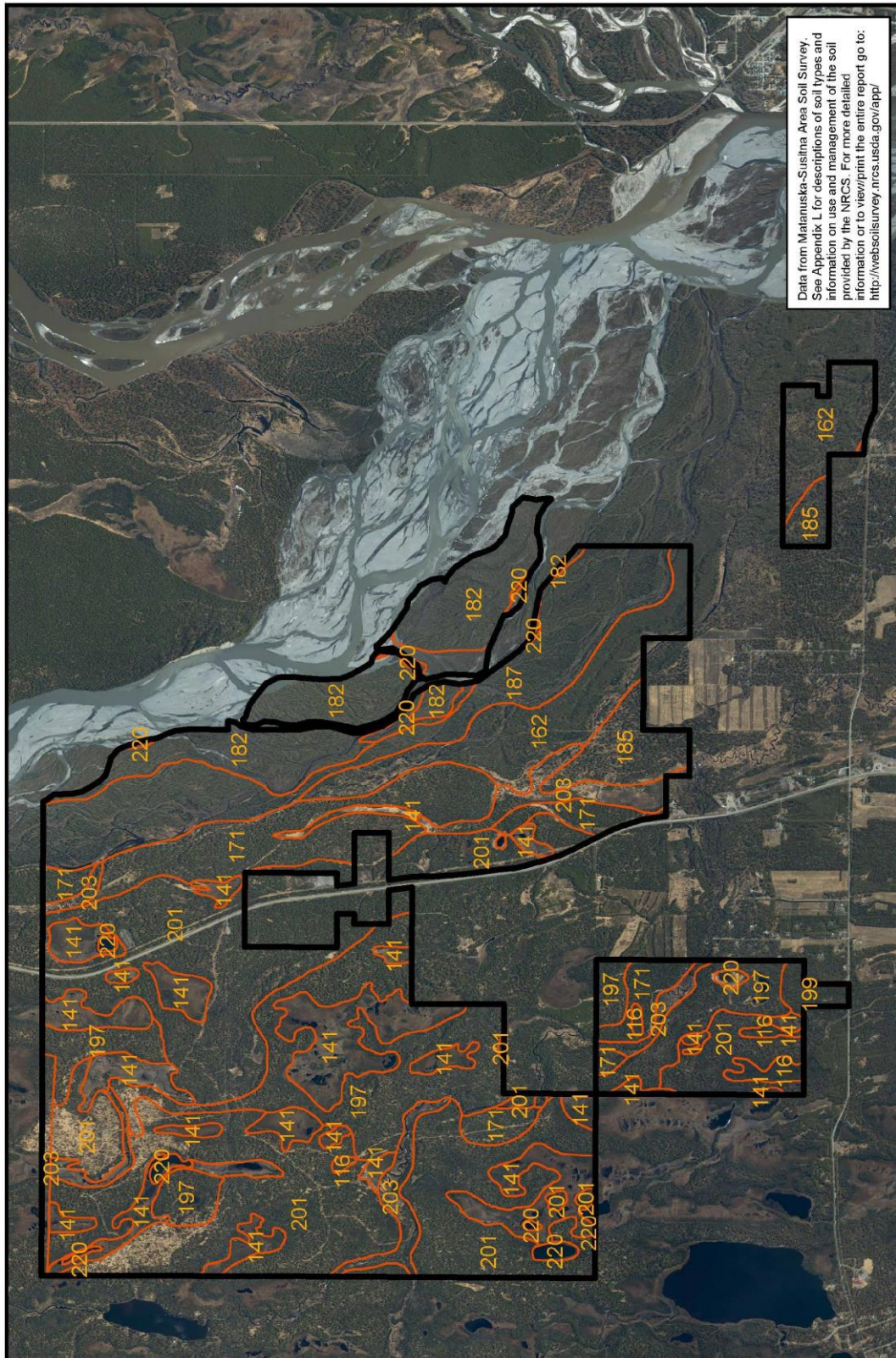
Other Uses

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 (see Volume I, Chapter 3, *Forest Education and 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.



