MATANUSKA-SUSITNA BOROUGH
AGRICULTURE ADVISORY BOARD

Chairman – Norman Harris (05)	Dick Zobel (02)	Steven Sawyer (06)	Jon Olsen (10)
Vice Chair – James Skinner (09)	Mark Stahl (03)	Derylee "Lee" Hecimovich (07)	Erik "Moe" Johnson (11)
VACANT (01)	Jenny VanderWeele (04)	Donald Brainard (08)	Branden VanderWeele (12)

AGENDA

REGULAR MEETING — JANUARY 16, 2019
DSJ BUILDING — 4:30 P.M.
LOWER LEVEL CONFERENCE ROOM

I. CALL TO ORDER; ROLL CALL

II. APPROVAL OF AGENDA; PLEDGE OF ALLEGIANCE

III. AUDIENCE PARTICIPATION (Limit 3 minutes)

IV. APPROVAL OF MINUTES

A. December 19, 2018

V. ITEMS OF BUSINESS

A. Draft Response to the Ad Hoc Agriculture Committee Recommendations

B. Staff Report

1. Ray Nix – update on Fish Creek NRMU

VI. MEMBER COMMENTS (Limit to 3 minutes)

VII. NEXT MEETING

A. February 20, 2019, 4:30 pm – DSJ Building Lower Level Conference Room

VIII. ADJOURNMENT

MATANUSKA-SUSITNA BOROUGH
AGRICULTURE ADVISORY BOARD

Chairman - Norman Harris (05)	Dick Zobel (02)	Steven Sawyer (06)	Jon Olsen (10)
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Bruce Bush (01)	Jenny VanderWeele (04)	Donald Brainard (08)	Braden VanderWeele (12)

DRAFT MINUTES

REGULAR MEETING **December 19, 2018**
DSJ BUILDING **4:30 P.M.**
LOWER LEVEL CONFERENCE ROOM

I. CALL TO ORDER; ROLL CALL

Dr. Harris called the meeting to order at 4:33 p.m.

Members present and establishing a quorum were: Dr. Norman Harris, James Skinner, Dick Zobel, Jon Olsen, Erik Johnson, Derylee Hecimovich, Mark Stahl, Steven Sawyer and Jenny VanderWeele.
Members Absent and Excused: Donald Brainard, Bruce Bush, Branden VanderWeele
Staff present: Tracy McDaniel, Asset Manager
Jill Irsik, CD Dept. Admin. Specialist

II. APPROVAL OF AGENDA; PLEDGE OF ALLEGIANCE –
MOTION: Mr. Skinner moved, Mr. Zobel 2nd. Agenda approved

III. AUDIENCE PARTICIPATION (Limit to 3 minutes)
None

IV. APPROVAL OF MINUTES
A. November 14, 2018
MOTION: Mr. Johnson moved, Mr. Skinner 2nd. Minutes approved.

V. ITEMS OF BUSINESS
A. Request to modify 5-acre home site – Alaska Peak Properties
Mr. Johnson reviewed the soils and topography of site. Everything looked kosher.
MOTION: Mr. Johnson moved, Ms. VanderWeele 2nd. All in favor.

B. Staff Report
1. Ad Hoc Agriculture Committee Recommendations for Ag Board specific functions
   - Ms. McDaniel handed out the recommendation for review, and advised that the board work on these items during future meetings.
   - Board would like to invite Senior Appraiser Steve Gallagher to a future board meeting to discuss tax appraisals on ag land.

2. Ray Nix – update on Fish Creek NRMU
   - A memo was included in the packet giving the board an update to the NRMU plan update.

VI. MEMBER COMMENTS (limit to 3 minutes)

- Mr. Sawyer – New to the board and is looking forward to participating.
- Ms. VanderWeele – Just returned from the Great Lakes Expo, which was held in Grand Rapids, MI. Felt like it was a great opportunity for Alaskan farmers to go outside and learn about the industry from larger farming communities that are doing a lot of the same stuff that we are doing.
- Mr. Johnson – Nenana Totchaket ag area is looking very promising because the Nenana Native Association just got nine million dollars to get the bridge across, which is what we have been waiting 30 some years for. There is 130,000 acres designated as ag land, with another adjacent 80,000 acres, which are un-designated for anything. Will not be present at the January meeting.
- Mr. Skinner – asked board where Alaska is with the hemp and cannabis production. Mr. Johnson suggested contacting the Plant Material Center.
- Dr. Harris – hopes everybody has a good holiday season and a happy New Year.

VII. NEXT MEETING

A. January 16, 2019 - 4:30 pm - DSJ Building Lower Level Conference Room

VIII. ADJOURNMENT

Dr. Harris adjourned the meeting at 5:05 p.m.

_____

Norman Rex Harris, Chairman

ATTEST:

_____

Jill Irsik,
Department Administrative Specialist

Matanuska-Susitna Borough

MEMORANDUM

TO: Agriculture Advisory Board Members

FROM: Tracy K. McDaniel, Asset Manager TKM

DATE: January 8, 2019 for the January 16, 2019 meeting

RE: Draft response to the Ad Hoc Agriculture Committee Recommendations, Resolution Serial No. 15-001,

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As requested at our December 2018 meeting, for your review is staff's draft responses to the recommendations of the ad hoc committee regarding the specific functions of the Agriculture Advisory Board. This is a working document and staff is looking for comments, additions and suggestions from the board.

1) Deal only with ag issues and make recommendation to the assembly regarding these issues.
    a. *The assigned staff presents requests and legislations to the board that require assembly approval and/or Manager's Decision.*

2) Determine how ag land conservation is to be implemented and how "no net loss" of agricultural lands is defined.
    a. *Staff proposes "fallow" as an agricultural use/activity.*
        i. *Allowing land used for agricultural activities to lie fallow in which it is plowed and tilled but left unseeded;*
        ii. *Allowing land used for agricultural activities to lie dormant because of adverse agricultural market conditions; and*
        iii. *Allowing land used for agricultural activities to lie dormant because the land is enrolled in a local, state, or federal conservation program (for fee simple property with Ag covenants only – Title 23).*
        iv. *Allowing naturally occurring grasslands and nonindustrial private forestland.*

b. *Protection of the long-term viability of the nation's food supply by preventing conversion of productive working land to non-agricultural uses.*
c. *Reduce the inappropriate conversion of agricultural land into sprawling, low-density development.*
d. *Retaining the development rights through covenants, conditions and restrictions allows an owner to voluntary preserve farmland in perpetuity for continued production of food and fiber, similar to a conservation easement achieved by a lower market agricultural value vs. the fair market value of the land.*

3) Review the equity of current tax policy on agriculture parcels.
   a. *Scheduled for the March 2019 meeting.*

4) Explore parcel size allowance of less than the required 40 acres minimum.
   a. As adopted by Resolution 15-06, "Borough-owned property, smaller than 40 acres, being considered for future sale is considered for agricultural classification and restrictions if more than 50% of soils are class III, or class IV, or Natural Resource Conservation Service classified soils of local importance and/or there is other land in the general area classified and restricted to agricultural use."

5) Review agriculture covenants/restrictions within Matanuska-Susitna Borough Titles 13, 15 and 23 and recommend changes, if any.
   a. *Scheduled for review at the February 20, 2019, meeting, identifying the pros and cons on conversion of agricultural rights to agricultural conditions, covenants and restrictions. Through this process, staff and the board will identify the differences of the agricultural restrictions between the different titles.*
   b. *Additionally, staff will prepare a packet with the recorded covenants for each agricultural sale program for the board to review.*

6) Determine if current subdivision requirements on these parcels is adequate or too restrictive. Below is the platting requirements that address the subdivision of a 5-acre home site only for Title 13 properties. Any other subdivision requires following standard platting regulations with assembly approval.
   a. ***Title 43.10.100 ACCESS REQUIRED.***

      (E) A subdivision plat whose sole purpose is to separate/divide a home/headquarters site in a Matanuska-Susitna Borough agricultural rights parcel under former MSB Title 13 is exempt from the road construction standards of the MSB Subdivision Construction Manual; provided, that the following conditions are fulfilled:

         (1) prior to preliminary plat submittal the agriculture rights property owner is to obtain assembly approval of the sale of the home/headquarters site through an application made to the borough land and resource management division;

         (2) the maximum parcel size is five acres for the home/headquarters site;

(3) only two parcels can be created from the farm unit parcel, the home/headquarters site and the remainder;

(4) the applicant demonstrates that legal access as defined in MSB 43.20.120, Legal Access, exists to all parcels or tracts created, and the suitability of the legal access for future residential road construction is documented by a land surveyor or civil engineer hired by the applicant;

(5) the property is to be surveyed and monumented and a plat submitted in conformance with MSB 43.15.016, Preliminary plat submittal and approval, 43.15.049, Final plat; general provisions, and 43.15.051, Final plat; submitted;

(6) a plat note declaring that the borough is not responsible for road construction or road maintenance; and

(7) a plat note restricting further subdivision of the parcels being created.

b. ***43.20.120 LEGAL ACCESS.***

(A) The applicant shall provide the platting division a right-of-way document verifying the existence of legal access. In this title, legal access exists only if one of the following is met:

(1) An unrestricted, public right-of-way connects the subdivision to a constructed public transportation system and one of the following is met:

(a) The applicant's land surveyor submits to the platting division for review and approval documentation and an opinion demonstrating that the right-of-way exists; or

(b) The applicant provides copies of borough-accepted recorded conveyances creating the public easement or right-of-way where the access is located, or that access or right-of-way is maintained by the state of Alaska or an incorporated municipality; or

(c) The applicant provides documentation satisfactory to the borough demonstrating the legal access is guaranteed through judicial decree;

(2) The right-of-way is an easement or fee interest at least 50 feet in width dedicated or irrevocably conveyed to the public; or

(B) The applicant proves that the proposed access can be constructed practically and economically within the legal access documented.

7) Other identified topics as requested by the assembly.
   a. *Currently, none identified.*

January 8, 2019 Status Update

Subject: Natural Resource Management Units, Plan Update

Provided in your packet is the Natural Resource Management Units Plan (Plan), Volume I, drafted by the Community Development Department. The entire Plan is in four volumes and includes over 800 pages of information. The updated Plan will include current forest management regulation, current land use information; and the previously excluded Fish Creek Unit will be included in the updated Plan as well.

Volume I is a cleanup of the Plan to include, rather than preclude, multi use opportunities for Borough land and inclusion of the Fish Creek Management Unit into the plan.

Volumes II & III of the Plan are also under review and we anticipate providing draft updates of Volumes II & III of the Plan to the board in March 2019. Volumes II & III explains each NRMU in more detail.

If you have any additional questions or seek additional information, please let me know.

Ray Nix
Natural Resource Manager
Community Development Department
Land & Resource Management
Matanuska Susitna Borough
(907) 861-7863
Ray.Nix@matsugov.us

Matanuska-Susitna Borough

Asset Management Plan:
Natural Resource Management Units

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

Draft: December 14, 2018

ACKNOWLEDGEMENTS

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

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

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

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

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

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

Matanuska-Susitna Borough

Asset Management Plan: Natural Resource Management Units

Volume I

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

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

Draft: December 14, 2018

Asset Management Plan:
Natural Resource Management Units

Table of Contents – Redline/Strikethrough Version

Volume I

Chapter 1 Introduction

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

Chapter 3 Forest Management

Figures

Tables

Chapter 1 Introduction

Background

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

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

The borough adopted a *Forest Management Plan* in August 1990[1]. Adoption of that plan was based on the *Multiple Use Forest Management Plan including Land Classification Report, (July 1989).* This plan was based on forest resource estimates from 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 resolution[2] that placed a moratorium on timber sales until a timber harvest permit and a new forest management plan could be adopted.

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

This ~~updated~~ 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 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 2018 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 ~~will be~~ 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 ~~will~~ replaced the ~~old~~ Forest Management Units.

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

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

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

Chapter 3 ~~replaces~~ includes the borough's current ~~all previous~~ forest management plan~~s~~. The land use classifications in Volume II ~~replaces~~ is the current ~~all~~ land use classifications for the geographic areas covered for each Natural Resource Management Unit.

Description of the Planning Area

The land covered by this plan is located entirely within the Matanuska-Susitna Borough. The plan covers 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. ~~See map~~ Figure 1 includes a map that ~~on the next page that~~ shows these Units.

What the Plan Will Do

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

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

The plan has no direct effect on private, state, Mental Health Trust Land, School Trust Land or University of Alaska lands.

How the Plan is Organized

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

Volume I

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

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

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

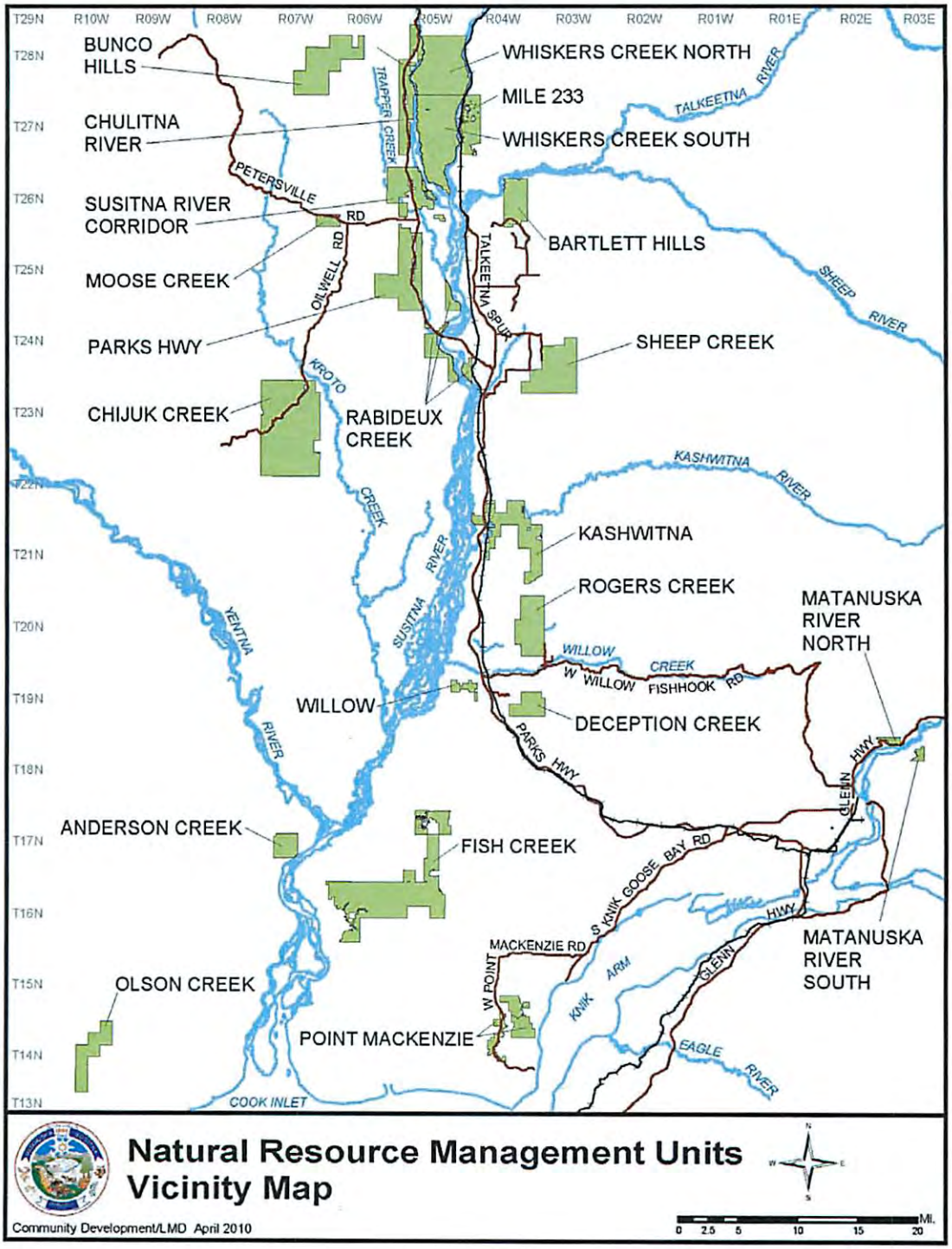
Chapter 4 discusses specific actions necessary to implement the plan; how amendments to the plan can be made; research needs; and makes some future management recommendations. This chapter also recommends some changes to existing borough code that will make implementation of this plan possible.

Volume II

This volume has natural resource management plans for the twenty-two~~one of the twenty-two~~ natural resource management units. The *Fish Creek ~~Management Plan~~ Unit* ~~i~~is ~~not~~ included in this ~~volume~~ updated plan~~because a management plan was adopted separately from this plan~~ for consistency. All these units, including Fish Creek, ~~will~~are ~~be~~ managed for

multiple-use purposes. All the units have active management or contain land and resources that are described in Volume I, Chapters 2 and 3.

