Moose feeding in a lake. Photo by Kate Banish, USFWS

Matanuska-Susitna Borough coastal Management Plan

Effective April 9, 2007

Prepared By:

Bristol
ENVIRONMENTAL & ENGINEERING
SERVICES CORPORATION

LaRoche + Associates

MATANUSKA-SUSITNA BOROUGH

Coastal Management Plan
Final Plan Amendment
Effective April 9, 2007

Citizens Advisory Committee

Matanuska-Susitna Borough Planning Commission

Matanuska-Susitna Borough Assembly

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1.0 CHAPTER ONE INTRODUCTION

The original Matanuska-Susitna Borough (MSB) Coastal Management Program (CMP) was adopted in 1984, with subsequent amendments in 1988. The major purpose of the 2005 Revised CMP is the balanced management of the physical, biological, and cultural resources of the MSB coastal zone. The CMP is used to manage the wide range of coastal uses and resources, including development along the lakes, rivers, streams, and roadways; important areas for community recreation; natural hazards; and coastal habitats. The CMP is a policy statement, directing issues of local concern and the development needs of MSB residents.

Recent changes in Alaska State law require that the MSB revise the CMP. This document has been prepared to comply with the Alaska Coastal Management Act, as amended by the Alaska State Legislature in 2003, and the Alaska Coastal Management Program (ACMP) regulations adopted in 2004. The MSB coastal zone encompasses 4,000 square miles of valuable watersheds, wetlands, uplands, rivers, streams, and lakes. All of these are important MSB resources that influence the quality of the MSB's coastal marine environment. New state regulations require the MSB to assign a designation to ensure that the MSB continues to have local input on proposed development occurring adjacent to or on rivers, streams, and lakes within its coastal zone. State-approved designations are limited to: recreation, tourism, natural hazards, major energy facilities, subsistence, commercial fishing and seafood processing, and archaeology/history. The most suitable designation for the MSB is the Recreation Use Designation. The proposed designation does not include Point MacKenzie AMSA, which is designated separately as a Major Energy Facility Use Area and has its own set of enforceable policies. The Designation allows the MSB to continue to have an opportunity to review development actions that require state or federal permits.

The MSB has supplemented existing resource information with updated information necessary to address emerging and changing issues in the community and to support its enforceable coastal management policies. New maps have been developed for proposed designations. Where data has been readily available, new resource inventory maps have been prepared.

The goals and objectives that cannot be addressed through enforceable policies of the Coastal Management Plan are achieved through the Borough through the Borough's land use ordinances, lake management plans, local comprehensive plans (city and sub-regional efforts, borough-wide comprehensive plans, public facilities and recreation plans, trails plans, and transportation plans.

The Matanuska-Susitna Borough, through its planning powers, exercises all planning, zoning and platting powers on an area wide basis. The Cities of Wasilla and Palmer exercise their own zoning powers. The Borough implements the City of Houston zoning ordinance. The borough retains exclusive responsibility for platting, final subdivision approval, planning and development of transportation networks. All subdivision plats are reviewed for consistency with borough coastal zone goals, objectives and enforceable policies.

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2.0 CHAPTER TWO PLAN ORGANIZATION

The MSB CMP has been developed in three volumes. Volume I is the plan for the MSB coastal zone excluding the Point MacKenzie Area Meriting Special Attention (AMSA), Volume II is the Point MacKenzie AMSA/Designated Major Energy Facility Use Plan, and Volume III contains the maps for Volumes I and II.

Key elements of the Volume I include:

- Chapter 1. Introduction
- Chapter 2. Plan Organization. A description of how the CMP is organized.
- Chapter 3. Boundary. A narrative description and map identifying the coastal zone boundaries.
- Chapter 4. Resource Inventory and Analysis. A description of the coastal resources upon which the MSB depends and an analysis of the impacts to uses and activities.
- Chapter 5. Issues of Concern, Goals, and Objectives. A description of the issues of local concern, goals for balanced management of coastal resources, and objectives for how the management is to occur. To be used to support enforceable policies applicable to the land and water uses subject to the CMP.
- Chapter 6. Enforceable Policies and Designated Use Areas. Enforceable policies implement the goals and objectives and provide the standards for uses and activities within the MSB coastal zone boundaries. Designated Areas are described in a narrative and include a map defining areas designated for specific use.
- Chapter 7. Implementation. Identifies the land and water uses and activities subject to the ACMP and describes how the plan is implemented locally and by State and federal agencies.
- Appendices. Includes the Enforceable Policies, Enforceable Policy Cross Reference Table, List of Abbreviations and Acronymns, References, and Definitions.

Volume II is the Point MacKenzie AMSA/Major Energy Facility Use Designated Area

Volume III are the Plan Maps for both the MSB CMP and AMSA Plan

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3.0 CHAPTER THREE BOUNDARY AND DESIGNATION

The MSB coastal zone is much smaller than the corporate area. The coastal zone is about one-sixth of the overall corporate acreage. The MSB coastal zone encompasses approximately 4,000 square miles, including approximately 200 square miles of offshore areas and 75 miles of coastline.

The coastal zone boundary generally begins at the eastern tip of the Knik Glacier and travels westward, encompassing the entire Knik River drainage, across the Knik River Bridge. The boundary continues westward along the north shores of Knik Arm and Cook Inlet, following the MSB corporate boundary. The coastal zone boundary then travels north approximately 10 miles south-southeast of the mouth of the Beluga River. The boundary roughly follows the river northwestward to the north shore of Beluga Lake, northward to Gold Hill, thence eastward across the southern slopes of Mount Yenco, to Montana Creek, where the boundary travels southward along the Parks Highway to the Nancy Lake State Recreation Area. The boundary then turns easterly through the northern portion of Wasilla and across Moose Creek and the Matanuska River. Here the boundary changes to a southeast direction across the east and south slopes of Lazy Mountain and along the Knik River Valley to the point of beginning. See Section 3.2 below for the complete legal description.

There are a number of federal and state parks, game refuges, recreation areas, or properties owned by entities other than the MSB (e.g., university or privately owned properties). The Goose Bay, Palmer Hay Flats, and Susitna Flats State Game refuges are located within the MSB coastal zone. Big Lake and Nancy Lake State Recreation areas are also located within the coastal zone.

The cities of Houston, Palmer, and Wasilla are partially located within the coastal zone. The MSB-recognized communities of Big Lake and Skwentna are completely within the coastal zone, and Willow is partially within the coastal zone.

3.1 DESIGNATION

The MSB coastal zone boundary is a Designated Recreation Area (Designation). The uses and activities, and the physical, biological, and cultural assets of the coastal zone, warrant creation of this designation in accordance with 11 AAC 114. 250(c) and, within this Designation, the CMP enforceable policies will apply. The Designation does not include Point MacKenzie, which is an AMSA and Designated Major Energy Facility Area.

3.2 LIST OF MAJOR STREAMS INSIDE THE COASTAL ZONE BOUNDARY

The coastal zone boundary extends to the 1,000-foot contour level and 200 feet from the ordinary high water mark on the banks (both sides) of each stream.

- Chulitna River
- Kahiltna River
- Kashwitna Creek
- Kroto Creek
- Lake Creek
- Little Susitna River
- Little Willow Creek
- Lower Kroto Creek (Deshka River)
- Matanuska River
- Montana Creek
- Moose Creek
- Sheep Creek
- Skwentna River
- Susitna River
- Talachulitna River
- Talkeetna River
- Willow Creek
- Yentna River

3.3 COASTAL ZONE BOUNDARY LEGAL DESCRIPTION

The following legal description delineates the MSB coastal zone boundary and includes all lands and waters within the following townships, or portions of townships described, on a protracted basis whether surveyed or unsurveyed.

T12N, R7, 8,and 9W:	All that portion within the Matanuska-Susitna Borough boundary.
T13N, R4, 5, and 6W:	All that portion within the Matanuska-Susitna Borough boundary.
T13N, R7, 8, and 9W:	All.
T14N, R3 and 4W:	All that portion within the Matanuska-Susitna Borough boundary.
T14N, R5 thru 11W:	All.
T15N, R2 and 3W:	All that portion within the Matanuska-Susitna Borough boundary.
T15N, R4 thru 11W:	All.
T16N, R1E:	All that portion within the Matanuska-Susitna Borough boundary.
T16N, R2 and 3E:	All.
T16N, R4E:	Sections 4 thru 10, 13 thru 36.
T16N, R5E:	Sections 19 thru 21, 28 thru 33.
T16N, Rl, 2, and 3W:	All that portion within the Matanuska-Susitna Borough boundary.
T16N, R4 thru 13W:	All.
T17N, Rl and 2E:	All.
T17N, R3E:	Section 6 thru 8, 16 thru 22, 25 thru 36.
T17N, R4E:	Section 31.
T17N, Rl thru 12W:	All.
T18N, R2E:	All.
T18N, R3W:	Section 15 thru 36.
T18N, R4 thru 12W:	All.
T19N, R4W:	All that portion lying west of the east boundary of the Parks Highway right-of-way.
T19N, R5 thru 12W:	All.
T20N, R4W:	All that portion lying west of the east boundary of the Parks Highway right-of-way.
T20N, R5 thru 12W:	All.
T21N, R4W:	All that portion lying west of the east boundary of the Parks Highway right-of-way.
T21N, R5 thru 12W:	All.
T22N, R4W:	All that portion lying west of the east boundary of the Parks Highway right-of-way.
T22N, R5 thru 12W:	All.
T23N, R4W:	All that portion lying west of the east boundary of the Parks Highway right-of-way.
T23N, R5 thru 12W:	All.

In addition, these descriptions are included on two versions of the Tyonek #89 Topographic map showing the MSB CZM boundary map and describe some of the irregular boundary details.

- The inland coastal zone boundary in this portion of the MSB includes all islands and the lands and waters within: 1) the 400-foot elevation contour near Beluga Lake, and 2) the 200-foot elevation contour east of the Parks Highway, which is included in the original coastal zone boundary map.

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4.0 CHAPTER FOUR ISSUES, GOALS, AND OBJECTIVES

4.1 INTRODUCTION

This chapter presents the issues, goals, and objectives of the MSB CMP. Many of the following statements of issues, goals, and objectives were developed for the original plan, and continue to form the basis for the Amendment and enforceable policies chapter. For the most part, the previously adopted issue and goal statements have been retained. However, some rewording has been necessary to comply with the current requirements of the ACMP.

The 1984 CMP identified current and potential issues, which continue to be subjects or matters of local or regional concern to residents of the MSB. The issues define the local matters of concern; the goals are statements of long-term results, conditions, or situations that the residents of the MSB wish to achieve; and the objectives are actions that can be taken towards achieving the goal.

The subject uses for which goals and objectives are presented in this chapter include:

- Coastal Development
- Recreation
- Natural Hazards
- Culture, History, and Archaeology
- Transportation Facilities and Utilities
- Energy Facilities
- Important Habitat
- Air, Land, and Water Quality

Issues, goals, and objectives provide the framework for developing enforceable coastal management policies. Coastal resource issues are interconnected, goals may directly support one another, objectives may aid in the accomplishment of more than one goal, and policies may implement more than one objective.

4.2 ISSUES

The issues have evolved from local perspective and local circumstances. Therefore, the issues must be considered when decisions are made that have the potential to significantly affect the physical, biological, or cultural use of coastal resources within the MSB coastal zone. Where appropriate, broader issues of concern to the ACMP have also been considered as they specifically relate to issues of local concern.

Issues may also overlap with concerns of other major planning efforts ongoing within the MSB such as: the Long Range Transportation Plan, Borough-wide Comprehensive Plan Update, and lake management program, local community and city comprehensive planning efforts, and other state and federal agency resource planning and management efforts. Issues of concern and goals and objectives have been derived from the following sources:

- Resource Inventory and Analysis. Resource sensitivities, development limitations and resources.
- Local Planning Efforts. Significant impacts to physical, biological, and cultural resources of the MSB coastal zone as described in a series of twenty-plus lake management plans and many local comprehensive plans (city and sub-regional efforts).
- Regional Planning Efforts. Significant impacts to physical, biological, and cultural resources as described in a series of State of Alaska planning documents such as area plans, fish and game management plans, and recreation management plans.

There is a strong desire for local influence over coastal resource management and for increased local control of the resolution of issues related to coastal resource development. The following section describes the coastal management issues for the MSB.

4.2.1 Coastal Development Issues

1. The MSB coastal zone encompasses 4,000 square miles of valuable watersheds, wetlands, uplands, rivers, streams, and lakes.
2. Based on population growth forecasts, there will continue to be increasing and competing pressures for development within the MSB coastal zone, and for use of its coastal resources.
3. There is increasing pressure on rivers, streams, and lakes for shoreline development with residential, commercial, and industrial uses.
4. There are uses and activities that are economically or physically dependent on a lakeshore location.
5. There are significant physical, biological, and cultural features of the rivers, streams, and lakes upon which recreation uses depend.
6. Responsible development of an industrial port/park complex at Point MacKenzie on the Knik Arm is important to the economic well being of MSB residents and the State of Alaska.
7. There is support for cooperative planning and development of the Knik Arm Crossing.

4.2.2 Recreation Issues

1. Recreation is a widely valued resource that relies upon the physical, biological, and cultural features of the rivers, streams, and lakes within the MSB coastal zone.
2. Adequate, safe, and maintained access to the coastal land and water resources upon which many uses and activities depend, including recreation activities, is key to future economic growth and development in the MSB.
3. Development immediately adjacent to major rivers, streams, and lakes should be designed and located so as not to preclude future public access to the resource.
4. Many residents and visitors enjoy hiking, camping, fishing, hunting, picnicking, viewing wildlife, berry picking, and other outdoor recreation activities.
5. Natural features, including scenic views, clean air, fish and wildlife resources, wild land terrain, and recreational opportunities, provide the basis for much of the recreation use in the MSB.
6. Natural features provide opportunities for scientific study and education.

7. There is a need for private and public economic development of the natural resources that support recreation potential.
8. Public access to rivers, streams, and lakes must be retained as land is subdivided or developed.
9. Existing, regularly used trails need to be included as a reservation of right-of-way or easement when land is subdivided or developed.
10. Public access to valuable upland hunting areas within the MSB coastal zone will be lost to private property development without retention of public access.
11. Littering is a problem and is associated, in part, with inadequate maintenance of public recreational areas in the MSB.

4.2.3 Natural Hazards Issues

1. There are a number of natural hazards areas within the MSB coastal zone. These hazards include flood-prone areas, seismically sensitive areas (earthquake and tsunami), slope instability-prone areas (landslide/mudslide and avalanche), areas subject to wind erosion, and areas vulnerable to wildfire.
2. Proper siting and design of development within these natural hazard areas is necessary to minimize the loss to life and property.

4.2.4 Cultural, Historic, and Archaeological Issues

1. Areas important to the study, understanding, or illustration of national, state or local history, should be identified and protected.
2. The Borough-wide Historic Preservation Management Plan is an important resource document and should be updated as needed.
3. Interest in the acquisition of historic resource information should be revived, and information should be made available to residents of the area and state as a whole.

4.2.5 Transportation and Utilities Issues

1. Construction and design of transportation and utility facilities should be accomplished in a manner that minimizes adverse impacts to important habitat. Increased runoff and sedimentation should be minimized or mitigated.
2. Coordinated extension and construction of utility lines and corridors is necessary to avoid waste of land and capital, interference with other development needs, creation of unnecessary visual pollution, and degradation of important scenic and recreation values.
3. Material sites (sand and gravel) essential to road, railroad, airport, port and utility development should be identified and reserved.

4.2.6 Energy Facilities Issues

1. The planning and developing of energy facilities within the MSB coastal zone should incorporate local, regional, and national interests.
2. Adverse environmental and social effects should be minimized, while satisfying the need for increasing energy consumption levels.

4.2.7 Important Habitat Issues

1. The 4,000 square miles of valuable watersheds, wetlands, uplands, rivers, streams, and lakes are important resources and influence the quality of the MSB's coastal marine environment and habitats.
2. The environmental and recreational resource features of the rivers, streams, and lakes may be negatively impacted by poor quality development and construction practices.
3. Development activities in the upland habitat can potentially negatively affect wetlands and river corridor habitat because of the natural link between upstream use and downstream affects.

4.3 GOALS AND OBJECTIVES

The goals describe the long-range purpose of the CMP. The objectives are more specific and shorter-range statements of intent. Policies are the standards used by all parties participating in the coastal consistency determination process during review of state and federal permit applications. They are the tool the MSB uses to influence and determine decisions and actions in such a way as to help achieve one or more CMP objectives.

The goals and objectives of the MSB CMP were originally written to address a wide spectrum of issues pertaining to coastal management and the well-being of MSB residents, businesses, and landowners. They have been slightly modified hereon to address the requirements of the recently amended ACMP, but have generally been carried forward from the 1984 MSB CMP for this plan amendment. The goals and objectives relate to the issues of local concern, as well as to a specific resource or use issue.

The goals and objectives that cannot be addressed through enforceable policies of the Coastal Management Plan are achieved through the Borough's land use ordinances, lake management plans, local comprehensive plans (city and sub-regional efforst), borough–wide comprehensive plans, public facilities and recreation plans, trails plans, and transportation plans.

The Matanuska-Susitna Borough, thorough its planning powers, exercises all planning, zoning and platting powers on an area wide basis. The Cities of Wasilla and Palmer exercise their own zoning powers. The Borough implements the City of Houston zoning ordinance. The Borough retains exclusive responsibility for platting, final subdivision approval, planning, and development of transportation networks. All subdivision plats are reviewed for consistency with Borough coastal zone goals, objectives and enforceable policies.

4.3.1 Coastal Development

Goal 1 To maximize MSB involvement in development decisions regarding coastal land and water resource use.

Objective A Develop a coastal management program that addresses issues of local concern.

Objective B Coordinate the goals and objectives MSB coastal management program with local community plans of the MSB.

Objective C Identify state and federal actions affecting the MSB coastal zone, and identify points of coordination and standards for consideration.

Goal 2 To allow development to occur in an orderly and efficient manner while minimizing adverse impacts to coastal resources of the MSB coastal zone.

Objective A Define areas within the MSB coastal zone that are of unique concern as demonstrated by local usage or scientific evidence.

Objective B Identify and designate areas meriting special attention.

Objective C Develop water-dependent public facilities and utilities to serve transportation, industrial, port, recreational, and community needs.

4.3.2 Recreation

Goal 1 To ensure the long-term viability of the valuable watersheds, wetlands uplands, rivers, streams, and lakes that contribute to the quality-of-life experience and economic prosperity found in the MSB.

Objective A Promote the retention of natural stream banks and shoreline habitat as wildlife corridors.

Objective B Promote, coordinate, and develop recreation-planning efforts to meet the needs of residents and visitors.

Objective C Evaluate the impact of commercial recreation development on sensitive fish and wildlife populations and habitat, cultural resources, and water quality.

Goal 2 To promote and maintain access opportunities to coastal areas for purposes of coastal development, recreation, and transportation and utilities.

Objective A Prioritize and reserve waterfront land for those uses needing direct access to water.

Objective B Improve public access to developed and undeveloped public waterfront areas on the road system.

Goal 3 To retain public access to important coastal resources and recreational areas.

Objective A Inventory, identify, and provide for adequate easements for trails across all public lands within the MSB coastal zone.

Objective B Ensure that borough-wide trail corridors are not lost through public or private development projects.

Objective C Develop a Public Recreational Access Plan for the MSB.

Objective D Develop information systems that educate the public about access to recreational opportunities within the MSB coastal zone.

Objective E Develop public land management policies, such as right-of-way or easement provisions, in order to designate and retain public access to important scenic values and natural resources.

Goal 4 To promote resident-owned recreation and visitor-oriented businesses.

Objective A Develop and maintain an economic development program that promotes resident-owned recreation development.

Goal 5 To ensure that public recreational facilities meet resident and tourist demand.

Objective A Prepare, maintain, and update recreation facilities plans in cooperation with local, state, and federal agencies.

4.3.3 Natural Hazards

Goal 1 To protect life, property, and coastal resources from the potential adverse impacts caused by natural hazards.

Objective A Incorporate available data concerning seismic, avalanche, erosion, flood, and wind hazards, into the siting, design, and construction of public and private facilities located in natural hazard areas.

Objective B Minimize the removal of trees and other vegetative cover that could increase erosion potential or intensify wind damage.

Objective C Work with property owners to implement best management practices for the siting and design of development in hazard-prone lands or in natural hazard areas.

4.3.4 Culture, History, and Archaeology

Goal 1 To preserve and protect the rich cultural, historical and archaeological resources of the MSB coastal zone.

Objective A Implement and update, as information comes available, a borough-wide Historic Preservation Management Plan.

Objective B Develop specific preservation advisory policies addressing the preservation, restoration and reuse of cultural, historic, and archaeological resources such as trails, sites and structures in the MSB.

Objective C Work in partnership with the local Native organizations and local, state, and federal agencies, to inventory sites, structures, and objects of cultural, historic, and archaeological importance.

4.3.5 Transportation and Utilities

Goal 1 To encourage economic development and coordination of short and long-term transportation and utility plans within the MSB coastal zone.

Objective A Coordinate road and utility design alignment and construction plans with State and private transportation and utility plans.

Objective B Prepare road and rail access plans for currently non-accessed areas where there are resources of significant economic potential such as mining, forestry, recreation, and fish and game.

Objective C Identify and reserve material sites (i.e., sand and gravel) for road, railroad, airport, and port development.