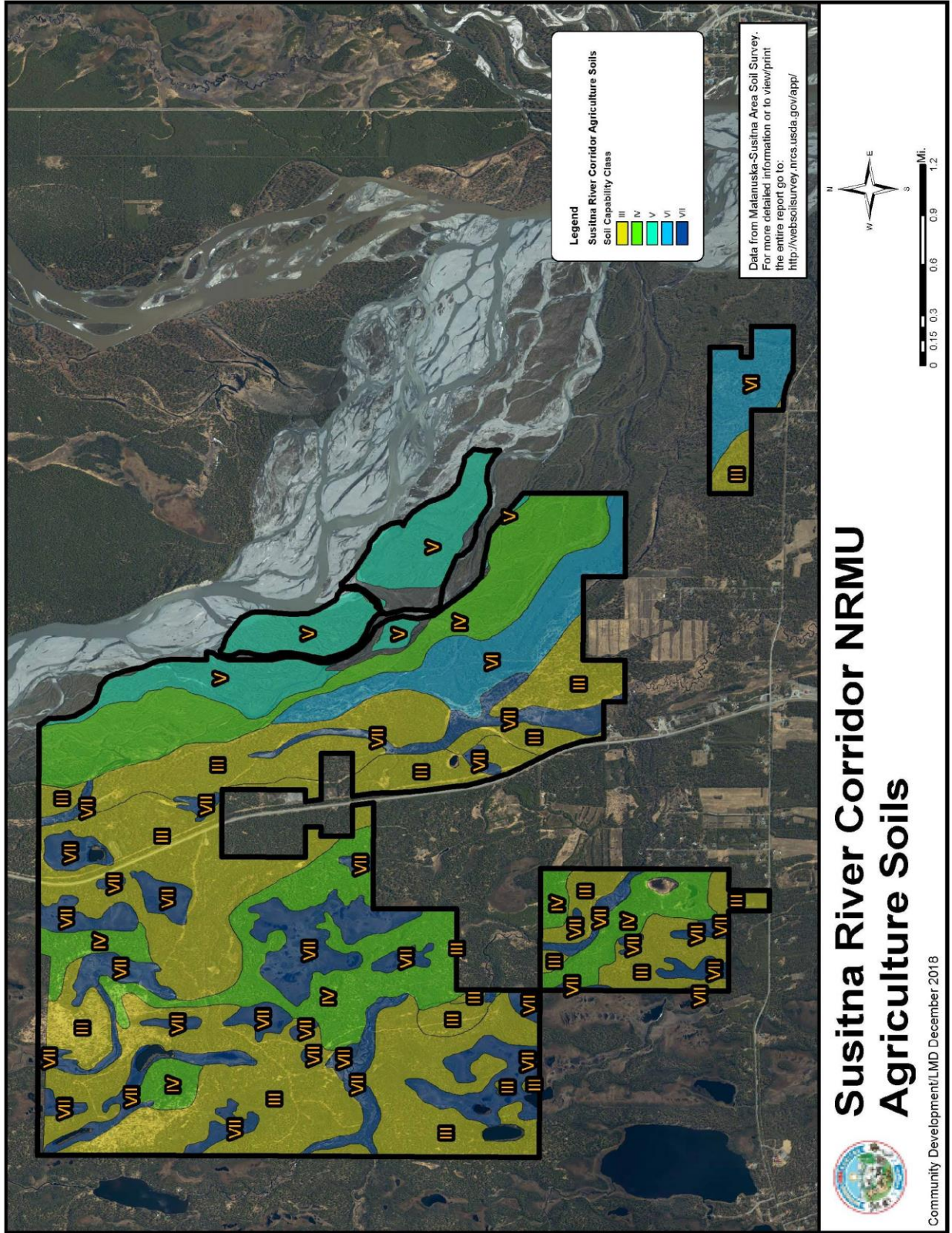


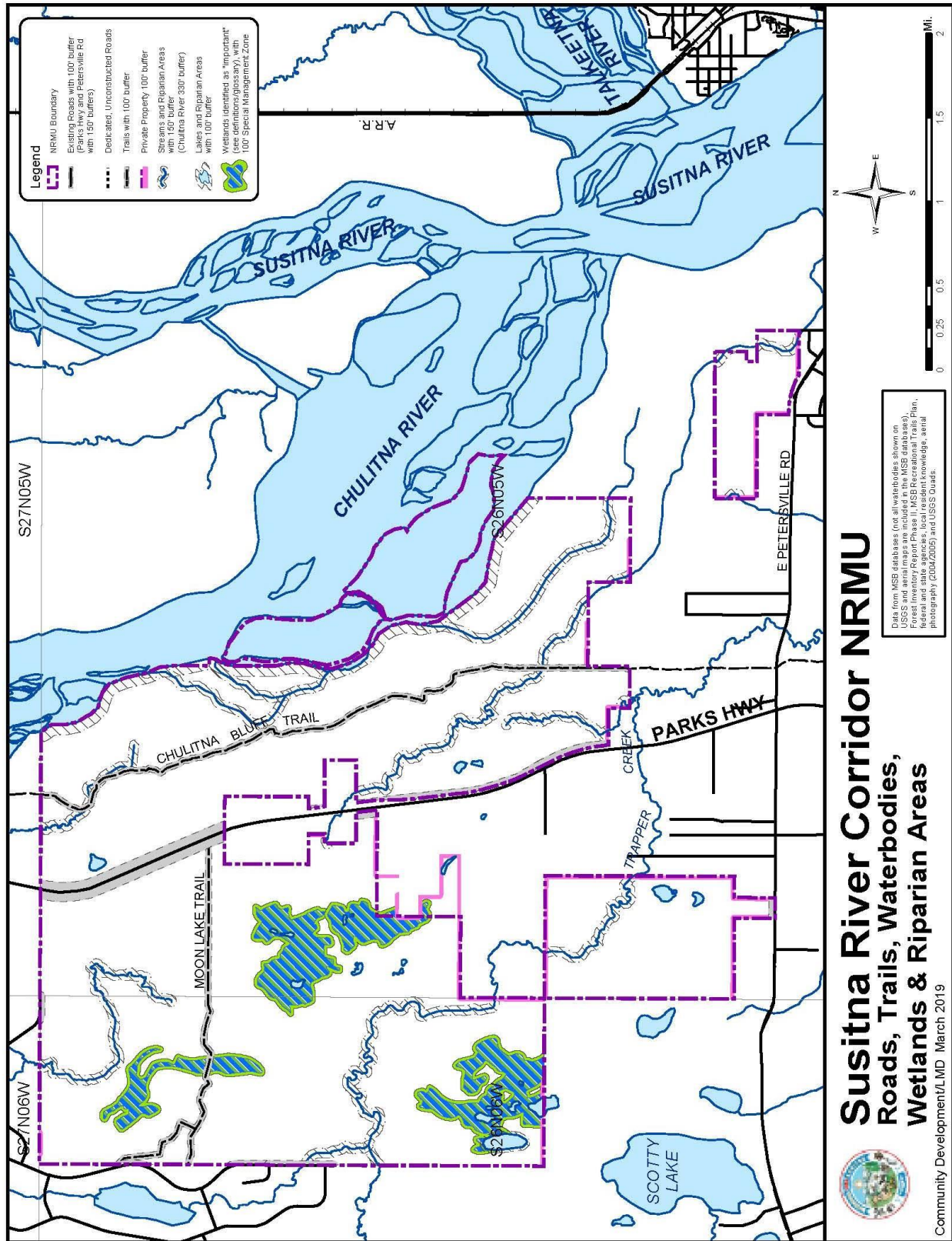


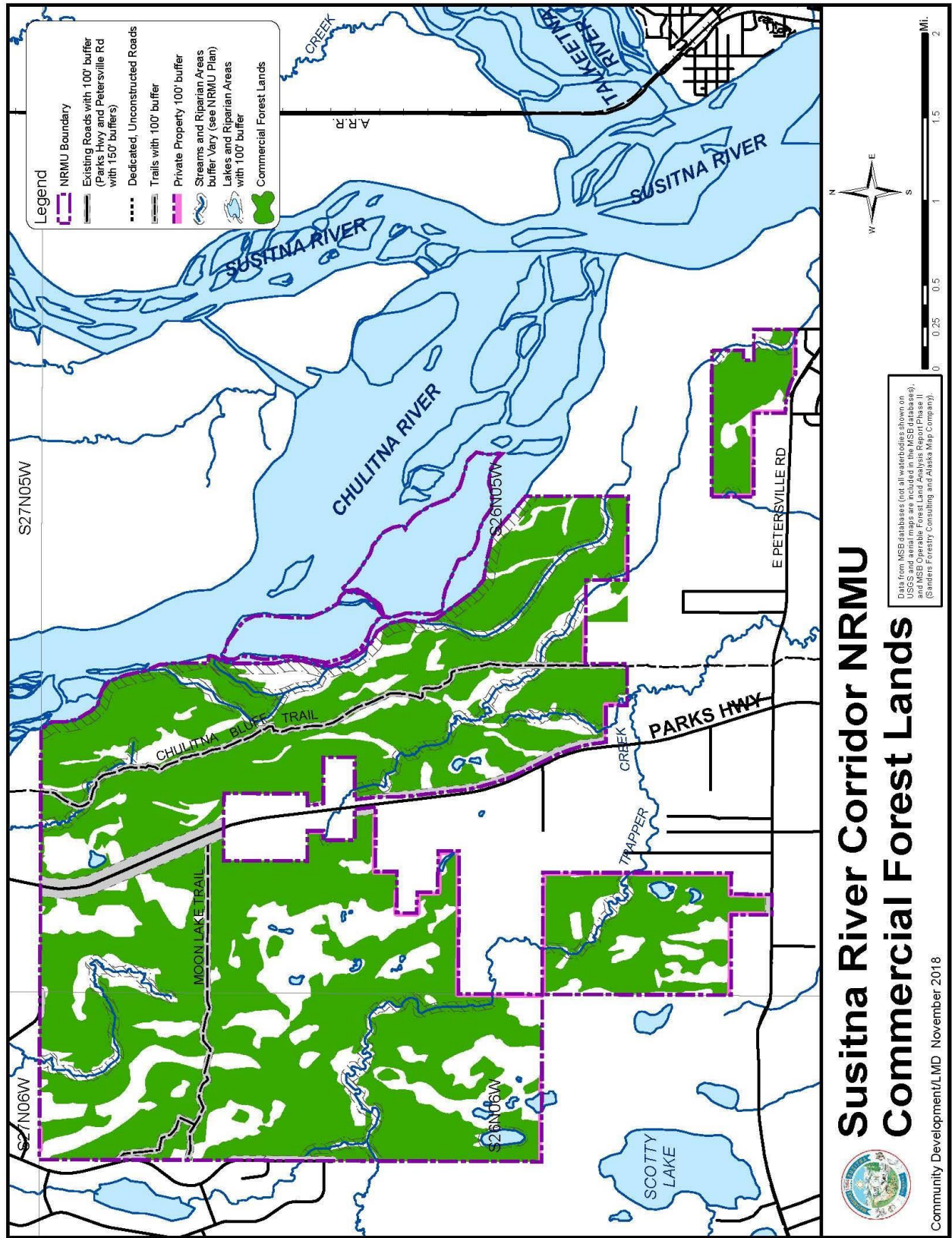
Susitna River Corridor NRMU Soils

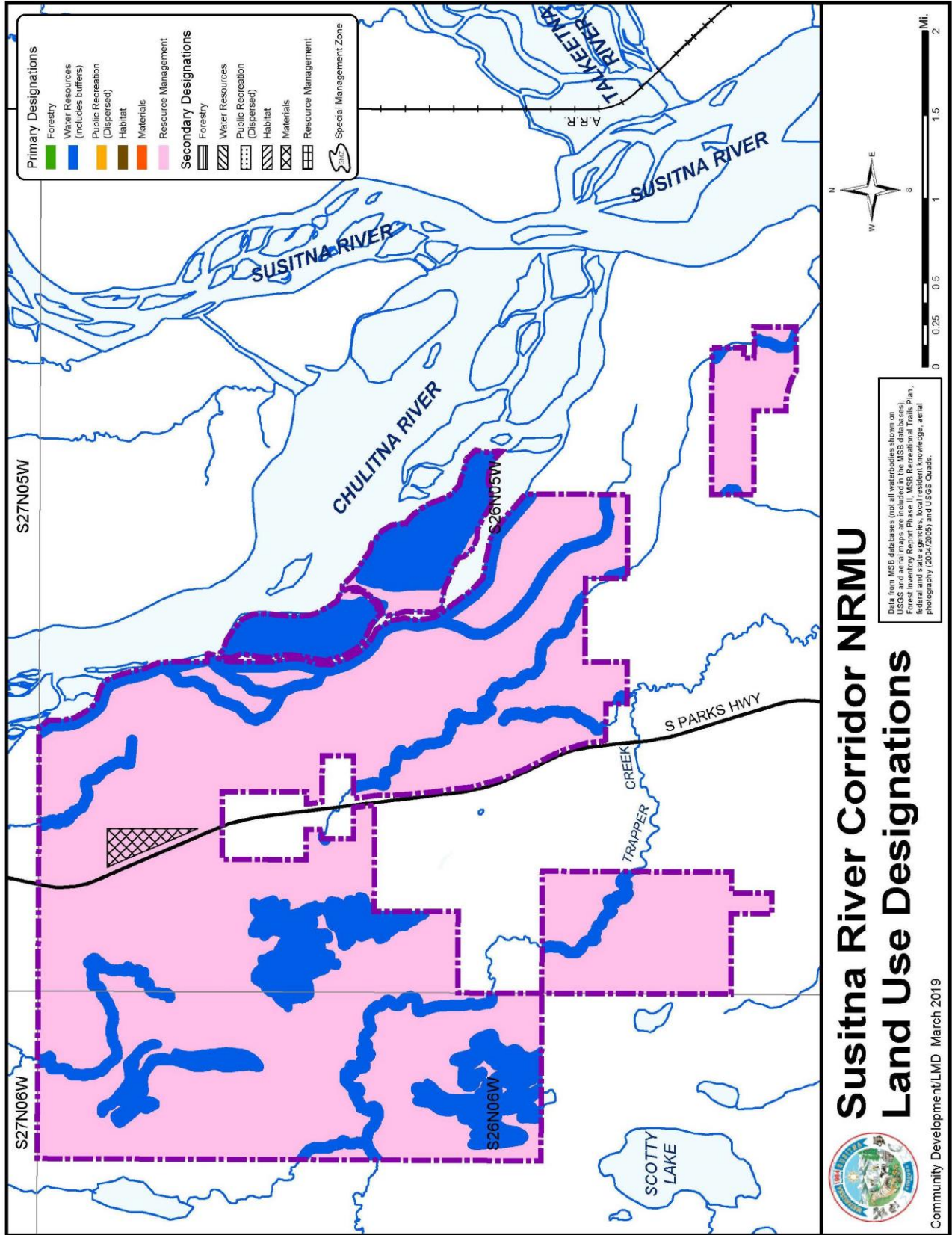


Community Development/LMD March 2019









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 10 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 snowmachines. 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

- Matanuska-Susitna Borough, *Recreational Trails Plan* (2016).
- Matanuska-Susitna Borough, *Parks, Recreation and Open Space Plan* (2001).

A Scenic Highway Plan was developed for the Parks Highway starting at the Susitna River Bridge and continuing north through Denali State Park.

Existing Land Use Classification

Resource Management with Watershed Lands on the large wetlands areas and streams.

Summary of Resources and Uses

Agriculture and Grazing

A review of soil capability classifications, published by the USDA, Natural Resources Conservation Service (<http://websoilsurvey.nrcs.usda.gov/app/>), indicates that there are some areas within the unit that may be suitable for 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.

See the *Soils* maps 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 unit's 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 6,647 acre unit, 4,690 acres (71% of the unit) is Commercial Forest Land.

Also, see *Commercial 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, 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 a 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 of 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.nrcs.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 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
<i>Primary</i>		
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 commercial 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.
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*.
<i>Secondary</i>		
None		

*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 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 (see definition in *Definitions/Glossary* in Volume III) shall be protected with a 100-foot buffer. The buffer shall not allow disturbance of the wetland area, but some uses may be allowed. For example, wintertime 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 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

Timber harvests are allowed on Commercial Timber Lands. Timber harvests, harvest units, and cutting areas shall not significantly reduce the areas recreational opportunities, significantly impact rural residents' lifestyles, and shall not impact the unit's watershed values.

Because of the unit's 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 mat.

Unlike some of the other nearby Natural Resource Management Units, this unit has more than sufficient commercial forest land to meet the projected needs for commercial opportunities, and still

provide timber for other local uses. The majority of the commercial forest land is located a short distance from existing all-season roads.