Figure 1 – Natural Resource Management Unit Vicinity Map



Volume III

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

Volume IV

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

How the Plan Was Developed

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

(1) First was a new public notice process[3], 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 boroughs forest resources was completed in 2006. The areas not inventoried, but identified for possible forest management and timber harvest during Phase I of development of this plan were inventoried in early 2009.

(4) The "Operable Forest Land Analysis Report"[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 also completed in 2007.

(6) A new chapter on Forest Management was adopted into Borough code[7] in 2007 that established Borough policy for:

- Forest Inventories
- Sustained Yield
- Annual Allowable Cut
- Forest Management Units

[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)

- Forest Management Plans
- Buffers
- Timber Sales
- Fair Market Value Determinations
- Land Use and Timber Harvest Plans

Adoption of this new *Asset Management Plan: Natural Resource Management Units* is the final step in order to actively manage blocks of land for various multiple uses 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 ~~and operable~~ timber resources. The purpose was to be able to describe general information on how the forest and other resources within these units should be utilized and to determine which resource values should be protected.

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

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

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

At the conclusion of the public comment period, 78 individuals and groups submitted 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 7 public meetings with Alaska Department of Natural Resources staff working on the update for the Susitna Area Plan (now called Susitna-Matanuska Plan) and the Susitna Forest Guidelines. The public was invited to comment on the proposed management intent and land use designations for the proposed Natural Resource Management Units. Copies of the information were also sent to all affected community councils with an invitation to submit comments. Only a few comments were submitted by those attending the meetings and the mail out to the community councils. The comments received were also considered in developing this plan.

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

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

When the public comment period ended on March 15, 2010, about 82 individuals and groups submitted input which 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~~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.

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 2018 update of the NRMU Plan. This update was made available for a 30-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.

More information, copies of pertinent information and summaries of public comments regarding these various elements of the public participation process described above is included in Volume IV, *Public and Agency Participation*, of this Plan.

Natural Resource Management Units

From a forest and land management standpoint, it is often desirable to divide large areas of land into smaller units, and sometimes sub-units, as a reference for future actions. In some areas of the country, units are designated based on counties, watersheds, long-term sales, or other useful means. This same general approach was used for the boroughs' *1989 Forest Management Plan* and is being used in this new Plan[8].

In 1990, the Borough Assembly placed land into Forest Management Units. See *Appendix "C" – 1990 Forest Management Units* for a background and maps of these units. Forest management lands or units are defined in borough code[9] 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."

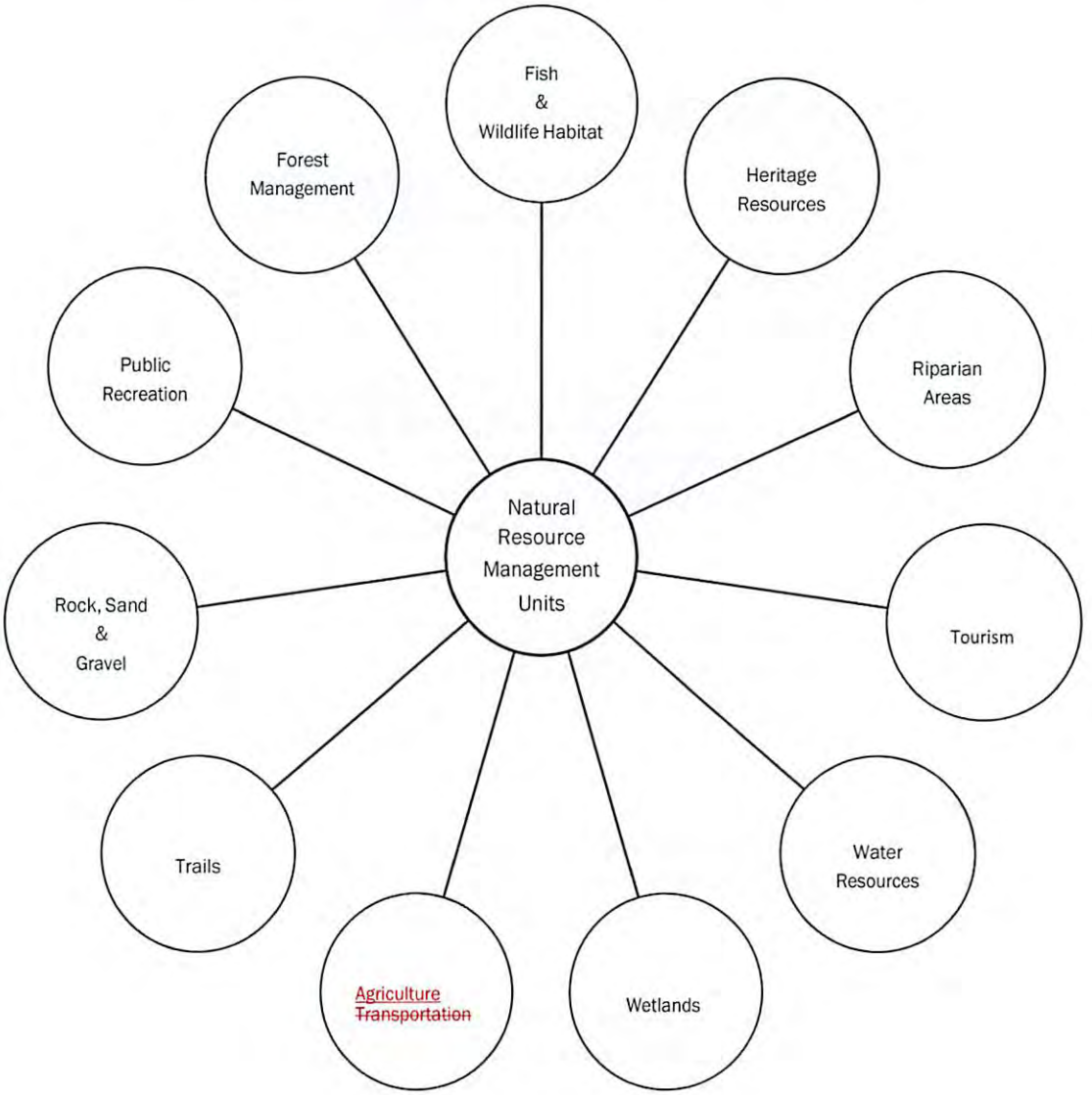
This more distinctive nomenclature, Natural Resource Management Unit, better reflects multiple resources, and does not imply one resource use has a higher priority over another resource. These units will be managed for multiple uses that reflect current and future social values and economics.

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 ~~2I-1-1~~
~~SOME NATURAL~~ RESOURCES AND USES ~~THAT ARE~~ FOUND IN NATURAL RESOURCE MANAGEMENT UNITS



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

Classifications, Goals, Management Intent, ~~Classifications,~~ 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 ~~general~~ purposes for ~~how~~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.

~~Classifications are defined in borough code.[11] Classifications identify the general purposes for how land will be managed.~~

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

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

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.

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~~1-1-2~~ is a broad look on how these various social, economic and land ownership portfolio and management terms apply at different levels. Figure 4~~1-1-3~~ illustrates the hierarchy and function of goals, management intent, classifications, designations, guidelines and best management practices.

Figure 3~~1-1-2~~
Relationship of Goals, Management Intent, Land-Use Classifications, Land-Use Designations and Guidelines to Borough Owned Land

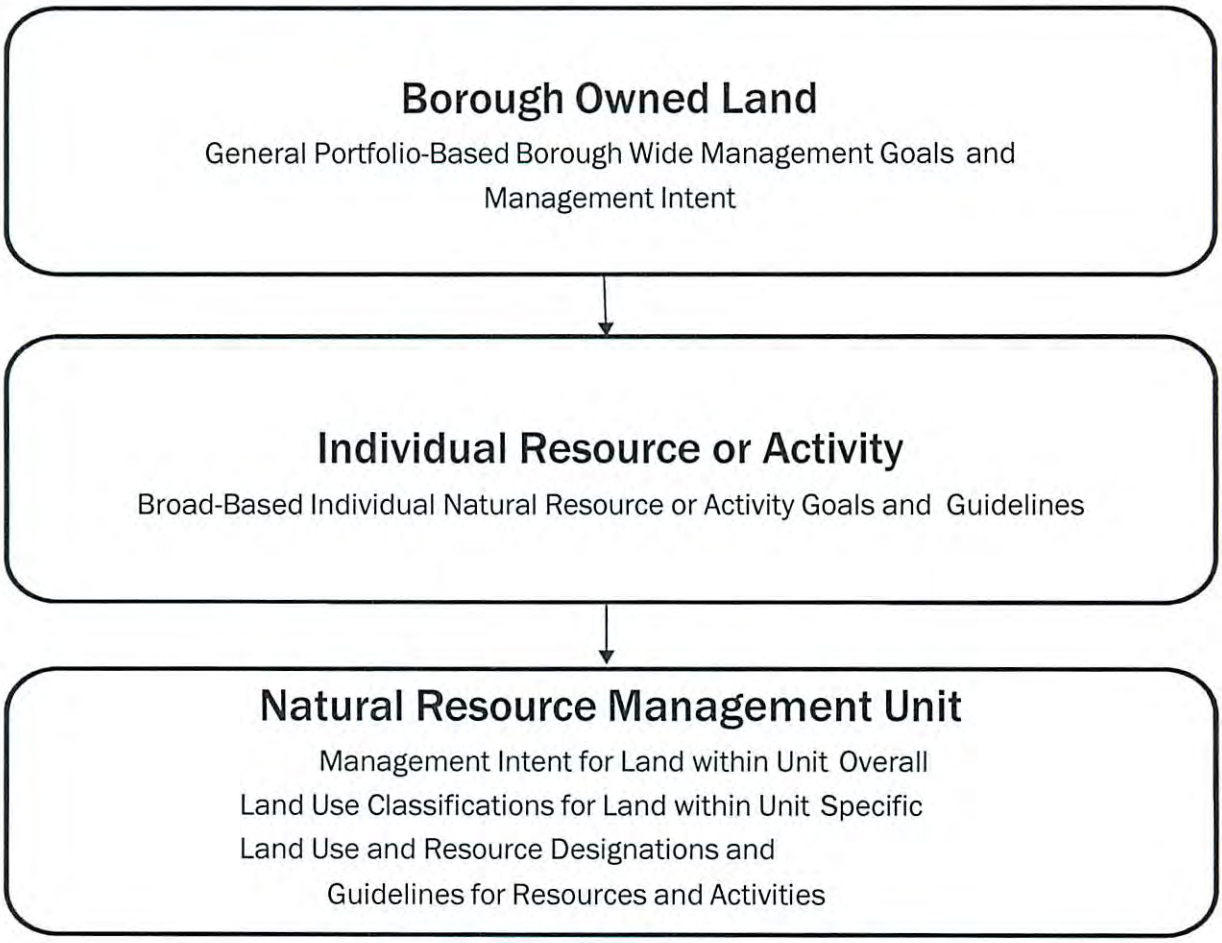
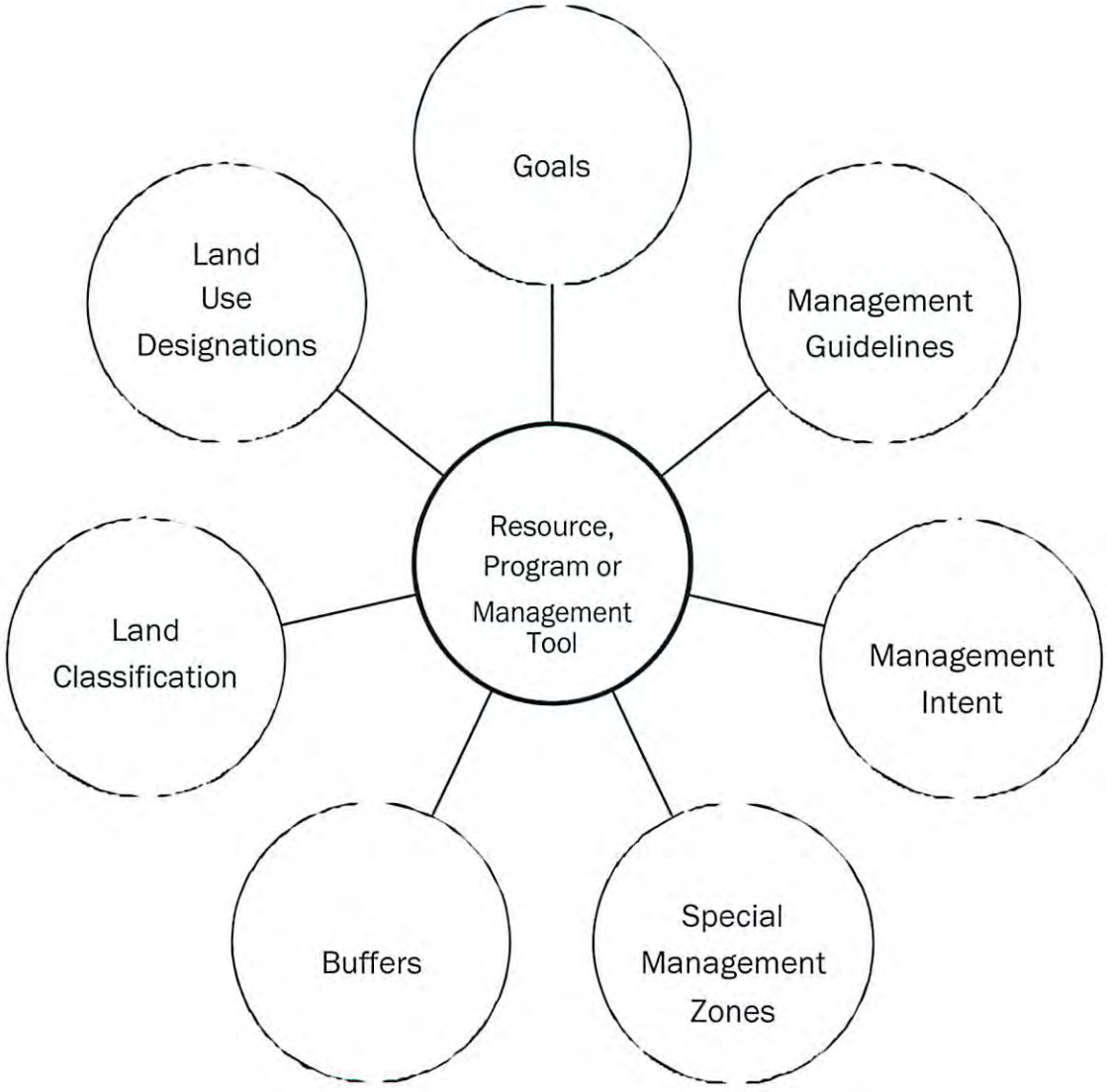


Figure 4~~1-3~~ Hierarchy and Function of Goals, Management Intent, Land-Use Designations, Land- Use Classifications, Guidelines and Best Management Practices.

Protective and/or management measures also include a variety of tools, such as a combination of buffers and special management zones on which results in an extensive, integrated system of land management options to protect such resources and uses as watershed, important fish and wildlife habitat and use areas, trails, and public recreation areas. Figure 5~~I-1-4~~ illustrates some of these management tools.

Figure 5~~I-1-4~~
Resource, Program and Management Tools for Managing Various Natural Resources and Activities



Special Management Zones

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

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

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

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

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

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

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

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

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

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

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

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

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

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

This *Natural Resources Management Units* plan builds from the general policies of the Borough Comprehensive Plan among other things. The Borough Comprehensive Plan includes, but is not limited to, polices on transportation, watershed management, parks, recreation, open space, and trails. All these resource plans, 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 2018 update included a consistency review of all adopted community comprehensive plans.
~~This plan is conceptually consistent with the general intent and policies of the *Matanuska-Susitna Borough Coastal Management Plan*. However, specific consistency~~

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

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

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

Who Developed the Plan?

The plan was developed by Ron Swanson (RWS Consulting) working under contract with the borough. RWS Consulting worked closely 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 boroughs' Parks, Recreation, and Trails Advisory Board, and particularly the Real Property Asset Management Board spent many hours reviewing, debating, and recommending additions, changes, and suggestions on how to make this plan better.

The public, interest groups, and community councils have also played a significant role in developing this plan. The hundreds of comments received throughout the development of this plan indicated that people 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 boroughs' land and resources. Borough-owned Natural Resource Management Units are managed for multiple uses for the benefit of all residents. For more information and details on individual resource policies, goals, objectives and guidelines, please refer to the specific resource management plan[12][13], 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.

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

General Information

The Alaska Constitution[13] and Borough Code[14] 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.