Objective D Coordinate trails planning and design with transportation and utility development.

Objective E Support transportation and utility projects that retain important view sheds and scenic values.

4.3.6 Energy

Goal 1 To encourage the development of energy facilities within the MSB coastal zone for local, regional, and national needs.

Objective A Provide for energy facility and transmission route development that minimizes negative environmental and recreational impacts through proper facility siting, design, and construction practices.

Objective B Promote a cooperative working arrangement between the State, Federal and MSB agencies involved in energy facility planning, siting, design, and construction.

Objective C Consolidate energy facility corridors where practicable.

4.3.7 Important Habitat

Goal 1 To manage habitats so as to maintain or enhance the biological, physical, and chemical characteristics of the habitat, which contribute to its capacity to support living resources.

Goal 2 To ensure that appropriate open space will be maintained between development, and identified and established wildlife areas.

Objective A Minimize adverse environmental impacts that may result from uses or activities in important upland game habitat, as identified by Alaska Department of Fish and Game.

Objective B: Where appropriate, incorporate mitigation opportunities for development siting, design, construction, and operation to minimize both short- and long-term impacts to coastal habitats.

4.3.8 Commercial Fishing and Seafood Processing

Goal 1 To encourage development of facilities related to commercial fishing, seafood processing, and hatcheries in suitable locations.

Objective A Work with the state administration and state legislature to adequately fund fisheries rehabilitation and enhancement work for the streams north of Anchorage, particularly within the Susitna River drainage.

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5.0 CHAPTER FIVE RESOURCE INVENTORY AND ANALYSIS

5.1 REGIONAL SETTING

The MSB is located in the heart of southcentral Alaska and is the third largest borough in Alaska, encompassing 24,000 square miles. Only the Municipality of Anchorage (MOA) and the Fairbanks North Star Borough (FNSB) are more populous. The landscape is comprised of mountain ranges and valleys; glaciers, rivers, and lakes; wetlands, tundra, and boreal forest; farms, towns, suburban homes and isolated cabins; and vast stretches of wilderness. A portion of the Alaska Range lies just outside the MSB's northern border. Here, the tallest mountain in North America, Mount McKinley, can be found. Portions of the Chugach Mountains lay to the south, with almost the entire Talkeetna and Clearwater Ranges within the interior area of the MSB. The MSB coastal zone encompasses 4,000 square miles of valuable watersheds, wetlands, uplands, rivers, streams, and lakes.

5.2 SOCIOECONOMIC SETTING

5.2.1 Population

According to the Alaska Department of Labor (ADOL), almost 10 percent of the state's population, or 63,475, live in the MSB (ADOL, 2003). Of that number, 18 percent live in the incorporated cities of Palmer, Wasilla, and Houston. Population concentrations include Palmer, Wasilla, the area between Palmer and Wasilla (the Core Area), Big Lake, Butte, Point MacKenzie, Skwentna, and Susitna. Nine out of ten MSB residents live along the road system between Willow and Sutton, in or adjacent to the communities of Palmer, Wasilla, and Houston. Since 1970, the population in the MSB has been growing faster than the rest of the state. Between 1990 and 2000, the state's population grew 18 percent, Anchorage's population grew 21 percent, and in contrast, the MSB's population increased by 70 percent. The 1990 U.S. Census population estimate for the MSB was 39,683. The 2000 U.S. Census population estimate for the MSB was 59,322.

The MSB recently completed a Draft Long Range Transportation Plan (LRTP, 2005) describing demographic and economic data for the period 1990-2000 with projections to 2025. Table 5-1 below describes population projections according to the LRTP. For the 2025 projection, several assumptions were made regarding economic growth that would affect population projections, including population projections with and without the Knik Arm Crossing.

Table 5-1 Population Data and Projections – Matanuska-Susitna Borough

	Year		
	1990	**2000**	**2025**
Matanuska-Susitna Borough	39,683	59,322	161,870[1] / 173,505[2]

[1] Without Knik Arm Crossing

[2] With Knik Arm Crossing

Source: Instituted of Social and Economic Research, University of Alaska Anchorage (MSB Long Range Transportation Plan, Draft 2005)

Upon reviewing the 2000 U.S. Census and the distribution of population in the MSB, it appears that roughly 25 percent of the census area population is located within the MSB coastal zone. Table 5-2 summarizes population estimates by census area within the MSB coastal zone.

Table 5-2 Population Estimates Within the MSB Coastal Zone, U.S. Census 2000

Census Area	Population
Meadow Lakes	4,819
Big Lake	2,635
Lakes	6,706
Chickaloon	213
Knik-Fairview	7,049
Total Estimate	15,422

5.2.2 Economy

The economy in the MSB was originally influenced by the agricultural and mining industries. Although the MSB is the largest agricultural producing area in the state, its proximity to Anchorage has heavily influenced area growth. It is estimated that approximately 30 percent of the MSB population commutes to Anchorage and 10 percent of the Anchorage work force consists of MSB residents.

Employment

Employment growth in the MSB has grown at a faster pace than the rest of Alaska and the nation. The major contributor to this growth rate is the service sector, which includes retail services. Between 1970 and 2000, services and professional jobs accounted for 12,838 of newly created 18,936 jobs. Government jobs accounted for 2,872 new jobs. The largest employment sector in 1970, and again in 2000, were in the services and professional, and government sectors. This information can be found in Table 5-3, which describes overall MSB employment by industry.

Table 5-3 Matanuska-Susitna Borough Employment by Industry

Industry Category	Number Employed
Agriculture, Forestry, Fishing & Hunting, Mining	126
Construction	1,318
Manufacturing	149
Wholesale Trade	156
Retail Trade	3,396
Transportation, Warehousing, & Utilities	874
Finance, Insurance, Real Estate, Rental & Leasing	312
Services	3,364
Other	3
Government	3,140

Source: 2003 MSB Fact Book and State of Alaska, Department of Labor, Research and Analysis

While the services and professional sector increased from 43 percent in 1970 to 65 percent in 2000, the government sector decreased from 27 percent in 1970 to 16 percent in 2000 (Sonoran Report, 2002).

Most of the new businesses established in the MSB between 1990 and 2000 have been small, with fewer than 20 employees. The largest growth has been in firms of one to four employees for a total of 401 new businesses. The major employers are construction (318), followed by retail trade (210) and accommodation, and food services (146), (Sonoran Report, 2002). This data does not account for self-employed businesses, therefore, the numbers of new businesses established may be on the low side. Table 5-4 describes the 2002 labor force (employed and unemployed).

Table 5-4 Matanuska-Susitna Borough Labor Force (2002)

Category	Number
Labor Force	32,417
Employment	29,465
Unemployment	2,408
Unemployment rate	7.8%

Source: 2003 MSB Fact Book and State of Alaska, Department of Labor, Research and Analysis

Natural Resources Economy

Gravel reserves found in the MSB coastal zone are the most important current mineral exports. The bulk of the gravel is transported to Anchorage. Ongoing construction activities in Anchorage and the limited local resources have served to increase yearly demand for gravel. Natural gas is being produced on a severely limited exploratory basis, but may be expanded in the future. Because of safety concerns and limited space for expansion of storage facilities at the Port of Anchorage, the Port MacKenzie area holds good prospects for handling and storage of petroleum products (other than crude oil), (2003 MSB Rail Corridor Study).

Mining activities are negligible with no sizeable ore mining operations. However, according to the MSB Comprehensive Economic Development Strategy (CEDS, 2000), opportunities for value-added wood products industries continued to be explored. Wood products are a potential resource from the Susitna Valley and the deep-water dock extension at the Port will permit large volume vessels to dock at Port MacKenzie.

Recreation

The MSB not only offers spectacular recreational opportunities, but it also offers an excellent quality of life for residents. This quality experience for both residents and visitors is inextricably linked to the physical, biological, and cultural features of the coastal environment.

In October 2004, the Alaska Tourism Satellite Account (TSA) was prepared for the Alaska Department of Commerce, Community, & Economic Development (DCCED). The TSA approach is becoming the standard for measuring the economic value of travel and tourism in the United States. Because tourists most often visit the area for recreational purposes, the TSA measurement of tourism also gives an indirect measure of recreational use throughout the area. Although travel and tourism are not considered “industries” in the classic sector definition sense, they are a part of a variety of other economic sectors.

According to the TSA, real estate, engineering-architectural services, and wholesale trade hold the top three spots of travel and tourism's indirect benefits in Alaska, with a combined $55.6 million indirect benefit in 2003. Many of these industries have a significant impact on travel and tourism spending. It is important to note that these three economic sectors are also the fastest growing in the MSB.

The above study indicates that there is increasing pressure and demand placed on the MSB by visitors who are recreating in the area. It is important to provide management mechanisms that will mitigate the potential impacts created by recreational users in the area.

Resident Alaskans visit the Matanuska-Susitna Valley (Valley) an estimated 3,000,000 times each year for recreational purposes. Another 170,000 out-of-state visitors pass through the Valley. Most out-of-state visitors are in transit, going north to Denali National Park or south to the Kenai Peninsula. In recent years, the traditional summertime recreation tax base has been supplemented by an increase in winter recreational activities (MSB CEDS, 2000).

Trends

The MSB has grown as a residential community and a commercial center. While a large number of MSB residents commute to work in Anchorage, many Anchorage businesses are moving to the Valley or establishing franchises or branch offices. There has been a significant public investment in infrastructure to serve the needs of this growth.

The MSB has grown as a destination for recreation. This has meant growth in the economic sectors and industries that support recreation uses and activities. According to the MSB Convention and Visitors Bureau (MSBCVB), the number of resident Alaskans that visited in 1997-1998 was 404,801. The number of local jobs supported by these visits was 2,120 (MSBCVB, 1999). Indications are that this trend is likely to continue.

For example, services and professional employment is the fastest growing sector in the MSB. The employment sector includes jobs in services and retail trade. The services component includes health, business, legal, engineering, and management services. The majority of the job growth (64 percent) has been in wage and salary employment or people who work for someone else. Business owners represented 30 percent of total employment in 1970, yet this sector represented 35 percent of new jobs in 2000 (Sonoran Report, 2002).

The amenities found in the MSB will continue to attract new settlement as well as commercial and industrial growth. Challenges include providing adequate infrastructure, such as services and adequate public access, and preserving the very amenities that make the MSB a desirable place to live, work, and play.

5.2.3 Land Use Patterns and Land Ownership

The following features have provided the impetus for growth in the MSB:

- Open space and natural areas;
- Rural and scenic feel of the Valley;
- The superior air, land, and water quality;
- Economy is maturing and there is an increase in the availability of local commercial facilities and services;

- Increased availability of institutional facilities and services such as medical and educational facilities;
- Short commuting distance to Anchorage, which serves as the major employment center for the region;
- Numerous recreational opportunities;
- A competitive real estate market; and
- Extensive improvements to infrastructure, such as roads and utilities, has made the MSB more accessible for residential, commercial, industrial, and recreational development.

Residential

Residential subdivisions are the predominant land use in the MSB. Single-family residential subdivisions on lots five acres or less are common in the "lakes region" north of the Parks Highway. Large lot (5 plus acres) residential uses are common along Trunk Road, sections of the Seward Meridian Road, and in the Fairview area. Multi-family uses are a located mainly in the cities of Wasilla and Palmer.

Commercial

The commercial land use pattern in the MSB is linear, and uses are predominantly highway-oriented. The geography of new commercial development will likely continue in this form, following major roads. For example, existing commercial uses are located mainly along major roads, with concentrations at the following major road intersections: 1) Parks Highway and Palmer-Wasilla Highway; 2) Parks Highway and Seward Meridian Road; and 3) Palmer-Wasilla Highway/Trunk Road intersections.

Industrial

The primary industrial activities include: gravel extraction operations; utilities; bulk fuel storage; contractors and industrial equipment sales rental, storage, and repair; warehousing and storage; airfields/airports; and other manufacturing uses.

High priority is given to future development of industrial uses, including a deep-water port, and transportation and utility infrastructure at Point MacKenzie. The area has access to deep water, proximity to Anchorage port and airport systems, potential future heavy rail connections to the Parks Highway, and the availability of uplands that can be used for port and industrial development. An AMSA Plan has been prepared for Point MacKenzie (Volume II). In addition, the AMSA has also been designated a Major Energy Facility Use Area. The purpose of the AMSA and Designation is to facilitate development of a port, commercial and industrial uses, transportation corridors, and upland uses. The Point MacKenzie area fit the criteria for establishment of an AMSA because it is an area where the development of facilities is dependent upon the use of or access to coastal waters. MSB leaders recognize there is also a need to ensure that conflicts between port-related development of the area and other uses and values are resolved, and that sound management of coastal resources and activities occur.

Most major community services and facilities are located in the cities of Wasilla and Palmer, and the area in between these two cities, known as the Core Area. The availability of services and facilities such as fire, police, and public utilities have a strong influence on the location of residential, commercial and industrial land uses.

Land Ownership

The bulk of lands within the MSB are owned by governmental entities. The State of Alaska is the largest landowner, with 9,455,031 acres; the federal government owns 4,932,031 acres; the MSB owns around 350,000 acres; and the Native regional corporation owns 477,957 acres. Because government is a major landowner, it will likely continue to play a key role in development activity in the MSB.

5.3 NATURAL SETTING

5.3.1 Climate

Climate in the MSB is predominantly maritime, with continental influences. Temperatures consist of cold winters and warm summers, with average January temperatures between 8.3 and 14.8 degrees Fahrenheit (°F) and average July temperatures between 56.8 °F and 59.4 °F. Average annual precipitation is 15.80 to 28.18 inches, with 50 to 70 inches of snowfall annually (Alaska Climate Research Center, 2005). Average annual climatic parameters for the communities in the MSB are provided in Table 5-5. As with most places, proximity to large water bodies and topographical variations influence temperature and precipitation.

Table 5-5 Average Annual Climate Parameters in Matanuska-Susitna Borough (1971 – 2000)

	Palmer	Skwentna	Sutton	Talkeetna	Wasilla	Average
Temperature (°F)	36.0	32.8	35.2	33.9	36.8	34.94
Total Precipitation (inches)	15.80	26.43	17.87	28.18	16.61	20.978
Snowfall (inches)	50	70	50	70	50	58

Sources: Alaska Climate Research Center and Alaska Department of Community and economic Development.
Websites: http://climate.gi.alaska.edu/ and http://www.dced.state.ak.us/dca/commdb/CF_BLOCK.htm

Wasilla daylight amounts are representative of the southern portion of the MSB. In Wasilla, the shortest day of the year (December 21) has 5 hours, and 19 minutes of daylight and the longest day of the year (June 21) has 19 hours 33 minutes of daylight (Alaska Climate Research Center, 2005). Traveling north, the days get shorter or longer depending on the season. Construction seasons are weather-dependent, or influenced by the particular weather patterns on a year-by-year basis. Typical construction seasons are April to October for roads and year-round for buildings or other enclosures.

5.3.2 Topography

Other than the mountainous areas, the topography is generally undulating with low hills, irregular slopes, and poorly drained bogs and other wetlands. The highest point is Mount Susitna at 4,396 feet above sea level. Steeper terrain is located around Mount Susitna and Beluga Mountain. Headwaters of drainages typically have steep sloping terrain, as water flows to the lowest point while traveling to the nearest water body and, in the process, has eroded those low-lying areas, creating yet steeper terrain.

Most of the southern portion of the MSB coastal zone consists of wetlands, tidal flats, and numerous small lakes and ponds, making it difficult to traverse the area during summer months. The wetlands are generally not much higher than 200 feet above sea level, with occasional wetland areas higher as a result of geological and environmental constraints.

5.3.3 Geology and Soils

The region has a high amount of seismic activity. Faults that enter and cross through the MSB coastal zone include the Border Ranges, Eagle River, Bruin Bay, and the Castle Mountain faults, of which the Castle Mountain Fault is considered an active fault (MSB Coastal Management Plan, 1984). Numerous tectonic plates and faults occur and converge in southcentral Alaska. The McKinley strand of the Denali Fault is located within the MSB. Mount Spurr, located eight miles south of the MSB boundary, is the northernmost volcano in a string of twenty-four volcanoes located along the Alaska Peninsula. Crater Peak, the active vent of Mount Spurr, erupted in June, August, and September 1992. The August eruption created an ash cloud that closed Anchorage International Airport and could be seen from space circling the globe. In addition, although not mapped at the surface in the MSB, the Aleutian Megathrust (subduction zone) poses an earthquake hazard (DGGS, June 2005).

Numerous types of bedrock and soils are located within the MSB. Areas on and surrounding Mount Susitna and the Beluga Mountain contain bedrock mainly consisting of Cretaceous granitic igneous deposits. The lowlands are generally underlain with a thick sequence of coal-bearing rocks of Tertiary Period, which rest on a thick layer of Mesozoic rocks (Selkregg, 1976). These deposits are thought to have potential oil and gas deposits.

Soils overlying the bedrock deposits are unconsolidated deposits. Soils within the lowlands consist of Glacial Moraine and Drift (slightly-to-moderately modified) and Glaciolacustrine (silt-rich deposits produced by glacially dammed lakes) deposits. Soils within river drainages consist of Alluvial (generally well sorted floodplain, terrace, and alluvial fan) and Glaciofluvial (slightly-to-moderately modified outwash and valley train) deposits. At the Susitna River mouth, Eolian or wind-blown sand and silt deposits exist. Areas along the Cook Inlet from Point MacKenzie, eastward to the mouth of the Little Susitna River and areas at the Theodore and Beluga River mouths contain coastal deposited beaches, spits, spits, and bars (Selkregg, 1976). Most of the rivers traveling are glacially fed contributing to the unconsolidated deposits.

Glaciolucustrine deposits were formed as glaciers receded. These deposits have high silt and clay contents (high density, low porosity soil particles), reducing water's ability to infiltrate the soils beneath it. Glaciolucustrine deposits in the lowland areas contributed to the development of numerous lakes, wetlands, muskeg, and swamps in that area.

Alluvial and Glaciofluvial areas are composed of a coarser material such as sand and gravel with lower density and higher porosity, resulting in water being able to infiltrate the spaces between the particles. The Alluvial and Glaciofluvial deposits are commonly located along the river drainages within the MSB coastal zone, thus the water level fluctuates more in these areas.

Permafrost generally occurs as discontinuous permafrost north of the Yentna River. South of the Yentna River, isolated permafrost masses of considerable depth are found, and permafrost masses may be connected by thinner masses where surficial ground insulations are very high or low. Areas around the Susitna River are generally free of permafrost; however, localized areas of permafrost may be present.

The glacial unconsolidated deposits are surficial geologic units, which are the parent material for soils. Soils are surface alteration zones and form on or within geologic units. Soil types influence the flow, pattern, and trends of surface and ground water.

The volume and location of construction materials depends on the aerial extent of geologic units such as gravel and glacial outwash, rather than on the extent of a soil unit that may form on one or more

geologic units. Buildings, roads, septic systems, water availability, and utility lines can be affected by the soils they are built on. The types and amounts of materials deposited dictate the types and amounts of natural resources found in a particular area. Deposited materials may also dictate the severity of natural hazards occurring throughout the MSB. Every development or construction project that encounters permafrost is affected; however, engineering techniques can be used that minimize the affects.

5.4 NATURAL HAZARDS

5.4.1 Earthquake

Earthquakes occur as a result of plate tectonics, or the movement of continental and oceanic plates. The size and position of these plates change over time and, as they shift, they either move along a convergent boundary (away from), divergent boundary (toward), or transform boundary (passing side to side) (Introduction to Plate Tectonics, 2005). As these movements occur, pressure builds along the boundaries or faults. When the pressure is too great, the faults break, creating a sudden slippage and a shaking effect that resonates to the earth's surface. The direct effects of an earthquake to an area depends on: the distance from the earthquake epicenter or origin; the duration, strength, and frequency of the shaking; geology; and the construction method used in the earthquake area.

Alaska is one of the most seismically active areas in the world, and has more earthquakes than any other region in the United States. As a result, earthquakes are one of the most (if not the most) common natural hazardous of many in the MSB. Numerous earthquakes are recorded everyday in the MSB.

Variations in the size and duration of an earthquake are great, and will determine the extent of damage created by the earthquake. Table 5-6 gives an idea of the severity of earthquakes and the exponential increase moving up the magnitude scale.

Table 5-6 Earthquake Magnitude and Intensity Scales Compared

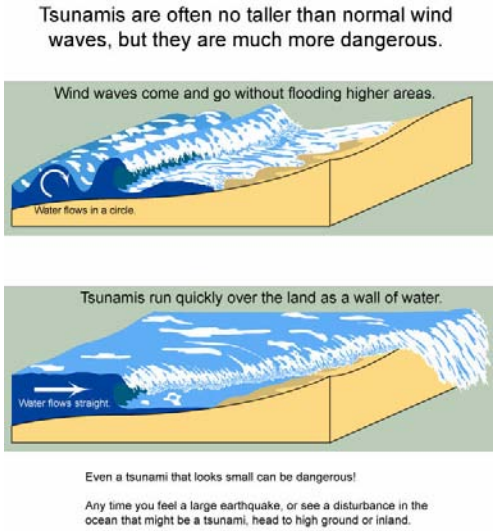
Earthquake Magnitude	Equivalent Energy in Weight of TNT	Equivalent Energy in Hiroshima-size Atomic Bombs	Mercalli Intensity Near the Epicenter	Human Observations
4	15 tons	1/1000	II-III	Feels like vibration from a nearby truck.
5	477 tons	3/100	IV-V	Small objects are upset, sleepers awaken.
6	15,095 tons	1	VI-VII	Difficult to stand, damage to masonry.
7	477,335 tons	32	VII-VIII	Widespread panic, some walls fall.
8	15,094,673 tons	1006	IX-XI	Wholesale destruction, large landslides.
9	477,335,482 tons	31,822	XI-XII	Total damage, waves seen on ground surface.