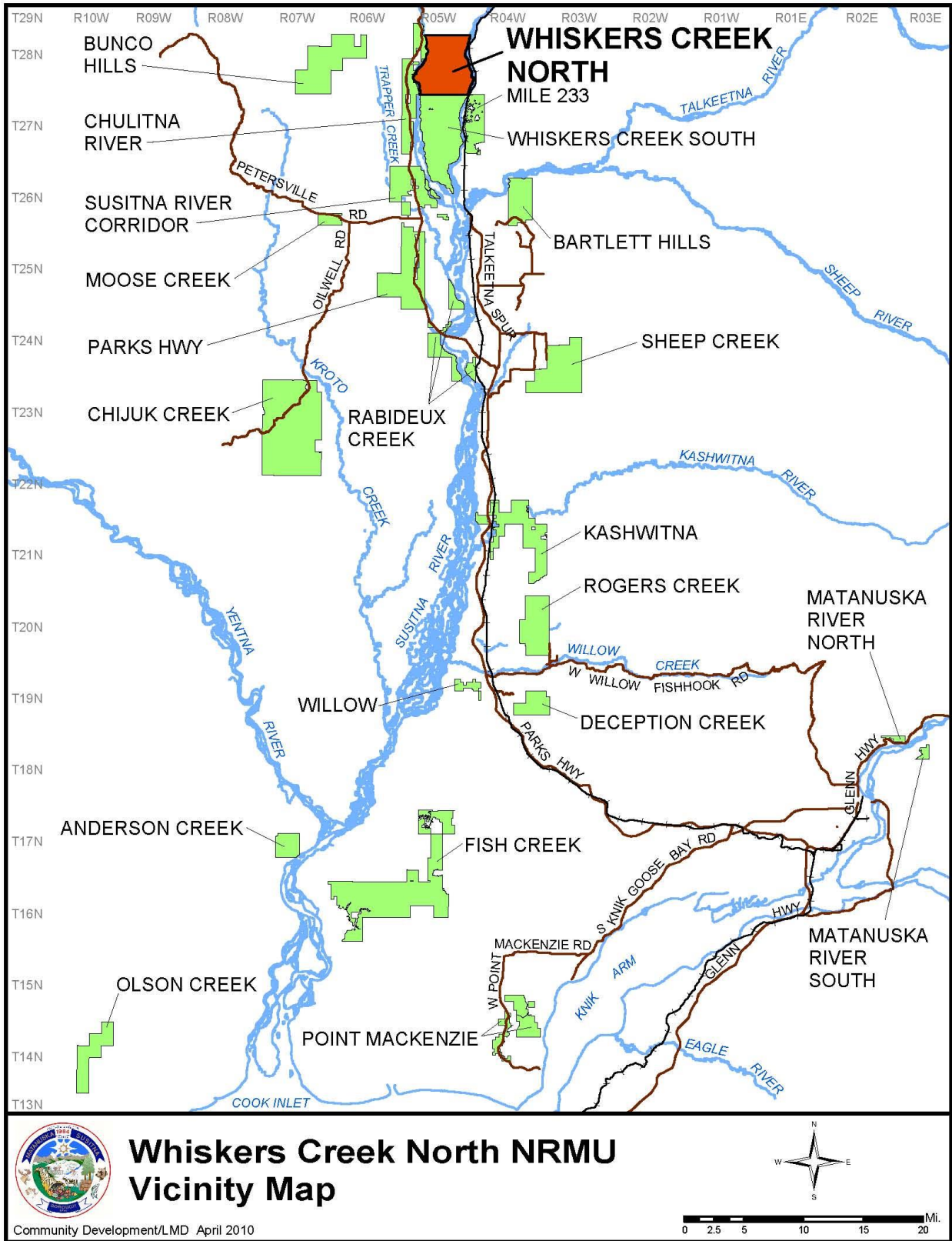
Materials Management

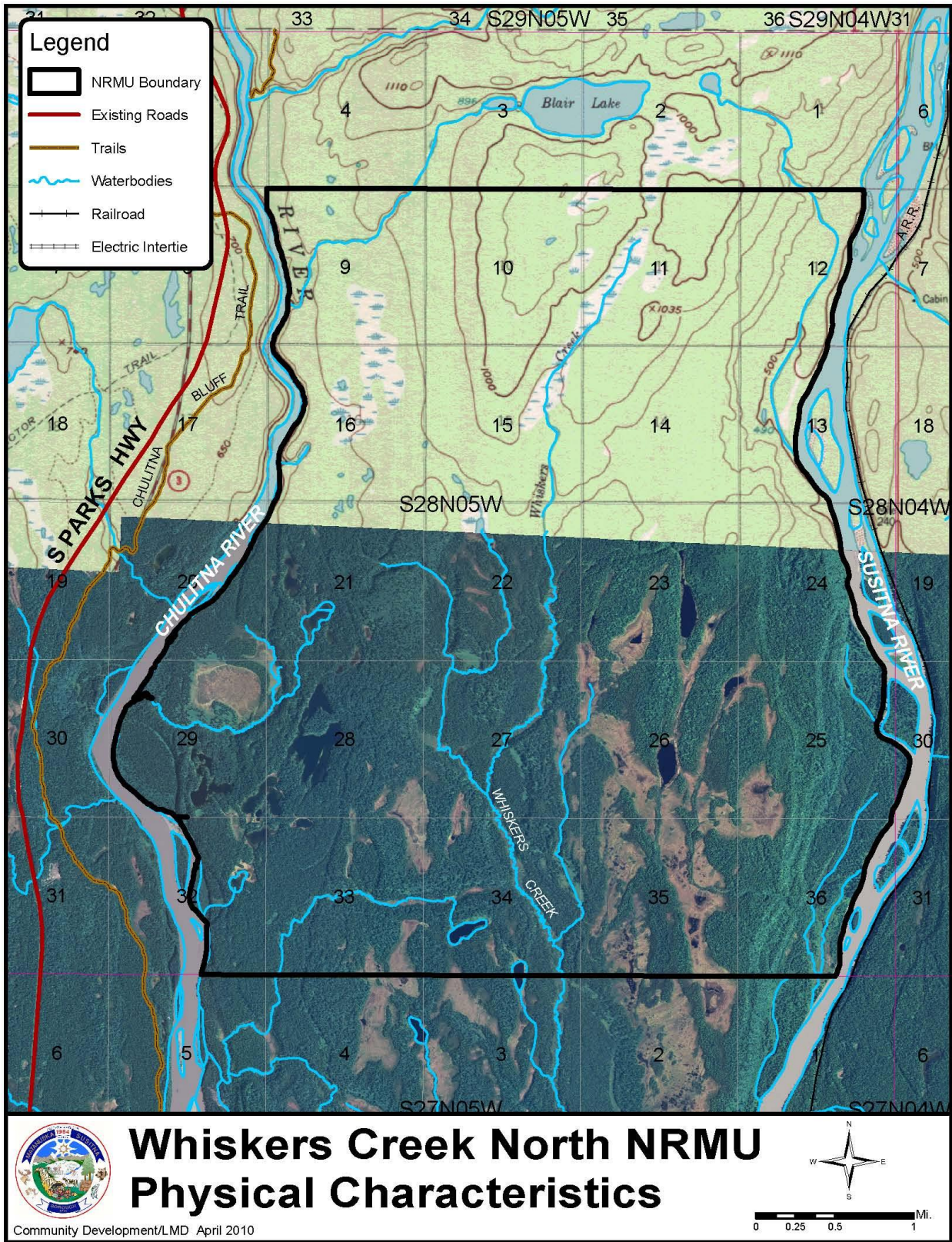
Extraction of rock, sand, and gravel resources is a permitted activity outside of buffered areas. Any material exploration and development shall follow State law and Borough code requirements.

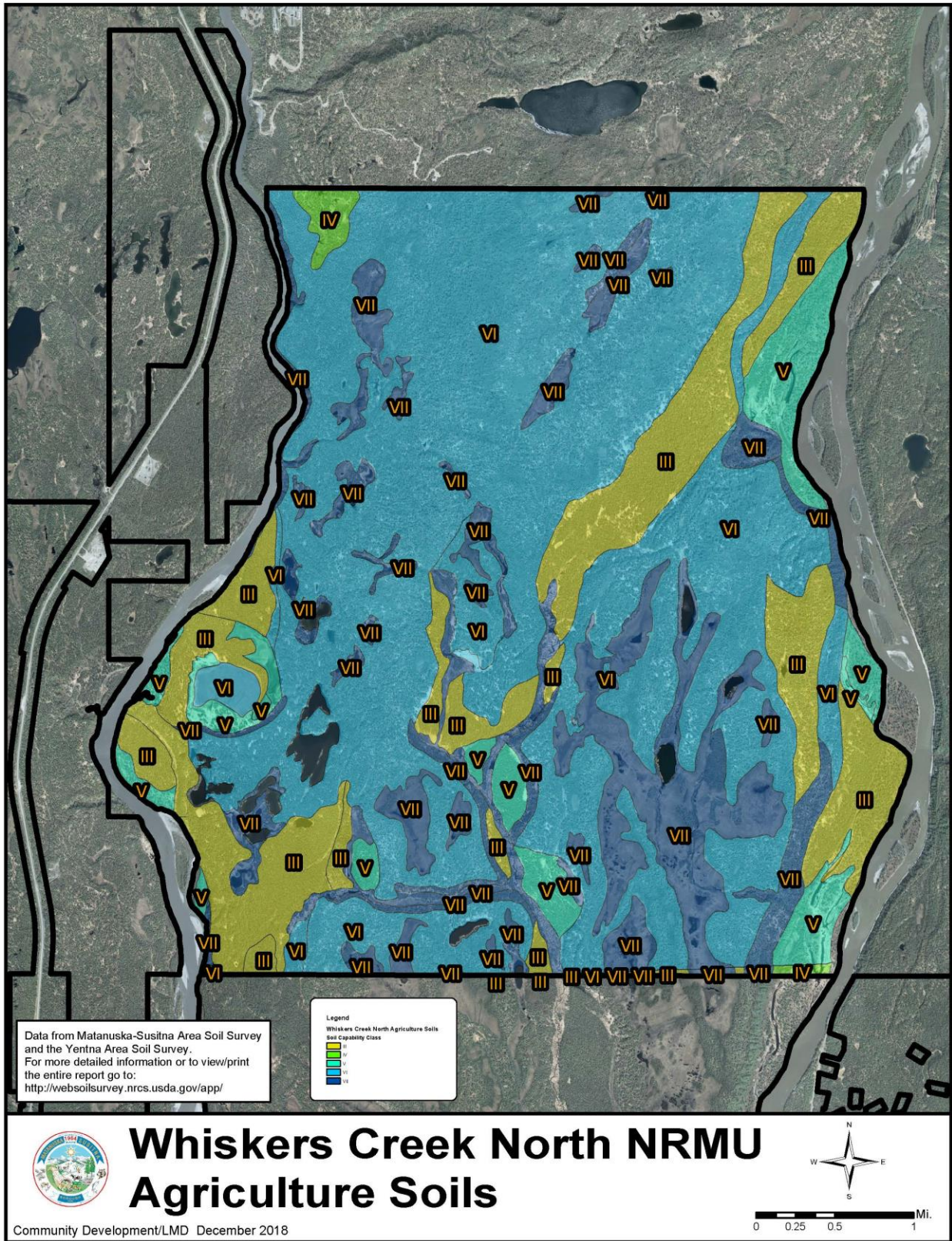
Other Uses

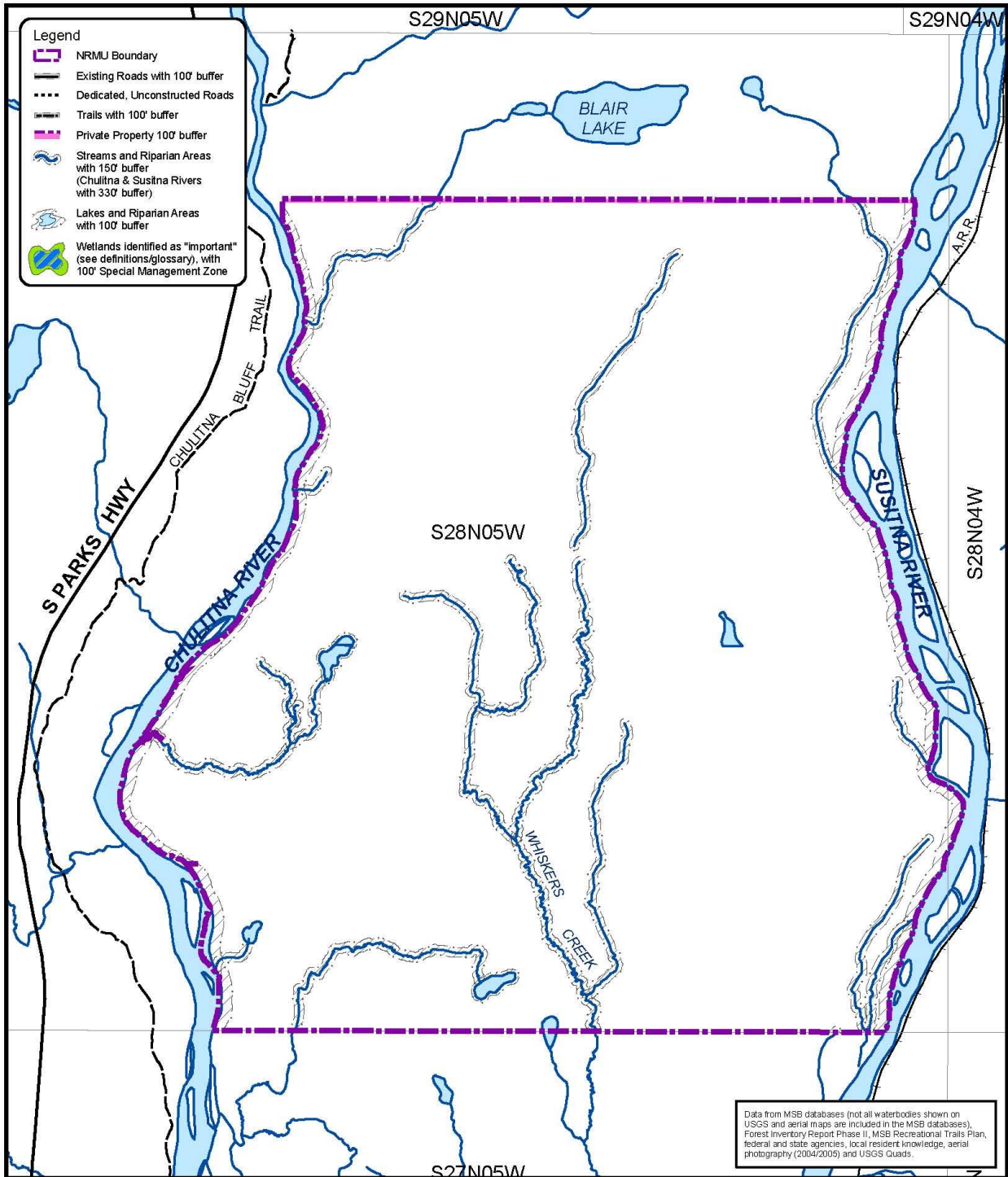
Because of the units location and easy access, this unit could be designated as a Special Management Area for the purpose of being a Forest Education and Improvement Study Area, (see Volume I, Chapter 3, *Forest Improvement Study Area(s)*, for more information).

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.