[13] Article 8

[14] 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 ~~management intent~~ and land use designations of this plan. In considering authorizations, the borough will adjudicate applications to:

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

2. Minimize conflicts between resources and users; and

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

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

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

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

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

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

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

5. Involve the Borough Parks, Recreation and Trails ~~and Real Property Asset Management~~Advisory Board~~'s~~ 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 ~~only if specifically approved~~ in any Natural Resource Management Unit ~~Plan~~ with soils suitable for agriculture, or on a case-by-case basis with~~by the~~ Borough Assembly approval. Specific sales are subject to additional public notice under MSB 23.05.025. ~~If sales are authorized by the Borough Assembly, the area shall be excluded from the specific Natural Resource Management Unit and not be subject to this plan.~~

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

Buffers

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

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

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

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

Except for those buffers required by federal, state, or borough laws and regulations, the size of buffers and Special Management Zones may be adjusted on a case-by-case basis in Natural Resource

Management Unit plans or other asset management plans as long as the guidelines for making adjustments in this plan are followed.

Management Goals

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

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

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

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

Roads, Trails and Utilities. Mandatory no-cut buffers shall be used along private property boundaries, dedicated roads, trails, and utilities to protect, among other things, scenic and visual values.
Special Management Zones. Utilize Special Management Zones, where necessary to provide an additional level of protection to important fish and wildlife habitat areas, important public recreation areas, cultural resources and historic sites or to where site specific conditions are needed, while still allowing forest management and an appropriate level of timber harvest or other specific activities.
Waterbodies. Mandatory no-cut and limited use buffers shall be used along and adjacent to all water bodies containing anadromous or high-value resident fish waterbodies to protect important fish habitat.

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

Management Guidelines

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

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

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

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

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

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

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

Also see G, exceptions, below.

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

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

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

G. Buffer Exceptions. Exceptions to the requirements for buffers along borough property, roads, scenic highways, important wildlife habitat, and trails, may be made, if during the public notice process, the specific terms and conditions or the adjustments are addressed. Besides exceptions, Special Management Zones may also be utilized.

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

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

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

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

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

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

H. Cultural Resources and Historical Sites. There shall be a mandatory 300-foot no-disturbance buffer surrounding the boundaries of known historic, archaeological or paleontological sites unless the State Historic Preservation Office or the Borough Cultural

Resources Division determines, in consultation with the Community Development Department, that certain activities can occur without significantly impacting the cultural resource. In such a case, a Special Management Zone should be utilized.

I. Wildlife Species of Concern.

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

2. Peregrine Falcon Nests. There shall be a mandatory no-cut and no- disturbance 330' buffer around the radius of any peregrine falcon nesting site. Wider buffers or a Special Management Zone may be established for individual nest sites where the Alaska Department of Fish and Game or the
U.S. Fish & Wildlife Service identifies activities or site-specific factors that make special provisions necessary. Determinations of where a wider buffer, or a Special Management Zone is needed shall be made with due deference to the Alaska Department of Fish & Game. The Alaska Department of Fish and Game shall be encouraged to consult with the U.S. Fish & Wildlife Service before making a determination.

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

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

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

Buffer Management Summary

Providing buffers and Special Management Zones provides an extra level of protection for such things as specific wildlife, resources, public use areas, etc. At the same time activities, such as

public recreation, timber harvest, sand and gravel extraction and other similar activities may be allowed to occur on a site specific or area specific basis, but under certain conditions.

Cultural Resources and Heritage Sites

Management Goals

The *Alaska Historic Preservation Act*[15] and Borough Code dealing with historic preservation[16] 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~~by the borough Cultural Resources Division~~;

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

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

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

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

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

[15] AS 41.35
[16] MSB 1.10.160

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.

The ~~Cultural Resource~~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 Survey[17] is an inventory of all reported historic and prehistoric sites. This Survey is used to protect heritage resource sites from unwanted destruction. By knowing of possible heritage sites prior to construction, conversion of land use, or natural resource utilization, efforts can be made to avoid project delays and prevent impairment of the heritage sites.

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

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

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

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

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

Cultural Resources and Cultural Sites Management Summary

Cultural resource and historic sites are not a specifically land use designation category. They 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, 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 and inoperable commercial forest land, and in some cases operable forest land, to provide natural habitat for wildlife that depend on undisturbed or old-growth forest habitats, provide for the sustained yield and healthy populations of fish and wildlife resources; maintain a diversity of species; and, support compatible commercial, recreational, and traditional uses.

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

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

Management Guidelines

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

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

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

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

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

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

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

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

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

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

~~3.~~4. How, and in what way will 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*[18], the *Eagle Protection Act*[19], 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.

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

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

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

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

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

Fish and Wildlife Habitat Resource and Management Summary

Protecting 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 viewsheds will be identified and managed pursuant to the borough's *Park, Recreation, and Open Space Plan.* These areas shall be classified with appropriate management intent and guidelines.

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

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

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

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

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

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

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

Green Infrastructure Program Summary

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

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

Private Property

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

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

Resource Goals

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

Management Guidelines

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

B. No Cut Buffers. The borough shall, pursuant to borough code[20], require a 100-foot no-cut buffer along all borough property boundaries between the boundary of forest operations areas, sand and gravel extraction areas, and other similar activities and the immediately adjacent private or semi-public property unless the property owner has been consulted and does not object to an adjustment.

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

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

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

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

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

Private Property Summary

Private property rights shall be recognized for all borough resource management and extraction activities, and other similar development activities. Property owners within 1-mile (see MSB

[20] 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.

23.05.025) and members of the public shall be provided opportunities to comment on proposed natural resource development activities.

Public Recreation and Tourism

~~Generally, it is the federal government's role is to retain and manage parks, wildlife refuges, forests, wild and scenic rivers and large multiple-use areas of national significance. The state's role is to retain and manage land supporting recreational opportunities of regional or statewide significance. The borough's role is to retain and manage locations of more local, community or sub-regional significance.~~ The federal and state governments, because of their financial and personnel resources are most capable of providing recreational opportunities that require large land areas, while the borough and cities are generally better able to provide and manage more for localized recreation.

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

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

Program Goals

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

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

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

Resource Protection. Protect important watershed areas and environmental quality.

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

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

Management Guidelines

A. Public Access. Access to Natural Resource Management Units shall be open to the public, but may be limited or curtailed at certain times to protect public safety, allow special uses, and prevent harm to the environment. Examples of conditions that may justify limiting public access are fire management, timber harvest operations, and high soil moisture content when traffic may cause extensive damage to roads and trails.

Traditional means of access as well as access to traditional use areas will be maintained. Traditional means of access means those types of transportation for which a popular pattern of use has developed and continues today. Traditional outdoor activities 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 patters. These activities do not extend to commercial uses of any kind.

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

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

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

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

E. Scenic Values. Development activities, such as timber harvesting, rock, sand and gravel extraction and other similar activities shall be sited, designed and carried out to minimize adverse impacts to high scenic values. This shall be done through a variety of methods and means. For example, using silvicultural techniques, timber harvest design,

revegetation, and using Special Management Zones for managing such things as harvesting schedules, harvesting systems, etc., in forest management and timber harvest areas. Areas with high scenic values in Natural Resource Management Units shall be identified in specific unit plans along with proposed management regimes. Vegetation that obscures scenic vistas may be managed to facilitate viewing.

F. Natural Surroundings. As much as feasible, natural resource extraction and other development activities, including related facilities on borough land should be located and designed to blend in with the natural surroundings. Specific stipulations (case-by-case basis) to accomplish this guideline should be part of a development plan, specific land use plan or plan of operations. These plans should 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 ~~usually~~ classified as Public Recreation. Public recreation can also be designated as ~~either~~ a ~~primary or~~ secondary activity on land classified as forest management, general purpose, land bank, reserve use, watershed, resource management and wetland bank lands. Public recreation designations do not exclude resource extraction where the extraction can occur without significantly damaging the recreation opportunities. ~~In many cases, these same land use classifications, coupled with management intent or management guidelines for specific land parcels or Natural Resource Plan~~

Rock, Sand and Gravel

Resource Goals

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

Specific goals include:

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

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

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

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

Management Guidelines

A. ~~Interim Mining Districts and~~ Conditional Use Permits. Besides these guidelines, Borough Code (MSB 17.28 and 17.30) establishes various mining (sand and gravel extraction) requirements throughout the borough. Borough code (MSB 17.30) further requires that 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 to be identified prior to any development or timber or other resource extraction activities.

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

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

Sand and gravel 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 in a specified area with special conditions or management methods and means.

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

Management Goals

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

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

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

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

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

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

Management Guidelines

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

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

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

3. It is recognized that events happen in the field (discovery or an historic or archeological site, bear den, etc.) while field operations, such as a gravel extraction or timber harvest, are underway. In these situations, the Community Development Director may immediately adopt or amend in writing a seasonal or temporary Special Management Zone. This action shall be in writing and state the reason(s) for the action and the length of time for the action. In such cases the temporary adoption shall only be effective for no more than 180 calendar days. The Borough Manager shall be immediately informed of the action and the Borough Assembly

shall be notified with an Informational Memorandum at the next regularly scheduled meeting. If the period of time is to exceed more than 180 days or become permanent, the process described in 1 or 2 of this paragraph shall be followed.

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

C. Public Use and Recreation Areas. Special Management Zones may be used 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 with little disturbance to moose. Similarly, large cuts (i.e., 100 acres) in areas that receive high snowfall and have difficult conditions for travel, provide travel corridors and additional browse. In addition, these type cuts when located at least one-mile from roads and the Alaska Railroad reduce the amount moose mortality caused by of winter vehicle collisions.

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

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

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

4. Other Special Wildlife Considerations. Following the public review period for a proposed natural resource extraction or other activity within a Natural Resource Management Unit where significant wildlife[21] 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.*

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

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

occur on a site specific or area specific basis within Special Management Zones, but under certain conditions.

Trails

Resource Goals

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

In the case of a conflict between the 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 boroughs *Recreational Trails Plan.*

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

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

Management Guidelines

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

K. Limiting Access. Access within Natural Resource Management Units may be curtailed at certain times to protect public safety, allow special uses, and prevent harm to the environment. Examples of conditions that may justify limiting public access are fire management, timber harvest operations, sand and gravel extraction activities and high soil moisture content when various uses may cause extensive damage to roads and trails.[22]

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

[22] See MSB 2.85.020

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

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

Trails Management Summary

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

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

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

Transportation and Utilities

Management Goals

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

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

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

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

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

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

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

Support Plan Designations. Through coordination with the 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 Manual,* shall be followed. Also, as required by MSB 23.20.190, the requirements of the *Alaska Forest Resources and Practices Act*[23], the *Alaska Forest Resources and Practices Regulations*[24] shall be followed. In addition, the publication, *"Implementing Best Management Practices for Timber Harvest Operations from the Alaska Forest Resources and Practices Regulations"*[25] provide additional guidance and should be followed where applicable and appropriate.
In the case of a conflict, between the borough code including the *Subdivision Manual*, the *Alaska Forest Resources and Practices Act*, the *Alaska Forest Resources and Practices Regulations*, and the following guidelines, the more restrictive shall be used.

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

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

C. Road Location and Design

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

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

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

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

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

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

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

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

(a) Construction and maintenance of transportation improvements in 100-year flood zones in the Matanuska-Susitna Borough require a permit from the Borough[26].

[26] See MSB 17.29

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

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

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

9. Standard Road Corridor Widths.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

D. Road Construction

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

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

3. For winter roads, the general standard for adequate ground protection from vehicle damage will be one foot of snow and one foot of frost. This standard may vary to allow for variation in winter conditions. For example, deep snow may prevent freezing but provide adequate ground protection. If the ground is not frozen to a depth of at least one foot, additional snow depth is required before winter travel

can occur. The amount of additional snow required will depend on the type of vehicle and must be adequate to support the vehicle. For example, vehicles with higher ground pressure require more snow to support them than light ground pressure vehicles.

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

4. All timber that has merchantable value or can be utilized for personal use, including firewood, shall be salvaged where practical on roads to be cleared for construction[27].

5. Material sites used for construction and maintenance should be located as near the transportation facility as practicable. Material sites shall be screened from roads, residential areas, recreational areas, and other areas of significant human use. Rehabilitation of material sites shall meet the requirements of state statutes and/or Borough code, as applicable[28].

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

[27] See AS 41.17.083 and MSB 23.20.190.
[28] See 11 AAC 97.250, MSB 17.28 and 17.30.

the roadbed would be damaged by vehicle traffic or when necessary to protect sensitive wildlife populations or other public resources along the road.

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

Road closures and restrictions shall be administered by the borough Public Works Department, in consultation with the Community Development Department pursuant to borough code[29] and policies.

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 put-to-bed, and closed to off-road vehicles, when the natural resource extraction or other development activity has been completed. In this case, "completed" includes the time period necessary to complete reclamation, reforestation, revegetation, rehabilitation, or other similar activities.

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

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

[29] See MSB 2.44.050

- Special Management Zones
- Trails
- Water Quality and Quantity, Wetlands and Riparian Areas

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

Transportation Summary

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

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

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

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

Water Quality and Quantity, Wetlands and Riparian Areas

Resource Goals

Access. Provide public access to and along all navigable and public waterbodies[30].

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.

[30] 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.*

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

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

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

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

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

Management Guidelines

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

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

Polices and issues addressed in this chapter are:

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

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

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

Forest Management Goals

Goals are statements of ideal intentions for management, they often are not quantifiable, nor having a specified date of completion. Goals identify desired long- range conditions that are not always achievable. Goals for different resources may conflict 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 processers including non-extractive uses, and larger scale industries where appropriate.

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

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

Interagency Coordination and Public Participation

To assure successful resource management decisions and actions, the borough will continue to consult and coordinate with federal, state, local entities and agencies, and private landowners. These agencies will typically include the U.S. 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 ~~as to~~on ~~the~~ non-timber values ~~of a forest are usually made at macro levels that~~ account for other products provided by the forest such as ~~important~~ scenic values, wildlife habitat, public recreation ~~opportunities~~, water quality, etc. Forests in the borough are managed for all types of uses and values, with input from residents, borough land managers, adjacent land managers (such as the Alaska Division of Forestry) and other interest groups (such as tourism based companies, fishing and hunting guides, and others).

~~Some of these "micro" and "macro" values can be directly valued on a monetary basis such as the commercial value of a tree to a manufacturer of an end product~~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. ~~Basic questions on any forest value are: who owns the forest and what are their management objectives?~~

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

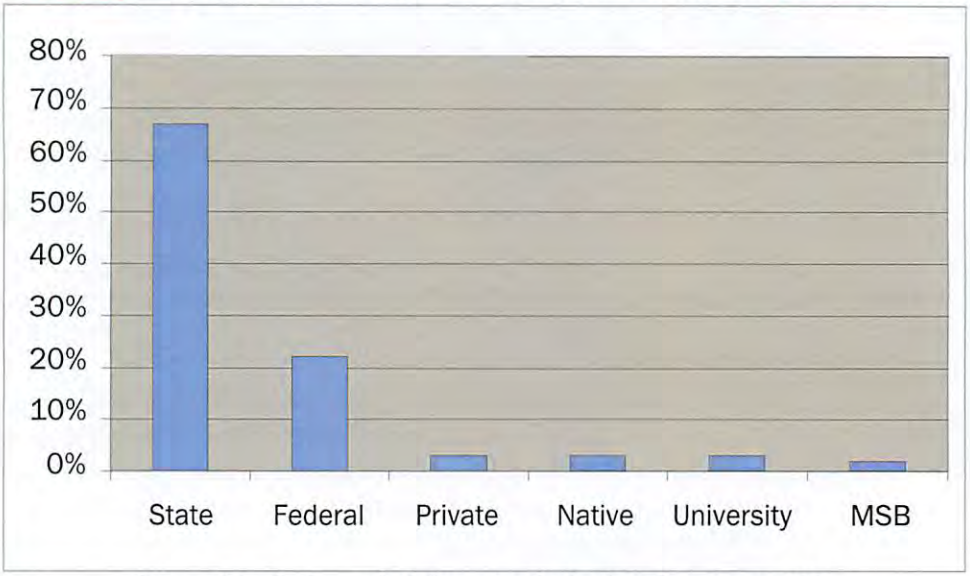
Natural resource (forest) management and planning are essential to reflect current and foreseeable conditions. ~~While doing so, i~~It is ~~equally~~ important to recognize goals, management intent and ~~the~~ management guidelines that combine balanced land use with science and projected future social-economics.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

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

The chart below (Figure 6~~I-3-1~~) reflects current land ownership.

Figure ~~6I-1-3~~: Approximate Land Ownership within the ~~Mat-Su~~ Borough



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

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

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

Within the 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~~I-3-2~~). This illustration does not show all costs and values that occur. However, it does show a portion of the monetary and intrinsic values that result from active forest management.

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.

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

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

Figure 8~~I-3-3~~ illustrates examples of ways that timber may be utilized. Trees with the highest value per volume are to the left and the less value per volume is on the right.