Figure Source: Alaska Earthquake Information Center,
Website: http://www.aeic.alaska.edu/Seis/html_docs/nextbigeq.html

The area most susceptible to earthquakes is the Castle Mountain Fault, which travels southwesterly from north of Wasilla, along the Little Susitna River, extending across the Susitna River (south of Susitna Station) to the south slopes of Mount Susitna. This fault is the only active fault mapped within the MSB coastal zone boundary. Lands adjacent to the affected water bodies are susceptible to tsunami hazards. Damaging earthquakes can be generated by blind thrust faults (appear as folds at the surface) such as the buried fault north of the Castle Mountain fault.

A tsunami can be caused by volcanic eruptions, displacement of the sea floor, or submarine or terrestrial landslides that displace water. An avalanche or landslide (whether triggered by an earthquake or not) can displace a large amount of water, causing a tsunami. The majority of the force created by the water in this regard is generally one directional.

An example of this type of tsunami was in 1958, in Lituya Bay, in southeast Alaska. A large piece of a slope broke away and slid into the water below, creating a tsunami. The landslide traveled with enough force to create a wave that reached 1,700 feet up a slope on the opposite side of the bay. This is the highest tsunami recorded in modern history (Ocean Fury Tsunamis in Alaska, 2004).



Volcanic eruptions may not primarily impact waters to generate a tsunami; however, secondary factors created by a volcanic eruption, such as an earthquake or avalanche/landslide created by the volcanic eruption can create a tsunami similar to the naturally occurring avalanche/landslide and earthquake tsunamis previously mentioned.

Many Alaska coastal communities have the highest tsunami hazard found anywhere in the Unites States. A tsunami is different from normal wind-generated waves, in that wind-generated waves will break and diffuse energy offshore; a tsunami normally does not break, and arrives as a flooding wave with strong currents.

See the "Welcome to Tsunami" website: http://www.ess.washington.edu/tsunami/ images/tsulg.jpg. It describes the difference between wind-generated waves (top) and a tsunami wave (bottom). In deep water, tsunamis can travel up to 500 miles per hour, and may only be inches higher than the normal water level. The same wave will dramatically slow down and gain height as it enters shallow coastal waters, such as the Cook Inlet and Knik Arm.

Development, in this case, may help to create protective barriers, in turn protecting facilities that may otherwise be prone to tsunami impacts. A Point MacKenzie port site would create an area built up with armor rock, breakwaters, and other port structures that could protect the coastline in that particular area from a tsunami. However, the ability to withstand such a force and impacts would depend on the design and strength of the port.

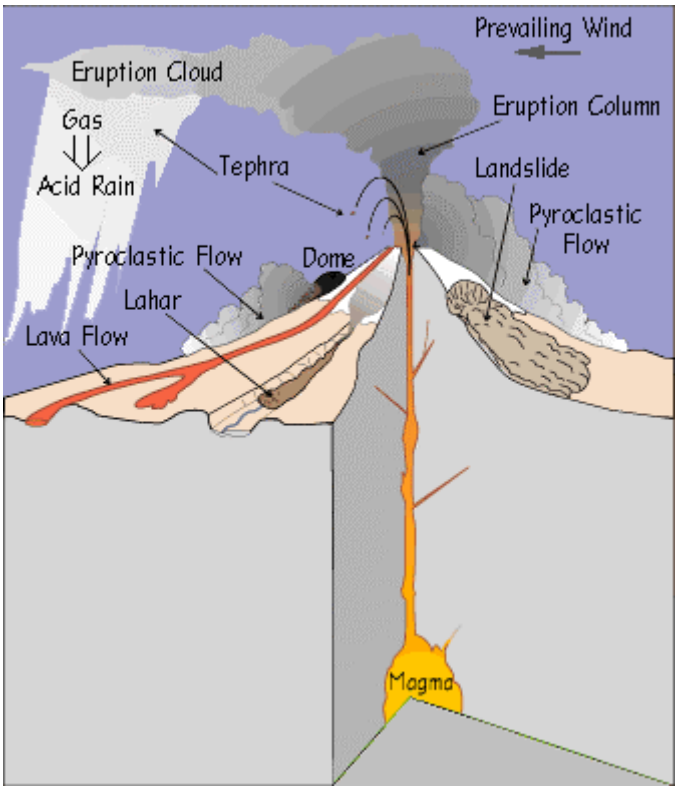
5.4.2 Volcanic Eruptions

Although volcanic eruptions are a less common natural hazard, they are a possible natural hazard. Mount Spurr is the closest active volcano (approximately 21 miles west). There are two ways volcanic eruptions can occur while a mountain is quiet: one, is with a lava flow, and the other, as an explosion. The 1992 Mount Spurr eruption was explosive. This is when gases dissolved in molten rock (magma) expand and escape violently into the air or when water is heated by magma and abruptly flashes into steam. The force of the escaping gas can violently shatter solid rocks. Expanding gas can also shred magma and blast it into the air, where it solidifies into fragments of volcanic rock and glass (USGS, 2005).

In 1992, Mount Spurr erupted three times over the span of three months. The three eruptions sent ash plumes 9 to 12 miles into the atmosphere. The ash cloud from the second eruption traveled nearly 770

miles downwind of Mount Spurr. The third ash plume traveled northeasterly across Cook Inlet, up the Matanuska Valley, and into Canada. Several days later, a photograph from space showed the plume reaching as far east as Quebec, Canada. Ash deposited by the eruption ranged from silt to sand sized particles. Projectiles from the eruption were observed as far as 6.5 miles east of Mount Spurr (Alaska Volcano Observatory, 2005). If an eruption was large enough, the projectiles could reach the MSB coastal zone.

Although Mount Spurr is a fair distance away, it does present a natural hazard risk. The volcano can emit significant amounts of water (in the form of steam and rainfall), ash, and other projectiles, which can create air and water quality hazards, as well as a hazard to different modes of transportation. Ash has been of particular concern during previous Mount Spurr eruptions. Volcanic ash is hard, abrasive, mildly corrosive, can conduct electricity when wet, and cannot be dissolved in water. Falling ash can turn daylight into complete darkness. Accompanied by rain and lightning, the gritty ash can lead to power outages, prevent communications, and disorient people. Furthermore, rain may accompany the ash and turn the tiny particles into a slurry of slippery mud. Ash fall can severely disrupt transportation systems over extremely large areas for hours to days, including roads and cars, airports and aircraft, and railways.



An ash fall of one to three millimeters can seriously reduce visibility on highways, make roads slippery, strand travelers, damage operating vehicles and aircraft, and result in the temporary shut down of airports and highways (USGS, 2005). This could affect future Port MacKenzie improvements and the modes of transportation associated with Point MacKenzie. Newly fallen volcanic ash may result in short-term physical and chemical changes in water quality, increased wear on water-delivery and treatment systems (for example, pumping stations), and high demand for water during cleanup operations by residents of communities affected by ash fall. The most common change in water quality results from the suspension of ash in open water-supply systems (uncovered reservoirs, lakes, streams, and water-catchment systems) (USGS, 2005).

Acid rain can develop from the ash cloud and create corrosive conditions. Future development should take acid rain into consideration. It is possible for a lahar (a liquid flow created by the eruption from snow and ice melt mixed with sand, silt, clay, wood, and other debris) to reach Beluga Lake and River, which are located along the far southeastern edge of the MSB coastal zone.

Figure source: USGS Volcano Hazards Program website: http://volcanoes.usgs.gov/Hazards/What/hazards.html

Other hazards caused by volcanic eruptions include pyroclastic flow's, tephras and lava flows. These hazards exist and precautions should be taken; however, the distance between Mount Spurr and the MSB coastal zone is great enough to mitigate most of the effects caused by these other hazards.

5.4.3 Wind

High winds are common along the Knik River, Knik Arm, Cook Inlet, Matanuska River, and Susitna River, and should be considered a hazard to any future development along these areas. In the Talkeetna area, the predominant wind direction is out of the north. Farther south, the winds generally are out of the north in winter and out of the south in summer (Alaska Climate Research Center, 2005).

Winds are dependent on the topography and vegetation of an area. If development occurs in an area where little or low standing vegetation is present, the wind effect may be stronger. This would also occur if most of the vegetation in an area has been removed. Wind effects would also be serious if the terrain around the area of development is flat, or required to be flattened as part of the development. Areas protected by higher terrain and vegetation are less windy than flat areas with less or smaller vegetation.

Hazards associated with winds include the wind chill factor, damage and loss of property, and possible loss of life. Wind during winter months can cause extremely low wind chill temperatures, posing a threat to property and personal well being, and can cause death. Transportation becomes very difficult in windy conditions, as visibility is decreased and heavy rains or snows combined with the winds can cause disorientation. When high winds are present, vehicles become difficult to control, especially if driving in slippery conditions (snow, ice, and rain).

Winds can be very strong along the Cook Inlet, and Point MacKenzie is located very close to the Cook Inlet. Future development in the Point MacKenzie area, whether at the port facility, or in the form of a bridge spanning Cook Inlet, would be prone to the high winds that occur in Cook Inlet and Knik Arm.

The effects from wind can be mitigated in various ways. This includes designing buildings to withstand high winds, retaining existing vegetation on terrain vulnerable to the effects of wind abrasion, and planting trees and other vegetative cover to hold soil together and provide a wind buffer. Strategically locating development in naturally protected areas can also reduce the affects of wind.

5.4.4 Slope Instability

Two types of slope instability can occur: 1) snow (avalanches), and 2) soil (land/mudslides). For the purposes of the MSB CMP, both soil/rock and mudslides (or mudflows) will be referred to as landslides.

Avalanches

Avalanches occur regularly throughout the MSB coastal zone where there is steep terrain. The most common avalanche is a slab avalanche. Two types of slab avalanches exist: hard and soft. Hard slab avalanches involve large blocks of snow and debris sliding down a slope. In soft slab avalanches, the snow breaks up in smaller blocks as it falls. Avalanches are not commonly recorded in the Mount Susitna and Beluga Mountain areas because it is not heavily populated. A small number of recreationalists travel the area (mainly snowmachines and planes). However, numerous avalanches occur in the Hatcher Pass area every year. Avalanches occur generally when winter snow pack conditions are right.

Landslides

Landslides are often generated by earthquake, or occur as a result of erosion processes, excessive digging or trenching, excessive rainfall, or other human activities. Landslides can have material ranging in size from mud to rocks and boulders, and can be as small as a few rocks falling to a large portion of a mountain sloughing. Landslides generally occur during summer months, however, they can occur year-round. Gravity is the force driving landslide movement. Factors that allow the force of gravity to overcome the resistance of earth material to landslide movement include: saturation by water, steepening of slopes by erosion or construction, alternate freezing or thawing, earthquake shaking, and volcanic eruptions (Federal Emergency Management Agency [FEMA] Hazards: Landslides, 2005).

Road construction can create these conditions that cause landslides to occur. Engineering standards are used to mitigate the possibility of a landslide, or to minimize the damage created by a landslide. Mitigation measures may include barriers protecting roadways from falling rocks, reinforcing slopes susceptible to landslides, and using terraces when creating road cuts or embankments.

Slope failures occur in the following locations: areas around the Knik River, the Pioneer Peak, and Matanuska Peak areas, Mount Susitna and Beluga Mountain areas, and the south and east slopes of the Alaska Range. The severity of slope failure depends on numerous factors such as grade or percent slope, type of material involved, volume of material involved, and weather conditions. Slope failures can occur from natural or man-made processes such as earthquakes, wind or water erosion, road construction, man-made explosions, and recreational activities.

Development in areas with steep slopes and/or grades should take slope failures into consideration. Roadways that travel through naturally steep areas, or create steep embankments, are vulnerable to slope failures. Areas close to river cut banks have potential for slope failures from the erosion process of the river. Damage to commercial and private property is inevitable in areas with potential for slope failures.

If recreational activities (skiing/snowboarding, snowmachining, or hiking) are expected, or if access to recreational activities is gained by future development, precautions should be taken in areas susceptible to slope failures, since personal injury or death can occur in these types of situations. Mudflows are covered under the National Flood Insurance Program; however, landslides are not (FEMA, 2005).

5.4.5 Wildfires

Three types of wildfires can occur: 1) surface, 2) ground, and 3) crown fires. Surface fires are the most common type of wildfires and burn slowly across the forest floor. A ground fire is usually started by lightning and burns on or below the forest floor. A crown fire is usually fueled by wind, causing it to rapidly spread by jumping across treetops.

Wildfires can be ignited by numerous factors, including human activities such as improperly extinguishing a campfire, disposing of cigarette butts, a house fire, or an out of control prescribed or permitted burn. The main natural factors contributing to wildfires are a combination of dry conditions and lightning.

A lot of the larger wildfires occur in Interior Alaska, because dry conditions and lightning are common. The MSB (including the area inside the coastal zone) is an area prone to wildfires. In five of the thirteen years between 1990 and 2002 (Table 5-7), the MSB had the highest (2000 through 2003

and 1996) number. The remaining eight years the MSB had the second highest number of recorded wildfires in Alaska.

Table 5-7 Annual Wildfires Under State Protection Reported for MSB

Year	90	91	92	93	94	95	96	97	98	99	00	01	02
No. of Fires	96	116	111	121	95	90	186	149	77	106	108	106	151
Acres	55.0	1,267.4	155.3	134.7	36.2	163.1	37,781.0	155.9	52.9	781.1	57.2	398.1	1,771.8

(ADNR, Division of Forestry, Fire Statistics. Website: http://www.dnr.state.ak.us/forestry/firestats/)

The Alaska wildfire season generally begins in April and lasts until October. Snow pack amounts generally dictate when the wildfire season begins and ends, whereas, the precipitation during the summer months generally dictates the severity of the wildfire season. Wildfires are more common during the hot summer months of June, July, and August. Precipitation during summer months creates natural wildfire suppression.

Development may create increased access to remote areas and potentially increasing the probability of wildfires occurring. According to FEMA, over four out of every five wildfires are started as a result of human activities (FEMA, 2005). Increased development may create more commercial and residential areas within the areas susceptible to wildfire, thus increasing the threat of a wildfire to human life and property.

Municipal fire regulations, laws, and codes will play a large role in how wildfires will affect future development in the MSB. For example, if development were to increase at a high rate, the municipal regulations, laws, or codes may require that a fire station be located closer to new development, which would help reduce the risk of a fire and its affects to future development.

5.5 COASTAL HABITATS

Not all of the nine coastal habitats described in the ACMP are present within the MSB coastal zone. The ACMP lists: 1) off shore areas; 2) estuaries; 3) wetlands; 4) tideflats; 5) rocky islands and seacliffs; 6) barrier islands and lagoons; 7) exposed high-energy coasts; 8) rivers, streams and lakes; and 9) important upland habitat. The coastal habitat categories for the MSB CMP have been modified or combined to conform to the natural characteristics found in the MSB coastal zone. Offshore and estuarine areas have been combined as one coastal habitat and rocky islands and seacliffs have been replaced with vegetated bluffs. Barrier islands and lagoons, and exposed high-energy coasts, are not present in the MSB coastal zone.

5.5.1 Offshore and Estuarine Areas

All offshore areas in the MSB coastal zone are considered estuarine. Offshore areas are defined as marine waters and submerged lands seaward of the shoreline. These areas provide essential habitat for marine mammals, anadromous fish, marine fish, seabirds, shellfish, marine plants, and microorganisms. The interface of terrestrial and marine environments along the northeastern Gulf of Alaska creates niches for a relatively high diversity of wildlife. The presence of marine environments greatly promotes the diversity of organisms dependent (directly or otherwise) upon marine ecosystems (e.g., anadromous fish, marine mammals, bears, bald eagles, waterfowl, and shorebirds).

Estuaries are defined as semi-closed coastal bodies of water, which have a free connection with the sea and within which seawater is measurably diluted with freshwater derived from land drainage. Estuaries include tidal rivers and river mouths, fiords, inlets, and basins of tidewater glaciers. Estuaries are extremely productive and vital habitats for many species of fish and shellfish and for diverse sea and shorebird populations. Anadromous fish returning from the sea to spawn in fresh water migrate through estuaries, and most spawning of pink and chum salmon along the southern coast of Alaska occurs within estuarine habitats. In addition, estuaries and the extensive adjoining tideflats provide critical habitat for many migrant and resident bird species.

Knik Arm and Upper Cook Inlet have an unrestricted connection to the sea, and salinities are greatly reduced by freshwater runoff. As a result, the offshore and estuarine habitat classifications have been combined and include all waters and submerged lands beyond mean lower low water to the offshore limits of the coastal zone. Human utilization of these offshore habitats is currently very limited. Future utilization of these coastal resources could change due to implementation of proposed projects such as development and construction of the Knik Arm Crossing and an industrial port and industrial park at Point MacKenzie.

Harvesting of marine mammals has been limited in the offshore area. A small commercial fishery operates in the area offshore of the Susitna Flats State Game Refuge. This activity has been limited to set gill net sites that are usually fished from late June to mid-August each year. Management of salmon stocks in the MSB coastal zone occurs with the control of escapements from the drift gill net fishing in central Cook Inlet.

5.5.2 Wetlands, Tideflats, and Vegetated Bluffs

Overview

There are a number of general vegetative types including open low growing spruce and closed-spruce hardwood forests, treeless bogs, and wet and alpine tundra, with the first two types occupying the majority of the MSB coastal zone. *Open, low-growing spruce forests* primarily include black spruce, but are often interspersed with tamarack, paper birch, and willows, with treeless bogs interspersed throughout. *Closed, spruce-hardwood forests* include white and black spruce, paper birch, aspen, and balsam poplar. *Treeless bogs* are described as wet, treeless areas with sedges, grasses, willow thickets, alders, and resin birches dispersed among widely spaced black spruce and tamarack. *Wet tundra* is described as wet coastal tundra and marsh, predominantly vegetated by grasses and sedges. *Alpine tundra* is predominantly barren with vegetation such as white mountain-avens, low heath shrubs, prostrate willows, and dwarf herbs (Viereck and Little, 1972).

Only one listed, proposed or candidate endangered or threatened plant exists in Alaska, the Aleutian shield fern (USFWS, 2005). No habitat for this species exists within the MSB coastal zone; its habitat is found only in the Aleutian Islands of Alaska.

Wetlands

Wetlands are those areas inundated or saturated by surface or groundwater at frequency and duration sufficient to support, and that under normal circumstances, do support, a prevalence of vegetation typically adapted for life in saturated soil (substrate) conditions. Wetlands can include both freshwater and saltwater wetlands.

Freshwater wetlands are those environments characterized by rooted vegetation that is partially submerged either continuously or periodically by freshwater. Wetlands generally include swamps,

freshwater and salt marshes, forested and treeless bogs, muskegs, wet and moist tundra, wet riparian corridors, and similar areas.

Saltwater wetlands include tidal marshes and swamps. Wetlands are rich in nutrients and plant life and are a key link in the coastal food chain. They are used variously for resting, nesting, feeding, and spawning by shorebirds and wading birds, waterfowl, fish, and some small mammals.

Tideflats

Tideflats typically include mostly unvegetated areas that are alternately exposed and inundated by the falling and rising of the tide. This includes the shore edge alternately exposed and covered by changing tides. Tideflats often support a rich growth of algae and plant life and organisms that are important as food sources or shelter in the life cycle of many fish and shellfish species.

Resource use in the wetland and tideflats habitat is well documented for the state game refuges along the coastline. Portions of tideflats along Knik Arm and Upper Cook Inlet have been designated state game refuges. These include Susitna Flats (~301,950 acres), Palmer Hay Flats (~25,340 acres), and Goose Bay (~13,262 acres). Tidelands and wetlands contribute to the biological productivity of the estuaries while providing valuable habitat for waterfowl and intertidal species. Wildlife can travel on the tidelands between drainages when the uplands are blocked by snow.

The primary purpose of the game refuges is to protect, maintain, and enhance fish and wildlife populations and habitats in agreement with other components of the ecosystem. All three refuges are State regulated to protect waterfowl habitat, and the Susitna Flats Game Refuge is regulated to protect big game habitat, particularly moose and black bear. The primary human uses of wetlands and tideflats are hunting for waterfowl and moose, and trapping of fur-bearing mammals.

Vegetated Bluffs

The vegetated bluffs coastal habitat designation replaces the rocky island and seacliff habitat described in Chapter 11 of the Alaska Administrative Code (AAC). According to 11 AAC 112.300 (5), rocky island and seacliff habitat typically refers to rocky shores with steep faces, offshore rocks, and capes. Because this habitat is not found in the MSB coastal zone, the habitat classification was modified to refer to the high coastal bank areas (generally between 25 and 100 feet) found in the MSB coastal zone. Rather than rock composition, these high banks consist of vegetated upper slopes with muddy intertidal zones. There are two areas that can be described as vegetated bluffs: 1) the shorelines between Palmer Hay Flats and Goose Bay and 2) south of Goose Bay to the Susitna Flats Game Refuge. Typical vegetation is a young mixed forest of spruce and birch. There is little wildlife or human use of the bluff habitat. Human use of this habitat will be concentrated as part of the continued industrial development at the Point MacKenzie Port site.