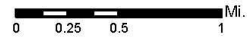
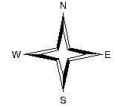


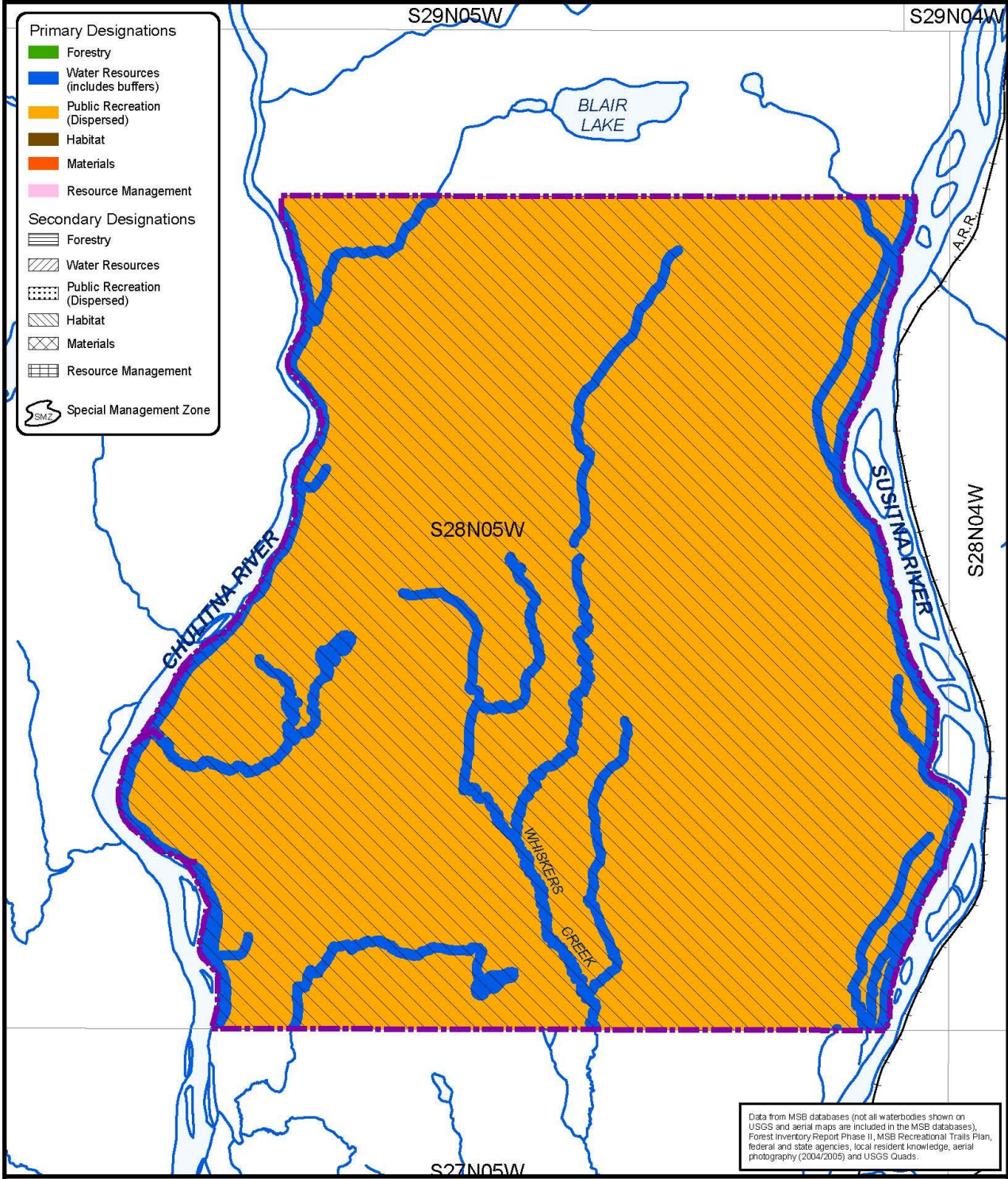


Whiskers Creek North NRMU

Roads, Trails, Waterbodies, Wetlands & Riparian Areas

Community Development/LMD April 2010







**Whiskers Creek North NRMU
Land Use Designations**

Community Development/LMD April 2010



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 the 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, owns 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.

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

- Matanuska-Susitna Borough, *Recreational Trails Plan* (20016).
- Matanuska-Susitna Borough, *Parks, Recreation and Open Space Plan* (2001).

Existing Land Use Classifications

Public Recreation with Watershed Lands along the streams in the unit.

Summary of Resources and Uses

Agriculture and Grazing

A review of soil capability classifications, published by the USDA, Natural Resources Conservation Service (<http://websoilsurvey.ncrs.usda.gov/app/>), indicates that there are areas within the unit suitable for agricultural or grazing use.

See the *Soils* maps 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 are 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 fieldwork 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 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.nrcs.usda.gov/app/> and *Soils* map at the beginning of this section) indicate that some commercial forest land may exist in the southern portion 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 is 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.nrcs.usda.gov/app/>) does not indicate any rock, sand or gravel resources within the unit. Additional fieldwork is necessary to determine if commercial quantities of sand and gravel exist.

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 specific resources or resource uses.

Land Use Designations

Whiskers Creek North		
Designation	Classification	Management Intent
<i>Primary</i>		
Public Recreation Dispersed	Public Recreation	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*.
<i>Secondary</i>		
Habitat		

*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 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 (see definition in *Definitions/Glossary* in Volume III) shall be protected with a 100-foot buffer . The buffer shall not allow disturbance of the wetland area, but some uses may be allowed. For example, wintertime 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 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.

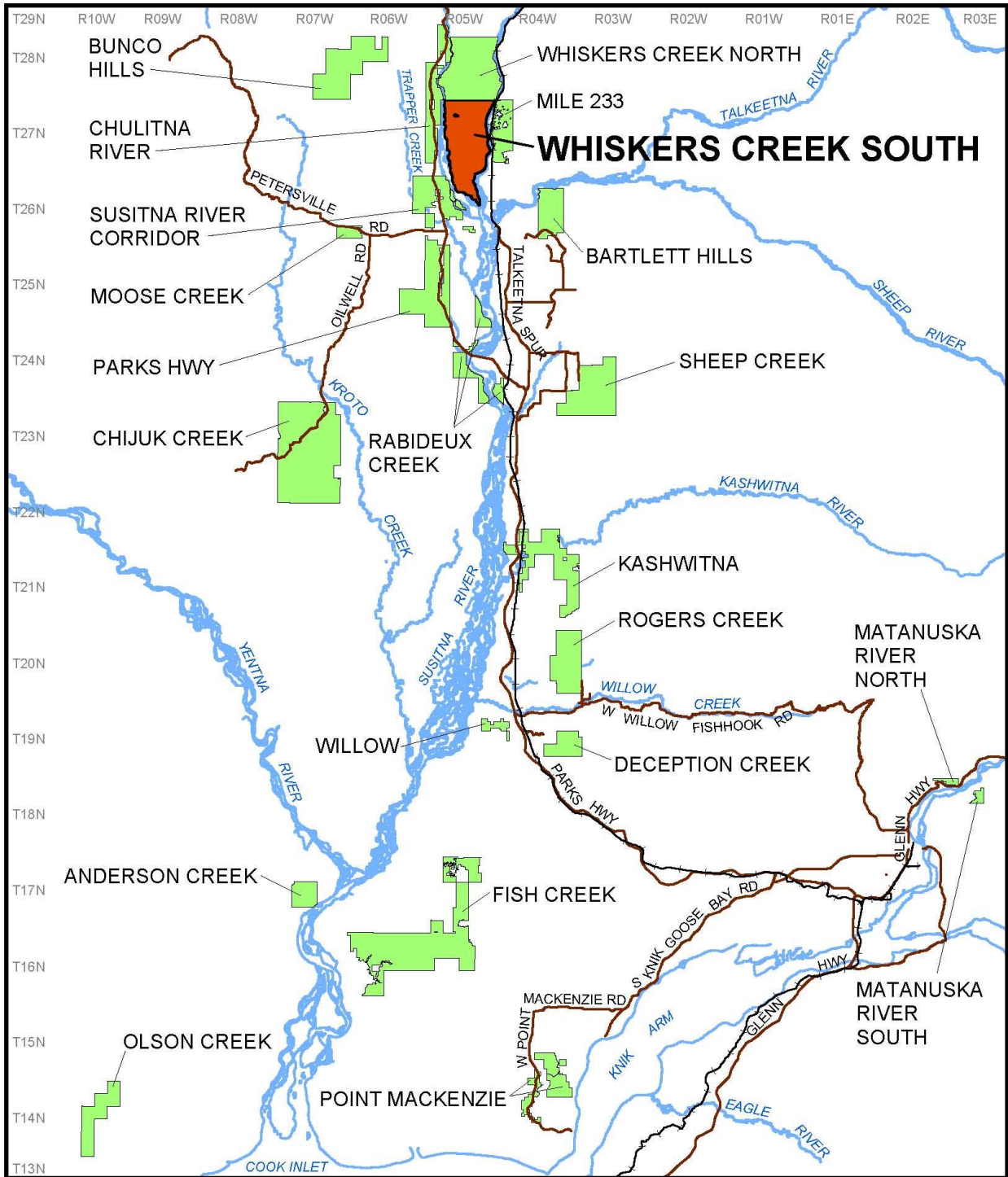
Also, see Volume I, Chapter 2, *Buffers and Special Management Zones* for additional information.

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.

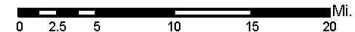
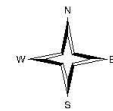
Other Recommendation

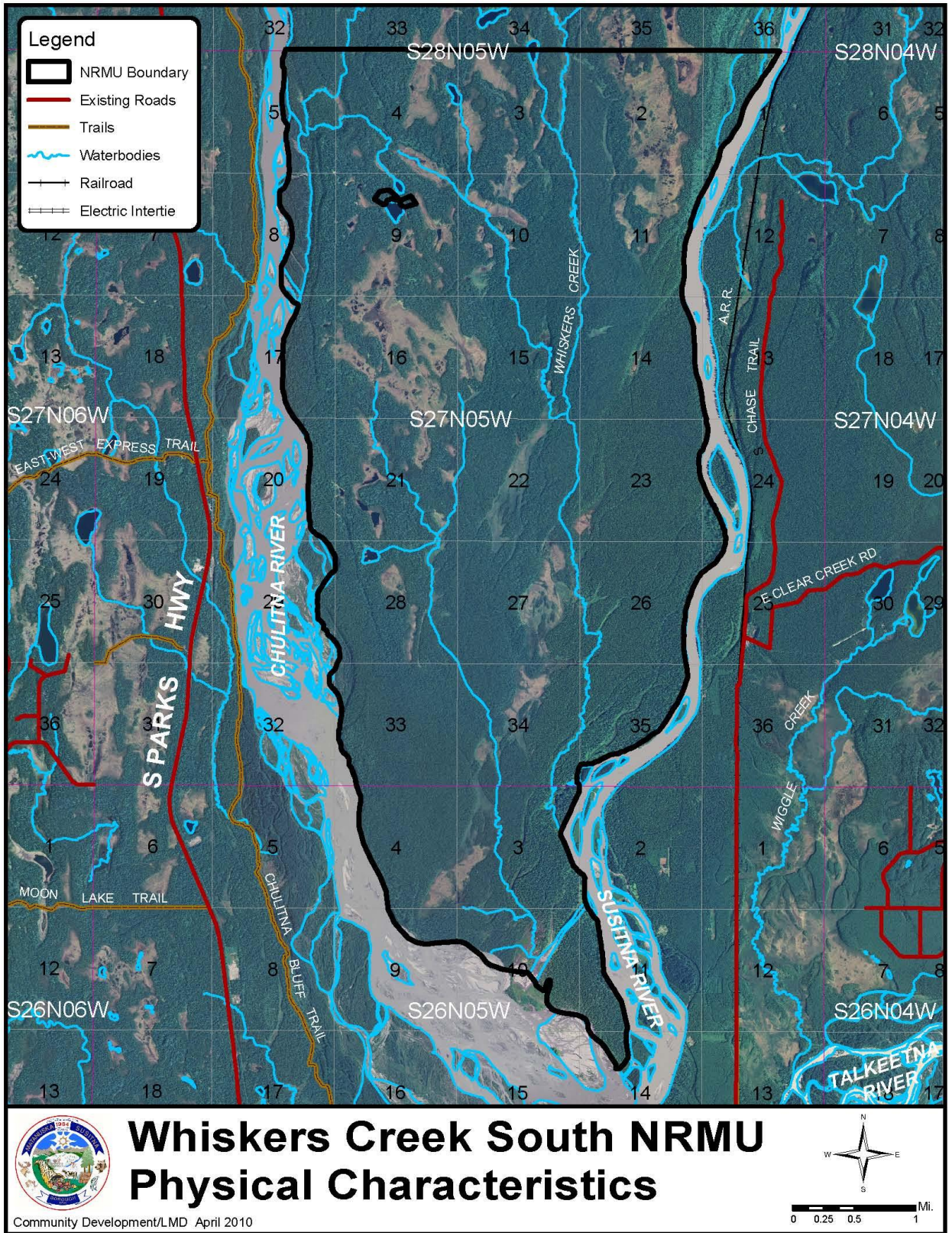
Because of the unit's proximity to Denali State Park and the users of the Boy Scout's Denali High Adventure Scout Base that will likely utilize both the land to the north (Denali State Park) and to the south (Whiskers Creek North Natural Resource Management Unit), the borough may want to exchange this 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.