Figure 7~~1-3-2~~: Example of Timber Harvest Costs and Values

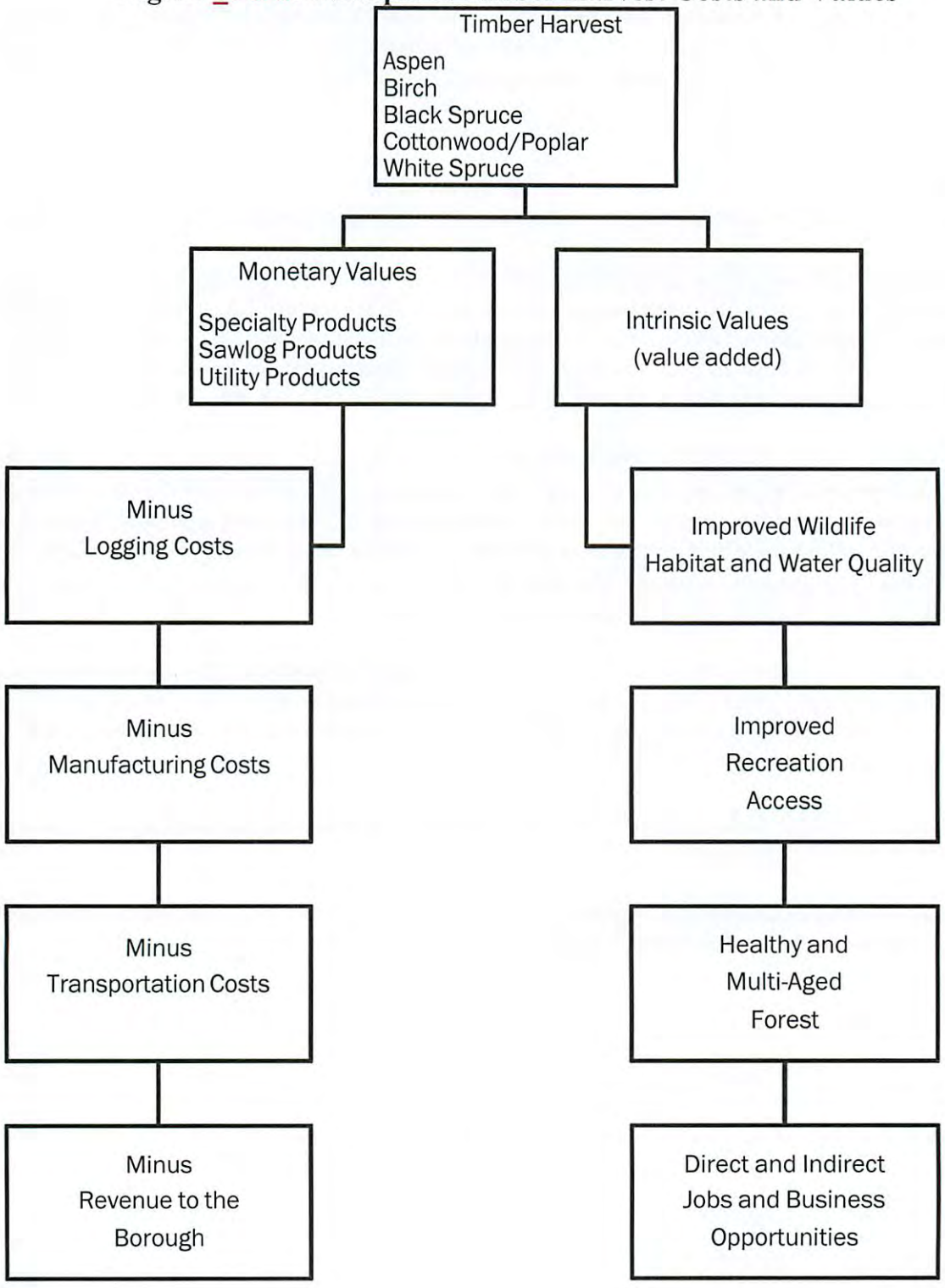
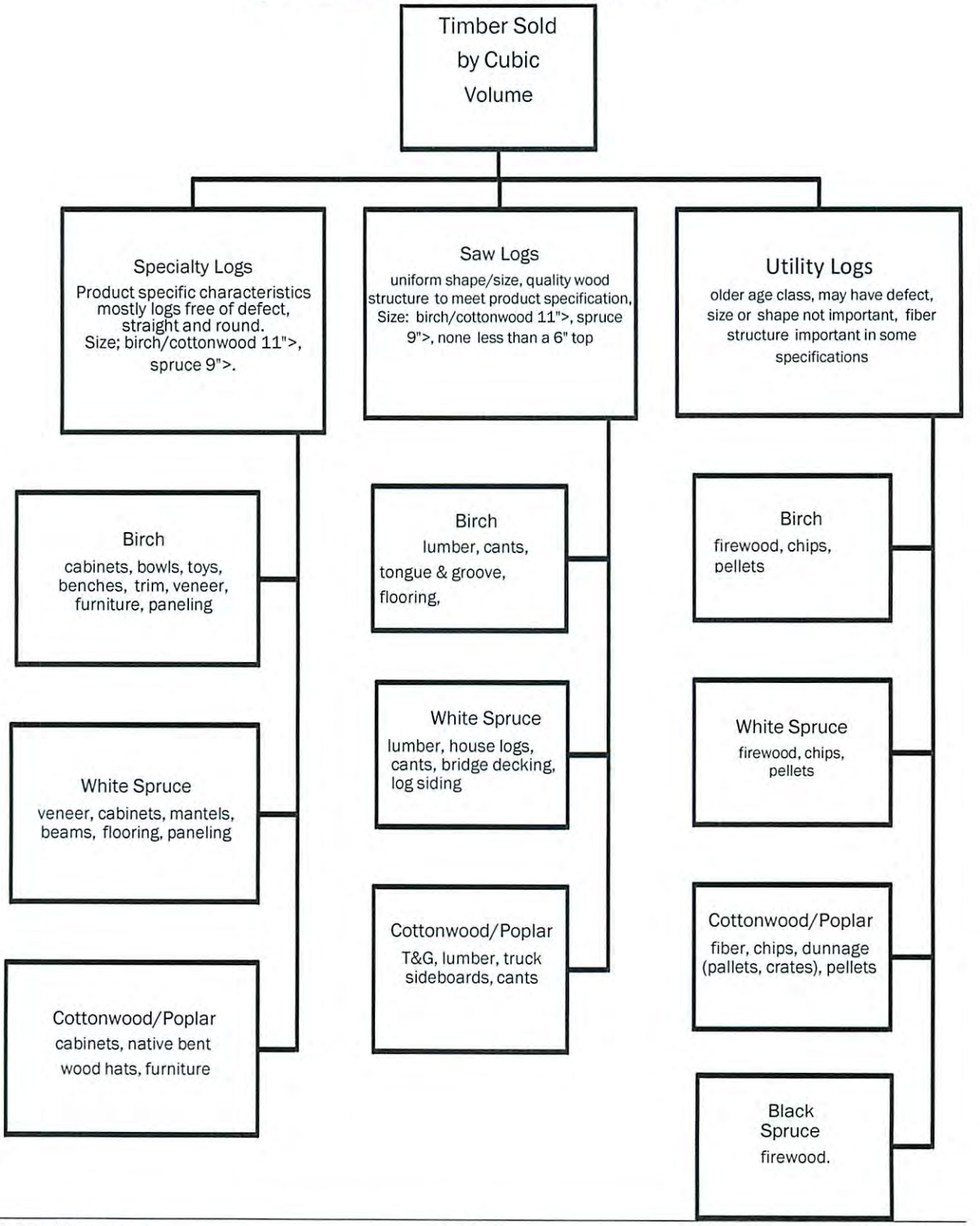


Figure 8~~I-3-3~~: Timber Use Opportunities



Selling by volume makes it easier to specify in contracts what species, grade (specialty, saw, or utility), and size of trees can be harvested. However, selling by volume does not mean that acreage will be ignored. The geographic area or acreage where ~~the~~ harvesting may ~~take place~~ 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 appraisal[31]:

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 ~~select~~, sawtimber, ~~utility~~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 ~~the~~ net return to the borough in the form of direct revenue~~cash~~.

~~For a simple example, Figure 1 illustrates how a sales value, cost and net revenue return to the borough could be calculated for a cord of birch firewood:~~

~~FIGUREI-3-4: Example of Value and Cost of Birch Firewood~~

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

~~*Source: Northern Economics, 2009*~~

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

Log Transportation Costs

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

- 10 cords of firewood, or approximately 600 to 1,000 cubic feet of solid wood (no branches, roots, etc.).[32]

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

Transportation costs are generally quoted by the hour or running mile. For example, if a truck renting for $120 per hour is equivalent to about $2.40 per running mile if it averages 50 miles per hour.

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

Value Added

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

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

For the majority of the borough's Natural Resource Management Units, besides local personal use needs, these "timber derived" value-added products should be the focus of timber harvest activities. This can be accomplished through a variety of silvicultural methods.
In the broadest sense, value-added forest products can be "timber derived" as described above or "non-timber derived." The latter are commonly referred to as non-timber forest products or non-extractive uses. These include such things as decorative foliage (ferns and conks), edible plants (mushrooms and berries), and sap removal for products such as syrup and candies, or small wood products such as diamond willow and other craft products.

In some areas of the northern portion of the borough, fishing, hunting, ~~and~~ wildlife viewing, and tourism produce significant 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 ~~and~~

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

successional forest that benefits recreation and tourism must be considered "when looking at the bottom line".

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

Given the complexity of the various resources those sub-sectors offering the greatest potential value-added margins over existing timber values is an important element to be recognized when making land management decisions. A report to the borough by H.P. Cole and Associates in June 2007[33], provides some additional findings and insights into ~~this~~ 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:

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*[34]. A copy of the executive summary for the *Matanuska-Susitna Borough: Forest Inventory Report Phase II* is located in Volume III, Appendix "N". The same

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

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

information for the *Operable Forest Land Analysis Report Phase II* is located in Volume III, Appendix "O".

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

~~Operable~~ Commercial Forest Lands are:

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

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

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

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

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

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

~~Inoperable~~ Non-Commercial Forest Lands are:

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

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

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

(Also see the *Definitions/ Glossary* at the end of this volume and volume III for definitions of commercial, ~~operable and inoperable~~non-commercial forest land).
~~The chart that follows (Figure I-3-5) illustrates the types of forested land within a Natural Resource Management Unit. This illustration does not show all the other resources and uses that occur within a Natural Resource Management Unit.~~**~~Figure I-3-5: Types of Forest Land in a Natural Resource Management Unit~~**

Inventory Results Tables

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

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

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

~~Figure~~ Table ~~I-3-61~~: ~~Operational~~ Commercial Forest Lands ~~Summary Results in~~ Total Acres ~~and Net Timber Volumes~~ by Natural Resource Management Unit

Natural Resource Management Unit	Total Acres In Unit	Total Acres Inventoried	Total Acres ~~of Operable~~ Commercial Forest Land	~~Operable Net Board Feet~~	~~Operable Net Cubic Feet (rounded)~~
Anderson Creek	2,510	No Inventory	0	~~0~~	0
Bartlett Hills	4,785	4,838	~~2,785~~ 4,255	~~12,733,000~~	~~4,926,000~~
Bunco Hills	10,440	No~~t~~ Inventory~~ied~~	0	~~0~~	~~0~~
Chijuk Creek	24,659	24,659	17,413~~14,867~~	~~62,194,000~~	~~24,334,000~~
Chulitna River	6,082	5,085	3,500~~2,845~~	~~11,834,000~~	~~4,674,000~~
Deception Creek	3,118	3,118	1,027~~676~~	~~3,055,000~~	~~1,173,000~~
Fish Creek[34]	23,376	18,053	11,946~~9,025~~	~~42,529,000~~	~~16,439,000~~
Kashwitna	9,358	9,366	5,024~~3,429~~	~~15,370,000~~	~~5,913,000~~
Matanuska River North	445	446	331~~264~~	~~1,251,000~~	~~15,000~~
Matanuska River South	540	No~~t~~ Inventory~~ied~~	0	~~0~~	~~0~~
Mile 233	4,146	4,146	3,738~~3,079~~	~~13,783,000~~	~~5,384,000~~
Moose Creek	1,228	1,229	991~~732~~	~~3,335,000~~	~~1,302,000~~
Olson Creek	5,119	~~N~~No~~t~~ Inventor~~iedy~~	0	~~0~~	~~0~~
Parks Highway	10,278	10,067	3,159~~1,534~~	~~6,674000~~	~~2,604,000~~
Point MacKenzie[35]	5,167	5,198	3,195~~2,631~~	~~11,558,000~~	~~4,483,000~~
Rabideux Creek	4,477	4,477	2,692~~1,585~~	~~7,038,000~~	~~2,726,000~~
Rogers Creek	7,039	7,038	2,193~~1,024~~	~~4,860,000~~	~~1,848,000~~

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

Natural Resource Management Unit	Total Acres In Unit	Total Acres Inventoried	Total Acres ~~of Operable~~ Commercial Forest Land	~~Operable Net Board Feet~~	~~Operable Net Cubic Feet (rounded)~~
Sheep Creek	9,703	9,703	4,924 ~~1,548~~	~~7,094,000~~	~~2,756,000~~
Susitna River Corridor	6,667	6,739	4,737 ~~3,032~~	~~12,986,000~~	~~5,087,000~~
Whiskers Creek North	12,757	Not Inventoryied	0	~~0~~	~~0~~
Whiskers Creek South	13,965	13,964	10,241 ~~7,518~~	~~33,482,000~~	~~13,097,000~~
Willow	1,077	Not Inventoriedy	0	~~0~~	~~0~~
TOTAL	166,939 ~~167,066~~	128,126	79,366 ~~56,574~~	~~249,776,000~~	~~97,215,000~~

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

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

~~Operable~~ Commercial Forest Land within Natural Resource Management Units

The table above ~~that follows~~ (~~Figure~~ Table 2~~3~~) ~~illustrates~~ lists the ~~composition in~~ acres ~~by strata~~ of the ~~operable~~ commercial forestland within the various Natural Resource Management Units that were inventoried for the ~~b~~Borough by Sanders Forestry Consulting and Alaska Map Company. The total data, including information by species and volumes, are not included in this chapter because of their complexity and length.

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

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 ~~49~~48% of all the land within the Units. ~~Within the commercial forest land there is about 56,574 acres of operable forest land or 34% of all the land in the Units.~~ It is important to remember that almost all the land within Natural Resource Management Units will be managed for

multiple purposes and uses. The commercial ~~and operable~~ forest lands are all within this multiple-use category.

Commercial~~, Operable~~ and Merchantable Forest Analysis

~~Although~~ 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 ~~operable~~ commercial~~area~~ forest land figures are ~~are~~ included in all the charts and computations in the following section of this chapter. ~~The Fish Creek Management Plan was adopted by the Borough Assembly in September 2009 and is considered as a Natural Resource Management Unit.~~

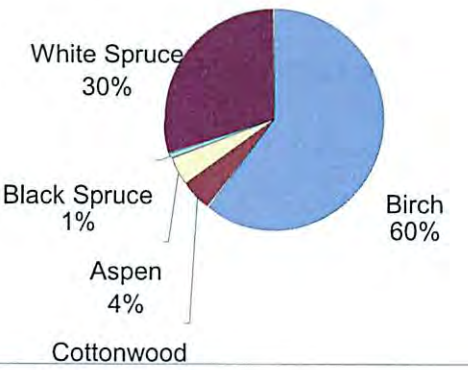
For all charts and figures in this chapter "Net Board Feet" is based on the Scribner Log Scaling, variable length rule. An explanation of the methods to calculate board feet is found in the Definitions/Glossary at the end of this Volume and in volume III. More detailed results are contained in the Forest Inventory Report Phase II. The executive summary of this report can be found in Volume III: Appendix "N".

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

~~*Source: Sanders Forestry Consulting and Alaska Map Company, 2009*~~

Figure ~~9~~I-3-8 shows the composition of tree species for lands that were inventoried in the *Forest Inventory Report Phase II.*

Figure ~~9~~I-3-8: ~~Operable~~ Commercial Forest Lands, Species Summary



Source: Sanders Forestry Consulting

Of the total gross volume, defects (rot, breakage, etc.) may reduce the amount of merchantable wood, depending on the end product. This is viewed as the net volume. While conducting the forest

inventory, Sanders determined the average visible defect by species. This is shown in the following table (~~Figure~~ Table 4~~I-3-9~~). This table does not include hidden defect or logging breakage or beetle kill.

Table 2~~I-3-9~~: Average Visible Defect by Species

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

Source: Sanders Forestry Consulting, 2009

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

Table 3~~I-3-3~~: Commercial Forest ~~Lands Total~~ 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

~~Figure~~ Table 4~~I-3-11~~ describes the timber inventory volumes by stratum and species.