5.5.3 Rivers, Streams, and Lakes

Uses and activities (transportation and utility facilities, residential, commercial, and industrial development, agricultural, and recreational activities) have the potential to impact the MSB's river, stream, and lake habitat and ultimately the fisheries' productivity and resource use. Development activities may create change in stream flow regimes, remove foliage from stream banks, increase surface runoff, and introduce large amounts of sediment or other foreign materials into the rivers and streams.

There are 19 lakes within the MSB coastal zone with adopted MSB Lake Management Plans. The lake management planning process is set out in local code (MSB Title 15, Section 15.24). Individuals

having concerns about a particular lake may initiate development of a lake management plan. The plans are developed with the input of local property owners and residents. It is these groups that define the issues of local concern for an individual lake. These issues of local concern have formed the basis for policy recommendations in Chapter Six (Enforceable Polices). Table 5-8 describes the 19 lakes, their features and activities. Table 5-9 provides an inventory of some of the major waterbodies in the MSB coastal zone and their uses.

Susitna River Watershed

The Susitna River basin is generally described as the area west of the Talkeetna Mountains, south and east of the Alaska Range and north of the Cook Inlet. Few roads exist west of the Susitna River so travel is restricted to riverboats, dog-teams, snowmachines, off-highway vehicles, and airplanes.

Rivers, lakes, streams and creeks within the Susitna River drainage include the Susitna River, Talachulitna River, Deshka River, Kroto Creek, Moose Creek, Talkeetna River, Lake Creek, Alexander Creek, Skwenta River, Yentna River, Lake Creek, Creek, Sheep Willow Creek, Chulitna River, Little Willow Creek, and Kashwitna Creek.

Fishing and hunting are some of the most common activities along the rivers, creeks, and lakes within the Susitna drainage. All types of watercraft including power boats, jet boats, canoes, rafts, and air boats are used to access the many recreational summer opportunities within the Susitna drainage. There are many recreational cabins located along these rivers and creeks. There are boat launches at the Susitna Landing and Deshka Landing which are used for access to the rivers, guides services, and remote properties. Once winter arrives, the rivers, lakes, and wetlands freeze and turn into trail corridors and are used for winter travel by snowmachiners, dog teams, and cross-country skiers.

In addition to the rivers and creeks, there are numerous overland trails such as the Petersville Road Trail, Safari Trail, Rolly Creek Trail, Cow Lake Trail, Dutch Creek/Peters Creek Trail, Collinsville Trail/Chelatna Lake Trail, Cache Creek Trail, Sheep Creek Trail, Talkeetna Multi-Use Trails, and Red Shirt Lake/Nancy Lake State Recreation Area Trails used for access to remote properties in the area. The Matanuska-Susitna Borough operates a campground at the mouth of the Deshka River. There are lodges on the Deshka, Yentna, Skwentna, and Chulitna Rivers, and Lake, Willow, Sheep, and Alexander Creeks.

Approximately 150 miles of the Iditarod Trail is located within the Borough. It is a winter use only trail and is used by snowmachiners and dog mushers. The Iron Dog Trail runs from Big Lake to Susitna Station. It is primarily used in the winter for snowmachining and dog mushing.

There are numerous air services operating out of Wasilla, Willow and Talkeetna, as well as several private airparks which provide access to remote properties for fishing, hunting, camping and wildlife viewing, as well as providing flight-seeing services.

The Parks Highway Scenic State Byway is from the Chulitna River Bridge to Cantwell. There are 48 miles of hiking trails within the Denali State Park. The Mt. McKinley Princess Lodge is located adjacent to the Chulitna River. The National Park Service, the Alaska Division of Parks and Outdoor Recreation, and the Matanuska-Susitna Borough are jointly developing a new recreation destination to prove access to the South Denali Region of the Borough.

Little Susitna River Watershed

The Little Susitna River extends from the Hatcher Pass public use area to the Susitna River Flats Game Refuge boundary. All types of watercraft widely used on the Little Susitna River. Floaters often

begin at the Parks Highway and float to the Nancy Lakes Recreation Area. There are two commercial campgrounds and one public campground in Houston.

There are interconnecting winter trails between Nancy Lake, Houston, and Big Lake that are used by snowmachines, dog teams, and skiers. There are also numerous foot trails starting from the Parks Highway and campgrounds and following the banks of the Little Susitna River. There are numerous trails, such as the Muleshoe Lake Trail and the Houston Power Line Trail, within the City of Houston which are primarily winter use trails for snow machining and dog mushing.

Scenic values are the highest on the upper river where the water is clear and there are views of the Talkeetna Mountains. The Hatcher Pass Bridge is the entrance to the scenic Little Susitna River canyon which runs through the Hatcher Pass public use area. Recreational uses within the public use area include hiking, picnicking, berry picking, camping, gold panning, skiing, snowmachining, snow boarding, fishing, hunting and trapping. The Independence Mine and State Historical Park includes several building and old mining machinery, associated with the gold-producers in the Willow Creek mining district. There are also two privately-owned lodges operating in the Hatcher Pass area.

Matanuska River Watershed

The Palmer/Moose Creek Rail Trail is a year round non-motorized trail following the old railroad bed located adjacent to the Matanuska River between Palmer and Moose Creek. Uses include hiking, mountain biking, horseback riding, skiing and skijoring.

Within the City of Palmer is the walking tour of the downtown historic district. The Visitors Center has a garden of Alaskan plants and vegetables and a small museum.

The Borough operates the Matanuska River Campground which includes a playground, trails and river access.

The Glenn Highway National Scenic Byway follows the Matanuska River for over half of its length. The route starts in Anchorage and ends at the Eureka Summit. The route travels through historic Palmer which includes the colony farms and the Alaska State Fair. The route also passes through the historical coal mining community of Sutton. Recreational activities adjacent to the highway include camping, fishing, hunting, fossil hunting, berry picking, cross-country skiing, and snowmachining.

Knik River Watershed

The Bodenburg Creek Trail is centrally located in the Knik River valley and offers a 360 degree view of the Knik River valley, the Knik Arm of the Cook Inlet and the Palmer and Wasilla Region.

The Pioneer Ridge/Knik River Trail is a hiking trail which offers wonderful views of the Knik and Matanuska River valleys, the Talkeetna Mountains, and the Knik Glacier.

Other trails in the area include the Jim Creek/Knik Glacier Trail, the Hunter Creek Trail, and the Jim and Mud Lakes Canoe Trail.

Recreational activities in the area include glacier tours, boating, hunting, and fishing.

Cottonwood Creek Watershed

Wasilla Lake and Lake Lucille are located within the City of Wasilla. The City operates a day use area on Wasilla Lake. Mat-Su Resort is located on Wasilla Lake.

Lake Lucille Park Trail System is built around the Lake Lucille Campground. This is a non-motorized year round trail system which includes hiking, running, mountain biking, skiing, and snowshoeing. The campground provides non-motorized lake access, boardwalks, and fishing deck, and soccer fields. The Lake Lucille Lodge is also located on the lake.

Other recreational uses within the City of Wasilla include the Wasilla Museum and Historical Park, the Iditarod Trail Headquarters, and Museum of Transportation and Industry. The City also maintains several parks: Iditapark/Wonderland, Newcomb Park and Wasilla Lake Park, Bumpus Ballfields, and the Wasilla Multi-Use Sports Complex.

Finger Lake State Recreation Site includes campsites, hiking trails and a boat launch. The Seven Mile Canoe Trail extends from Finger Lake to Wasilla Lake.

Meadow Lakes/Big Lake Watershed

The Meadow Lakes/Big Lake drainage is located south of the Little Susitna River. Hundreds of Fish and Game stocked lakes dot the area.

Active recreational areas within the Big Lake area include local play areas, neighborhood parks, community parks, and regional parks. Fish Creek Day Park is a day use park that provides access to Fish Creek and provides a picnic area, salmon observation deck, and a playground. The Big Lake North State Recreation Site and the Big Lake South State Recreation Site and the Rocky Lake State Recreation Site provide camping sites and boat launches.

Recreational opportunities in the Big Lake area include hiking, snowmachining, dog mushing, cross-country skiing, four-wheeling, boating, fishing, and hunting.

Trails in the Big Lake area include the Iditarod National Historic Trail and Iditarod Trail Connections which connect with the Iditarod Trail. The Big Lake to Knik Loop Trail runs from South Big Lake Road to Knik Lake; the Knik Area Dog Mushers Trails, and Big Lake-Houston-Nancy Lake Winter Trails.

There are many trail opportunities in the Meadow Lakes area for those who enjoy hiking, four-wheeling, horseback riding, and biking in the summer, or snowmachining, skiing, and dog mushing in the winter.

The Little Susitna River is also accessed from Schrock Road. This area is used for launching floatboats, fishing, and a day use area.

Table 5-8 Lake Features, Uses, and Activities
Lakes in the MSB with Adopted Lake Management Plans

	Area Number	1	2	3	4	5	6	7	8	9	10
	Name/Location	Big Lake	Three Mile Lake	Knik Lake	Whiskey Lake	Long Lake	Wolverine Lake	Honeybee Lake	Blodgett Lake	Little Lonely Lake	Crystal Lake
Protected Features	Trails	x	x	x							
	Fish habitat	x	x	x	x			x	x		x
	Visual point of interest	x									
	Beach	x									
	Wildlife habitat	x	x	x	x	x	x	x			x
	Cultural and Historic Features	x		x							
Uses and Activities	Fishing	x		x	x	x	x	x	x		x
	Hunting	x									
	Camping	x	x	x			x		x		
	Floatplane	x		x	x			x	x		
	Walking/hiking		x								x
	Swimming	x		x	x						x
	Motorized watercraft	x	x		x	x	x		x		
	Non-motorized watercraft	x	x	x	x	x	x				x
	Bird and wildlife viewing	x	x				x				x
	Commerical recreation	x	x	x				x	x		
	Recreation cabins	x	x	x	x	x		x	x		x
	Recreation sites/ parks	x	x	x				x			

Table 5-8 Lake Features, Uses and Activities (continued)

	Area Number	11	12	13	14	15	16	17	18	19	20*	21*
	Name/Location	Christiansen Lake	Crooked	Diamond	John	Marilee	Marion	Rainbow	Twin Island	West Papoose	Wasilla Lake	Cottonwood Lake
Protected Features	Trails											x
	Fish habitat	x	x	x	x	x	x	x	x	x	x	x
	Visual point of interest											
	Beach										x	x
	Wildlife habitat	x	x	x	x	x	x	x	x	x	x	x
	Cultural and Historic Features										x	x
Uses and Activities	Fishing	x	x	x	x	x	x	x	x	x	x	
	Hunting											
	Camping	x					x					
	Floatplane	x	x				x				x	x
	Walking/hiking										x	x
	Swimming	x	x	x	x	x		x	x	x	x	x
	Motorized watercraft	x	x	x				x			x	x
	Non-motorized watercraft	x	x	x	x	x	x	x	x	x	x	x
	Bird and wildlife viewing	x		x		x		x	x	x	x	x
	Commerical recreation	x									x	
	Recreation cabins	x	x	x	x	x	x	x	x	x	x	x
	Recreation sites/ parks	x					x				x	x

*Lake Management Plans adopted under MSB Title 17, Chapter 58.

Table 5-9 Water Bodies Features, Uses, and Activities

	Name/Location	Alexander Creek	Alexander Lake	Chulitna River	Deshka River	Judd Lake	Kahiltna River	Kroto Creek
Protected Features	Trails							
	Fish habitat	X	X	X	X		X	X
	Visual point of interest	X	X		X			X
	Beach	X		X				
	Wildlife habitat				X			
	Cultural and Historic Features	X	X		X			X
Uses and Activities	Fishing	X	X		X			
	Hunting	X	X		X	X		
	Camping	X	X		X			
	Floatplane	X	X		X	X		X
	Walking/hiking		X			X		
	Swimming							
	Motorized watercraft							
	Non-motorized watercraft	X			X			X
	Bird and wildlife viewing	X	X		X	X		X
	Commerical recreation				X			
	Recreation cabins	X	X	X	X	X		X
	Recreation sites/ parks	X	X	X	X	X		X

Table 5-9 Water Bodies Features, Uses, and Activities (continued)

	Name/Location	Lake Creek	Little Susitna River	Little Willow Creek	Kashwitna Creek	Matanuska River	Montana Creek	Moose Creek	Nancy Lake
Protected Features	Trails								
	Fish habitat	X	X	X	X	X		X	X
	Visual point of interest	X	X				X	X	
	Beach	X	X			X			
	Wildlife habitat								
	Cultural and Historic Features	X	X					X	
Uses and Activities	Fishing	X	X			X			
	Hunting	X	X	X			X	X	X
	Camping	X	X					X	
	Floatplane	X	X			X		X	X
	Walking/hiking	X							
	Swimming		X		X	X			X
	Motorized watercraft	X							
	Non-motorized watercraft	X	X						
	Bird and wildlife viewing		X			X		X	X
	Commerical recreation		X						
	Recreation cabins	X	X			X	X		
	Recreation sites/ parks	X	X					X	

Table 5-9 Water Bodies Features, Uses, and Activities (continued)

	Name/Location	Nancy Lake Creek	Sheep Creek	Skwentna River	Susitna River	Talkeetna River	Talachulitna River	Willow Creek	Yentna River
Protected Features	Trails								
	Fish habitat	X	X	X	X	X	X	X	X
	Visual point of interest					X	X		
	Beach				X	X			
	Wildlife habitat						X		
	Cultural and Historic Features					X	X		
Uses and Activities	Fishing			X	X	X	X		
	Hunting	X	X			X	X	X	
	Camping					X	X		
	Floatplane	X				X	X		
	Walking/hiking						X		
	Swimming								
	Motorized watercraft								
	Non-motorized watercraft				X	X	X	X	X
	Bird and wildlife viewing	X				X	X		
	Commerical recreation					X			
	Recreation cabins		X	X		X	X	X	X
	Recreation sites/ parks			X	X	X	X		X

5.6 FISH AND WILDLIFE HABITATS

The fish and wildlife resources of the MSB coastal zone are among the most diverse and abundant in Alaska. Fish and wildlife species are photographed, viewed, hunted, trapped, and fished by recreational, commercial, and subsistence users. The economic importance of fish and wildlife resources to the MSB and the regional economy is significant.

Rivers, streams, and lakes provide good harvests of both anadromous and freshwater fish. There are 17 anadromous and freshwater species as listed below (ADFG, website visited 2005).

- Chinook Salmon
- Chum Salmon
- Coho Salmon
- Pink Salmon
- Sockeye Salmon
- Dolly Varden
- Arctic Grayling
- Rainbow Trout
- Arctic Char
- Lake Trout
- Northern Pike
- Hooligan (Smelt)
- Whitefish
- Stickleback
- Halibut
- Burbot

There are three state game refuges in the MSB coastal zone: Susitna Flats, Palmer Hay Flats, and Goose Bay State Game Refuges. The primary purpose of all three refuges is to protect, maintain, and enhance fish and wildlife populations and habitats in agreement with other components of the ecosystem. All three refuges are State regulated to protect waterfowl habitat, and the Susitna Flats Game Refuge is regulated to protect big game habitat, particularly moose and black bear.

5.6.1 Anadromous and Freshwater Fish Resources

Anadromous Fish

Anadromous fish are defined as: a fish or fish species that spends portions of its life cycle in both fresh and salt waters, entering fresh water from the sea to spawn. These include: the anadromous forms of pacific trout and salmon of the genus *Oncorhynchus* (rainbow and cutthroat trout and chinook, coho, sockeye, chum, and pink salmon), Arctic char, Dolly Varden, sheefish, smelt, lamprey, whitefish, and sturgeon.

Anadromous fish species include: all five species of Pacific salmon (chinook, sockeye, coho, pink, and chum), steelhead, trout, Dolly Varden, and smelt. Nearly every clear water stream provides important spawning habitat for one or more species of Pacific salmon. All streams provide important migration corridors for adult as well as juvenile salmon. The Susitna River drainage is the major spawning drainage in Cook Inlet for chinook, pink, and chum salmon. Significant runs of sockeye also use the extensive lake system associated with the Susitna River drainage, including the Yentna, Skwentna, and Talachulitna rivers. All salmon use the offshore and estuarine coastal habitat area as they prepare to enter the river systems.

Chinook salmon are caught primarily on drainages on the west side of the Susitna River. The east side drainages provide the greatest pink and chum salmon catches. Willow and Montana creeks are prime producers of pink salmon, and Willow Creek, Montana Creek, and the Little Susitna River are prime producers of chum salmon.

Destruction of the riparian zone can have multiple deleterious effects on anadromous fish habitat**.** A stream's carrying capacity to produce salmonids is controlled by the structure and function of the riparian zone. The riparian zone includes stream banks, riparian vegetation and vegetative cover. Damaging any one of these elements can cause stream bank destabilization, resulting in increased

erosion, sediment and nutrient inputs, and reduced shading and bank cover, that leads to increased stream temperatures. Destruction of riparian trees also means a decrease in the supply of large woody debris. This results in a loss of in-stream habitat diversity, caused by removing the source of materials responsible for creating pools and riffles, which are critical for anadromous fish growth and survival (Koski, 1992; Murphy, 1995; OWRRI, 1995).

Streams that support these types of fish are considered anadromous fish streams and are listed below.

- Kahiltna River
- Matanuska River
- Susitna River
- Little Susitna River
- Skwentna River
- Yentna River

During summer months, the creeks, streams, rivers, sloughs, rivulets, and backwaters connected to major waterways leading to Cook Inlet provide juvenile salmon rearing habitat. In late fall, juvenile chinook and coho salmon migrate to lakes and streams where ice and water conditions are favorable for winter survival. Chinook salmon migrate directly to the ocean. Juvenile coho salmon generally spend a second winter in freshwater before migrating to the ocean. Since most adult sockeye salmon spawn in lake systems, their offspring generally remain in those lake systems for two years before migrating seaward. Pink and chum salmon fry migrate to the ocean after emergence from spawning grounds rather than overwintering in freshwater. Coho salmon can be found throughout Cook Inlet and the MSB river valley drainages. During high years, as many as one million coho return to Cook Inlet streams (ADFG, 2004)

Freshwater Fish

Freshwater fish include: land locked coho, rainbow trout, Arctic grayling, northern pike, burbot, and whitefish. Northern pike are considered non-native to the area as a result of illegal introductions into the waters of the MSB. Other freshwater fish found in the lakes, rivers, and streams include sticklebacks, suckers, and sculpins. The majority of the clearwater streams, rivers, and riparian areas, are important for sustaining freshwater fish habitat.

Sport Fishing

The larger rivers, such as the Susitna River, are used primarily for migration and as essential wintering habitat when ice inhibits activities in many of the small tributaries. The Susitna River drainage also provides many of the most important recreational fishing rivers and streams in the state. The Susitna River and its tributaries support the second largest salmon run in the Cook Inlet (ADWC, 2005).

Statistics indicate that the Deshka River, Lake Creek, Alexander Creek, Clear Creek, Little Willow Creek, Rabbit Slough, Kepler Lake Complex, Lucille Lake, Big Lake, and the Nancy Lake Recreation Area are some of the most heavily fished rivers and lakes in the MSB. Statistics also indicate that Finger Lake, Little Susitna River, Sheep Creek, Willow Creek and Montana Creek are heavily fished areas.

Drainages between and including the Little Susitna River and Knik Arm, provide the largest harvests for landlocked salmon, the highest catch of landlocked salmon, while the Little Susitna River has the highest catch of coho salmon. Cottonwood Creek generally has the highest catch of sockeye salmon while the Little Susitna River has the second largest Harvest of sockeye salmon. Big Lake and Kepler Lake have the highest harvest of rainbow trout, sockeye salmon, and rainbow trout.

Coho (Silver) Fishing Areas

The Knik Arm drainages offer silver salmon fishing opportunities, with much of the fishing taking place in the Palmer Hayflats State Game Refuge, Cottonwood Creek, Jim Creek, Fish Creek, Wasilla Creek, Rabbit Slough, and other smaller fishing areas. The Little Susitna River also is a popular and prime coho fishing area. Drainages with silver salmon fishing include Willow Creek and everything north of it on the eastern side of the Susitna River (ADFG, 2005).

Chinook (King) Fishing Areas

The Little Susitna River is the only stream in the Knik area open to king salmon fishing. Other King salmon fishing areas include the eastside Susitna River waters such as Willow Creek and everything north of it (ADFG, 2005).

Numerous lakes containing freshwater fish are located, most notable are Big Lake and Nancy Lake, parts of each are state game refuges or state recreation areas managed by the State of Alaska.

As lands are opened up for development, access to streams and lakes for sport fisherman will improve. More sport fishing may impact the populations of fish in streams or lakes that currently have fewer impacts from sport fishing. Salmon numbers have been declining in Western Alaska, salmon runs in the MSB have not been affected as much as runs in Western Alaska. However, this may change as access to currently remote river drainages improves and puts a strain on future salmon populations.