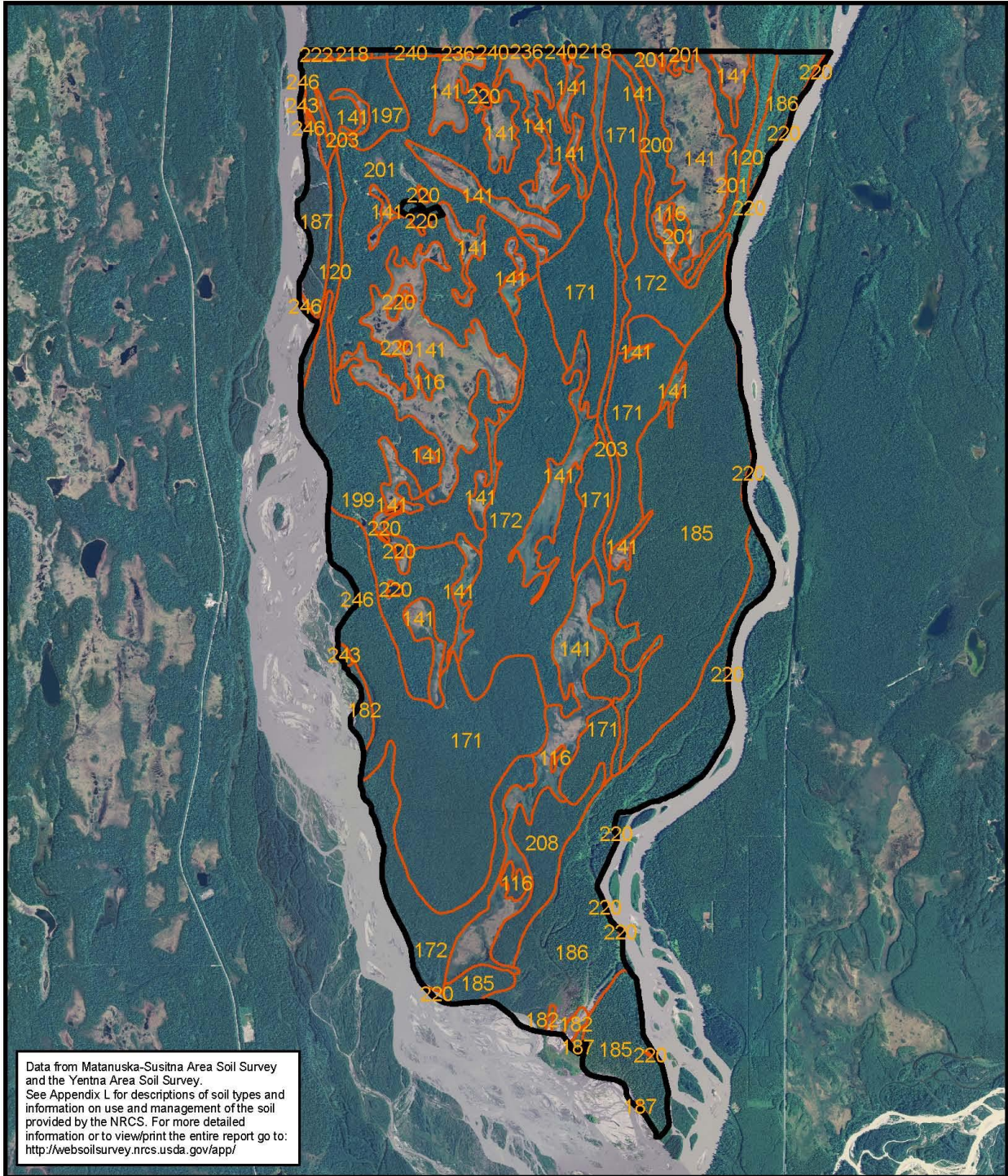


**Whiskers Creek South NRMU
Vicinity Map**

Community Development/LMD April 2010



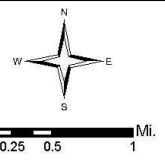




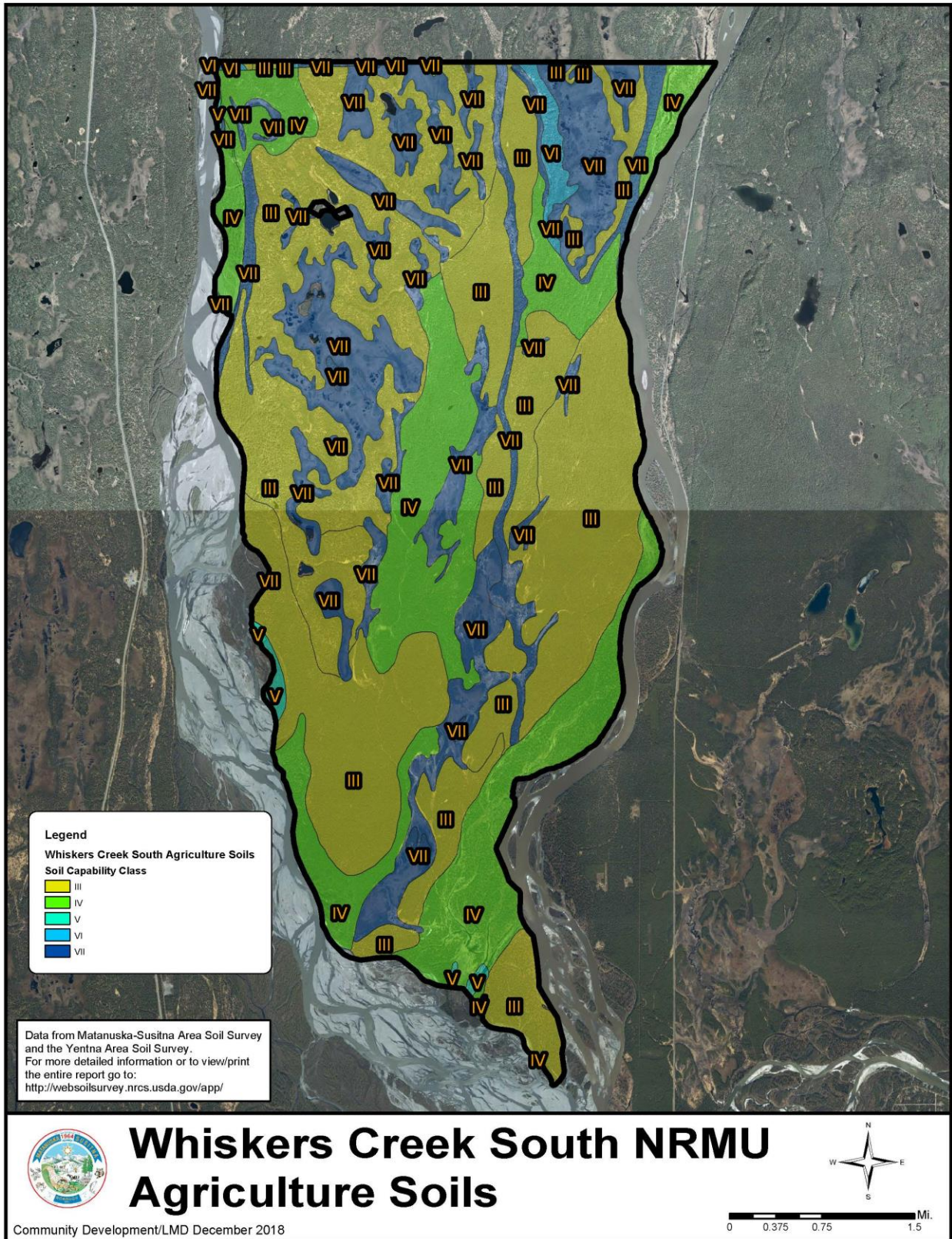
Data from Matanuska-Susitna Area Soil Survey and the Yentna Area Soil Survey. See Appendix L for descriptions of soil types and information on use and management of the soil provided by the NRCS. For more detailed information or to view/print the entire report go to: <http://websoilsurvey.nrcs.usda.gov/app/>