~~Figure~~ Table 4~~I-3-11~~: 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
STRATUM #1 – Pole Timber Closed 11,330 acres				
Aspen	770	8,720,000	29,800	3,379,300
Birch	2,920	33,082,000	110,100	12,478,900
Black Spruce	117	1,320,000	4,000	452,300
Cottonwood	172	1,944,000	6,000	680,800
White Spruce	742	8,408,000	29,100	3,292,700
TOTALS	**4,720**	**54,357,000**	**179,000**	**20,284,000**
STRATUM #2 – Pole Timber Open 3,415 acres				
Aspen	326	1,112,000	13,200	450,900
Birch	1,329	4,537,000	55,900	1,980,100
Black Spruce	123	422,000	4,600	158,700
Cottonwood	6	20,000	300	11,800
White Spruce	969	3,310,000	34,900	1,192,800
TOTALS	**2,752**	**9,400,000**	**109,000**	**3,722,400**
STRATUM #3 – 90+% Hardwood Sawtimber Closed 2,410 acres				
Aspen	519	1,250,000	16,300	393,700
Birch	2,496	6,015,000	97,400	2,347,700
Black Spruce	17	42,000	60,000	14,700
Cottonwood	2,638	6,358,000	9,310,000	2,242,600
White Spruce	542	1,305,000	1,910,000	460,700
TOTALS	**6,212**	**14,970,000**	**5,579,500**	**5,459,400**
STRATUM #4 – 80% – 90% Hardwood Sawtimber Open 3,962 acres				
Aspen	24	96,000	600	24,800
Birch	2,285	9,052,000	93,700	3,713,600
Black Spruce	13	51,000	500	20,500
Cottonwood	728	2,866,000	22,100	876,200
White Spruce	942	3,733,000	35,400	1,401,100
TOTALS	3,993	15,819,000	152,400	6,036,200
STRATUM #5 – Mixed Sawtimber Closed 43,427 acres				
Aspen	83	3,598,000	2,700	1,168,900
Birch	2,888	125,422,000	117,900	51,204,600
Black Spruce	24	1,041,000	800	346,100
Cottonwood	140	6,084,000	4,200	1,844,100
White Spruce	1,497	65,011,000	54,800	23,811,600
TOTALS	**4,632**	**201,156,000**	**180,500**	**78,375,300**
STRATUM #6 – Mixed Sawtimber Open 14,015 acres				
Aspen	111	1,562,000	4,400	615,700
Birch	2,006	28,117,000	84500	11,841,900
Black Spruce	2	24,000	100	8,300
Cottonwood	17	236,000	500	63,500
White Spruce	1,534	21,495,000	58,800	8,247,000
TOTALS	**3,670**	**51,434,000**	**148,200**	**20,776,500**
TOTALS FOR ALL	**25,979**	**317,197,000**	**6,348,600**	**134,653,800**
TOTAL ACRES IN ALL STRATUMS: 78,559				

Source: Sanders Forestry Consulting, 2009

Sustained Yield and Annual Allowable Cut

The Alaska Constitution requires that natural resources be managed on a sustained yield basis[36]. State law and borough code for forest management provide further guidance on periodic sustained yield[37], and annual allowable cut[38]. 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. ~~Generally this is when an average of 450 seedlings per acre have been established, they have survived 2 winters and show signs of growth and/or reached a height of approximately 12 inches, or a combination of residual trees and seedlings has been achieved as determined by the Alaska Division of Forestry.~~

Periodic Sustained Yield

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

For example, if the commercial ~~operable~~ forest land within all Natural Resource Management Units totals a volume figure of 100,000 and the rotation period to maintain sustained yield is 100 years, the annual allowable cut would be a volume of 1,000 per year, or a total volume of 10,000 over a ten-year period. This ten-year volume may be either larger or smaller than the average volume of 100 per year.

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

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**

Periodic Sustained Yield Guidelines

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

B. If the total of ~~Operable~~ 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 ~~next~~ 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 is derived by dividing the total of Commercial ~~Operable~~ Forest Land acreage (as determined by inventory) by the rotation period. Results are expressed as the acreage available for harvest each year of the rotation, on a sustained yield basis.

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

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

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

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

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

In the *Operable Forest Land Analysis Report Phase II* annual allowable cut calculations were made using each of the three methods for various rotation periods ranging from 50 to 100 years. The option to pick which of the three methods, using the variable rotation rates shown in the Operable *Forest Land Analysis Report Phase II does* not currently exist because the rotation periods have been established in borough code (MSB 23.20.030), Borough code[39] allows adjustments to the annual allowable cut through this plan process.

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

Using volume also aids in laying out cutting units for areas that have the potential for clear cutting. Areas can be laid out, utilizing uncut islands, that produce the needed volume(s), and discourages potential harvesters from harvesting every available tree within a small confined area to get the needed volume(s). This ~~same~~ practice will 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[40] could be managed (harvested and regenerated) on an 80-year rotation to favor birch, and commercial ~~operable~~ forest lands identified as Strata 5 and 6 in the Forest *Inventory Report* could be managed (harvested and regenerated) on a 100-year rotation to favor spruce.

[39] See Volume III, Appendix "Q" MSB 23.20.030.

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

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

Total Net Commercial Standing Timber Volume = 97,213,400 cubic /feet[41]

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

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

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

Annual Allowable Cut Guidelines

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

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

Rotation Period

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

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

Currently, borough forest lands are in a predominantly old-growth condition. Some forest stands may be actually declining in usable net volume because of damage, decay and mortality that exceed

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

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 ~~will~~ 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 Act*[42]; the *Alaska Forest Resources and Practices Regulations*[43]; and the related booklet *Implementing Best Management Practices for Timber Harvest Regulations*[44] is necessary.
The *Forest Health Conditions in Alaska – 20~~0~~17*[45] provides extensive information of status of insects, diseases, and invasive plants. These reports have published annually since 2002.
The *Alaska Interagency Wildland Fire Management Plan* (~~1998~~2018)[46] and the *Matanuska- Susitna Borough Community Wildlife Protection Plan*[47] 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 - 201~~0~~7* the infested areas in the Mat-Su valley ~~have~~ more

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[42] Alaska Forest Resources and Practices Act of 1990, as amended (FRPA), codified as A.S. 41.17
[43] See 11 AAC 95
[44] Implementing Best Management Practices for Timber Harvest Operations of the Alaska Forest Practices Act Regulations, 2005, State Department of Natural Resources, Division of Forestry.
[45] The *Forest Health Conditions in Alaska – 201~~0~~7* (comp. 20~~0~~18, Forest Health Conditions in Alaska – 20~~0~~17. 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.
[46] The *Alaska Interagency Fire Management Plan – ~~1998~~ 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/fire/fireplans.htm.
[47] 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.

than doubled from 2016 to 2017and are estimated to total over 400,000 acres~~increased 43 percent to nearly 25,000 acres, with the largest single infestation along the Iditarod Trail from Skwentna to Rainy Pass~~. The ~~same~~ report states that there is a ~~infestations are evenly distributed throughout the valley suggesting that this may eventually develop into a~~ large-scale infestation. ~~The dead trees have lost their value as saw timber and for some utility wood uses.~~ Some of the infected stands continue to be~~have been~~ the focus of both state and borough harvest programs~~since shortly after the infestation began~~.

The management of invasive plant species is a significant concern throughout the borough. The borough shall manage its land to avoid the introduction of, and reduce the spread of, invasive non-native species, consistent with state law and regulations[48].

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's[49] also have program's in place that concentrate on surveying areas of infestation and providing landowners with treatment options and to develop Best Management Practices in an effort to control these species.

Forest Pest and Invasive Plant Species Management Guidelines

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

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

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

[48] See AS 03.05.010(5), AS 03.05.027, and 11 AAC 34

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

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. Fertilization. Fertilization can improve the nutritional status of nutrient-poor soils and make sites more hospitable to seedlings. Nitrogen fertilization of mineral soils should be considered early in the post-logging period to improve seedbed.~~
~~H.~~G. Aerial Application. Aerial application of any chemicals for the control of forest pests and invasive species shall not be permitted.

~~I.~~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

~~J.~~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 "D": *Fire Protection Designations in the Matanuska-Susitna Borough.*

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

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

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

Reforestation

Reforestation is part of the silvicultural process. ~~where there are no hard and fast rules that can be applied to every situation.~~ At a minimum the reforestation requirements of the *Alaska Forest Resources and Practices Act* ~~shall be~~ are followed. ~~The regulations for implementing this Act require that within 7 years following harvest, harvested areas must contain an average of 450 seedlings per~~

~~acre or a combination of residual trees and seedlings approved by the Alaska Division of Forestry. Seedlings must have survived at least two winters and show signs of growth. Post-harvest stocking of commercial trees and/or seedlings is the responsibility of the landowner.~~

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

Monitoring and learning from past practices shall be an on-going process. The *Reforestation Handbook*[50] is a good and practical reference for the planning and evaluation of reforestation.

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

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

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

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

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

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

Reforestation Guidelines

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

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

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

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

2. On aspen sites, harvest should occur during the winter dormant season~~cleared areas should be heavily scarified or lightly burned~~ to produce maximum sucker response.

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

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

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

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

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

Other Guidelines Related to Reforestation

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

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

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

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

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

F. Borough resource professionals shall work with timber harvesters to ensure that regeneration requirements are met and that comply with the Alaska 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 ~~operable~~ timber of commercial quality available in the various Natural Resource Management Units, three kinds of timber end products may be produced from borough forests:

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

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

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

General Harvest Unit Guidelines

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

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

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

Cut and Leave Area Guidelines

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

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

Cutting Unit Size, Shape, Width and Orientation Guidelines

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

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

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

The following figures are based on Chart I-3-6 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 an average, occur on up to about 40 acres of land.

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

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

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

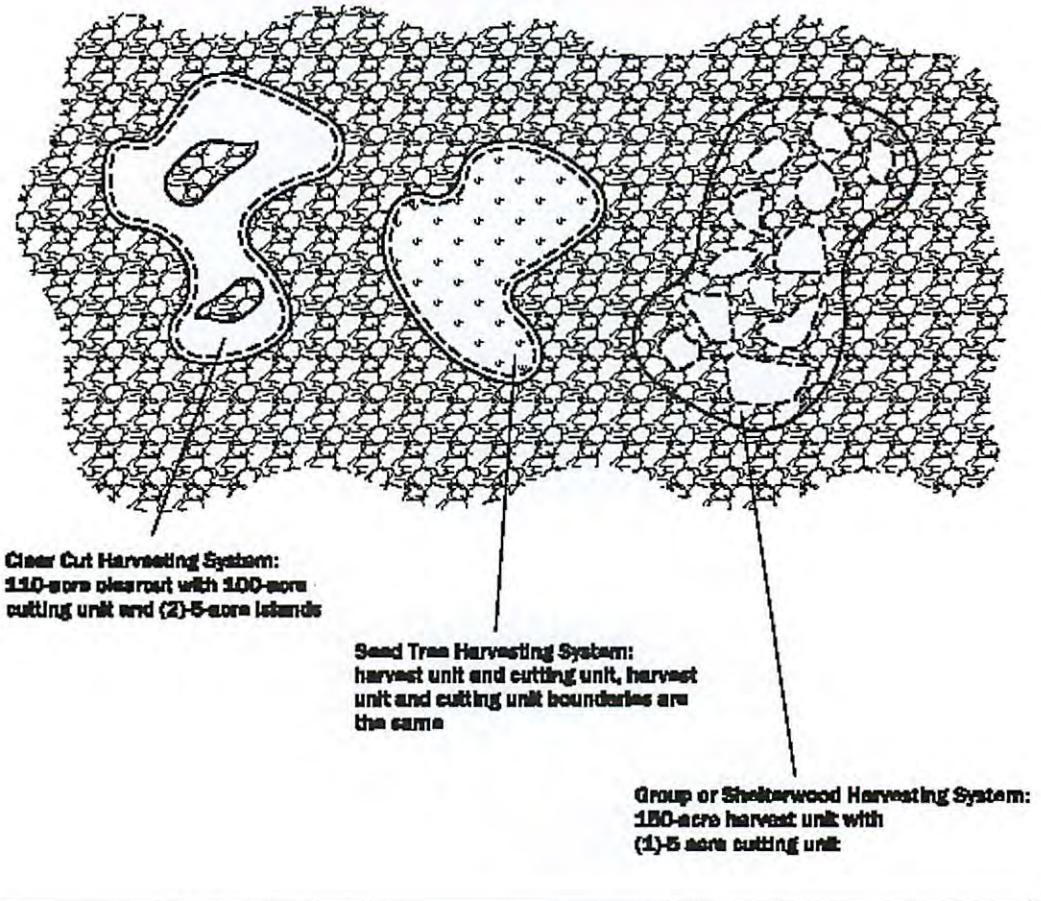
Harvesting System Guidelines

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

Figure 10: Examples of Cutting and Harvest Units



Harvesting Schedule Guidelines

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

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

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

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

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

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

Slash Management Guidelines

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

Slash that falls on uncut lands adjacent to harvest areas should be cleaned up or removed to facilitate moose and other wildlife cover and feeding areas.

B. Appropriate methods to deal with slash include:

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

2. Controlled burning may be used as a means of manipulating vegetation, as a method of site preparation and/or as a means of slash disposal. Controlled burning is 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 of these issues during the interagency review and public notice process.

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

Saw Timber Guidelines

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

B. Since each harvest area will be different, based on location, type of species, tree size, terrain, slope, accessibility, cutting unit size, width, arrangement of cutting units and leave

areas, no special guidelines, other than those listed elsewhere in this chapter, are established that would apply in all cases.

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

Utility Timber Guidelines

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

~~B.~~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.

~~C.~~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.

~~D.~~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.

~~E.~~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.

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

Forest Education and Improvement Study Area(s)

During Phase I of developing this plan, numerous public comments were received on the need to conduct additional research and to study various elements of forest health and timber harvest practices throughout the borough. The state, with its much larger land and timber base has established several research study areas and experimental forest areas (See Appendix "H": *Forest Research and Study Areas).*

The borough does not have the land and forest base, staff or funding to conduct such studies itself, nor is there is a need for the borough to duplicate the existing research areas that have been established by the state, University of Alaska or federal agencies. ~~In addition the State Division of Forestry is considering recommending to the Alaska Legislative the establishment of a Susitna State~~

~~Forest.~~ Combined, these areas, plus any others established or utilized by other federal or state agencies or the University of Alaska should meet the needs for studies and research on a large scale basis. Also, see Volume I, Chapter 4, *Implementation and Recommendations.*
What are missing are study areas at a small scale (i.e. 5 to 100 acre) studies. The majority of the timber harvests and harvesting that will occur in the various Natural Resource Management Units fall into this category and be located relatively close to existing communities. The borough should work with state or federal agencies, the University of Alaska to develop studies, and with local community organizations, non-profits and schools to conduct research and both short and long-term studies on the effects of small scale logging efforts.

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

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 uses the forest as a "window" to the world to increase students' understanding of forest ecology and our environment; stimulate students' critical and creative thinking; develop students' ability to make informed decisions on environmental issues; and instill in students the commitment to take responsible action on behalf of the environment. Two of these are: *Project Learning Tree* and *Discover the Forest* which provides curriculum for both teachers and students.

The American Forest Foundation, is a nonprofit 501(c)(3) organization that is recognized for its commitment to sustainable forestry, quality environmental education, and wildlife habitat and watershed protection. There programs include *Project Learning Tree,* and *Forests for Watersheds and Wildlife.*

Forest Improvement Area Guidelines

A. Local volunteers, schools, community organizations, and non-profit organizations, university students (especially graduate students) may be utilized for specific study or research projects. Most projects will need to be short term because of the time commitment and possible expense.

B. Educational programs should be coordinated and conducted in cooperation with the Mat-Su School District with curriculum based on national education standards.

C. Research studies shall be scientifically sound in design and properly conducted.

D. Studies will need to be approved in advance by the borough and receive borough oversight on goals, area, techniques, timing, etc.

E. Signed agreements shall be in place before any research or studies begin. It must be clear between the parties on what is expected of each other, costs to be borne by each party, and what the end product will produce.

F. The agreements, studies and research shall not assign management of any borough land to a third party without approval of the borough Assembly.

Administrative Forest Products Sale and Permit Processes

One of the goals of the timber harvest program is to make forest products available, within the prescribed annual allowable cut, for local residents' personal use needs, to timber harvesting and processing businesses, and to optimize local employment and economic return. Timber harvest must also be compatible with other uses within the Natural Resource Management Units.

This section generally supplements the basic steps that must be taken to make forest products available. At minimum, all forest product disposals must be performed in accordance with MSB 23.05, MSB 23.10, and MSB 23.20.