In addition, the Northern pike was introduced to waters in the MSB in the 1950s and inhabits the sloughs, ponds, and streams. Fifty-eight percent of pike caught in the region are from the Susitna River and its tributaries. Pike are extremely predacious fish, and studies have found they can eradicate local fish from ponds, sloughs and streams. Once this happens, the pike start eating themselves and invertebrates such as snails. Pike diets include: clams, Dolly Varden, ducks, Arctic grayling, lemming, mice, other pike, rainbow trout, snails, sticklebacks, salmon, voles, and animals that may travel or fall upon pike-inhabited waters. ADFG has performed pike studies throughout the Anchorage and MSB area. They found that some populations of pike were found to prefer anadromous fish species (salmon and trout) to other species, and may target these species before other species. This can be dangerous to aquatic ecosystems and can reduce the biodiversity and food sources within waterways. The increase in sport fishing may help to control the pike populations, which may, in turn, help the aquatic ecosystems within the MSB coastal zone.

As growth continues and access improves, other recreational activities such as various water sports, snowmachining, all-terrain vehicle (ATV) trips, hiking, and biking, may increase the amount of human-to-wildlife interaction. This has the potential to disturb important fish habitats and spawning beds. Riverbanks are crucial to the health of fish. Vegetation slows runoff and erosion, provides a hiding place for juvenile fish, slows the current so the young fish are not washed out, and cools the stream.

5.6.2 Game Refuges

The ADFG, Division of Wildlife Conservation, is responsible for management within the refuges. Primary human use of the three state game refuges is recreation oriented, including hunting, fishing, trapping, and nature enjoyment.

Susitna Flats State Game Refuge

According to ADFG, approximately 10 percent of the waterfowl harvest in the state occurs on Susitna Flats each year. About 15,000 ducks and over 500 geese are taken. Many hunters land floatplanes on the numerous lakes on the flats. Other hunters cross the inlet by boat.

Palmer Hayflats State Game Refuge

The refuge is located north of Anchorage at the head of the Knik Arm in Cook Inlet. The 28,000-acre refuge encompasses the mouths of the Knik and Matanuska rivers. Palmer Hay Flats is a 45-square-mile complex of forest, wetlands, tidal sloughs, lakes, and tideflats. Marsh and bog communities predominate. The area subsided in the 1964 earthquake, before which it supported a drier grassland habitat. According to ADFG, each year fishermen spend over 15,000 angler days on Cottonwood Creek and Wasilla Creek/Rabbit Slough fishing for coho and sockeye salmon. Easy access and proximity to over half of Alaska's population has made this refuge one of the most important recreational areas in the state. It is also one of the two most popular waterfowl hunting areas in Alaska. Boats can be launched at the Knik River Bridge, off the Glenn Highway. Boats can also launch from the Rabbit Slough landing on Wasilla Creek, off the Glenn Highway.

Goose Bay State Game Refuge

Goose Bay State Game Refuge features a wetlands embayment drained by Goose Creek. The refuge is located in Upper Cook Inlet on the west side of Knik Arm across from Anchorage. Along its inland boundary, shrub habitat predominates. Knik Arm tides scour the outer shoreline of the refuge's eastern boundary. According to ADFG, Goose Bay wetlands provide an important spring and fall resting and feeding area for waterfowl on their way, to and from, northern nesting grounds. Over 20,000 geese stop to rest and feed in the refuge in the spring (mid-April to mid-May). The most numerous species is Canada geese, with several thousand snow geese and occasionally white-fronted geese. Trumpeter and tundra swans can also be observed during spring migration.

Access to the refuge can be found at several points along the “Old Burma Road” at the end of Knik/Goose Bay Road. Boat access can be gained by crossing Knik Arm and traveling up Goose Creek. Off-road use of motorized vehicles is restricted in the refuge. Currently there are no developed public access points or public use facilities in the refuge.

5.6.3 Game

The main large game species found in the MSB coastal zone include moose, black bear, and brown bear, along with numerous furbearers and small game species.

Moose

Moose are very abundant in the MSB coastal zone. They are generally found in all areas except steep rocky alpine slopes and north-facing, deep-snowfall areas. Moose use a variety of habitat types, all of which are considered necessary for maintaining the area's large moose population. Moose are largely dependent on vegetation in the early successional stages, which may occur in disturbed areas, at timberline, and within riparian zones. Plant species used by moose include willow, birch, aspen, poplar, spruce, alder, cottonwood, and a variety of herbaceous species. These plants may also occur in uplands, wetlands, and particularly in riparian zones from sea level to alpine elevations.

Moose forage range is considered extremely important for calf production and for providing the nutritional requirements of moose populations in preparation for breeding and winter survival. The amount of fat and prime meat produced by moose is directly related to the amount and quality of

moose summer habitat available. Moose lowland summer habitat occurs throughout the MSB coastal zone. Summer feeding habitats consist of willow, birch, aspen, spruce, grass, aquatic plants, and alder plant communities. These plant communities may occur in widely distributed stands, isolated patches, or in large concentrated stands. Alpine shrub areas are also important for summer feeding and for breeding.

Moose generally inhabit those areas where there is sufficient food; they travel to lower elevations during winter months. Moose winter habitat occurs mostly within lowland riparian and wetland areas, and on south-facing, alpine slopes and other upland areas supporting preferred browse species. Winter habitat provides adequate energy sources for body maintenance during winters of average snowfall. Moose densities in summer and winter habitat are generally similar, except during severe winters when higher densities occur as moose become concentrated in areas where browse remains available. Heavy winter and summer concentrations of moose occur mainly along the Susitna and Yentna Rivers and a large area west of the Yentna River.

With increased development pressures, moose habitat may decrease and moose-human interactions will become more common.

Black Bear

Black bear are found throughout the MSB coastal zone. However, one of the densest populations of black bears is in the Susitna Valley. Intensive use areas are also located along the Susitna River west of Willow, and at the Susitna River mouth northward to about Susitna Station. These areas are entirely within the coastal zone boundary. During spring, summer, and fall, black bear distribution is largely determined by food availability.

Black bear are opportunistic feeders, eating both plant and animal foods. Upon emergence from hibernation, new green vegetation is the main food item, but they will eat carrion. Black bear habitats include: low brush bog and muskeg, alpine tundra, coastal western hemlock-Sitka spruce forests, bottomland spruce-poplar forests, upland and lowland spruce-hardwood forests, and high brush plant communities. Of these, the spruce-hardwood and poplar forests dominate the habitat. Moose calves are frequently consumed later in the spring and early summer (late May through June) by black bear. Salmon are often utilized heavily during the spawning season, and berries are the most important food item in late summer and fall. Black bear habitat is closely associated with timber areas and dense alder growth.

Brown Bear

Brown bear are generally less common than black bear in the MSB coastal zone. Distribution of brown bear is similar to black bear; however, brown bear are more commonly found and harvested at higher elevations and in remote mountainous areas such as the headwater areas of the Talkeetna, Susitna, and Yentna rivers. Brown and grizzly bear are usually found along upper river drainages. Some known denning sites are located outside the MSB coastal zone; however, brown bear may be found along river drainages searching for fish. Brown bear feeding habitats are similar to that of black bear.

Development pressures may increase the human-brown/grizzly bear encounters. Access from development could increase the human-brown/grizzly bear encounters, increasing the risk of serious injury or even death to either the bears or humans.

Furbearers and Small Game

Numerous furbearers and small game species can be found in the MSB coastal zone, including beaver, coyote, ermine, flying squirrel, ground squirrel, land otter, lynx, marmot, mink, marten, mink, muskrat, red fox, red squirrel, weasel, wolf, and wolverine. Small game also includes rock, white-tailed, and willow ptarmigan, spruce grouse, and snowshoe hare (MSB CMP 1984, and ADNR).

Furbearers are found throughout the MSB coastal zone, with most species found in riparian, wetland, or forested areas, the majority of the habitat. Rock and white-tailed ptarmigan are found in higher alpine habitats and snowshoe hare and willow ptarmigan are found in mixed shrublands. Hares are also found in wooded forests. Spruce forests often contain spruce grouse (MSB CMP 1984, and the Alaska Department of Natural Resources [ADNR]). Development may decrease the amount of small game and furbearer habitat. However, clear-cutting of the larger trees generally recover with willows and other shrubs, which may increase the habitat for these types of animals.

5.6.4 Marine Mammals

Although there are no major concentrations of marine mammals in the MSB coastal zone, beluga whales and harbor seals have been identified near the Point MacKenzie shoreline. Both species are sometimes found many miles upriver in the Little Susitna and Susitna Rivers. Between May and June, several hundred white beluga whales concentrate in an area extending from the Little Susitna River to the Beluga River. Belugas gather in nearshore waters to calve, breed, and feed on the large runs of eulachon (hooligan) fish that return to spawn in the Susitna River.

Harbor seals also congregate at the mouth of the Susitna River and in lower Knik Arm to take advantage of the spawning runs of anadromous fish. Most marine mammals use offshore and estuarine coastal habitat areas only in the spring, summer, and fall, due to extreme winter weather conditions. Beluga whales and harbor seals are protected under the Marine Mammal Protection Act. Development of the port at Point MacKenzie may influence the presence of seals and whales in these areas. The port site could provide shelter for seals, which may start to gather along the port facilities.

5.6.5 Invasive species

Invasive species are defined as: species not native to the ecosystem likely to cause harm (economic, human health or environment). Numerous invasive plant species are found in Alaska, too many to list. Invasive plant species is a spreading concern in Alaska. There is concern because of the threat to habitat loss and biodiversity, as the invasive plant species tend to overtake large areas of habitat over a short period of time. Every year in the U.S., 1.7 million acres of new habitat is invaded by invasive plant species (4,500 acres/day).

Factors that increase the spread of invasive species include: globalization of trade and tourism (reduction of trade barriers), global warming (climate change), genetic engineering, the internet, and bioterrorism. A potential major factor is the development of the Point MacKenzie Port. The port will increase the amount of global commerce in the area. Ships docking at the facility can transport numerous types of invasive animal, plant, and insect species. Three examples of how global commerce can spread invasive species include:

- Animals such as rats can travel from far areas of the globe by boarding ships destined for Port MacKenzie, where they may be able to get off and thrive, possibly spread throughout the MSB and beyond.
- Pallets off-loaded at Port MacKenzie may contain European spruce beetles (a far more

aggressive species than the current spruce beetle affecting Alaska), or other wood-boring insects, the insects can then spread to the forests of the MSB and beyond.

- Bilge water from ships docking at the Point MacKenzie Port may contain spores, eggs, or seeds of terrestrial or marine-invasive species. When the water is pumped in to the waters near Point MacKenzie, the invasive species may thrive and take over coastal and inland areas of the MSB and beyond.

Other factors contributing to the transportation of invasive species include: fisheries enhancement/bait sales, the pet/nursery trade, educational institutions, and the live food industry. A crawfish incident occurred in the Kenai Peninsula in 2004. A family ordered live crawfish for a family get-together, some kids in the family decided they did not want some of the crawfish to be cooked alive and let some into local waterways. Fortunately, the incident was reported to authorities and all the crawfish were caught. Exotic plants in nurseries can be invasive species, or can have invasive species in the root clump or transplant soil.

Global commerce will increase the possibilities of invasive species. Areas developed will also increase the risk of invasive species invading the MSB coastal zone, especially plants, which can invade clear-cut areas, and along roadways, and other disturbed soils.

5.6.6 Birds

Numerous birds migrate through and reside within the MSB coastal zone. The entire coastal zone provides habitat for birds, however, the southern half is of particular importance. Areas with heavy concentrations of birds include the Jim Lake and Creek area, Palmer Hay Flats, Goose Bay, and Susitna Flats.

Waterfowl and Shorebirds

The tideflats and associated wetlands provide important waterfowl and shorebird habitat for both breeding and migration. Most waterfowl nesting occurs at the interface of the marsh and shrub habitats. Key areas for duck staging and brood rearing include the Jim-Swan lakes areas, Palmer Hay Flats, Goose Bay and Susitna Flats. Approximately 75 percent of the ducks utilizing these wetlands are dabblers, primarily pintails, mallards, and green-winged teals. Scaups are the primary diving ducks found in the coastal wetlands.

The population size and composition of migratory waterfowl shift continuously. These changes reflect the constant departure and arrival of new individuals. Seasonal variations also occur and reflect the timing of migrations for different species. Trumpeter swans are abundant on the Palmer Hay Flats during both spring and fall migration, and have been observed to use other open waters. Canada, white-fronted, and snow geese also utilize the coastal tideflats, wetlands, and nearby agricultural fields. Numerous other waterfowl and shorebirds utilize the wetland and tideflat habitats.

The Susitna Flats Game Refuge and Palmer Hay Flats Game Refuges rank first and second, respectively, among State Game Refuges for the number of hunter days spent waterfowl hunting per year. Duck harvests from the Susitna Flats Game Refuge rank highest in the state, while Palmer Hay Flats Game Refuge duck harvests are typically second. Goose harvests are also very substantial. Waterfowl harvests are strongly influenced by hunter access. Hunting pressure is often temporarily concentrated.

Duck hunting season typically extends from September to December or January. However, one-third to one-half the hunting effort is expended from September 1 through September 10 every year. Due to

limited access within the Palmer Hay Flats Game Refuge and the surrounding area, hunting is usually restricted to the Duck Flats and Cottonwood Creek areas, which are accessible by road or boat. Access to Goose Bay State Game Refuge is limited to roads along the northern and western boundaries. The Susitna Flats Game Refuge is accessible only by boat or plane, and hunters typically concentrate around landing sites rather than along road access points. Four-wheel drive access to the Susitna Flats Game Refuge is possible from a non-maintained road that heads south from the Big lake Area.

Raptors

Primary use of coastal wetlands by raptors occurs during spring and fall migrations. Bald eagles are the most abundant species. They are usually associated with waterfowl presence on the Palmer Hay Flats, and with spawning salmon in anadromous streams. Peregrine falcons utilize the coastal wetlands and use the Susitna River as a migration route. Resident raptors that breed in the MSB coastal zone include goshawks, great horned owls, and hawk owls. Migratory raptors include marsh hawks and red-tailed hawks. Passerines are abundant throughout the MSB coastal zone, with thrushes, warblers, and dark-eyed juncos being particularly cannon.

5.7 IMPORTANT UPLAND HABITAT

Important upland habitats are those areas above mean higher high water, exclusive of wetlands, rivers, streams, and lakes. Typical dry upland vegetation includes willow thickets, cottonwood stands, tall white spruce stands, and mixed forests, such as cottonwood/birch/spruce and cottonwood/willow/alder, and agricultural areas. Upland habitat areas are frequently interspersed among poorly drained wetlands and lakes, streams, and rivers. Upland uses and activities are often extensions of activities found along river corridors and in wetland habitats. As a result, sharp distinction in uses among these three habitats is difficult.

Important upland habitats include those areas associated with heavy wildlife use, especially, areas meeting particular seasonal or life cycle needs, such as winter or summer forage areas, calving areas, denning areas, and migration corridors. Winter habitat is usually the most limited and any loss may have severe affects on wildlife productivity. There are portions of four State Game Management Units: 13A, B, D, and E; 14A, B, and C; 16 A and B; and 19C. These game management boundaries include substantial upland habitat outside of the MSB coastal zone boundary, but within the MSB corporate boundary.

Statistics indicate that the majority of the upland moose hunting occurs near the road system within the 1,000-foot contour. Much of the black bear harvest likewise occurs within the 1,000-foot contour. The upland river systems of Lake Creek, Little Susitna River, Susitna River, Theodore River, Chuitna River, Alexander Creek, Yenta River, and Skwentna River, are prime moose harvest areas. Other prime areas include the Matanuska Valley, Knik Arm, Kahiltna Flats, Black Creek, Cache Creek, 20 Mile Slough, the areas around and between Beluga Mountain and Mount Susitna, Sunflower Basin, and the Kahiltna – Peters Hills area. All of these are within the MSB, but some are outside of the coastal zone boundary. Weather conditions, harvest practices, and access are some of the factors that can influence the size and location of upland moose harvests.

5.8 SURFACE AND GROUND WATER RESOURCES

Natural users of water in the MSB coastal zone include vegetation, fish, and wildlife. Increasing development pressures could potentially lead to a multitude of new demands on the water resources. These demands can include: community development (residential, commercial, industrial), timber

harvesting, road building, utility expansion, oil and gas development, mining, sand and gravel extraction, fish hatcheries, irrigation, and hydroelectric development.

A significant demand for any type of development is community use. The amount of water used per capita, depends on the water distribution system. In communities with municipal water systems, such as Palmer, use may exceed 100 gallons per day per capita. Although some of the above-mentioned users do not exist at this time, potential does exist for the alteration of the natural watershed characteristics and its water quality. Many current watershed problems are associated with landforms or slopes where geologic erosion and sediment production is naturally high. These areas can be particularly sensitive to upland activities, such as the removal of vegetation and transportation and utility corridor construction. Shallow slopes, coarse-textured soils with high permeability, thick organic layers, and rapid re-vegetation, generally render the land less sensitive to human activities. Geologic factors also influence the amount and quantity of groundwater available through structure and distribution of aquifers. Landforms and water currents influence the mixing characteristics of water, an important consideration in disposing of treated and untreated wastes.

5.8.1 Surface Water Resources

The Susitna and Matanuska rivers are the two major streams bordering most of the developed land in the MSB coastal zone. Numerous smaller streams, which are tributaries of the Susitna and Matanuska rivers or to Upper Cook Inlet or Knik Arm, also provide a potential surface water source for the communities in the coastal zone. Most of the major streams originate in the mountains and are fed by large glaciers. The glacial origin results in these streams carrying large quantities of water even between rainstorms; however, the water is heavily laden with silt and glacial flour.

The average discharge of gauged streams, such as the Knik, Matanuska, Susitna, Little Susitna, and Skwentna Rivers, indicates that there is an ample supply of surface water available from these streams. This average discharge is typically exceeded in the months of May through September when rainfall, glacier melt, and snowmelt are at a maximum. Peak flows typically occur in June, July, and August. Stream flow decreases in October, as the temperature drops, decreasing melt waters and causing precipitation in the mountains to fall as snow. Lowest flews typically occur in February and March. The winter months are most critical in terms of surface water availability. All streams freeze over, and many of the smaller ones freeze to their bed. Streams typically freeze up in later October or early November, and do not break up until late April or May.

There are many lakes in the MSB coastal zone that can be termed surface water resources. The largest lakes include Big Lake, Wasilla Lake, and Nancy Lake, which are all used for recreational purposes. Most lakes feed small streams and, therefore, contribute to their flow regulation.

5.8.2 Groundwater Resources

The best potential source of groundwater in the MSB coastal zone is located in the Susitna lowlands. Well yields of 1,000 gallons per minute (gpm) can be expected near major streams in this area. Most wells serving communities yield 10 to 50 gpm. Palmer City Well #3, located north of Palmer, has yielded 325 gpm at a well depth of 625 feet; an irrigation well, south of Palmer, typically yields 200 gpm at a depth of 95 feet; and the well at Big Lake summer camp yields 300 gpm at a depth of 31 feet. Well water is characteristically located in the interbedded sand and gravel lenses in glacial deposits. Well depths average 30 to 295 feet near Palmer, and 25 to 170 feet near Wasilla, and westward. The most successful wells are drilled 50 to 150 feet below the surface. Wells that yield 10 to 50 gpm are usually 75 to 150 feet deep.

Springs occur along the base of the mountains and the largest known spring is located near Palmer, where it flows at a rate of 150 to 200 gpm.

5.8.3 Water Quality

All major rivers are sustained primarily by snow and glacial melt water. These glacial fed rivers contribute heavily to sediment load in Upper Cook Inlet and Knik Arm. Sediment load in this region is one of the highest in the State. The highest rate of suspended sediment yield per square mile has been recorded in the Knik River near Palmer. The average annual yield for this area is 6,000 tons per year. The Knik, Matanuska, and Susitna rivers, and Susitna River tributaries, carry the bulk of sediment load during the summer months. Very little sediment is transported during the winter months, when the rivers are frozen over and the glaciers contribute very little melt water.

Surface water has less chemical-quality variation than groundwater and it is also softer than groundwater. Generally speaking, the quality of surface water in the MSB coastal zone is good. Surface water hardness is less than 150 milligrams per liter (mg/L) and is mainly composed of calcium magnesium bicarbonate. The Matanuska River near Palmer contains a higher concentration of sulfate than other streams in the coastal zone. This is attributed to the presence of coal mines near Palmer, the drainage from which enters tributaries of the Matanuska River. The iron count is usually less than 0.3 mg/L. Water taken from shallow wells drilled in alluvium contains high concentrations of iron.

Groundwater quality is characteristically of a calcium bicarbonate type. Palmer City Well #3 water is of the sodium bicarbonate type, and registers the highest concentration of sulfate present in the well water in the area. The presence of sulfate in the well is attributed to the fact that the well is located in a former channel of the Matanuska River. Water levels and sulfate concentrations in the wells seem to fluctuate with river level and sulfate content. Palmer well water also contains a high concentration of boron. Both surface water and groundwater along the Matanuska River contain measurable concentrations of boron. Nitrate is present in some wells. High concentrations of nitrate have been found in water near Palmer and Wasilla. The nitrate present in regional groundwater appears to be geologic in origin.

5.9 RECREATION RESOURCES

There are many areas in the MSB that, because of their special physical, biological, and cultural features, are used by both residents and visitors. Hundreds of lakes, miles of riverbank, and a high diversity of wildlife create a setting for hunting, fishing, boating, hiking, and camping. Recreation opportunities are plentiful for those seeking everything from sport fishing, hunting, hiking, bicycling, ice and rock climbing, horseback riding, rock and fossil hunting, golfing, wildlife viewing, and river rafting, to dog mushing, skiing, ATV use, and snowmachining. Hunters are attracted to the region by the abundance of game and by various waterfowl found in the extensive tidal marshes bordering Knik Arm. Other important attractions include historic sites at Wasilla, Knik, and Palmer.