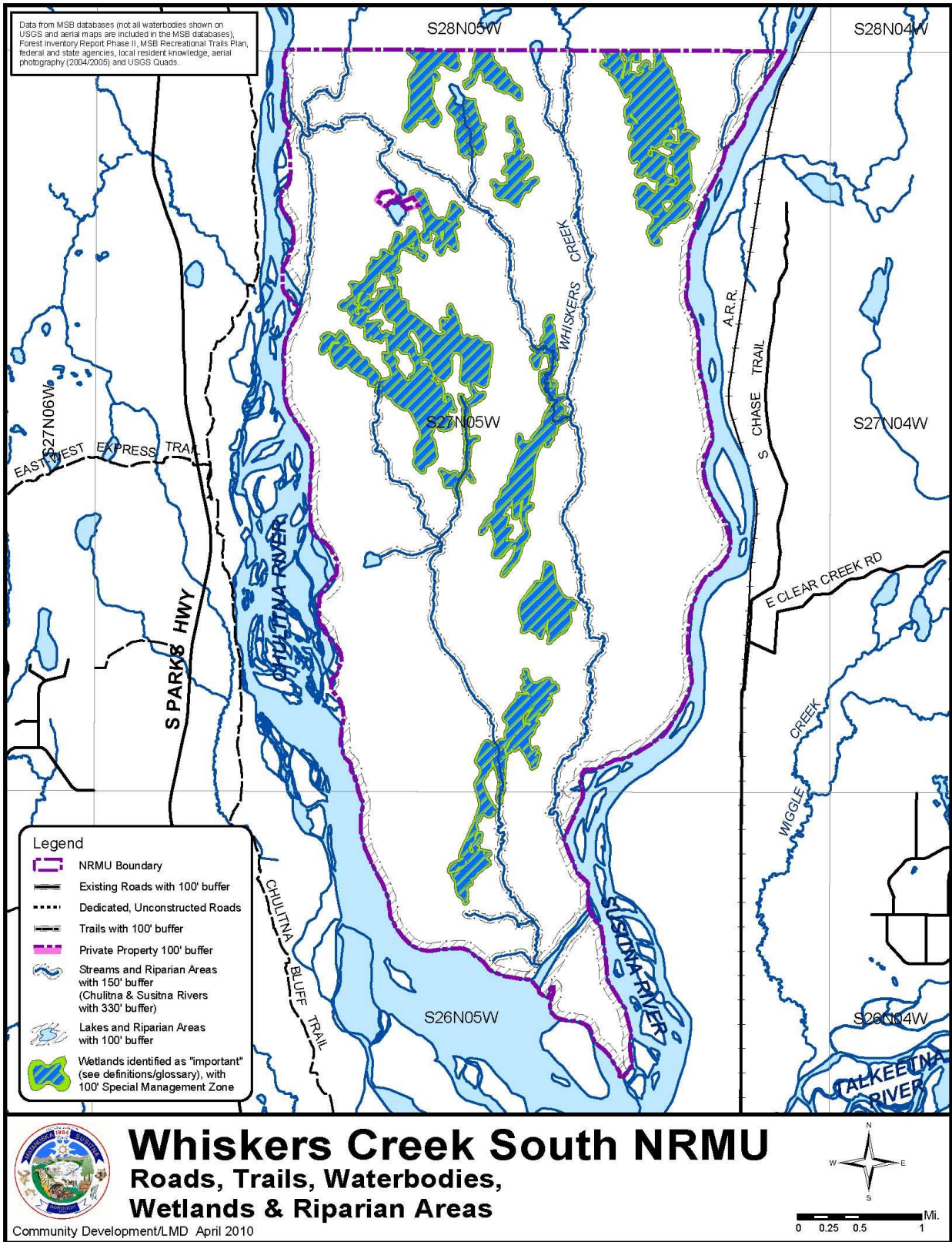


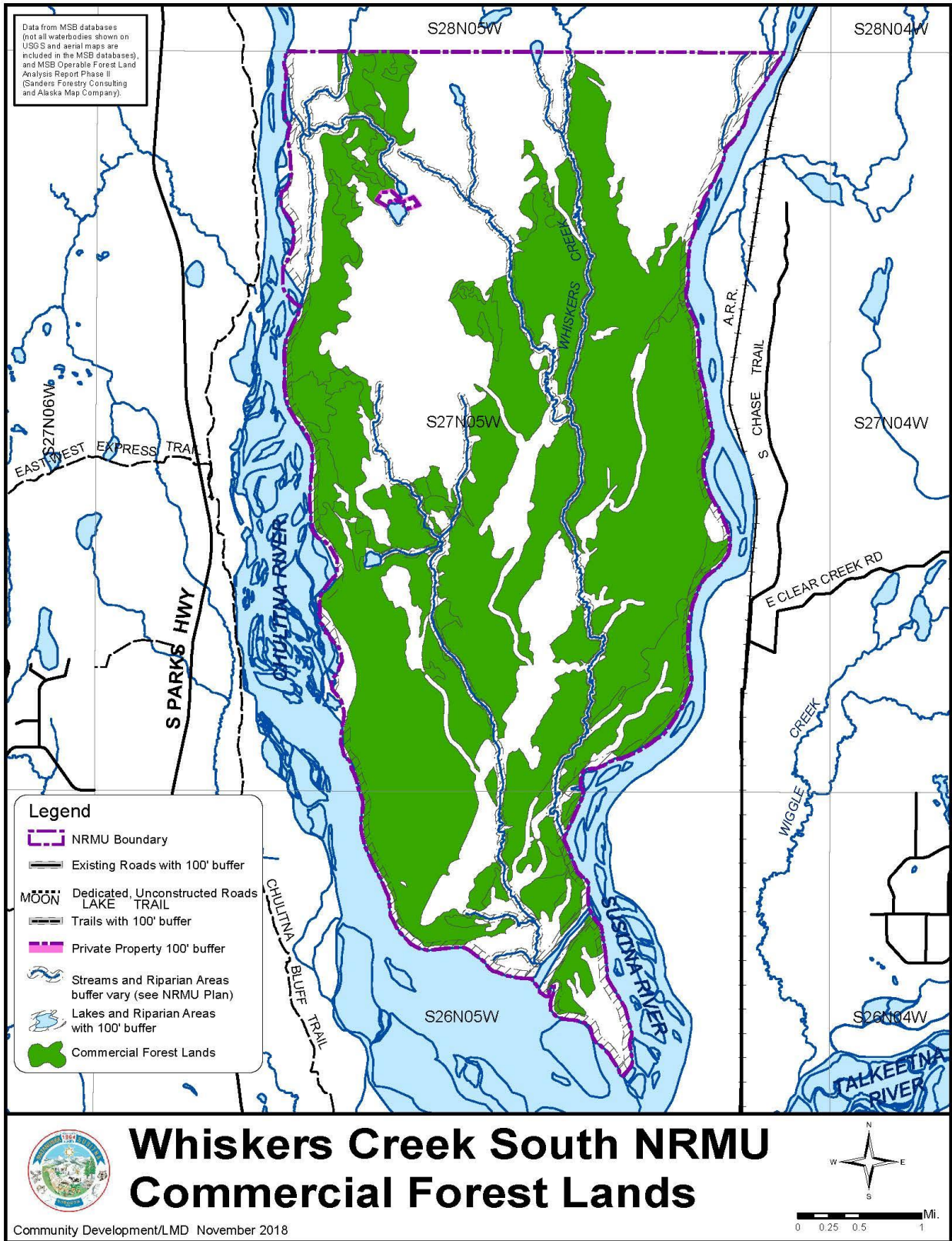
Whiskers Creek South NRMU Soils

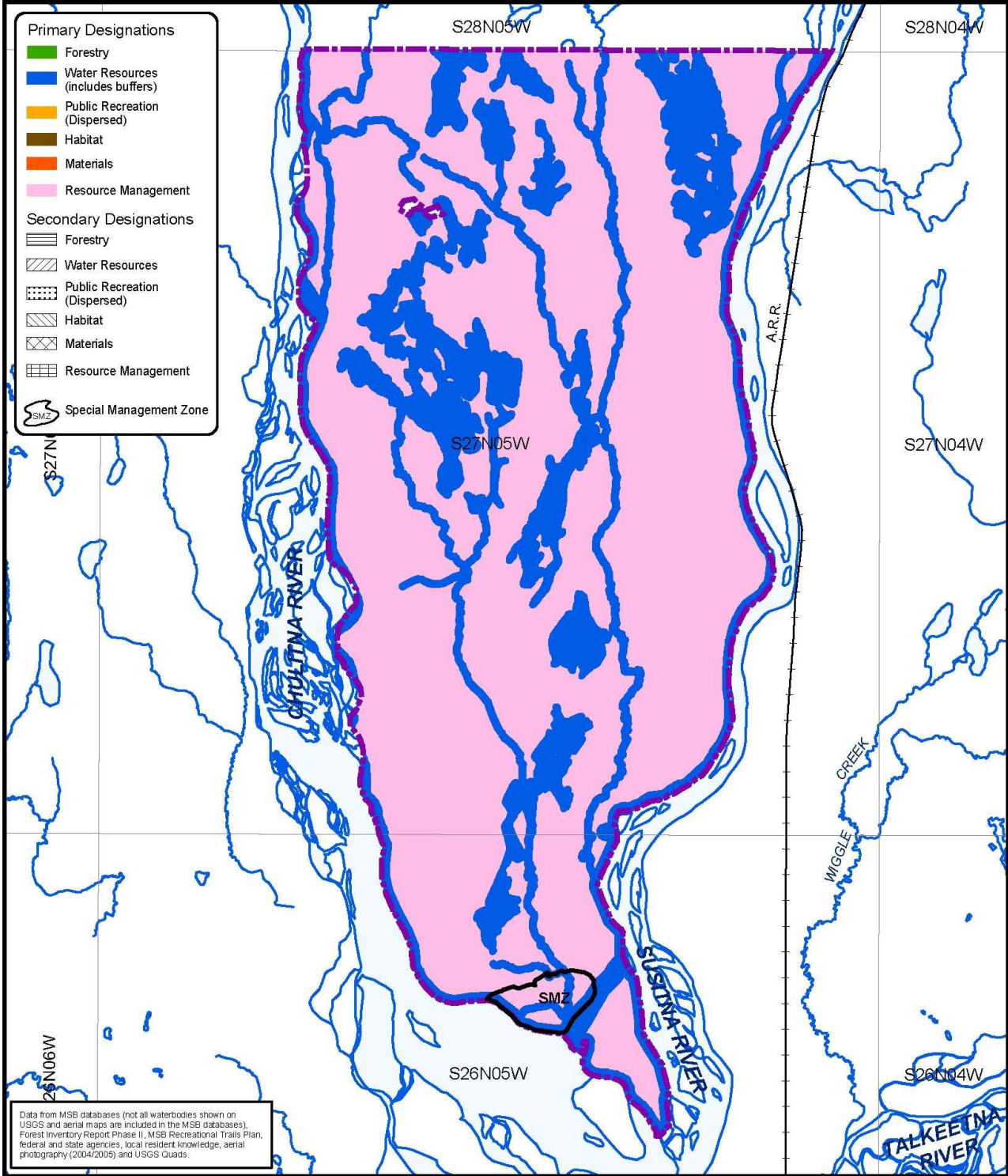


Community Development/LMD April 2010











Whiskers Creek South NRMU Land Use Designations



Community Development/LMD April 2010

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 eight 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

- Matanuska-Susitna Borough, *Recreational Trails Plan* (2016)
- Matanuska-Susitna Borough, *Parks, Recreation and Open Space Plan* (2001).

Existing Land Use Classifications

Resource Management and Watershed Lands.

Summary of Resources and Uses

Agriculture and Grazing

A review of soil capability classifications, published by the USDA, Natural Resources Conservation Service (<http://websoilsurvey.nrcs.usda.gov/app/>), indicates that there are areas within the unit suitable for agricultural or grazing use.

See the *Soils* maps 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 eagles and migratory birds, including Sandhill Cranes, and Trumpeter Swans. Various waterfowl and Arctic Terns also nest there in abundance as well.

Additional fieldwork 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.

Also, see Commercial *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 five-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.nrcs.usda.gov/app/>) does not indicate rock, sand or gravel resources within the unit. Additional fieldwork is necessary to determine if commercial quantities of sand and gravel exist.

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
<i>Primary</i>		
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 commercial 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*.
<i>Secondary</i>		
None		

*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 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 (see definition in *Definitions/Glossary* in Volume III) shall be protected with a 100-foot buffer . The buffer shall not allow disturbance of the wetland area, but some uses may be allowed. For example, wintertime 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 unit's recreational, habitat, scenic, and water resource values.

The harvest areas should be dispersed.

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.

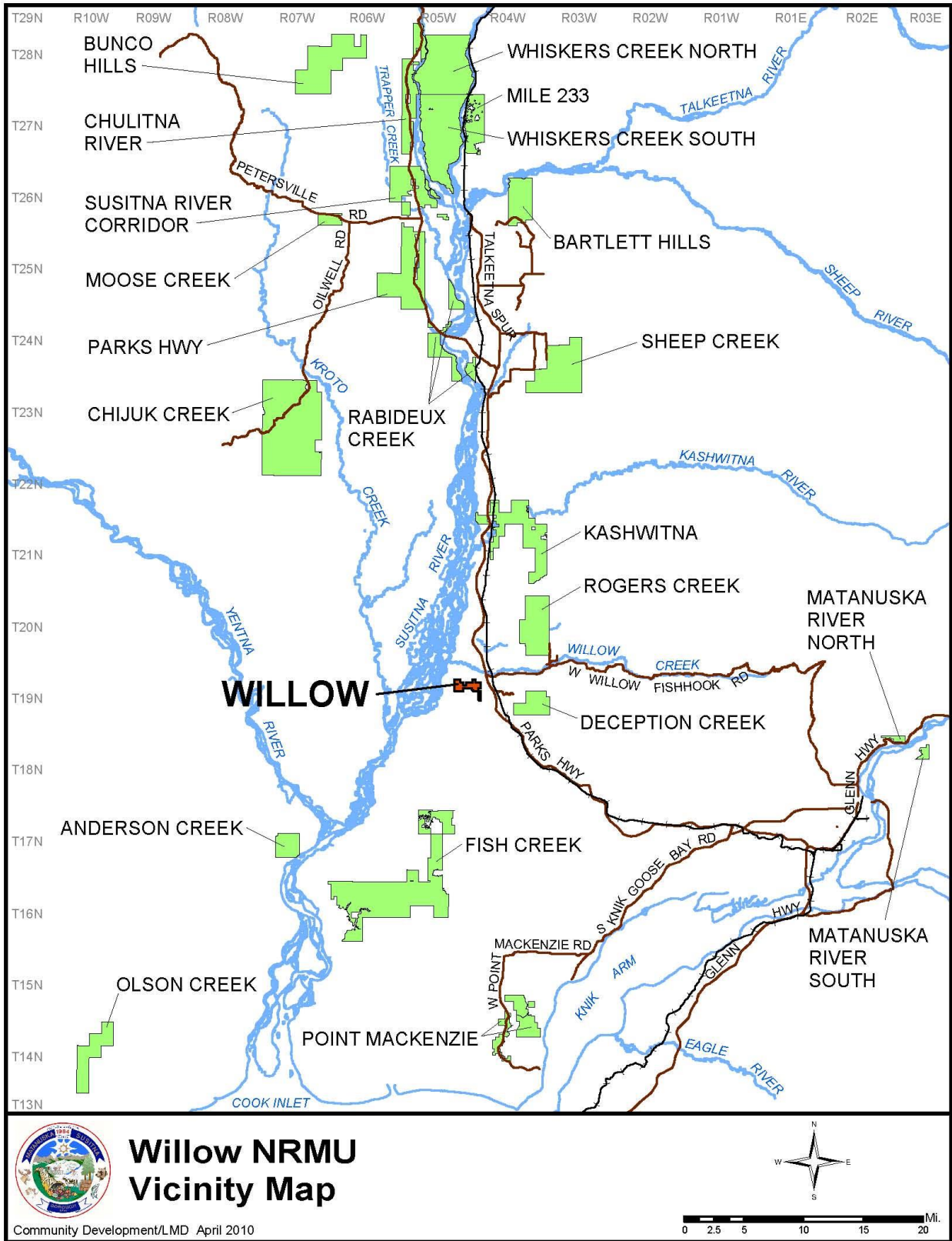
Harvest areas and cutting units should be laid out to improve wildlife and to avoid existing important habitat areas.