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 commerical forest land must then be classified for Forest Management or Resource Management with a forestry designation. A Five-Year Timber Harvest Scehdule 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 peridoic 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.~~The following chart (figure I-3-13) shows the sequence and steps involved in the sale process.~~

~~Figure I-3-13:~~

~~The asterisks "*" in Figure I-3-13 indicate what current borough code (MSB 23.20.130 (B) and (C)) states for the approval of forest resource sales. At current per acre values of around $80.00 per acre, a sale of $25,000 equates to a sale of about 300 acres.~~ It is recommended (see Volume I, Chapter 4, *Recommended Ordinance Changes*) that the current monetary values be changed to volume values for all timber harvests to be consistent with the rest of this plan which states that volume, other than acreage, measurements be used for all timber harvests.

The change recommended would be for timber harvests less than 68,000 cubic feet or less than 500 cords of wood may be approved by the borough manager. For timber harvests of 68,000 cubic feet or more or 500 cords or over borough Assembly approval would be required. This equates for timber harvests of about 39 acres or under could be approved by the borough Manager. Timber harvests of about 40 acres or more would require Assembly approval.

Timber Harvest Nominations

Management Guidelines

A. Public Notice. A general public notice (does not have to comply with MSB 23.05.025) and/or display ad in at least one newspaper of general circulation in the borough

shall be provided at least every two years notifying the public and known persons and industries interested in timber products that nominations for either the Five-year Harvest Schedule or annual/periodic Timber Harvest Implementation Schedule are being accepted.

A similar notice shall also be sent to all Community Councils and borough libraries. Notice shall also be posted on the borough web site.

B. Nomination Areas. Only those lands within Natural Resource Management Units that are classified as Forest Management or Resource Management and that have either a primary or secondary land use designation for forest management may be nominated for a timber harvest.

C. Nominations. Nominations shall be solicited for personal and/or community use as well as areas for commercial timber harvest.

D. Acceptance of Nominations. Nominations for timber harvest may be accepted at any time, but shall only be processed through the regular Five-year Timber Harvest Schedule or annual Timber Harvest Implementation Schedule.

E. Compliance with Borough Code. Nominations for the harvesting of borough owned timber shall comply with the requirements of MSB 23.20.080 (see Volume III, Appendix "P": *MSB 23.20; Forest Management*).

Five-Year Timber Harvest Schedule

The Five-Year and Timber Harvest Implementation 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, the boroughs Five-Year Timber Harvest Schedule must be approved by a legislative body (Borough Assembly) prior to being implemented.

Management Guidelines

A. The Five-Year Timber Harvest Schedule shall include areas for personal and/or community use as well as a variety of commercial sales.

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

C. Coordination with Other Landowners. The borough will coordinate its timber harvest offerings with timber harvest offerings of other landowners, especially the Alaska Division of Forestry. The intent is to increase the viability of the offerings or provide other public benefits.

D. Harvests by Volume. All timber harvests should be based on timber volume (cubic feet, board feet, or cords). Harvest areas shall be described by legal description and/or geographic area with the volume, harvest density, species and size based on diameter at breast height (dbh). The average number of trees to be harvested per acre should also be given if possible to aid the public in "visualizing" the harvest.

E. Public Notice. All proposed timber harvests shall receive public notice pursuant to MSB 23.05.025. The public notice shall provide all the information and meet the requirements of MSB 23.20.100.

F. Compliance with Borough Code. The borough shall develop Five-Year Timber Harvest Schedules for a regular predictable series of personal use and/or community use as well as commercial sale offerings pursuant to the requirements of MSB 23.20.090 and .100 (see Volume III, Appendix "P": MSB 23.20; Forest Management).

Timber Harvest Implementation Schedule

The Five-Year and Timber Harvest Implementation 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 (see Volume III, Appendix "P": MSB 23.20; Forest Management).

Concurrent Harvests

Management Guidelines

A. Concurrent Harvests. To meet silvicultural or other needs, concurrent personal use harvests and sales for different products within the same cutting unit and/or area are encouraged. For example, a personal use harvest concurrently with a select or specialty log sale for a specific value-added product (log, bowls, cabinets or veneer). This could be followed by another select cut sale (for example saw logs) for a different value-added product (lumber, house logs, flooring). The impacts and effects of concurrent sales shall be aggregated as if it were one sale for purposes of methods and means, forest regeneration, compliance with the *Alaska Forest Resources and Practices Act*, and other management requirements.

B. Compliance with Borough Code. All the requirements of, MSB 23.20.120 shall be followed. (see Volume III, Appendix "P": *MSB 23.20; Forest Management*).

Methods and Authorizations for Sales

Management Guidelines

A. Sale Schedule. No timber products shall be offered for sale unless the area is on the approved five-year and timber harvest implementation schedules.

B. Commercial Timber and Non-Timber Product Sales.

1. Commercial firewood sales for less than 500 cords and timber sales for less than 64,000 cubic feet may be sold over-the-counter without a competitive bid.

2. Commercial firewood sales for more than 500 cords and timber sales for more than 64,000 cubic feet shall first be offered by competitive sale. If no bids are received or accepted, they may be sold over the counter for a period not to exceed two-years at the same terms and conditions as the competitive sale.

3. Non-timber products with a total gross value of less than $25,000 may be sold over-the-counter without a competitive bid.

4. Non-timber products with a total gross value of more than $25,000 shall first be offered by competitive sale. If no bids are received or accepted, they may be sold over the counter for a period not to exceed two-years at the same terms and conditions as the competitive sale.

C. Sales by Volume. All timber sales should be based on timber volume (cubic feet, board feet, cords, 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 (See Volume III, Appendix "P": *MSB 23.20; Forest Management*).

Contract Provisions

Management Guidelines

A. Terms and Conditions. All the terms and conditions specified in MSB 23.20.140 shall be included in all contracts.

B. Additional Terms and Conditions. The borough may add additional terms and conditions to any sale, lease or permit beyond what is required by MSB 23.20.240 depending on the type, location and other considerations.

C. Compliance with Borough Code. All the terms and conditions specified in MSB 23.20.140 and .150 shall be followed. (See Volume III, Appendix Q, *MSB 23.20; Forest Management*).

Plan of Operations

Management Guidelines

A. Compliance with Borough Code. All the terms and conditions specified in MSB 23.20.160 shall be followed (see Volume III, Appendix "P": MSB 23.20; Forest Management). This includes providing a copy of the State of Alaska, Division of Forestry, Detailed Plan of Operations, where the requirements of the Alaska Forest Resources and Practices Act must be followed (see Volume III, Appendix "M" for a copy of the *Detailed Plan of Operations Summary* as used as the date of this plan), and compliance with MSB 28.60: *Forest Harvest, Timber Transport Permit.*

B. Additional Requirements. Besides the requirements of paragraph A above, the borough's Plan of Operations may require other information depending on the type, size and other conditions of the individual sale and contract terms. In the case where a State of Alaska, Division of Forestry Detailed Plan of Operations is not required (sale of less than 10,000 board feet or 830 cubic/feet), the borough shall require a plan of operations that meets the requirements of MSB 23.20.160.

Monitoring and Enforcement

Management Guidelines

A. Monitoring and Enforcement. In accordance with public input, monitoring and enforcement of timber harvest contracts, personal use permits, fire wood harvests, and etc., will require a field presence by borough staff to ensure that contract and/or harvest terms are followed, reforestation conditions are being met (where applicable), and forest management goals are being achieved. This issue is addressed in more detail in Volume I, Chapter 4: *Implementation and Recommendations.*

B. Timber harvests, Leases or Permits. Timber harvests, leases or permits shall not be offered in excess of what the borough can adequately administer and enforce.

C. Contracts. Only realistic and enforceable terms and conditions should be included in contract terms and conditions.

D. Bonds or Other Form of Surety. Performance and reforestation or scarification bonds or other acceptable form of surety shall be established and held to ensure that contract terms and conditions are met. All bonds or other acceptable form or surety shall be of sufficient monetary size and time duration to ensure that the borough, as the land owner, does not end up bearing the financial burden of meeting the *Alaska Forest Resources and Practices Act* requirements or other performance requirements.

E. Legal Action. Prompt legal action shall be taken where necessary to address timber trespass, failure to meet contract terms and conditions, or other actions that are not authorized in a sale, lease contract, or permit.

Personal Use Forest Product Harvest

Firewood, timber, and other non-commercial forest products may be sold using non- competitive permits or permits for free.

~~Illustration (F~~figure 11~~1-3-14)~~ shows the general process used to determine if a permit can be issued.

Management Guidelines

A. Locations within Natural Resource Management Units.

1. Areas Classified as Forest Management. Personal Use timber products may be made available in areas classified forest management and designated either primarily or secondarily for forest management.

2. Areas or Classified as Resource Management with a Secondary Land Use Designation for Forest Management. If classified resource management the personal use permit must be consistent with the management unit for the area and compatible with any other secondary designations.

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

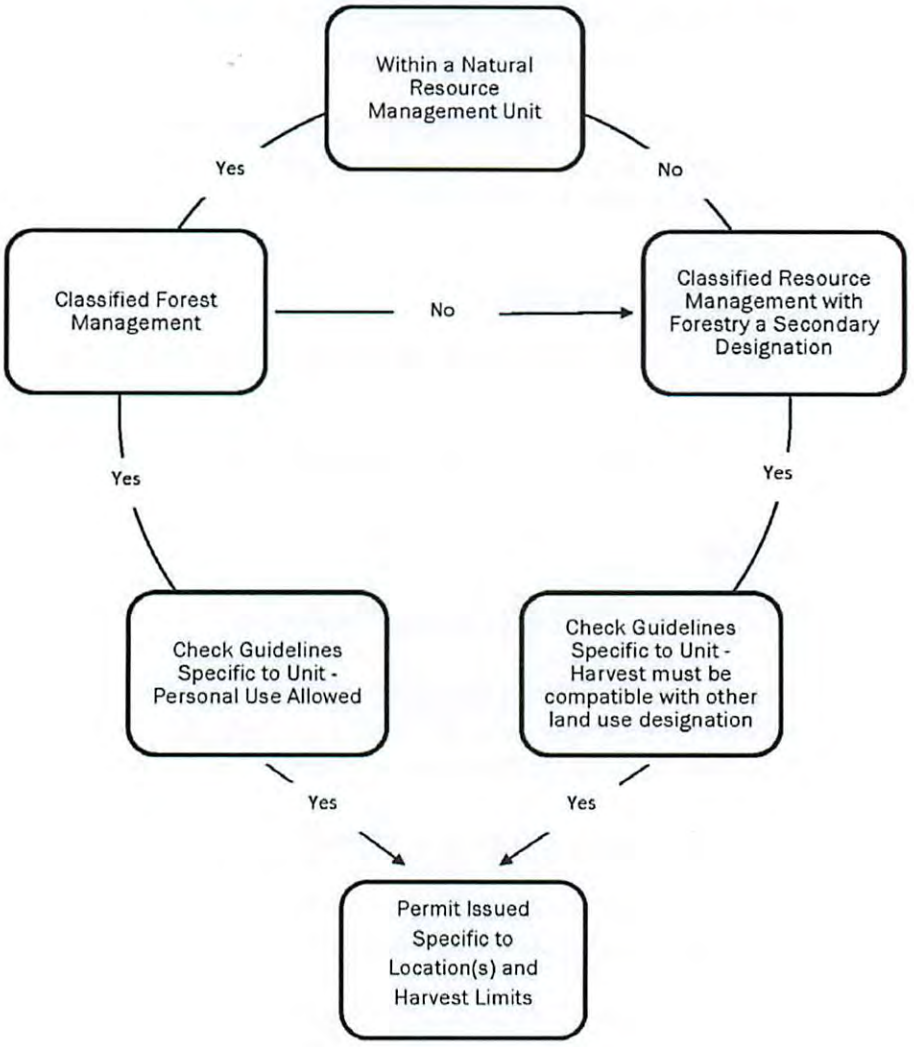
C. Marking of Areas. All personal use timber harvest areas shall be identified and marked on the ground.

D. Quantities. Quantities for personal use shall be limited as specified in Borough Code (See MSB 23.20.170(D).

E. Compliance with Borough Code. All the terms and conditions specified in MSB

23.20.170 and .150 shall be followed. (See Volume III, Appendix "P": *MSB 23.20; Forest Management*).

Figure 11~~I-3-14~~ Personal Use Timber by Permit



Timber Salvage Sales and Permits

Management Guidelines

A. Forest Product Salvage. All forest products with a commercial value that exist on any borough owned land where the timber will be removed because of a conversion of land use to non-forest (e.g., construction of trails, roads, or a public facility such as a recreation site, school, or emergency services facility, etc.) or following a natural disaster such as a wind storm, wildfire, or insect infestation shall be salvaged to reduce waste.

B. Location. All timber with a commercial value or that can be used for personal use, no matter what the land classification or land use designation shall be salvaged and utilized prior to a conversion of land use. All areas shall be clearly identified and marked on the ground.

C. Annual Allowable Cut. Timber harvested or salvaged prior to a conversion of land use, unless classified forest management or resource management and with a timber harvest designation, shall not count against the Annual Allowable Cut computations. Timber harvested or salvaged prior to a conversion of land use that is classified as forest management or resource management and with a timber harvest designation, shall count against the Annual Allowable Cut and Periodic Sustained Yield computations.

D. Five Year Timber Harvest and Timber Harvest Implementation Schedules. Timber harvested or salvaged prior to a conversion of land use does not have to appear on the Five-Year Timber Harvest Schedule or Timber Harvest Implementation Schedule. However, any salvage harvests shall be considered when placing other land on the Five-year Timber Harvest Timber Harvest Implementation schedules when meeting local or industry needs.

E. Conversion of Land Use. In order to be considered as a conversion of land use and subject to a salvage sale or permit, the project must be approved and funded prior to timber salvage operations commencing.

F. Sale or Permit. The decision 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. (See Volume III, Appendix "P": MSB 23.20; Forest Management).

Non-Commercial Timber Products

Non-commercial timber products may be collected through the use of non-competitive permits~~, or use by a permit for free~~ 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 (See Volume III, Appendix "P": *MSB 23.20; Forest Management*).

Non-Timber Biological Products

Non-timber biological products may be harvested with competitive or non-competitive permits for commercial harvesting, or free for personal use. These products include, but are not limited to:

- Berries
- Boughs
- Burls
- Cones
- Conks
- Diamond Willow
- Ferns
- Flowers
- Fruits
- Landscaping transplants
- Leaves
- Mushrooms
- Roots
- Sap

Management Guidelines

A. Commercial Use

1. Areas shall be identified in advance of any harvest activities.

2. Areas outside of Natural Resource Management Units may be made available as long as the use is not in-consistent with the underlying management intent of the parcel of borough land.

3. Commercial non-forest products may only be made available under a competitive or non-competitive permit issued annually on a calendar year basis.

4. Compensation to the borough shall be for a minimum set fee per acre, with the option at the borough's discretion for a percentage of the gross product(s) monetary value taken or utilized.

5. Bonding or Other Form of Surety may be required based on the size (acreage and/or volume) and type of activity.

6. A report shall be required following expiration or termination of the permit indicating:

a. harvest areas

b. dates and quantities harvested (by type or species) for each area

~~B.~~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 in-consistent 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 Resources 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. ~~The Alaska Division of Forestry has stated they will be updating or revising that plan following adoption of the *Susitna-Matanuska Area Plan*~~.

This Natural Resource Management Unit Plan, specifically Chapters 2 and 3, ~~does~~ incorporates portions of ~~what is in~~ the *Susitna Forest Guidelines* that are still pertinent today. The borough should work with the State Division of Forestry to make the updated or revised version of the *Susitna Forest Guidelines* (or other similar plan) and this Natural Resource Management Unit Plan as consistent as possible, recognizing that there are some differences between state laws, borough ordinances, and policies.