The Glenn and Parks Highways are the principal take-off points for hunting, fishing, and most other activities. Consequently, most lodges and visitor facilities are located at regular intervals along these transportation routes. Other points of destination in the include state and local public campgrounds, Nancy Lake State Recreation Area, Denali State Park, Hatcher Pass, Talkeetna and Lake Louise. Tourism and recreation is, and will continue to be, an important and expanding sector of the MSB economy (MSB CMP 1984 and 2000 CEDS).

The number of out-of-state visitors to the MSB has been increasing. Out-of-state visitors typically consist of: parties driving through the MSB along the Glenn Highway to, or from, Anchorage;

individuals visiting friends and family in Anchorage out on weekend excursions; or tour buses from Anchorage (in the summer).

5.9.1 Relationship Between a Healthy Ecosystem and Healthy Economy

According to the Institute for Social and Economic Research (ISER), healthy ecosystems are valuable economic resources. Commercial fishing and tourism are two industries that support almost 60,000 total Alaska jobs, and provide more than $1.6 billion of total income to Alaska workers. Both industries rely on healthy ecosystems. Sport fishing and government resource management are next in importance, each supporting about 10,000 total Alaska jobs. Sport hunting, wildlife viewing, and other resident recreation, together, support another 13,000 jobs. Subsistence activities require substantial commercial inputs: the provision of these inputs supports almost 2,000 Alaska jobs in the cash economy. Travel is a valuable source of revenue for state and local governments. Business taxes, motor fuel taxes, and fees for licensing (hunting and fishing) and fines comprise a significant portion of the revenue that goes to local governments in the form of property and bed taxes.

There are significant recreation-related investments and businesses in the MSB that are directly linked to visitor-related purchasing, sales and property tax revenue generated by visitors, and businesses that serve them, and from the local employment and businesses visitors help support. According to the *Alaska Travelers Survey (ATS) Mat-Su Visitor Profiles*, Summer 2003 (McDowell Group, Inc., 2003), non-cruise visitors to the MSB in 2003 stayed longer and spent more money than the average statewide visitor. Popular activities noted by the profile, included wildlife viewing, hiking/nature walks, fishing (guided and unguided), boating/rafting, bear viewing, bird-watching, biking, camping, museums, Native tours, riding the railroad, and visiting friends and family.

According to the MSB CEDS, the mild four-season climate makes the region a pleasant place to live and work. The Valley is a natural gateway to many business, residential, and recreational opportunities. The MSB CEDS identifies recreation and tourism as a major employer, with a substantial part of the service sector growth in the MSB traced to growth in tourism and year-round visitor activities. The many rivers, streams, and lakes are only 50 miles from Anchorage, providing a popular getaway for summer and winter recreationalists, visitor and resident alike.

The CEDS also included a survey that described uses and activities that relate directly to the natural environment, recreation uses, and activities in the MSB coastal zone. These include:

- Views of Mount McKinley and the Chugach peaks
- Hunting
- Sport fishing
- Sled dog mushing
- Sled dog racing
- Skiing
- Snowmachining
- Visiting historic sites
- Golfing
- Camping

According to an ADFG presentation in February 2000, there is an increased public interest in viewing wildlife. Alaska has superb and unique wildlife viewing resources; many of these opportunities are in the MSB and within its coastal habitats such as the rivers, lakes, streams, estuaries, tideflats, and wetlands. In 1996, 24 million Americans took 266 million trips, primarily to see wildlife. According to ADFG, the Pacific Region, which includes Alaska, will experience the highest rate of increase in wildlife viewing. Bird-watching has increased 155 percent nationally, more than any other outdoor recreation. Wildlife viewers will spend more money in-state and in more regions of the state than

other visitors. Alaskan residents are also willing to pay more for high quality viewing experiences – salmon, sea birds, bears, and eagles, to name a few.

In addition, there are numerous social benefits to these recreational experiences such as education for residents and visitors, and the preservation of cultural/traditional uses. Alaska has abundant populations of wildlife that have become rare or have disappeared in other parts of North America, such as the wolf, lynx, brown bear, wolverine, bald eagle, trumpeter swan, peregrine falcon, and common loon.

Travel-related capital investment also plays a key role in the economic contribution by this sector. Examples of capital investment include construction of hotels, shoreline preservation along rivers, streams, lakes and coastal areas, transportation, and other travel and tourism infrastructure. There has been substantial infrastructure development (roads and utilities) to support the dynamic growth occurring in the Valley, which in turn, supports the growth in the recreation industry.

5.9.2 Designated Recreation Area

The MSB coastal zone encompasses 4,000 square miles of valuable watersheds, wetlands, uplands, rivers, lakes, and streams. All of these are important resources and influence the quality of the coastal marine environment. New state regulations require the MSB to assign a designation to ensure that the MSB continues to have local input on proposed development occurring adjacent to or on rivers, lakes, and streams within the MSB's coastal zone. State-approved designations are limited to: recreation, tourism, natural hazards, major energy facilities, subsistence, commercial fishing and seafood processing, and archaeology/history.

The most suitable option for the MSB that meets the requirements of the ACMP, is to designate the existing coastal zone as a Designated Recreation Area (Designation). The uses and activities, and the physical, biological, and cultural assets of the coastal zone, warrant creation of this designation in accordance with 11 AAC 114. 250(c) and, within this Designation, the CMP enforceable policies will apply. The Designation does not include Point MacKenzie, which is an AMSA and Designated Major Energy Facility Area. The Designation is synonymous with the MSB coastal zone, does not create an area-wide zoning district, as defined by Title 29, Municipal Government.

Without designating the MSB coastal zone, the state regulations do not allow coastal districts to develop policies for coastal development and coastal access, as it relates to rivers, streams, and lakes. Heavy use of local rivers, streams, and lakes, especially if the water body is particularly sensitive and close monitoring is not conducted, could negatively impact healthy fish and wildlife populations as well as the coastal marine environment.

Disturbance due to increased human presence can impact fish and wildlife habitat and potentially create conflict with, or impact, commercial and subsistence uses. Noise can displace or deflect fish and wildlife from their feeding areas. There are a number of rivers and streams that are also important areas for recreation. For example, Willow Creek provides a recreation area for snowmachine and equestrian trails. The Little Susitna River provides fish viewing and benefits recreational users, as well as local businesses.

The health of the environment as expressed by its physical, biological, and cultural features, and the natural beauty, are key to supporting the quality of life for residents and visitors alike. Fish and wildlife resources are sensitive to pressures such as over-fishing or over-hunting. Sport fishing and hunting can put pressure on fish and wildlife populations that could conflict with and/or impact traditional commercial and subsistence harvest.

The proposed Designation does not include the Point MacKenzie AMSA, which is designated separately as a Major Energy Facility Use Area and has its own set of enforceable policies. The Designation allows the Borough to continue to have an opportunity to review development actions that require state or federal permits.

5.10 TRANSPORTATION, UTILITY, AND ENERGY RESOURCES

5.10.1 Transportation Facilities and Routes

Transportation facilities include: roads and trails; airports, airparks, and floatplane facilities; railroad; port facilities; and support facilities. Thirty percent of the roads in Alaska are located in the MSB. The road grid is the largest and most developed outside of Anchorage. Numerous local roads connect to secondary roads; many of these roads were once miners' trails, logging tracks or early routes of the postal system. New road and trail access to rivers, streams, and lakes could have immediate and localized affects, due to increased fishing efforts and possible environmental changes, caused by road construction. Affects of road construction can increase sedimentation of streambeds and restrict movement of anadromous fish.

Roads

The MSB is in the process of developing a Long Range Transportation Plan (LRTP). The LRTP will outline future transportation needs of the MSB. Road building and improvements for state-owned facilities are set by the Alaska Department of Transportation and Public Facilities (ADOT&PF) ranking process that results in a list of projects slated for each construction season. This process is called the Statewide Transportation Improvement Program (STIP). Level of funding, safety problems, usage, and development needs all play a role in determining which projects move forward and which ones are delayed. The MSB participates in the development of the STIP.

Trails

There is a long history of trail use in the MSB. There is an extensive transportation network for ATVs, snowmachines, mountain bicycles, boats, airplanes, dog teams, hikers, and others. This includes the historic Iditarod Trail – a well-marked and maintained trail that, along with other trails, has formed an important network of winter trails. This system links remote areas to the railroad, road system, and coast.

According to the MSB 2000 Recreational Trails Plan, an "effective, dedicated, well-developed, and well-maintained recreational trail system" will, among many things:

- Bolster economic development of the tourism and recreation industries, and
- Increase the appeal of the area to businesses and prospective residents by improving the quality of life.

There are 2,000 miles of regionally significant recreational trails. The goal is to have 2,005 miles of dedicated trails by the year 2005. The trails are described in the plan as:

> "*…those which are likely to attract high use due to high quality of recreational experiences or unique attributes.*"

To facilitate and manage the dynamic growth in the MSB, planning for development and recreational opportunities is ongoing, with efforts by the MSB Parks, Recreation and Trails Advisory Board,

numerous community councils, many non-profit groups, the MSB Planning Commission and Assembly, and state and federal resource agencies.

Trail facilities provide the healthful, outdoor recreational opportunities that residents and visitors desire. Trail establishment, improvement, and maintenance have been identified as issues of local concern in the MSB coastal zone.

There are numerous local, MSB, and state planning documents that identify trail facilities and recommendations, as presented in Table 5-10.

Table 5-10 Recreational Trail System Documentation
Local, MSB, and State Plans with Trail Elements

Sustina Area Plan	Big Lake Comprehensive Plan
Willow Sub-Basin Area Plan	City of Houston Comprehensive Plan
Alaska Statewide Comprehensive Outdoor Recreation Plan	City of Wasilla Comprehensive Plan
Comprehensive Development Plan, Trails Element	City of Palmer Comprehensive Plan
Alaska Recreational Trails Plan	Chase Comprehensive Plan
Susitna Basin Land Use/Recreation Atlas	Core Area Comprehensive Plan
Trail Systems: • Nancy Lake Trails • Houston-Willow Creek Trails • Parks Highway Bike Trails • Montana Creek Dog Mushing Trails • West Gateway Trail System • Haessler-Norris Trail System • Emil J. Stancec Trail System	Talkeetna Comprehensive Plan
	Chickaloon Comprehensive Plan
	Knik-Fairview Comprehensive Plan
	Meadow Lakes Comprehensive Plan

5.10.2 Utility and Energy Facilities and Routes

Utilities include: transmission lines and routes for electricity and communication facilities; pipelines and routes for sewer, water, gas, and fuel distribution; and solid waste disposal facilities. Major energy facilities include marine service bases, storage depots, pipelines, oil and gas terminals, refineries, and generator plants.

The siting of major energy facilities and activities, because of their magnitude of their effect on the economy or surrounding areas, are reasonably likely to present issues of both local concern and regional/state significance. Facilities and activities include: oil and gas exploration development, production, and transportation. Consolidation and/or the concurrent use of facilities is encouraged.

Utility, and energy facility projects and routes have the potential to negatively impact the rivers, streams, and lakes, the resource habitat, and ultimately the fisheries' productivity and resource use. Projects may cause changes in stream flow regimes, foliage removal from stream banks, increased surface runoff, introduce large amounts of sediment, or other foreign materials into the rivers and streams.

5.11 SAND AND GRAVEL RESOURCES

Sand and gravel extraction operations are a key industry in the MSB. These resources are extracted from coastal waters, riverbeds, river floodplains, and intertidal areas. Channel hydraulics, sediment transport, and morphology are directly affected by human activities such as gravel mining and bank erosion control. The immediate and direct effects are to reshape the boundary, either by removing or adding materials. The subsequent effects are to alter the flow hydraulics when water levels rise and inundate the altered features. This can lead to shifts in flow patterns and patterns of sediment transport. Local effects also lead to upstream and downstream effects. In addition, sand and gravel operations not only involve the channel and boundary, they also require land access and material storage, activities that typically occur in the riparian areas.

Altering these habitat parameters can have harmful impacts on in-stream biota and the associated riparian habitat (Sandecki, 1989). For example, impacts to anadromous fish populations due to gravel extraction include: reduced fish populations in the disturbed area, replacement of one species by another, replacement of one age group by another, or a shift in the species and age distributions (Moulton, 1980).

The potential effects of gravel extraction activities on stream morphology, riparian habitat, and anadromous fishes and their habitats can be summarized as follows:

- If the floodplain aquifer discharges into the stream, groundwater levels can be lowered because of channel degradation. Lowering the water table can destroy riparian vegetation (Collins and Dunne, 1990).
- Long-term loss of riparian vegetation can occur when gravel is removed to depths that result in permanent flooding or ponded water. Loss of vegetation occurs when gravel removal results in a significant shift of the river channel that subsequently causes annual or frequent flooding into the disturbed site (Joyce, 1980).
- Heavy equipment operations, processing plants, and gravel stockpiles at or near the extraction site can destroy riparian vegetation (Joyce, 1980; Kondolf, 1994a; OWRRI, 1995). Heavy equipment operations also cause soil compaction, thereby increasing erosion by reducing soil infiltration and causing overland flow. In addition, roads, road building, road dirt and dust, and temporary bridges can also impact the riparian zone.
- Removal of large woody debris from the riparian zone during gravel extraction activities negatively affects the plant community and in-stream fish habitat (Weigand, 1991; OWRRI, 1995). Large woody debris is important in protecting and enhancing recovering vegetation in streamside areas and providing fish habitat diversity (Franklin et al., 1995; OWRRI, 1995).
- Rapid bed degradation may induce bank collapse and erosion, by increasing the heights of banks (Collins and Dunne, 1990; Kondolf, 1994a).
- Portions of incised or undercut banks may be removed during gravel extraction, resulting in reduced vegetative bank cover, causing reduced shading and increased water temperatures (Moulton, 1980).
- Banks may be scraped to remove "overburden" to reach the gravel below. This may result in destabilized banks and increased sediment inputs (Moulton, 1980).
- The reduction in size or height of bars can cause adjacent banks to erode more rapidly, or to stabilize, depending on how much gravel is removed, the distribution of removal, and the geometry of the particular bed (Collins and Dunne, 1990).

5.12 HISTORIC, CULTURAL, AND ARCHAEOLOGICAL RESOURCES

Historic, prehistoric and archaeological resources are an important resource in the MSB. The number of known, and potential, cultural, and historical resources is significant, thereby making a valuable contribution to understanding the past. An inventory of historic sites was commissioned by the MSB Historical Preservation and Restoration Commission and completed in December 1981. The purpose of that survey was to locate, identify, photograph, catalogue, and research the number of historic and prehistoric sites within the MSB's boundaries. The survey concentrated on sites and structures established prior to the arrival of Matanuska Valley Colonists in 1935. The survey and inventory from the 1981 report provide an initial database of information, valuable to the preservation of the MSB's cultural heritage. A number of buildings in the MSB are known to be on the National Register of Historic Places (NRHP):

- Original Wasilla Elementary School
- Knik Pool Hall/Museum
- Wasilla Museum
- Wasilla Depot
- United Protestant Church in Palmer
- Independence Mine

The 1981 report also stated that all of the Colony farm office buildings, stores and churches from the 1930's, meet the 50-year requirement for nomination to the NRHP. Locating sites related to past events and past people gives residents and visitors a sense of pride and a sense of place. The preservation and protection of these historical, cultural, and archaeological features of the community are important issues of local concern.

In addition to those buildings currently on the NRHP, according to the 1984 MSB CMP, there were a number of buildings deemed suitable for nomination to the NRHP. They included:

- Werner Farm
- Lakeview School
- Woodward Cabin and Barn
- Chickaloon House (Lucas Place)
- Chickaloon Bridge
- Felton Store and Post Office
- Willow Section House
- Talkeetna Section House, Tool Sheds, and Depot
- University Experimental Farm
- Roy Cornelius Homestead
- Wrinkle-Faced Swanson Cabin
- Tyonek Village
- John Springer Cabin and Barn
- Dave Reedy Cabin
- Forks Roadhouse
- Chickaloon House (Gladson House)
- Felton Fishhook House and Cabins
- Palmer Depot
- Sunshine Section House
- Talkeetna Historic District
- Austin Meekins Hunting Cabin
- Jake Metz Cabin
- Howard Ross Cabin and Warehouse
- Fairview School

The State Historic Preservation Office (SHPO) maintains the Alaska Heritage Resource Survey (AHRS) inventory. A local inventory of historic sites is maintained by the Cultural Resources Division located within the MSB Planning and Land Use Department. The MSB inventory, in

accordance with the MSB Ordinance No. 87-007, includes historic and prehistoric sites, buildings and monuments situated within the MSB, in addition to objects, structures, districts and travel-ways with a general provision that they are a minimum of 50 years old. There are approximately 1,327 sites inventoried within the MSB. The following is a breakdown of sites.

- 7 paleontology sites;
- 481 prehistoric sites;
- 20 proto-historic sites;
- 815 historic sites; and
- 4 modern sites

There are 65 sites determined eligible for the National Register; 66 are ineligible, and 30 are listed in the National Register of Historic Places. There are no national landmarks at present. The Colony Historic District in Palmer, however, is currently under review for nomination as a national landmark.

Although the MSB has 1,327 listed sites, much of the land has not been archaeologically surveyed and inventoried for historic and prehistoric sites. Approximately two percent of the MSB has been surveyed and inventoried for historic sites. Most of those surveys have been for historic sites located on public land with very few surveys conducted on private property.

For each individual site, a record is maintained, containing the following information: site name, a description of physical remains, data on the site's location, and a list of bibliographic citations, and any additional information relevant to management and research needs.

6.0 CHAPTER SIX ENFORCEABLE POLICIES

6.1 INTRODUCTION

Enforceable policies applicable within the MSB coastal zone and Designation, excluding the Point MacKenzie AMSA, are described in this Chapter. Refer to Volume I, Chapter Three, Boundary for the legal description of the MSB coastal zone and Designation. Refer to Volume III, CMP Maps, for a map of the Designation.

6.2 MSB COASTAL ZONE AS A DESIGNATED RECREATION AREA

All of the lands and waters within the existing MSB coastal zone, as defined in chapter Three, are included in the Designated Recreational Use Area. Federal lands within the coastal zone, and the Point Mackenzie AMSA are excluded from the designation. See Map 2 for supplemental information.

The ACMP does not allow for management of uses and activities that are adjacent to the lands and waters within the Designation, unless that adjacent area is included within the Designation. This means that in order to address uses and activities that may have a direct and significant impact on the physical, biological, and cultural features upon which the recreational uses of the rivers, streams, and lakes depend, the "bright line" must be drawn more broadly to include these uplands.

Thus, the Designation has been delineated to coincide with the MSB coastal zone boundary. A designation for the purposes of coastal management does not imply that all areas within the Designation are in public ownership, or used for public recreational purposes. Rather, the Designation encompasses actively used areas, those areas that have the potential to be used, and those areas that are setbacks or buffers needed to protect the adjacent recreational resource. The Designation is not a zoning district. The state regulations regarding subject uses, activities, and designations are described below.

> ***11 AAC 114.250. Subject uses, activities, and designations.*** *(c) A district shall consider and may designate areas of* ***recreational use****. Criteria for designation of areas of recreational use are*
>
> *(1) the area receives significant use by persons engaging in recreational pursuits; or*
>
> *(2) the area has potential for recreational use because of physical, biological, or cultural features.*

6.3 RECREATION, DEVELOPMENT AND ACCESS (RDA)

6.3.1 State Standards

> ***11 AAC 112.200 Coastal Development.*** *(a) In planning for and approving development in or adjacent to coastal waters, districts and state agencies shall manage coastal land and water uses in such a manner that those uses that are economically or physically dependent on a coastal location are given higher priority when compared to uses that do not economically or physically require a coastal location.*
>
> *(b) Districts and state agencies shall give, in the following order, priority to*
>
> *(1) water-dependent uses and activities;*
>
> *(2) water-related uses and activities;*
>
> *(3) uses and activities that are neither water-dependent nor water-related for which there is no practicable inland alternative to meet the public need for the use or activity.*
>
> *(c) The placement of structures and the discharge of dredged or fill material into coastal water must, at a minimum, comply with the state standards contained in 33 CFR Parts 320-323, revised as of July 1, 2003. (Eff. 7/1/04, Register 170)*
>
> ***11 AAC 112.220 Coastal Access.*** *Districts and state agencies shall ensure that projects maintain and, where appropriate, increase public access to, from, and along coastal water. (Eff. 7/1/04, Register 170)*

6.3.2 Applicability

All of the lands of waters within the existing MSB coastal zone, as defined in Chapter Three, are included in the Designated Recreational Use Area (Map 2). The state standards for coastal development and coastal access are, by definition, limited to marine coastal water, consequently, neither standard is applicable to rivers, streams, and lakes in the MSB coastal zone. Recreation, Development and Access (RDA) policies derive their authority from the recreational use designation and are therefore applicable throughout the MSB coastal zone (including rivers, lakes and streams).

6.3.3 Enforceable Policies

Shoreline Development Requirements

RDA-1 Within the designated recreational use area, projects that involve dredging or filling in the shall be located, designed, constructed, operated, and maintained to:

(1) avoid significant adverse impacts to the physical, biological, and cultural features, described in section 5.9, upon which the recreation resource depends; and

(2) limit the extent of direct disturbance to the minimum area necessary to accommodate the proposed purpose or use.