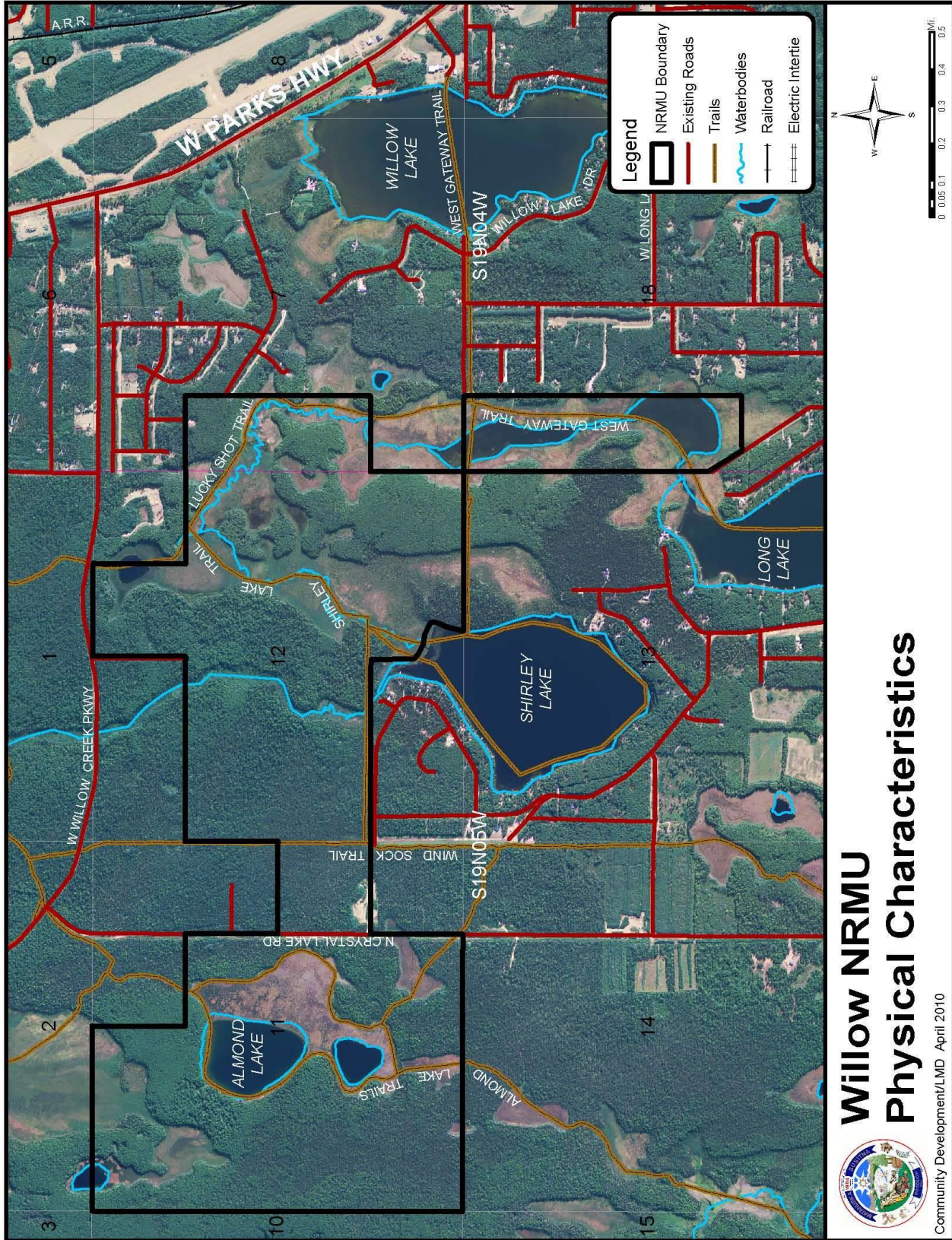
Other Uses

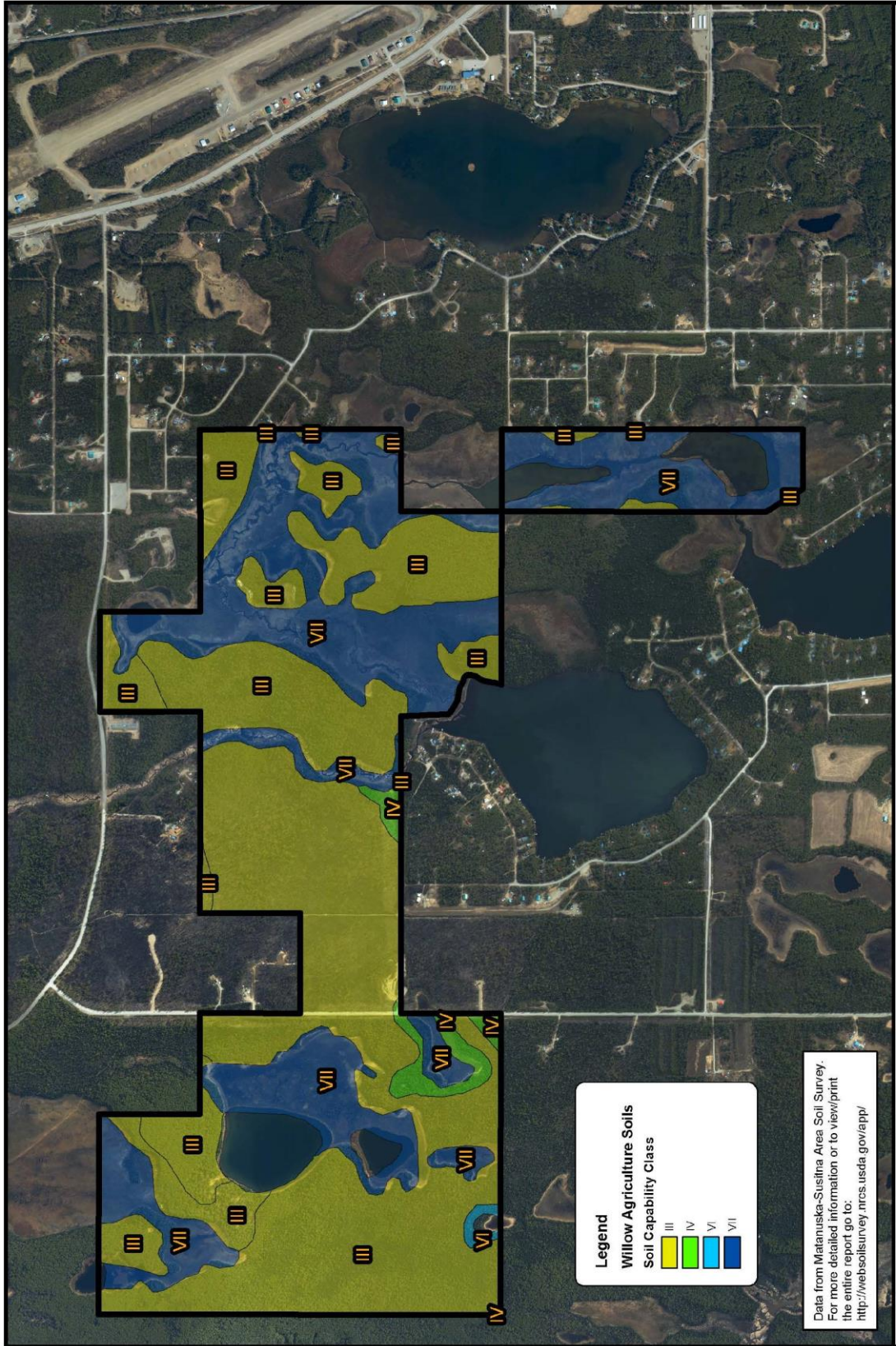
No additional unit-specific guidelines are required for this unit. See Volume I, Chapters 2 and 3 for area-wide guidelines that apply to all Natural Resource Management Units.

Other Recommendations

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.