~~*Susitna Area Plan*~~

~~The 1985 *Susitna Area Plan* generally applies to borough land, and was adopted by ordinance into the *Matanuska-Susitna Borough Comprehensive Plan*. However, both the borough and the State Department of Natural Resources recognize that countless amendments have been made to this plan since it was adopted, and neither entity has kept accurate track of all the various changes of policies and land use designations made to the original plan.~~

~~The Department of Natural Resources is currently in the process of re-writing this plan (to be called the *Susitna-Matanuska Area Plan*). When the *Susitna-Matanuska Area Plan* is adopted, the original *Susitna Area Plan* (and all its amendments) will replaced by the new plan.~~

~~The *Susitna-Matanuska Area Plan* will not apply to borough owned land.~~

~~*Willow Sub-Basin Area Plan* and *Southeast Susitna Area Plan*~~

~~The 1982 *Willow Sub-Basin Area Plan* also applies to borough land and was also included into the *Matanuska-Susitna Borough Comprehensive Plan* by ordinance.~~

~~The State, Department of Natural Resources in 2009 completed a new *Southeast Susitna Area Plan* which replaced the entire *Willow Sub-Basin Area Plan* and portions of the *Susitna Area Plan*. The *Southeast Susitna Area Plan* does not apply to borough owned land.~~

~~*Hatcher Pass Management Plan*~~

~~None of the area covered by the 1986 *Hatcher Pass Management Plan* or any subsequent amendments overlap land involved in this *Natural Resource Management Unit Plan*. The Alaska Department of Natural Resources is in the process of revising that plan. Other than the Government Peak Subunit, there is no borough owned land in the *Hatcher Pass Management Plan* area.~~

~~Alaska Coastal Management Program~~

~~The Matanuska Susitna Borough Coastal Management Program is implemented by the Alaska Coastal Management Program (ACMP) through the coastal consistency review process described under Title 46 of the Alaska Statutes and associated regulations. State and borough actions within the coastal zone must be consistent with the provisions of the *Alaska Coastal Management Program* and the *Matanuska- Susitna Borough Coastal Management Plan.*~~

Mineral Orders

Alaska law, AS 38.05.185, requires that the State Department of Natural Resources Commissioner determine that mineral (sub-surface) entry and location is incompatible with significant surface uses in order to close state-owned mineral rights to mineral entry. If not specifically closed or subject to leasehold location, borough land is available to mineral entry under state law.

None of the Natural Resource Management Units included in this Plan contain any land with known mineral values. The borough should not request the Alaska Department of Natural Resources to

close these areas to mineral entry because the Alaska Legislature would also have to approve the closure because of acreage limitations contained in AS 38.05.300.

Oil and Gas Leasing

This plan and other borough land use plans do not make decisions concerning leasing for oil and gas on state or federal mineral estates. Those decisions are made under separate processes under state and federal law and regulations.

Also, see Volume I, Chapter 1; *Relationship of this Natural Resource Management Unit Plan to other Borough Land.*

Procedures for Changes to the Plan, Goals and Guidelines

Polices, implementation actions, and management guidelines of this plan may be changed if conditions warrant. For example, changes may be needed as new data and new technology become available. Changes in social, economic, and environmental conditions will place different demands on borough land.

Periodic Review

As required by MSB 23.20.060(E), this Plan ~~, specifically Volume I, Chapter 3: *Forest Management,*~~ must be reviewed on a decadal ~~regular~~ basis ~~(approximately once every five years),~~ to determine if revisions are necessary.

~~Other portions of this Plan should also be reviewed at the same time to determine if updates or revisions are necessary.~~

The review should be conducted by borough staff ~~and the Real Property Asset Management Board~~. Following that review, the public should be informed about the results of that review and be provided an opportunity to comment.

Changes to the Plan or Guidelines

The method for changing the plan depends on the type of change required. There are three types of changes possible to a plan: amendments, special exceptions, and minor changes. Amendments are considered 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 ~~who, in consultation with the Planning and Land Use Director,~~ will determine if a proposed change constitutes an amendment, a special exception, or a minor change.

Plan Amendments

An amendment permanently changes the plan, which includes the guidelines by adding to or modifying the basic management intent. For example, an amendment might change the guidelines

for the type and/or size of a buffer or the size of a timber-cutting unit. Only the Borough Assembly may change the plan, add, amend or delete a guideline and change a land use classification.

Procedures for Plan Amendments~~, Including Guideline, Amendments~~

~~1.~~7. The Community Development Director shall prepare a written Best Interest Finding (see Volume III, Appendix "C", *Best Interest Finding General Format)* that specifies:

- the reasons for the amendment such as changed environmental, social or economic conditions;
- the alternative courses of action (what the plan, guidelines or classification are being proposed to be changed to), including a no change or action alternative; and
- why the amendment is in the public's best interest.

~~2.~~8. A public notice of the proposed decision shall be provided pursuant to the requirements of MSB 23.05.025.

~~3. Following the public notice and comment period, the Community Development Director shall make a recommendation.~~

~~4.~~9. The Community Development Director shall submit a recommendation along with the public comments ~~and recommendations of the Real Property Asset Management Board~~ to the Borough Manager ~~for placing on the agenda~~ for the Borough Assembly's consideration.

Special Exceptions

A special exception does not permanently change the provisions of the guidelines. Instead, it allows a one-time, limited purpose variance of the guidelines, without changing their general intent.

Special exceptions may apply to prohibited uses or guidelines. For example, a special exception might be used to allow a specific timber harvest in a buffer closed to timber harvesting if the Alaska Department of Fish and Game requested the harvest to benefit wildlife habitat or to manage a timber disease.

A special exception might also be made if complying with the guidelines would be excessively burdensome or impractical or if compliance would be inequitable to a third-party, and if the purposes and spirit of the guidelines can be achieved despite the exception.

A special exception might also be used to put a seasonal or temporary Special Management Zone in place to protect wetlands, wildlife congregation areas or a bear den during periods of timber harvesting, material extraction, or for other similar reasons.

Special Exceptions to Guidelines Modified by "Will" or "Shall"

Special exceptions to guidelines modified by the word "will" or "shall" may be allowed for individual actions. The decision not to follow a pertinent guideline modified by the term "shall" or "will" must comply with the procedures for special exceptions.

Procedure for Special Exceptions

1. The Community Development Director will prepare a written Best Interest Finding (see Volume III, Appendix "C", *Best Interest Finding General Format)* that specifies:

- the reasons for the special exception (i.e., why a variance of the guidelines is needed, including reasons why the guideline is burdensome, impractical or why compliance would be inequitable to a third-party);
- the alternative action or course of action to be followed;
- why the special exception is in the best interest of the public.

2. A public notice of the proposed special exception shall be provided pursuant to the requirements of MSB 23.05.025.

~~3. Following public notice and before making a final recommendation on the proposed special exception, the Community Development Director shall provide the Real Property Asset Management Board the opportunity to review and make a recommendation.~~

~~4.~~3. The Community Development Director shall submit a recommendation, along with the public comments ~~and recommendation of the Real Property Asset Management Board,~~ to the Borough Manager for a final decision.

Minor Change

A minor change is not considered a plan or guideline revision. A minor change is a change that does not modify or add to the guideline's basic intent, and that serves only to clarify the guideline's, make them consistent, facilitate their implementation, or make technical corrections.

Procedure for Minor Changes

Minor changes are made at the discretion of the Community Development Director, after consulting with the ~~Planning and Land Use or~~ Borough Manager~~Public Works Director~~, as appropriate.

A minor change does not require public review under MSB 23.05.025. However, affected individuals and groups may be notified and have an opportunity to comment. ~~The Real Property Asset Management Board shall be given the opportunity to review and make a recommendation.~~

The Community Development Director's decision shall be prepared as a Best Interest Finding (see Volume III, Appendix "B": *Best Interest Finding General Format)* which may be appealed to the Borough Manager.

Discretion Within The Guidelines

Some guidelines, like those modified by the term "should", are written to allow for exceptions if the conditions generally described in the management intent and the guidelines for the unit are met.

For example, if a guideline says timber should only be sold on a volume basis within a firewood cutting area and the intent of the harvest to not only provide firewood but to also clear cut an area to create a moose grazing area to draw moose away from a transportation corridor, a sale using the acreage basis would best accomplish both goals.

Allowing exceptions, following the procedures below, are neither revisions nor changes to the guidelines.

Procedure for Using Discretion Within The Guidelines

Exception to guidelines with discretionary terms, such as those modified by the word "should" can be made by the Community Development Director, after consulting with the ~~Planning and Land Use or Public Works Director's~~Borough Manager~~, as appropriate~~.

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 Volume III, Appendix "B*": Best Interest Finding General Format)* in the administrative record.

The justification shall describe how the action meets the intent of the guideline or why particular circumstances justify deviation from the intended action or conditions.

Forest Research

Site specific information on forest management throughout the borough is relatively limited. Some information and research that has been done is shown in Volume III, Appendix "H": *Forest Research and Study Areas.* Both borough and state forest managers recognize that, with available funding, additional research is desirable to tailor forest management to the soils, vegetation, fish and wildlife, and other resources and uses. The borough should partner with the Alaska, Division of Forestry and the Alaska Department of Fish and Game and other interested researchers (University of Alaska, U.S.D.A., Soil Conservation Service, etc.) to share information about the following subjects:

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 timber stands does not exist. As the forest is converted to second growth through natural stand replacement processes (including wildfire) or through timber harvest and regeneration, site index, and growth and yield data should be developed.

Research to provide this information should be located throughout the borough (state and borough land) and across all types of growing sites. Permanent sample plots associated with on-going, long-term forest growth and yield research conducted by the University of Alaska research foresters needs to be mapped so these areas can be protected and preserved.

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 south-central Alaska. Analysis of the effects of existing shoreline management techniques and determination of the most appropriate techniques for the Matanuska and Susitna valleys are high priorities for research.

Winter Roads

Little information on winter road construction exists for southcentral Alaska. Snow depths and soil temperatures vary significantly from conditions in the interior Alaska and North Slope areas of Alaska and Canada where most research has been conducted.

More studies are needed for:

- Long-term impacts of winter roads in forested and muskeg regions in the Matanuska and Susitna Valleys.
- Review of standards for winter road construction in this plan and the Susitna Forestry Guidelines area including ground, snow, or frost conditions.
- Appropriate standards for ice bridge construction in various geographic locations and climatic locations in the Matanuska and Susitna Valleys.

Experimental Forests and Forest Improvement Study Areas

There is no comprehensive inventory of candidate sites for experimental forests and Forest Improvement Study areas on either borough or state land within the borough. Several areas have been proposed, such as research and educational forest related to the possible use of a wood burning facility to heat the Su Valley Middle/High School. A joint comprehensive review of both borough and state land for candidate sites is needed.

Herbicides

A complete literature review and possible field study of herbicide effects on fish and wildlife and habitat shall be conducted prior to any operational herbicide use. Because the use of herbicides and other chemicals is regulated and controlled by the Alaska Department of Environmental Conservation, and the effects of fish and wildlife is regulated and controlled by the Alaska Department of Fish and Game this work should be completed by the state. The data should address:

- Cold weather studies that approximate the Matanuska and Susitna valley's climate conditions. These studies include analysis of inert ingredients, surfactants, etc.
- Direct adverse effects of herbicides on non-target fish and wildlife species, and a contingency plan for mitigating impacts on fish and wildlife.
- Effects of shrub competition on growth and survival of spruce and birch regeneration; identification of what amount and duration of competition suppresses tree growth.
- Effects of herbicides on riparian habitat; identification of the size of buffer needed to prevent contamination of aquatic habitats.
- Effects of herbicide on the amount of 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 commenter's felt the cost was too high. Very few of the comments received recognized that there is a cost to administer all timber harvests or that the timber is owned by all borough residents. Abuses can occur in both large and small timber harvests that need to be monitored and permit and sale terms enforced.

Reforestation must also occur even for personal use harvest areas. Some of the associated costs can be reduced by harvest unit layout and harvesting techniques which encourage natural regeneration.

A review of past personal use timber harvest management shows that administration, enforcement and reforestation costs exceed permit revenues. Personal use harvest, especially for firewood, is an integral part of many borough residents daily life. Setting permit fees at a level to offset costs would likely result in people harvesting the trees without obtaining permits, which in turn raises the cost for monitoring and enforcing timber trespass.

Permit costs should be evaluated on a regular basis with the Assembly being informed of revenue raised versus operational expenses. The Assembly needs to make the final decision on what level of the costs should be offset by permit fees and where the additional funds should come from to continue the personal use timber harvest program.

The public needs to be informed on the costs associated with providing for personal use timber harvests.

Funding, Education and Enforcement

Adequate staff for field research, forest management, timber harvest and road design, monitoring, and enforcement are essential to implement the Forest Management Plan and manage natural resource management units. Staff and funding levels should be reviewed on an annual basis.

Information about the proper use and enjoyment of borough public land for all uses and users is best done through education. Educational programs in schools, interacting with Community Councils, special interest groups, etc., and use of various written and electronic mediums (i.e., web site) should be encouraged and funded.

While education is preferred to enforcement, reality is that education does not work effectively unless enforcement is available as a "last resort" management tool. It is recommended that the Borough Assembly give designated borough staff limited authority (similar to animal control or code enforcement) to enforce trespass, theft of public resources, activities that exceed those allowed in various land-use authorizations, vandalism, damage to public land and water resources, and unauthorized uses of borough land.

Recommended ~~Ordinance~~ Code Changes

In order to implement this plan and to make the plan work effectively and efficiently, some changes and additions to borough code are recommended[51].

The Fish Creek Management Plan should be repealed and replaced by this updated Plan. The management guidelines in the Fish Creek Plan were onerous and varied considerably from the management guidelines that apply to the other 21 Natural Resource Management Units. One purpose of this update of the NRMU Plan is to bring the Fish Creek Unit into conformance with the other units to enhance the borough efficiency and effectiveness as implementing this Plan. The management guidelines in this updated plan provide adequate protections for the environment and surrounding property owners. The last eight years of implementing this Plan have provided ample evidence that the standard NRMU management guidelines will be sufficient to manage development and use of the borough land within the Fish Creek Unit.

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 2018;**

(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.

~~MSB 23.05.100 Classifications~~

- ~~Change the definition of "Forest management lands" to read:~~

~~"Forest management lands" are those lands which, because of physical, climatic, and vegetative conditions, are presently or potentially valuable for the production of timber and other forest products. [FOREST MANAGEMENT SHALL EMPHASIZE THE MULTIPLE USE CONCEPT.]~~

[51] ~~These recommended changes and additions were adopted though ordinance serial number 10-084 (am).~~

~~This revised definition applies only to land determined by a Forest Inventory to be Operable Forest Land, Merchantable Forest Land, or both. This type of land will only be located within a Natural Resource Management Unit, and where forest management is a primary or secondary activity. Other activities can still occur as long as the guidelines for those activities are followed.~~

~~The sentence "forest management shall emphasize the multiple use concept" is a management intent statement that is not appropriate in a definition. Forest Management lands will all be located in Natural Resource Management Units which will be defined (see definitions below) to require multiple use management.~~

- ~~Change the definition of "Resource management lands" to read: "~~

~~Resource management lands are lands which, because of surface or subsurface resources contained within the land or in connection with adjacent lands, are presently or potentially valuable for [TO] multiple use management. [SUCH MANAGEMENT MAY BE ACCOMPLISHED IN WHOLE OR IN PART PURSUANT TO AN INTERAGENCY AGREEMENT].~~

~~55 These recommended changes and additions were adopted though ordinance serial number 10-084 (am).~~

Many areas within Natural Resource Management Units ~~will~~ were~~be~~ classified as Resource Management Lands because of their multiple-use values. Any resource, such as forestry, public recreation, important wildlife habitat, etc. can occur at the same time and in the same place. Management intent for the unit or sub-unit will specify which uses are primary and which are secondary uses. The classification provides the overarching guidance for land use.

~~The sentence dealing with interagency agreements is unnecessary because all borough owned land can be managed via an interagency agreement, consignment, or other agreement to be managed by a third party, with Assembly approval.~~

~~MSB 23.05.150 Definitions~~

- ~~Add a definition for Natural Resource Management Unit to read:~~

~~An Assembly designated geographic area of borough owned land that has and is managed for multiple use values. This includes, land classified or with management intent for; important fish and wildlife habitat, forest management, material, mineral, public recreation, watershed, and important wetlands. These units shall not include non-borough owned land, or land classified for agricultural, commercial, industrial, private recreation, or residential land.~~

~~This definition is needed to clearly define what a Natural Resource Management Unit is and what types of land uses, land designations and land use classifications can, and cannot occur within the unit. This is a new type of land and natural resource management category which replaces and clarifies what multiple use actives can occur within what were formally called Forest Management Units.~~

- Add a new definition for a Special Management Zone to read:

Land within a natural resource management unit or sub-unit where special resource protections are put in place for a specific reason yet allowing some activities to occur with restrictions. For example special management zones can be used for wetland protection (allowing some uses to occur when adequate snow cover exists), seasonal wildlife concentration areas, seasonal trumpeter swan staging areas, brown bear denning areas, protecting cultural resources and historical sites, or designating specific areas for certain timber harvest methods and means. Resource extraction and use activities, such as timber harvesting can occur in these zones, conditionally, such as imposing seasonal restrictions or requiring specific operational methods and means. When creating a special management zone, the management intent and management guidelines for the zone must be clearly defined.

This is a new category of land that can be used to extend a protection area beyond a buffered area, yet allow some limited activities to occur, such as certain types of public recreation. It may also be used to provide seasonal protections for such things as wildlife congregation or calving areas, bear denning locations, or bird breeding areas. They can also be used to protect important cultural resources and historical sites, or educational and research areas.

The guidelines for Special Management Zones (Volume I, Chapter 2, Special Management Zones) specify how permanent, temporary or seasonal Special Management Zones can be created, modified or eliminated.