Waterbody Setback Requirements

RDA-2 Within the designated recreational use area, proposed uses and activities within 75 feet of the ordinary high water (OHW) line of rivers, streams, and lakes shall protect the physical, biological, and cultural features upon which the recreation resource depends.

RDA-3 Within the designated recreational use area, water-dependent structures such as docks, piers, marinas, floatplane hangars, or boathouses, and access to such structures, are allowable within 75 feet of OHW, provided they are constructed and used in a way that minimizes adverse impacts to the recreational uses shown in tables 5-8 and 5-9.

RDA-4 Within the designated recreational use area, other uses and activities within 75 feet of OHW are also allowable if the proposed development will have no significant adverse impact to recreational uses shown in Tables 5-8 and 5-9.

RDA-5 Within the designated recreational use area, natural or vegetative buffers shall be required for commercial and industrial developments within the 75-foot setback from OHW to protect the recreational character of the waterbody. Requirements for the size and extent of buffers shall be determined on a case-by-case basis and shall be commensurate with the reasonably foreseeable impacts of the development on recreational uses and activities shown in tables 5-8 and 5-9.

In-water Development Requirements

RDA-6 Uses and activities on rivers, streams, lakes, and coastal waters within the designated recreational use area, shall meet the following requirements:

A. In-water structures and buoys shall be visibly marked and placed in a manner to minimize navigation hazards or obstructions to other uses; and

B. To the extent practicable, all developments, structures, and facilities in waterbodies shall be sited, constructed, operated, and maintained in a manner that does not create a hazard or obstruction to other uses.

Access Requirements

RDA-7 Within the designated recreational use area, new subdivisions shall increase public access to and from the shoreline.

RDA-8 Within the designated recreational use area, capital improvements on non-federal publicly owned waterfront property shall incorporate walkways, shelters, viewing platforms, and landscaping whenever practicable to increase public access and to facilitate public enjoyment of recreational waters.

Specific Waterfront Development Requirements

RDA-9 Within the designated recreational use area, proposed uses or activities shall avoid, minimize, or mitigate direct and significant impacts upon the existing activities and the physical, biological, visual, or cultural features upon which the recreation resource depends. Protected features, uses, and activities subject to this policy are presented in tables 5-8 and 5-9.

Sequencing of Sand and Gravel Extraction and Practicable Alternatives

State Standard

> ***11 AAC 112.260. Sand and gravel extraction.*** *Sand and gravel may be extracted from coastal waters, intertidal areas, barrier islands, and spits if there is no practicable alternative to coastal extraction that will meet the public need for the sand or gravel. (Eff. 7/1/2004, Register 170)*

Applicability

Enforceable policies apply throughout the entire MSB coastal zone, which is synonymous with the Designation Area.

RDA-10 Within the designated recreational use area, in order to minimize impacts on recreational uses shown in Tables 5-8 and 5-9 and to the extent practicable, sources of sand and gravel shall be approved in the following sequence:

A. Existing approved gravel pits or quarries operated in compliance with state and federal authorizations;

B. Reuse of material from abandoned development area;

C. New upland sites; and

D. Streams that do not provide fish habitat.

7.0 CHAPTER SEVEN IMPLEMENTATION

7.1 INTRODUCTION

This chapter of the MSB CMP describes the following:

- Coastal Management Program Participant Duties and Responsibilities
- MSB Participant Duties and Responsibilities
- General Coastal Consistency Information
- Coastal Consistency Review Process
- Federal Authorities
- MSB Participation in State-coordinated Consistency Reviews
- Elevation and Appeals Process
- Planning for Major Projects
- Amendments and Revisions to the Plan
- Monitoring and Enforcement
- Public Education and Outreach

7.2 COASTAL MANAGEMENT PROGRAM PARTICIPANT DUTIES AND RESPONSIBILITIES

The MSB is incorporated as a Second Class Borough and is eligible to be a coastal district in accordance with state law at Alaska Statute (AS) 46.40.210(2)(B).

The Planning Director works with the MSB Planning Commission, which is an advisory body to the MSB Assembly, to implement the MSB CMP. The Planning Director regularly consults with the Planning Commission on matters related to implementation of the CMP. Consistency reviews are handled internally, and do not go to the Planning Commission.

The point of contact for local consistency reviews, involving the MSB coastal zone is the Planning Director, who can be reached at:

Matanuska-Susitna Borough
350 East Dahlia Avenue
Palmer, Alaska 99645
Phone 907-745-9833
Fax 907-745-9876

7.3 MSB DUTIES AND RESPONSIBILITIES

7.3.1 MSB Planning Commission

The MSB Assembly has delegated local implementation of the MSB CMP to the Planning Commission and Planning Director. The MSB Planning and Land Use Department implements the MSB CMP when issuing consistency comments. The Planning Commission normally delegates authority to make consistency comments to the MSB CMP Coordinator, who acts under the authority of the Planning Director. In addition, the Planning Director has the following responsibilities:

- Monitor and assess consistency comments issued by the CMP Coordinator;
- Review the CMP every five years and amend, if required;
- Review whether the MSB is appropriately implementing the CMP every year; and
- Submit the MSB CMP to the Office of Project Management and Permitting (OPMP) for re-approval every 10 years. The submittal shall include an evaluation of the CMP effectiveness and implementation, a presentation of any new issues, and a recommendation for resolving any problems that have arisen.

7.3.2 MSB CMP Coordinator

The CMP Coordinator is a member of the MSB Planning and Land Use Department staff and serves as a dedicated staff member to the Planning Commission. The CMP Coordinator is supervised by, and is under the authority of, the Planning Director. The CMP Coordinator may also receive oversight and direction from the Planning Commission.

The CMP Coordinator's day-to-day responsibilities include:

- Helping applicants fill out the coastal project questionnaire, including an evaluation of the MSB CMP's enforceable policies, along with the boundary determination, and educate them about the ACMP and the MSB CMP throughout the process;
- Ensuring that information has been received in a timely manner by the parties involved in the consistency review process;
- Determining if information received is complete and sufficient for a consistency review;
- Deciding which projects are routine and which projects have great significance to the MSB and should be reviewed and discussed with the MSB Manager (routine approvals will be processed by the CMP Coordinator);
- Evaluating uses and activities that require local, state, or federal permits or authorizations for consistency;
- Evaluating proposed projects against the enforceable policies of the MSB CMP;
- Accurately assessing the effect of applicable policies of the MSB CMP on the application;
- Managing project information to ensure that it reaches all affected persons and organizations;
- Drafting effective, concise, and comprehensive consistency determinations and recommendations and produce evidence in support of the conclusions reached;

- Integrating feedback from local contacts and other interested parties into the MSB's consistency recommendation;
- Coordinating consistency review activities with adjoining coastal districts where issues or activities of mutual concern are under consideration;
- Preparing and submitting the consistency recommendation in a timely manner;
- Preparing quarterly and annual reports to the state, as required by the MSB's ACMP grant agreement; and
- Facilitating and receiving public input and act as an information resource concerning the MSB CMP.

The CMP Coordinator represents the MSB at meetings, conferences, and in ongoing interactions with applicants, the general public, and state and federal agency staff regarding the MSB CMP.

7.4 GENERAL COASTAL CONSISTENCY INFORMATION

7.4.1 Consistency Review Definition

According to AS 46.40.210 (5), definitions:

> *"consistency review" means the evaluation of a proposed project, the scope of which is determined under AS 46.40.094 and 46.40.096, against the state standards adopted under AS 46.40.040 for those evaluations and the enforceable policies in an applicable district coastal management plan approved under AS 46.40.060.*

7.4.2 Subject Uses

In accordance with 11 AAC 100.010, land and water uses and activities in the coastal zone, that are subject to consistency review and enforceable policies, include the following:

- Federal activities affecting coastal uses or resources;
- Land and water uses and activities requiring federal permits or authorizations (see 11 AAC 110.400); and
- Land and water uses and activities requiring state permits or authorizations.

In addition, outside of the state consistency review process, there may be a local consistency review for land and water uses in the MSB coastal zone for land and water uses and activities requiring local permits or authorizations.

7.4.3 Proper and Improper Uses

In accordance with 11 AAC 114.260, District plans are required to identify uses and activities, including uses of state concern, that are considered proper and improper within the coastal zone. The MSB has not identified any uses that are categorically prohibited within its coastal zone. Proper and improper uses are determined by their compliance with enforceable policy requirements.

All land or water uses or activities within the MSB are considered to be proper as long as they comply with the policies of MSB CMP, the ACMP standards under 11 AAC 112, and applicable federal and

state regulations. All other land or water uses or activities are considered to be improper if they are inconsistent with ACMP standards, or the policies of this CMP, or if they do not comply, or cannot be made to comply, with applicable federal and state regulations. Designated areas included in this CMP identify specific land or water uses and activities that will be allowed or not allowed.

7.4.4 Designated Use Areas

Enforceable policies related to coastal development and coastal access; recreation; sand and gravel; transportation, energy and utility facilities and routes; apply to projects within the Designation, which is synonymous with the MSB coastal zone boundary. The Point MacKenzie AMSA is not included in this designation, but rather is a Designated Major Energy Facility Use Area with its own set of enforceable policies (Volume II).

7.4.5 Uses of State Concern

Uses of state concern are uses and activities that are considered to be of state or national interest. The MSB cannot restrict or exclude uses of state concern unless they provide ample justification for the exclusion or restriction within the MSB CMP.

AS 46.40.210(12) defines uses of state concern. In addition, the former Coastal Policy Council issued Resolution Number 13, which specifies more categories and criteria for uses of state concern. This resolution remains in effect until it is superceded by statutes or regulations, or until it is formally rescinded by the ADNR.

7.5 COASTAL CONSISTENCY REVIEW PROCESS

Because the State of Alaska has adopted the MSB CMP as an amendment to the ACMP, the MSB is one of several reviewers that concurs or objects to an applicant's consistency certification, or a federal agency's consistency determination to the coordinating agency during consistency review. Based on these comments, and on the policies and procedures of the ACMP, the coordinating agency issues a consistency finding.

7.5.1 Two Types of Consistency Reviews

The enforceable components of this CMP form the basis for a determination of consistency with the MSB CMP. There are two types of reviews: state-coordinated consistency reviews and locally coordinated consistency reviews. When a project is proposed, State ACMP project reviewers determine which authorizations are needed. If the project is a federal activity, or needs state or federal authorization, the State of Alaska reviews the project for consistency with the ACMP. The MSB also participates in the state-coordinated review. If only local authorization is required (but not state or federal authorization), then the MSB itself reviews the project for consistency with the ACMP.

7.5.2 Determination of Consistency in Connection with Other Permits and Approvals

In addition to consistency, an applicant is required to obtain all other necessary permits and approvals required in connection with a proposed project. A determination of consistency does not guarantee, or presume, approval of any other federal, state, or local permit.

7.5.3 ADEC "Carve out"

The Alaska Department of Environmental Conservation (ADEC) air, land, and water quality standards are the exclusive standards of the ACMP for those purposes. Issuance of ADEC permits, certification, approvals, and authorizations establishes consistency with the ACMP program for those activities of a proposed project subject to those permits, certifications, approvals, or authorizations. A project that includes an activity subject to an ADEC authorization on the C List (see ABC List next) may require a coordinated review if the project includes a different activity that is not subject to an ADEC authorization, but is the subject of an enforceable policy or another C-listed authorization. However, the specific activities subject to ADEC authorization are not within the scope of those project activities to be reviewed.

In the case of an ADEC single agency review, the scope of review is limited to an activity that is the subject of an enforceable policy. ADEC Policy Guidance No. 2003-001, January 7, 2004, contains the actual procedure by which ADEC will participate and coordinate in ACMP consistency reviews. This document is titled, "DEC Single Agency Coastal Management Consistency Review Procedures," and sets forth the Uniform Procedures for Conducting a Coastal Management Consistency Review for Projects that Only Require a [ADEC] Permit or Contingency Plan Approval to Operate.

7.5.4 "ABC" List

The ABC List is a classification system of state and federal approvals that can streamline the consistency review portion of the state permitting process for a proposed project. The intent of the ABC List (specifically the "A" and "B" portions of the list) is to reduce the amount of time reviewers must spend on reviewing routine individual projects. The ABC List allows them to concentrate on those projects requiring a more involved consistency review.

The ABC List actually breaks down into three lists:

- The "A" List represents categorically consistent determinations – approvals of activities requiring a resource agency authorization, when such activities have been determined to have minimal impact on coastal uses or resources;
- The "B" List has been broken into two sections: Section I of the "B" List represents generally consistent determinations – approvals for routine activities that require resource agency authorization(s), when such activities can be made consistent with the ACMP through the application of standard measures; and Section II of the "B" List includes nationwide permits and general permits that have been found to be consistent with the ACMP.
- The "C" List represents a comprehensive listing of those state permits that may trigger consistency review.

Projects do not always fit neatly into just one of the three lists ("A," "B," or "C"). Some projects need authorizations that fall under more than one list or include activities that are not found in the "B" List. For these projects, OPMP will determine how much review the project requires.

7.6 FEDERAL AUTHORITY AND CONSISTENCY DETERMINATION

In accordance with federal law, the MSB coastal zone excludes all federal lands and waters within its boundaries. Federal lands and waters are those lands and waters managed, owned, or held in trust by the federal government.

However, the federal government is not exempt from the ACMP or the MSB CMP. Federal law requires "federal agencies, whenever legally permissible, to consider State management programs as supplemental requirements to be adhered to in addition to existing agency mandates" per Code of Federal Regulations (CFR), 15 CFR 930.32(a). The federal government meets this requirement in several ways, depending upon the type of project or activity being considered.

First, federally licensed or permitted activities proposed within the coastal area and affecting coastal uses or resources must be **consistent** with the ACMP, including the MSB CMP (15 CFR 930.50).

Second, federal license and permit activities described in detail in Outer Continental Shelf plans and affecting coastal uses or resources must be **consistent** with the ACMP, including the MSB CMP (15 CFR 930.70).

And finally, all **federally conducted or supported activities**, including **development projects** directly affecting the coastal zone, must be **consistent to the maximum extent practicable** with the ACMP, including the MSB CMP. Federal activities are "any functions performed by, or on behalf of, a federal agency in the exercise of its statutory responsibilities." This does not include the issuance of a federal license or permit. Federal development projects are those federal activities "involving the construction, modification, or removal of public works, facilities, or other structures, and the acquisition, utilization, or disposal of land or water resources" per 15 CFR 931.31. The phrase "consistent to the maximum extent practicable" means that such activities and projects must be "fully consistent with such programs unless compliance is prohibited based upon the requirements of existing law applicable to the federal agency's operations" per 15 CFR 930.32(a).

7.7 MSB Participation in State-Coordinated Consistency Review

7.7.1 Procedures

The point of contact for state and federal consistency reviews involving the MSB CMP is OPMP.

OPMP addresses are:

Southcentral Regional Office
550 West 7th Avenue, Suite 1660
Anchorage, Alaska 99501
Phone: (907) 269-7470
Fax: (907) 269-3981

Central Office
302 Gold Street, Suite 202/P.O. Box 111030
Juneau, Alaska 99801-0030
Phone: (907) 465-3562
Fax: (907) 465-3075

The state-coordinated consistency review process is contained in state regulations at 11 AAC 110. The MSB may participate in that process as an affected coastal district. A brief discussion of the MSB's role in the state consistency review process is described in this section. However, applicants should obtain current information on the state consistency review process from OPMP.

The MSB strongly recommends that applicants who seek state or federal permits for a major or complex project located within the MSB coastal zone, request pre-review assistance prior to submitting such an application. The MSB seeks to work with applicants to initiate early communication and facilitate an expedient and informed consistency review.

The coordinating agency will notify the MSB of a pending consistency review. If requested, the MSB will participate in determining the scope of review of a proposed project, based on the MSB's enforceable policies.

Upon the notification from the coordinating agency of the start of a consistency review, the MSB CMP Coordinator will determine whether the project information is adequate to allow the MSB to concur or object to an applicant's consistency certification. If more information is required, the MSB will notify the coordinating agency by the "request for additional information" deadline and specifically identify the additional information required.

7.7.2 Permit Application Meeting

During a consistency review, the CMP Coordinator may contact the coordinating agency to request a meeting to resolve issues. The purpose of the meeting is to discuss the coastal management and permitting issues of the proposed activity, and to work toward resolution of issues of local concern and potential conflicts. This meeting should be scheduled no later than 10 days after the CMP Coordinator receives notification of the action. At a minimum, representatives of the coordinating agency, the MSB, affected communities, affected major landowners, the applicant, affected interest groups and organizations, and affected resource agencies will be invited to participate. Depending on the nature of the activity and travel constraints, the meeting may involve a meeting or teleconference. Subsequent work sessions may be beneficial to reaching early consensus on the consistency determination. Scheduling a permit application meeting does not change the final consistency review deadline of 90 days as directed in 11 AAC 100.265.

7.7.3 Consistency Comments

During the period allowed to review and consider the proposed use, the MSB will prepare written comments on the applicant's consistency certification. In preparing a consistency review comment, the MSB will comment on consistency with state standards. In order to be considered by the coordinating agency, MSB comments must be in writing and must:

- State that the MSB concurs with the applicant's consistency certification and explain why, or
- Identify that the MSB objects to the applicant's consistency certification.

If the MSB objects, then it must:

- Identify and explain why the proposed project is inconsistent with specific state standards or the MSB CMP enforceable policies; and
- Identify any alternative measure that, if adopted by the applicant, would achieve consistency with the specific state standard or MSB CMP enforceable policy.

Alternative measures are project conditions proposed by a state resource agency or the MSB that, if adopted by the applicant, would make the project consistent with either state standards or MSB CMP enforceable policies. If alternative measures are proposed, the MSB must explain how the alternative measure would achieve consistency with the specific enforceable policies in question.

When the consistency review is routine in nature and the MSB Planning Commission does not need to take action, the CMP Coordinator will issue the MSB's consistency comments on behalf of the MSB.

The CMP Coordinator will ensure that local concerns are solicited and appropriately incorporated in the MSB's consistency comment. Input from appropriate Native corporation land managers may also be solicited. The MSB representative is responsible for providing information on local community concerns and input about the proposed development. Local input to the MSB consistency comment must be received promptly in order to meet the state review deadlines. The MSB will consider such

input in developing comments and alternative measures regarding the consistency of a proposed project. Where local concerns cannot be incorporated in the MSB consistency comment, the CMP Coordinator must provide justification for this decision to the local contacts involved.

7.7.4 Public Hearing During a State-coordinated Consistency Review

Any person or affected party may request that the coordinating agency hold a public hearing on a project or activity undergoing a consistency determination, by providing adequate justification for the request as specified in 11 AAC 110. During the initial consistency review, the CMP Coordinator, in consultation with the Planning Director and affected parties, may decide if the scope of a project will require a public hearing. If a public hearing is needed, the CMP Coordinator will submit a written request to the coordinating agency that a public hearing be held and outline the need for such a hearing. The coordinating agency will review the request to determine if it is based on concerns not already adequately addressed in the review. If a public hearing is held, the 90-day deadline in 11 AAC 110.265 for the completing the consistency review is unchanged. The coordinating agency should be consulted for the exact schedule.

7.7.5 Changes in the Nature of a Permitted or Approved Activity

Per 11 AAC 110.280, an applicant that proposes a modification to an activity, for which a final consistency has been issued, must submit a new coastal project questionnaire to the agency that coordinated the consistency review. The modification is subject to another consistency review if the modification will have significantly different effects than the existing use on the resources of the MSB coastal zone, and if a new authorization or change in authorization is required.

7.7.6 Due Deference

Due deference is a concept and practice within the consistency review process that affords the commenting review participants the opportunity to include, review, or refine the alternative measures or consistency concurrence if they have expertise in the resource, or the responsibility for managing the resource. The MSB and resource agencies are provided deference in interpretation of policies and standards in their area of expertise or area of responsibility. First, in order to be afforded due deference, the MSB must have an approved coastal management plan and have commented during the consistency review. Then, the MSB may be afforded due deference if no resource agency has specific authority or expertise, and if the MSB can demonstrate expertise in the field.

A district does not have to have a specific policy that applies to the proposed project under review. The MSB may comment on the consistency of the proposed project within the state standards.

If the coordinating agency rejects the MSB comments, or any alternative measures that the MSB might seek to have imposed on the application in connection with a consistency determination, the coordinating agency must provide a brief, written explanation stating the reasons for rejecting or modifying the alternative measure. *Note: this requirement only applies when the coordinating agency disagrees with the MSB on issues involving the interpretation and application of the MSB CMP*.

AS 46.40.090(b) requires coastal districts that have and exercise zoning or other land use controls to implement their plans. While there is no specific guidance in statute or regulations on how to implement the district plan, the preferred method is through the performance of local consistency review. In this section, the MSB has described how municipal review fits within the timeframe of state-coordinated reviews. Local projects will enter the coastal management review process at the time of application for a special land-use permit (Title 17), subdivision or short plan approval (Title

16), or through comprehensive plan consistency (Title 15). Applications must contain sufficient a description of the proposed activity with an appropriately scaled map showing the location of the proposed development. The application must discuss how the activity will be in compliance with MSB adopted ordinances and codes.