Legend
 Willow Agriculture Soils
 Soil Capability Class

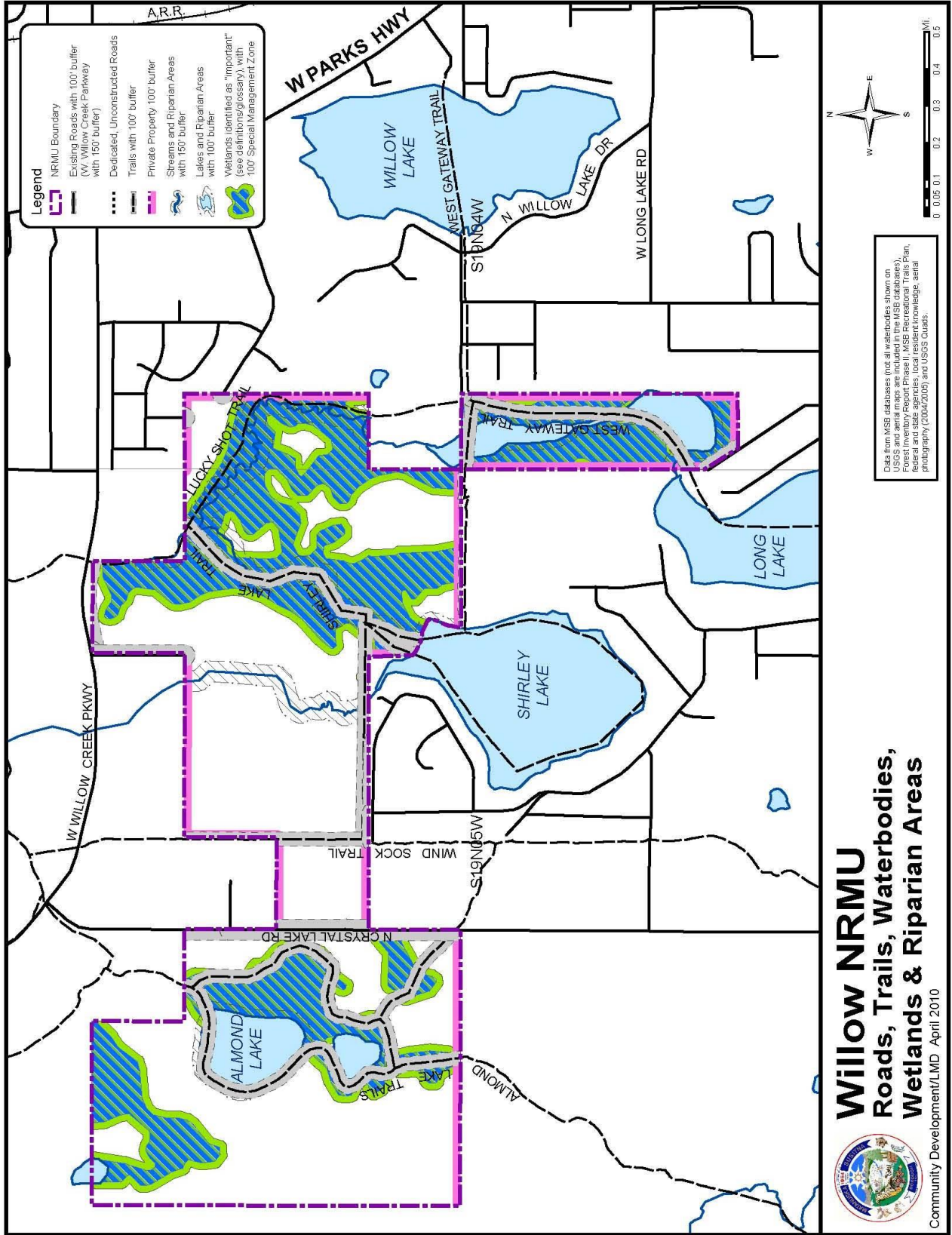
- III
- IV
- VI
- VII

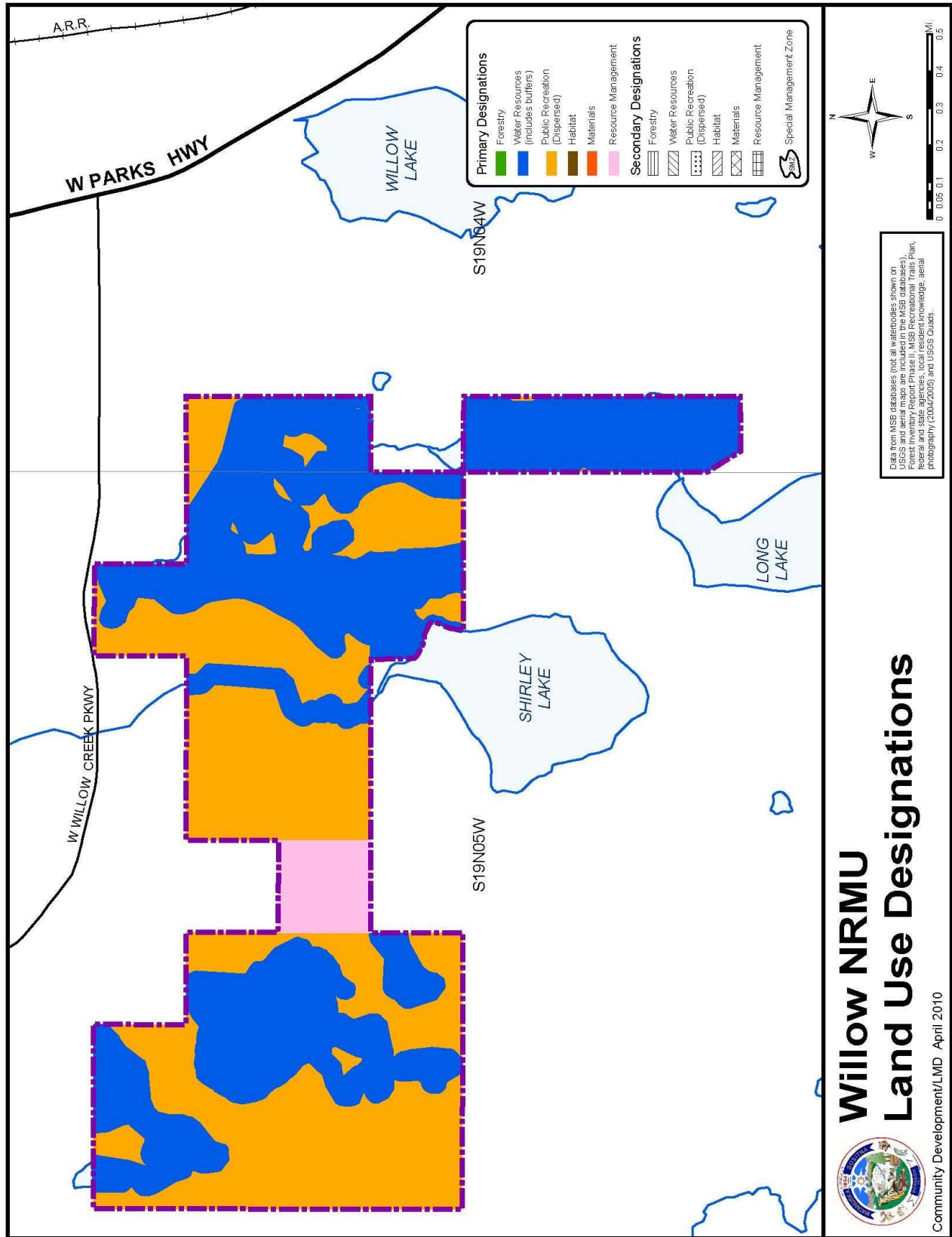
Data from Matanuska-Susitna Area Soil Survey.
 For more detailed information or to view/print
 the entire report go to:
<http://websoilsurvey.nrcs.usda.gov/app/>

Willow NRMU Agriculture Soils



Community Development/LMD December 2018





WILLOW

Natural Resource Management Unit

General Information

The Willow Natural Resource Management Unit contains about 1,080 acres. The unit located two miles west of Willow proper, half a mile west of the Parks Highway at Milepost 70. Willow Lake is half a 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

- Matanuska-Susitna Borough, *Recreational Trails Plan* (2016).
- Matanuska-Susitna Borough, *Parks, Recreation and Open Space Plan* (2001).
- *Willow Comprehensive Plan* (2013)

Existing Land Use Classifications

Public Recreation, Resource Management, and Watershed Lands along the waterbodies in the unit.

Summary of Resources and Uses

Agriculture and Grazing

A review of soil soil capability classifications, published by the USDA, Natural Resources Conservation Service (<http://websoilsurvey.nrcs.usda.gov/app/>), indicates that there are 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 fieldwork 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 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 nesting area, 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.

Shirley Creek, a tributary of Willow Creek bisecting the unit and connecting Shirley Lake to the lake in the southeastern corner of the unit is a cataloged anadromous fish stream that supports Chinook, Chum, Coho and Pink salmon. Shirley and Almond Lakes and other named and unnamed lakes in the area have resident rainbow trout, grayling, and Dolly Varden char and support Coho 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. 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 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 miles northwest of the unit.

Forest Resources

The unit has not been inventoried for commercial forest land. 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 forest land 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.

Smokey's Track and Shirley Gap Trails are 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 Summer and Winter Trail Plans*, adopted by the Willow Area Community Organization, document 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.nrcs.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 mined 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 is necessary to determine the volume, extent and feasibility of developing this resource.

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. Additional material excavation may be allowed if it does not significantly detract from the areas recreational values.

Land Use Designations

Willow		
Designation	Classification	Management Intent
<i>Primary</i>		
Public Recreation Dispersed	Public Recreation Lands	All upland areas in the subunit, except those designated as water resources and resource management. Timber harvest in support of forest health, public safety, and fire hazard reduction is allowed.
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. Additional material extraction areas are allowed.
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*.
<i>Secondary</i>		
None		

*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 (see definition in *Definitions/Glossary* in Volume III) shall be protected with a 100-foot buffer . The buffer shall not allow disturbance of the wetland area, but some uses may be allowed. For example, wintertime 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



Updated by: Matanuska-Susitna Borough
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: October 2019

Asset Management Plan:
Natural Resource Management Units

Volume III

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Definitions/Glossary

A

- 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. 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.
- 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 forestland. 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 Statute.
- 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.

B

- 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.

C

- 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 Clear-cuts. 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 forestland combined add up to, or constitute the entirety of commercial forestland. 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 that 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 art), 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.

D

- 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).

E

- 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.
- Earth Materials. Earth materials include those natural resources such as sand, gravel, rock, peat moss, sphagnum, soil, pumice, cinders, clay; also called “materials”.
- 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 stream 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 stream’s delta at the mean lower low water mark.
- Experimental Forest. Forestland retained for forest research that involves site manipulation or long-term observation (e.g., timber management or habitat enhancement research).

F

- 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 Clear cuts.
- 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.

G

- Generally Allowed Uses. Refers to uses allowed on borough-owned land in accordance with MSB 23.05.050, Policy and Procedures Manual, Part 31. . Such uses do not require a permit. Generally Allowed Uses typically do not apply on land encumbered through an existing exclusive use agreement, is prohibited by the borough, or the land is otherwise utilized for parks, schools, or other borough facilities.
- 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.

H

- 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.

I

- 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.
- Invasive Species. An invasive species is a species that 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.

J

- Jurisdictional Wetlands. See “Wetlands”.

L

- 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, forest management can occur on land designated for public recreation or water resources.
- Land Use Plan. A plan that determines management intent, designations, and guidelines for borough land. Also, see Natural Resource Management Unit.
- 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 stream 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.

M

- 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 earth materials, 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. firewood).
- 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 that 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.

N

- 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.

O

- Off-Highway Vehicles. A vehicle designed or adapted for cross-country operation over unimproved terrain, ice, or snow, 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. Forestland on which trees cover 10% to 50% of the surface area.
- 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 of a water body, 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.

P

- **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 facilities 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. Policies 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.

R

- 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 based on environmental differences that 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*, a spur road 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.

S

- 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 inch 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 (vener, 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.

- Shrub. A small to medium woody plant with a persistent woody stem, and shorter than a tree with a 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 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. 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.** Contiguous group of trees sufficiently uniform in age-class distribution, composition, and structure, 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.

T

- **Thermal Cover.** Thermal cover is vegetation that moderates adverse climatic conditions by providing summer shade and trapping radiant energy in 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 determined to be Commercial Forest 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 that they attack more extensively and at a greater mean attack density than they do standing spruce. Trap trees felled into the shade and left unbucked 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.

U

- 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 firewood, 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.

W

- 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, states, 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 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 adapted for life in saturated soil conditions (hydric soils). Wetlands generally include swamps, marshes, bogs, and similar areas (40CFR232.2(r)).

B. Jurisdictional Wetlands. Jurisdictional wetlands are those that are regulated by the U.S Army Corps of Engineers¹. These wetlands must exhibit:

1. At least periodically, the land supports predominantly hydrophytes; 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.
- 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).

Y

- 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.

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.

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APPENDICES

Appendix A	Land Use Classifications and Designations
Appendix B	Fire Protection Zones in the Mat-Su Borough
Appendix C	Resource Extraction Road Standards

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 borough-owned land designated for various purposes.

- “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.
- “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 through a land use plan. Land use designations can be for either a primary or secondary use.

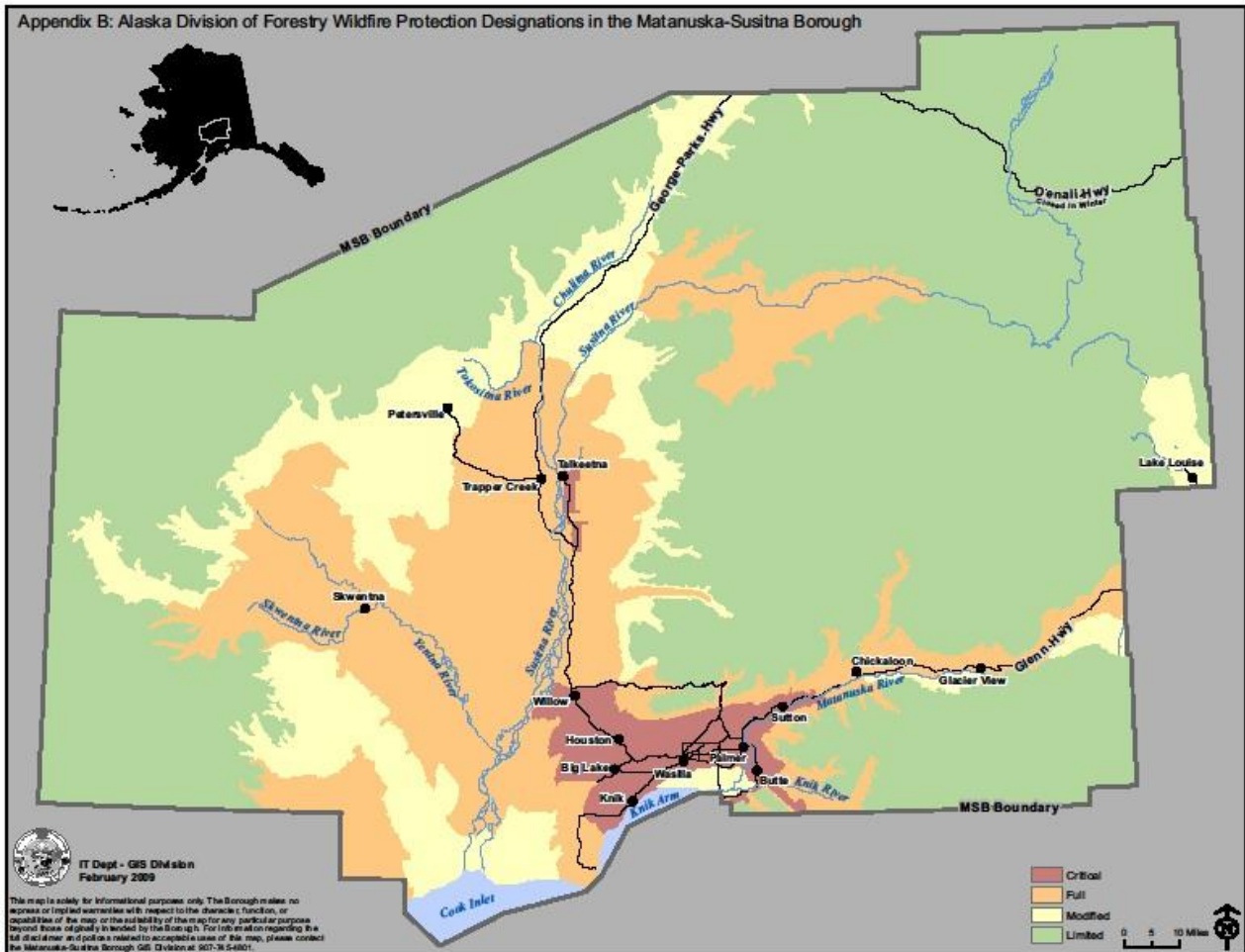
- Agriculture (Ag) Land that is agricultural or that, by reason of its climate, physical features, and location, is suitable for present or future agricultural cultivation or development and that is intended for present or future agricultural use.

- 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 earth 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 and 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 to 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

Fire Protection Zones in the Mat-Su Borough



Appendix C

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 temporary² roads³ 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	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, an settling basins (See also 11 AAC 95.290 (c), (g); 295(g)	Same as 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.