MSB 23.20 Forest Management

- Amend MSB 23.20.040 (Annual Allowable Cut) to read:

(A) The allowable cut on borough land is the amount of [ACREAGE OR] volume, not acreage, of commercial forest land that may be harvested periodically.
(B) Annual allowable cut equals the total volume, not acreage [AMOUNT] of operable forest land [ACREAGE] in all borough [FOREST MANAGEMENT] Natural Resource Management units classified as "forest management lands", or "resource management lands" and has a primary or secondary land use designation for forest management divided by the rotation period of the dominant timber stand type established in MSB 23.20.020.
(C) The total commercial and operable forest land by volume [ACREAGE] in all borough forest management units will be determined by the forest inventory in MSB 23.20.020.
(D) An annual allowable cut on available borough commercial forest land within all [FOREST MANAGEMENT] Natural Resource Management Units shall be managed on a decadal (10-year) basis. Harvest volumes in an individual forest management unit may be above or below the annual allowable cut to allow for efficient management, silvicultural needs, and responsiveness to market fluctuations.
(E) Timber harvest volumes sold, leased, or permitted and harvested under Personal Use of Timber resources (MSB 23.20.170) shall not count against annual allowable cut limitations established in this section.

~~(F) Land that is classified as "forest management lands" or "resource management lands" and that has a primary or secondary land use designation for forest management and that will undergo a conversion of use from forest management to another primary use within 5 years of a timber harvest, shall not be considered as operable forest land acreage for determining annual allowable cut. The annual allowable cut shall be recomputed to reflect the reduction in the operable forest land acreage base to ensure that timber harvests are conducted on a sustained yield basis. Land that is converted to another use shall be reclassified to the most appropriate use prior to the conversion of use.~~

~~Changes to Sections A and C reflect that appropriate volume (i.e., board feet, cubic feet, weight, etc., but not acreage) shall be used to determine annual allowable cut. Prior to this point, only acreage was used which was and is inconsistent with forest management practices and industry standards.~~

~~This change will ensure that annual allowable cut is not exceeded in areas where volume is higher in some locations (different units or within the same unit). In addition, using a volume measurement, is more conducive for making larger areas available for specialty products where select or selective harvest is utilized (house logs, bowls, cabinets, flooring). In these situations the harvest is very low per acre and usually spread out over a large area. In other cases, such as firewood harvest or to create wildlife habitat, acreage is the preferred harvest method to strictly define a harvest area and the means and methods of harvest.~~

~~In all cases, Annual Allowable Cut and Sustained Yield will be based on a volume measurement, which shall not include acreage as a volume measurement.~~

~~See Chapter 3, Forest Management, Sustained Yield and Annual Allowable Cut, for a more complete discussion on volume versus acreage.~~

~~Changes to Section B ensure that only operable timber areas that could be made available for timber harvest are used to compute the Annual Allowable Cut, not all areas that may have operable timber. Areas available for timber harvest must be classified as Forest Management Lands, or Resource Management and be available (areas with either a primary or secondary designation) for timber harvest. In other words, some areas may have been inventoried and have operable timber, but through the land use planning process the land has been classified as Public Recreation Lands. These lands are not available for timber harvest and the operable timber area cannot not be used to determine annual allowable cut.~~

~~Section E makes it clear that all personal use timber harvest volumes sold, leased, permitted and harvested shall not count towards the Annual Allowable cut limitation. Also, see proposed changes to MSB 23.20.170 which lowers the current volumes that can be harvested for Non-commercial Personal Use of Forest Products. These two proposed ordinance changes should be adopted together.~~

~~If MSB 23.20.170 is not adopted, then Section E of this section should be changed to have personal use harvest count against the Annual Allowable Cut in order to ensure that sustained yield for timber resources is maintained.~~

New Section F ensures that annual allowable cut and sustained yield is based on operable forest land that will remain as forested land where regeneration will occur. Conversion of such lands to other uses within Natural Resource Management Units is expected to be rare, and shall only be done to serve a compelling public purpose and only with the authority of the Assembly. Land that will be converted to another use within 5 years cannot be used to retain a higher annual allowable cut. In order to ensure that timber is harvested at a continued sustainable rate, the subject operable forest land shall be removed from the operable timber base, and the Annual Allowable Cut recomputed and put into immediate effect. Land that is converted to another use shall also be reclassified to reflect the conversion of use prior to the conversion of use.

For example, operable forest land designated as forest management land, is used to calculate the annual allowable cut and sustained yield. However, if it is proposed that the land will be converted to agricultural use within 5 years after the timber harvest, the land must be reclassified and the amount of operable timber land subtracted from the base figure for figuring annual allowable cut and sustained yield. However, if the conversion of use to agricultural use (or any other use) does not occur within five years, the area may remain as operable forest land and the land shall continue to be managed for forest management purposes until such time a conversion of use does occur, if ever.

Other changes to this section are to make it consistent with other proposed changes to MSB 23.20 as described in this chapter.

- Amend MSB 23.20.050 (Forest Management Units) to read:

Natural Resource Management Units [FOREST MANAGEMENT UNITS]
(A) Land classified as Forest Management Lands shall be placed into Natural Resource Management Units [FOREST MANAGEMENT UNITS] and be subject to a Natural Resource Management Unit Plan [FOREST MANAGEMENT PLAN].
(B) Unclassified land and land classified for another purpose may also be placed in Natural Resource Management Units [FOREST MANAGEMENT UNITS] in order to facilitate overall management of all land and resources within the Natural Resource Management Unit [FOREST MANAGEMENT UNIT].

This change is needed to make this section consistent with other changes to this title. Natural Resource Management Units are being substituted for Forest Management Units and plans for forest management will be included in plans for Natural Resource Management Units instead of a stand-alone Forest Management Plan. This change emphasizes the multiple-use concept for all resources and uses within Natural Resource Management Units.

- Amend MSB 23.20.060 (Forest Management Plan) to read:

(A) The Borough shall maintain a natural resource management plan for natural resource management units which shall include a [F]forest [M]management [P]plan that provides for the planning and management of land and resources within and among the natural resource management [FOREST MANAGEMENT] units.
(B) A natural resource management plan [FOREST MANAGEMENT PLAN] may cover more than one natural resource management unit [FOREST MANAGEMENT UNIT], and conversely, more than one natural resource management plan

~~[FOREST MANAGEMENT PLAN] may be adopted to cover the various natural resource management [FOREST MANAGEMENT] units.~~

~~(C) Natural resource management plans [FOREST MANAGEMENT PLANS] shall be consistent with borough adopted land use and management plans.~~

~~(D) The plans shall contain, at a minimum, the following elements:~~

~~an analysis and determination of commercial forest land, operable commercial forest land, potential timber harvests, access, and market demand;~~

~~commercial timber harvests for forest products that include such things as firewood (cordwood), fence posts (posts), house logs and saw logs (logs), or wood fiber (chips);~~

~~permits, leases, and sales for the harvest of non- timber forest products;~~

~~forest management guidelines for non- extractive uses shall addresshabitat~~

~~and recreaimportantareas for fish and wildlife~~

~~local business enterprises;~~

~~scenic quality;~~

~~substantial areas important to tourism~~

~~environmentally sensitive areas;~~

~~water quality; and~~

~~soils.~~

~~Natural Resource Management Plans [FOREST MANAGEMENT PLANS] shall be reviewed on a regular basis, undergo full public review and comment under MSB 23.05.025, and any proposed changes to the plan shall be approved by the Assembly.~~

~~This change is consistent with other changes suggested for this chapter. Natural Resource Management Plans are being substituted for Forest Management Plans. This change emphasizes the multiple-use concept for all resources and uses within Natural Resource Management Units.~~

~~Amend MSB 23.20.090 (Five-year Sale Schedule) to read:~~

~~Five-Year [SALE] Timber Harvest Schedule~~

~~Only land that is classified as "Forest Management Lands," or "Resource Management Lands" and has been determined to be to operable timber land and has a primary or secondary land use designation for forest management and is located within a natural resource management unit [FOREST MANAGEMENT UNIT], and is subject to [HAS] an adopted natural resource asset management [Forest Management P] plan may be included in the five-year [SALE]~~

~~timber harvest schedule.~~
~~Land that is not classified as "Forest Management Land" may be utilized [SOLD, LEASED, OR PERMITTED] for firewood sales, salvage sales, personal use, or for non-forest products. This land does not have to be located within a natural resource management [FOREST MANAGEMENT U]unit[;] and does not need to be subject to an adopted natural resource asset management [FOREST MANAGEMENT P]plan[; AND DOES NOT NEED TO BE].~~
~~However, firewood and personal use harvests shall be included in the five-year [SALE] timber harvest schedule.~~
~~At least every two years, the director shall prepare a five- year schedule of timber [SALES] harvests planned on forest land owned by the borough.~~
~~The amount proposed for [SALE] timber harvest per year must be within the requirements of MSB 23.20.040.~~
~~[(E) TO THE EXTENT POSSIBLE, THE FIVE-YEAR SALE PROCESS SHOULD BE COORDINATED WITH THE ALASKA, STATE DEPARTMENT OF NATURAL RESOURCES, DIVISION OF FORESTRY'S FIVE-YEAR TIMBER SALE PROCESS.] Repealed and reenacted as (I).~~
~~[(F) THE FIVE-YEAR SALE SCHEDULE SHALL BE SUBJECT TO PUBLIC REVIEW AND COMMENT AS PROVIDED BY MSB 23.05.025.]~~
~~Repealed and reenacted as (J).~~
~~[(G) THE ASSEMBLY SHALL APPROVE THE FIVE-YEAR SALE SCHEDULE.] Repealed and reenacted as (K).~~
~~To the extent possible, ensure that local resident timber needs are made available, principally for personal use firewood, before or during any other timber harvest activity.~~
~~To the extent possible, the five-year timber harvest schedule process should be coordinated with the Alaska, State Department of Natural Resources, Division of Forestry's five-year timber sale process.~~
~~The five-year schedule shall be subject to public review and comment~~

~~as provided by MSB 23.05.025.~~
~~The Assembly shall approve the five-year timber harvest schedule.~~

~~Existing sections E, F, and G are being repealed and renumbered as sections I, J, and K in keeping with the general order of the information presented to the Assembly. The order does not indicate any priority order. Section H is new to ensure that local resident needs for personal use timber (firewood) are on the five-year timber harvest schedule.~~

~~The other changes are necessary to delete the reference to "sales" and change it to "timber harvests" in the five-year schedule. This change will reflect that all timber harvests, including personal use and community use, not just commercial sales will be nominated and made available for public comment and Assembly approval. This section also states that timber harvests on the Five-Year Timber Harvest Schedule must be on land within Natural~~

~~Resource Management Units and be classified and designated for timber harvest. Amend MSB 23.20.100 (Contents of Five-year Sale Schedule) to read:~~

~~Contents of Five-Year [SALE] Timber Harvest Schedule~~
~~Timber [SALES] harvests should be offered in a range of volumes, timber types, products and duration to accommodate different sectors of [THE] forest products [industry].~~
~~Proposed [SALE] harvest offerings shall consider:~~
~~location and access;~~
~~markets;~~
~~volumes;~~
~~limits of the annual allowable cut;~~
~~personal and community needs;~~
~~other forest uses, and;~~
~~public comments.~~

~~For each proposed [SALE] harvest at least the following information shall be included in order to provide the public, communities and the forest product industry with a basis on which to comment on the proposed [SALE] harvest(s):~~
~~acreage of the total area and operable area:~~
~~timber species, volume, and size category (sapling, pole timber, saw timber);~~
~~current land/resource uses;~~
~~existing infrastructure (including road and trail access);~~
~~existing land use plans;~~
~~development patterns and surrounding land use;~~
~~zoning, or other land use restrictions;~~
~~public health, safety, welfare concerns;~~
~~public water bodies (including buffers);~~
~~soils and terrain;~~
~~cost/revenue analysis of the proposed [SALE] harvest;~~

~~estimated minimum price based on current market value as determined b MSB 23.20.150; [AND]~~
~~contract or permit performance standard; and~~
~~type(s) of harvest (personal use, firewood, specialty, sawlog, utility.~~

~~The primary change is to ensure that personal/community needs are specifically addressed in the contents of the Five-Year Timber Harvest Schedule. In order to maintain a logical order for information that must be provided, Section (B) sections 2 through 6 are being repealed and renumbered as 8 through 12.~~

~~Other changes reflect the change from "sale" to "harvest" in the contents of the Five-Year Timber Harvest Schedule so it is consistent with the Five-Year Timber Harvest Schedule (23.20.090).~~

~~Amend MSB 23.20.110 (Sale Implementation Schedule) to read:~~

~~[SALE] Periodic Timber Harvest Implementation Schedule~~
~~For those areas covered under an approved five-year [SALE] timber harvest schedule, the director shall prepare a schedule to implement approved timber [SALES] harvests.~~
~~The schedule may not propose more [SALE} timber harvest volume than that allowed under MSB 23.20.040.~~
~~[(C)] [THE IMPLEMENTATION SCHEDULE SHALL BE SUBJECT TO PUBLIC REVIEW AND COMMENT AS PROVIDED BY MSB 23.05.025. REVIEW AND COMMENTS SHALL BE LIMITED TO THE SALE SCHEDULE AND TERMS AND CONDITIONS OF THE SALE.]~~
~~The schedule shall reasonable ensure that local resident timber needs are made available, primarily for personal use firewood, before or during any other timber harvest activity.~~
~~The [SALE] periodic timber harvest implementation schedule shall be subject to public review and comment as provided by MSB~~

~~Review and comments shall be limited to the [SALE] timber harvest schedule and terms and conditions of the [SALE] timber harvest. This change reflects the change from "sale" to "timber harvest" in the Timber Harvest Implementation Schedule to make it consistent with the Five-Year Timber Harvest Schedule (23.20.100).~~

~~Section C is being repealed and moved to Section E in order to keep the order for the Periodic Timber Harvest Implementation Schedule is a logical sequence.~~

~~Section D has been added to reasonably ensure that local personal use needs are met prior to, or at the same time, commercial harvests are made available.~~

~~Amend MSB 23.20.120 (Multiple Sales Within the Same Sale Unit) to read:~~

~~Multiple [SALES] types of timber harvests for different forest products within the same site or cutting area are encouraged (i.e., a select cut sale for a specific value-added product followed by, or in conjunction with, another select cut sale for a different value-added product or a sale for wood fiber products).~~
~~[MULTIPLE SALES ON THE SAME SITE OR CUTTING AREA SHALL ONLY BE COUNTED ONE TIME AGAINST THE ANNUAL ALLOWABLE CUT AS DETERMINED BY MSB 23.20.040 EVEN THOUGH THE SUCCESSIVE SALE MAY OCCUR IN A DIFFERENT YEAR.]~~
~~(C)~~
~~The deletion of paragraph B is needed to ensure that annual allowable cut and sustained yield rotation periods are not exceeded. Paragraph B was written based on an acreage calculation rather than a volume calculation. This plan, and the previous recommended ordinance changes, requires that a volume measurement (excluding acreage as a volume measurement) be~~

~~used. Multiple sales on the same site will be computed by the total volume harvested in the multiple sales, not on the acreage harvested.~~

~~Amend MSB 23.20.170 (Non-Commercial Personal Use of Forest Products) to read:~~

~~Amend MSB 23.20.180 (Real Property Asset Management Board Review) to read:~~

~~(A) The board shall review asset management plans for natural resource management units, including forest management, sustained yield, and harvest goals and levels, [FOREST MANAGEMENT], five-year [SALE] timber harvest and timber harvest implementation [PLANS AND] schedules of sales and leases, and permits and make recommendations to the director, manager, and assembly for:~~
~~(1) adherence to borough code;~~
~~(2) forest plan recommendations and requirements; and~~
~~(3) to ensure public and forest land needs are being met.~~
~~This change reflects the use of asset management plans for managing Natural Resource Management Units and the need for the Real Property Asset Management Board to have the responsibility for reviewing and making recommendations on those plans and their implementation.~~

Land Ownership and Exchanges

During Phase I (Scoping) and subsequent public involvement steps of developing this Plan, many members of the public felt that borough ownership of all, or portions of the Bunco Hills, Whiskers Creek North and Whiskers Creek South Natural Resource Management Units should be owned by the State of Alaska, not the Matanuska-Susitna Borough.

More specifically, the commenter's thought all or portions of these units should be added to the Alaska State Park system. The reasons varied, but the majority of commenter's believed that adding the areas to the state park system would ensure that the areas stay the way they are today and are not developed or used for other purposes.

Borough management of the Bunco Hills, Whiskers Creek North and Whiskers Creek South Natural Resource Management Units is described in Volume II, *Natural Resource Management Units.*

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 by the land owned by the state in the Fish Creek Management Area that is adjacent to where the borough already owns land.

The borough may, at some point in the future, want to pursue a land exchange with the state under AS 29.65.090 (Municipal Land Exchanges) if suitable other state land can be identified.