The MSB Planning and Land Use Department staff will respond to the applicant within 10 working days as to whether the information submitted is complete or if more information is required. Such supplemental information may include additional drawings, plans, specifications, project management schedules, data, and statements of anticipated impacts on coastal resources. The MSB will complete the consistency review process for local projects within 24 days.

The MSB Planning and Land Use Department staff will determine whether or not the application is consistent with MSB ordinances, codes, and regulations. Applications that are not at variance with the code may be approved immediately by the Planning Director. Applications for which a formal and written consistency analysis is not needed must meet all of the following criteria:

1. The project or action is found to be in compliance with all rules applicable to special land-use districts or geographic areas significantly affected by the proposed action;
2. The project or action is consistent with all rules applicable to the affected uses, activities, habitats, and resources; and
3. The project or action is consistent with the management plan for any AMSA, which it will significantly affect.

Under the provisions of AS 46.40.100, actions and approvals by local governments are also subject to consistency with approved coastal management programs. In some cases, a proposed action, requiring a municipal permit or approval will also need a state or federal permit, and the federal/state consistency review will take place at the state level. Sometimes, a proposed action will only require a municipal permit and no state or federal permit. In such cases, the municipal government is responsible for reaching the consistency determination.

7.7.7 Uses Subject to Local Consistency Review

All uses that are proposed in the MSB coastal zone that do not require federal or state authorization, or that are not a federal activity, will require a determination of consistency from the MSB if they are land and water uses requiring a permit or approval in accordance with MSB Code Title 17.

MSB procedures for local consistency determinations are simple, and are designed to quickly determine whether a proposed use is consistent with the MSB CMP.

7.7.8 Application Procedure and Time Line

There is no separate application for a local consistency determination under the MSB CMP. Rather, the applicant desiring to undertake a subject use applies to the MSB (depending on where the use is to be located) for the required land-use permit or approval.

7.7.9 Local Consistency Determinations Inside the MSB

The point of contact for local consistency reviews is the MSB CMP Coordinator, a staff position in the MSB Department of Planning. The address of the CMP Coordinator is:

Matanuska-Susitna Borough
350 East Dahlia Avenue
Palmer, Alaska 99645
Phone 907-745-9833
Fax 907-745-9876

The MSB will issue its consistency determination in conjunction with the any local permit or approval. The underlying permit or approval process will establish the timeline for a local MSB CMP consistency determination. If the information provided by the applicant is incomplete or insufficient to allow a local consistency determination, the MSB will ask the applicant for the missing or required information in accordance with local authorization procedures.

The MSB land development ordinance details the review process and schedule for each specific local permit or approval required. The MSB will conduct its consistency review concurrently with its permit or approval review process. Upon issuing its permit or approval, the MSB will also issue a consistency determination.

Subject uses within the MSB that do not require a state or federal authorization, or that are not a federal activity, will have a local consistency determination made by the MSB. Rezoning, conditional uses, variances, and new subdivisions, are actions that require local consistency determinations by the MSB.

Reviewing certain actions for coastal consistency under a municipal zoning and subdivision ordinance, does not make the zoning and subdivision ordinances part of the MSB plan, and subject to state review and approval. Therefore, amendments to the local zoning and subdivision ordinances will not require an amendment to the approved CMP; however, the local zoning and subdivision ordinances may not conflict with the MSB CMP.

The MSB strongly recommends that applicants, who seek authorization for a major project, requiring local consistency review, request a pre-application meeting before submitting the application.

7.8 Elevation Process and Appeals

7.8.1 Elevation of State Consistency Determination

Elevations of a consistency determination issued by a coordinating agency follow the procedures established under regulations at 11 AAC 110.600.

7.8.2 Appeal of Local Consistency Determination Outside the MSB

The applicant, or any aggrieved person, may appeal the MSB's consistency determination to the Planning Commission, and then the Board of Adjustment and Appeals, in accordance with the procedures established for the appeal of the underlying permit or approval in the MSB land development ordinances. Subsequent appeals may be made to the superior court in accordance with the procedures established in the MSB land development ordinances.

7.8.3 Appeal of Local Consistency Determination Inside the MSB

The applicant, or an aggrieved party, may appeal the MSB's consistency determination, in accordance with the procedures established in the MSB's land use ordinances, for the appeal of the underlying permit or approval.

7.9 PLANNING FOR MAJOR PROJECTS

7.9.1 Introduction

Certain types of activities can significantly impact coastal resources and create major changes within the MSB Coastal zone. The MSB is interested in participating in agency planning for large-scale development projects, and land management decisions. A consistency determination for a major project often takes place after the planning process is completed, which may mean that substantive decisions concerning the use have already been made. Conflicts that could have been avoided by mutual agreement early on become costly in terms of time and effort spent on resolving differences later on. To avoid this, major project planning establishes the following objectives:

- MSB CMP enforceable policies should be considered as early as possible in planning for proposed major uses.
- Problems and potential consistency conflicts should be addressed and resolved prior to the application stage.
- Prior resolution of differences should speed the issuance of subsequent permits or approvals.

There are three procedures that are strongly encouraged for major activities of area-wide concern: 1) pre-application meetings, 2) permit application meetings, and 3) local partnership in planning activities. Participation in these procedures has the following objectives:

- Apply coastal management policies early in project or plan development;
- Address problems and potential consistency evaluation conflicts prior to the permit or approval stage;
- Speed up subsequent permits or approvals through early resolution of issues; and
- Ensure the compatibility of future planning projects with the approved MSB CMP.

7.9.2 Major Projects

The following types of activities and actions are considered to be major activities of regional concern:

- Oil and gas exploration, development, and support activities;
- Land disposal and subdivision of land over 100 acres in size;
- Transportation/utility facility and corridor designation or construction;
- Mineral exploration or development (projects requiring development of new airstrip or roads, major energy generation or transmission facilities, slurry pipelines, port facilities, extensive overburden or tailings disposal areas, offshore mining, or significant stream diversion);
- Large-scale sand, rock, and gravel extraction activities (greater than 25,000 cubic yards);
- Transportation, storage, cleanup, and disposal of hazardous substances (including the Defense Environmental Restoration Act Program and other federal sites);
- Development of management guidelines for subject uses and activities on National Wildlife Refuges, National Parks and Preserves, and State of Alaska Critical Habitat Areas;

- Development of management guidelines for subject uses and activities on Native corporation lands;
- Industrial projects, including fish processing and petroleum product storage and transfer; and
- Construction or major additions to military facilities within the MSB.

7.9.3 Local Participation in Planning Activities

Local participation in state and federal planning activities that affect the allocation of resources in the MSB coastal zone benefits everyone involved. State and federal agencies should invite representatives of the MSB Planning Commission, MSB communities, and major landowners, and land managers to take part when conducting regional planning and resource allocation studies. The MSB Planning and Land Use Department will assist in identifying local representatives who are capable of ensuring that the plans that are developed accurately reflect local concerns and have credibility both in the MSB and in state government.

7.9.4 Pre-application Meeting Between MSB and Applicant

Parties involved in activities on the "major project" list are strongly encouraged to present their plan to the MSB Planning and Land Use Department and other participants in the consistency review process at least 60 days prior to filing a permit application for a federal, state, or local permit for approval, or prior to proposing action be taken on a state or federal land disposal or state or federal management plan. This presentation is not part of a state-coordinated consistency review and is optional.

Developers of large industrial projects allow for sufficient lead time between their plan presentation to the MSB Planning and Land Use Department and filing the permit application, so that key issues can be addressed in project planning and the permit applications submitted. It is recommended that presentations include the following information, which the prospective applicant may submit to the MSB, in any format desired that conveys the following information clearly and in sufficient detail:

- **Project Description.** The description should consist of a narrative, describing the proposed use or activity.
- **Site Description.** The description should include information about the site, as it currently exists, including such items as size, existing structures, vegetation, topography, and any other features that may be a factor in the design of, or operation of, the proposed project.
- **Owner, Sponsor or Developer.** The name of the agency, activity, business enterprise, or owner should be provided, along with the name of other operators, if any.
- **Location and Size.** The location and size of the proposed project should be identified. A map, prepared at the most appropriate scale, and may initially be hand drawn, should be provided, showing the location of the proposed use and any structures, roads, or alterations planned for the area. As the significance or complexity of the proposed project increases, the MSB may, at its discretion, determine that professionally prepared maps and other documentation are needed at the time of application.
- **Construction Schedule.** The dates of any construction or other preparatory site activity should be given.
- **Operation Schedule.** The dates, times, and, if applicable, seasons of operation should be given.

- **Special Circumstances.** Any special circumstances that exist that effect decisions made should be described.
- **Impact Assessment.** The prospective applicant's assessment of the impact on MSB Coastal zone resources, that will be created by the proposed use, should be given.
- **Statement of Consistency.** The applicant should provide a sufficiently detailed statement, demonstrating that he or she has assessed the project against applicable MSB CMP policies, and believes that the proposed use is consistent with the MSB CMP. Supporting material, such as studies and assessments supporting the prospective applicant's assertions, should be submitted to support any area where compliance is not apparent. Written justification for deviating from any applicable MSB CMP policy, should be provided in the event that the proposed use does not comply with one or more of the pertinent policies.
- **Mitigation Measures.** Any actions or measures that will be undertaken to bring a nonconforming use into conformity with the MSB CMP policies should be explained.

The MSB recommends that the applicant provide the following additional information in connection with proposed uses that are of large size, occupy a large land area, involve intensive activities, or are generally complex in nature:

- **Statement of Local, State, or Federal Need**. Information supporting the public need and necessity for, and the benefit to be gained from, the project.
- **Alternative Sites**. Consideration of alternative locations outside the MSB coastal zone.
- **Alternative Size and Scope**. Consideration of a reduced size and/or scope of the project.
- **Alternative Development Schedule**. Consideration of alternative construction and site preparation times.

Within 30 days of notification that an applicant would like to make a presentation, the CMP Coordinator will notify major landowners, the general public, and other consistency review participants, and will work with these groups to hold the presentation meeting. As appropriate, discussions may follow the presentation to identify issues and conflicts that need to be addressed prior to permit review and preparation of the MSB consistency comment. The CMP Coordinator will be available to work with developers in project planning. The CMP Coordinator may provide a written summary to the developer, outlining major consistency concerns and policy issues. Copies will be sent to OPMP and the coordinating agency. All pre-application meetings sponsored by the MSB are open to the public, and public notice of the meeting will be provided. The MSB will notify appropriate state agencies in advance and invite them to attend.

After the applicant's presentation, discussions will be held to identify issues and conflicts that need to be addressed prior to the submission of a formal application. Following the meeting, the MSB will, if requested, undertake additional pre-application work with the prospective applicant in project planning on request.

7.10 AMENDMENTS AND REVISIONS

AS 11 AAC 365(b) requires that the MSB review and submit their plan to ADNR every 10 years for re-approval. The MSB may specify a shorter time frame to review its plan.

Every five years, the CMP Coordinator should initiate a local review of the approved coastal program. This formal review gives residents, developers, affected communities, and local landowners an opportunity to become familiar with the plan and its policies and to propose amendments. Changes can keep the CMP up-to-date and relevant. Some adjustments may be made to the MSB coastal zone boundaries or land-use districts based on new information. Policies may be further refined and standards adopted to facilitate the consistency review process. More detailed plans developed for special areas, such as AMSA plans, may be incorporated into the MSB CMP after state and federal approval.

In addition, after completing any regional planning efforts, the Planning Commission may evaluate amending the MSB CMP to include pertinent policies, classifications, and resource data developed through the specific planning process. The MSB Assembly must approve all amendments to the MSB CMP. The Commissioner of ADNR and the federal Office of Ocean and Coastal Resource Management must also approve any amendment to the MSB CMP. The process for amending the MSB CMP is provided in regulations at 11 AAC 114.

Two processes are available to the MSB for amending its CMP. The minor amendment process quickly incorporates minor changes. The significant amendment process provides a more thorough review for important changes. Examples of changes that are a significant amendment to the MSB CMP are:

- New policies or changes to existing policies,
- Alteration to the coastal zone boundaries,
- AMSA or ACMP special management areas, and
- Restrictions or exclusions of a use of state concern not previously restricted or excluded.

7.11 MONITORING AND ENFORCEMENT

AS 46.40.100 gives state resource agencies and municipalities enforcement responsibility for provisions of the ACMP. If an applicant fails to implement an adopted alternative measure, or if the applicant undertakes a project modification not incorporated into the final determination, and not reviewed under 11 AAC 110.800-820, it is a violation of the ACMP. The responsibility for enforcing alternative measures carried on state and federal permits rests with the permitting agency. The MSB strongly encourages the state to enforce alternative measures and bring violators into compliance.

Enforceable policies and ACMP standards are implemented at the state level through alternative measures incorporated into the project description. The ACMP does not issue a separate coastal permit, but relies on existing state authorities. Thus, state monitoring and enforcement of the ACMP occurs primarily through agency monitoring and enforcement of alternative measures on their permits. A district can assist in this process by monitoring projects and providing information to appropriate state agencies.

The CMP Coordinator and Planning Commission have first-hand knowledge of local concerns and issues related to development activities in the MSB coastal zone. The CMP Coordinator and Planning Commission may, within legal and logistical constraints, assist agencies and municipalities in their monitoring and compliance efforts. The intent is to ensure that alternative measures associated with the MSB CMP are carried out in the development process.

The CMP Coordinator is the key individual in monitoring projects to ensure that alternative measures are carried out in the development process. The CMP Coordinator and Planning Commission will rely on community input in monitoring implementation of alternative measures. Individuals, local governments, and landowners in the MSB coastal zone, may report suspected violations to the CMP Coordinator or state and federal resource agencies. The CMP Coordinator will investigate reports of violations, and follow-up with appropriate action to ensure state or federal enforcement. The CMP Coordinator will work with state and federal agencies in monitoring and enforcement, and provide responsible agencies with copies of local reports on noncompliance. This will include adherence to permit conditions, cooperative plans, and the policies of the CMP.

When a MSB permit or approval is required, the permit will include all conditions placed on the subject use during the consistency determination. The MSB shall do the same for subject uses, requiring a permit or approval from the MSB. In such instances, the permitting state and/or federal agency will share concurrent jurisdiction with the MSB, and either or both may seek to enforce the conditions placed on the subject use.

7.12 PUBLIC EDUCATION AND OUTREACH

The MSB CMP Coordinator is committed to understanding how coastal management can benefit communities and residents within coastal zone boundaries, and knows the most important way to gain this understanding is to listen to people. This local coastal professional also knows if coastal management is presented within the framework of local issues, concerns, and visions for the future, residents will be more likely to participate and support the program.

The CMP Coordinator already has a general feel for local issues and sentiment, and should encourage decision-making bodies and residents of the MSB to use coastal management as a way to identify areas appropriate for development, keep coastal resources healthy, and as a way to effect state and federal decision making. The CMP Coordinator also wants to ensure that local knowledge and public needs are heard and considered when local coastal resources and way of life might be affected by a development proposal. Education and outreach opportunities that the CMP Coordinator can consider for communicating coastal management issues and projects within the MSB include:

- Acquiring coastal management publications from OPMP and making available publications to local residents.
- Developing a MSB coastal management program website and providing local news and article for the ACMP website and MSB website.
- Using public service announcements (radio and newspaper), flyers, newspaper ads, and phone calls to encourage the input from residents during the review of projects.
- Encouraging local residents to communicate with the CMP Coordinator about coastal issues.
- Developing a presentation on the local coastal management program, and pursue speaking engagements with different community organizations and local schools.
- Participating in watershed volunteer efforts.
- Participating in state, federal, and tribal natural resource planning efforts.
- Encouraging MSB Assembly and Planning Commission members to participate in education and outreach efforts.

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APPENDIX A

Enforceable Policies

APPENDIX A
DESIGNATIONS, ENFORCEABLE POLICIES & DEFINITIONS

Applicability

All of the lands and waters within the existing MSB coastal zone, as defined in chapter Three, are included in the Designated Recreational Use Area. Federal lands within the coastal zone, and the Point Mackenzie AMSA are excluded from the designation. See Map 2 for supplemental information.

The state standards for coastal development and coastal access are, by definition, limited to marine coastal water, consequently, neither standard is applicable to rivers, streams, and lakes in the MSB coastal zone. Recreation, Development and Access (RDA) policies derive their authority from the recreational use designation and are therefore applicable throughout the MSB coastal zone (including rivers, lakes and streams).

Shoreline Development Requirements

RDA-1 Within the designated recreational use area, as described in section 6.3, projects that involve dredging or filling in the shall be located, designed, constructed, operated, and maintained to:

(1) avoid significant adverse impacts to the physical, biological, and cultural features, described in section 5.9, upon which the recreation resource depends; and

(2) limit the extent of direct disturbance to the minimum area necessary to accommodate the proposed purpose or use.

Waterbody Setback Requirements

RDA-2 Within the designated recreational use area, as described in section 6.3, proposed uses and activities within 75 feet of the ordinary high water (OHW) line of rivers, streams, and lakes within shall protect the physical, biological, and cultural features upon which the recreation resource depends.

RDA-3 Within the designated recreational use area, as described in section 6.3, water-dependent structures such as docks, piers, marinas, floatplane hangars, or boathouses, and access to such structures, are allowable within 75 feet of OHW, provided they are constructed and used in a way that minimizes adverse impacts to the recreational uses shown in tables A-1 and A-2..

RDA-4 Within the designated recreational use area, as described in section 6.3, other uses and activities within 75 feet of OHW are also allowable if the proposed development will have no significant adverse impact to recreational uses shown in tables A-1 and A-2.

RDA-5 Within the designated recreational use area, as described in section 6.3, natural or vegetative buffers shall be required for commercial and industrial developments within the 75-foot setback from OHW to protect the recreational character of the waterbody. Requirements for the size and extent of buffers shall be determined on a case-by-case basis and shall be commensurate with the reasonably foreseeable impacts of the development on recreational uses and activities shown in tables A-1 and A-2.

In-water Development Requirements

RDA-6 Uses and activities on rivers, streams, lakes, and coastal waters within the designated recreational use area, as described in section 6.3, shall meet the following requirements:

A. In-water structures and buoys shall be visibly marked and placed in a manner to minimize navigation hazards or obstructions to other uses; and

B. To the extent practicable, all developments, structures, and facilities in waterbodies shall be sited, constructed, operated, and maintained in a manner that does not create a hazard or obstruction to other uses.

Access Requirements

RDA-7 Within the designated recreational use area, as described in section 6.3, new subdivisions shall increase public access to and from the shoreline.

RDA-8 Within the designated recreational use area, as described in section 6.3, capital improvements on non-federal publicly owned waterfront property shall incorporate walkways, shelters, viewing platforms, and landscaping whenever practicable to increase public access and to facilitate public enjoyment of recreational waters.

Specific Waterfront Development Requirements

RDA-9 Within the designated recreational use area, as described in section 6.3, proposed uses or activities shall avoid, minimize, or mitigate direct and significant impacts upon the existing activities and the physical, biological, visual, or cultural features upon which the recreation resource depends. Protected features, uses, and activities subject to this policy are presented in tables A-1 and A-2.

Sequencing of Sand and Gravel Extraction and Practicable Alternatives

RDA-10 Within the designated recreational use area, as described in section 6.3, in order to minimize impacts on recreational uses shown in tables A-1 and A-2 and to the extent practicable, sources of sand and gravel shall be approved in the following sequence:

A. Existing approved gravel pits or quarries operated in compliance with state and federal authorizations;

B. Reuse of material from abandoned development area;

C. New upland sites; and

D. Streams that do not provide fish habitat.

Table A-1 Lake Features, Uses, and Activities
Lakes in the MSB with Adopted Lake Management Plans (effective November 1, 2005)

	Area Number	1	2	3	4	5	6	7	8	9	10
	Name/Location	Big Lake	Three Mile Lake	Knik Lake	Whiskey Lake	Long Lake	Wolverine Lake	Honeybee Lake	Blodgett Lake	Little Lonely Lake	Crystal Lake
Protected Features	Trails	x	x	x							
	Fish habitat	x	x	x	x			x	x	x	x
	Visual point of interest	x									
	Beach	x									
	Wildlife habitat	x	x	x	x	x	x	x		x	x
	Cultural and Historic Features	x		x							
Uses and Activities	Fishing	x		x	x	x	x	x	x	x	x
	Hunting	x									
	Camping	x	x	x			x		x		
	Floatplane	x		x	x			x	x		
	Walking/hiking		x								x
	Swimming	x		x	x					x	x
	Motorized watercraft	x	x		x	x	x		x	x	
	Non-motorized watercraft	x	x	x	x	x	x			x	x
	Bird and wildlife viewing	x	x				x			x	x
	Commerical recreation	x	x	x				x	x		
	Recreation cabins	x	x	x	x	x		x	x	x	x
	Recreation sites/ parks	x	x	x				x			

Table A-1 Lake Features, Uses, and Activities (continued)

	Area Number	11	12	13	14	15	16	17	18	19	20*	21*
	Name/Location	Christiansen Lake	Crooked	Diamond	John	Marilee	Marion	Rainbow	Twin Island	West Papoose	Wasilla Lake	Cottonwood Lake
Protected Features	Trails											x
	Fish habitat	x	x	x	x	x	x	x	x	x	x	x
	Visual point of interest											
	Beach										x	x
	Wildlife habitat	x	x	x	x	x	x	x	x	x	x	x
	Cultural and Historic Features										x	x
Uses and Activities	Fishing	x	x	x	x	x	x	x	x	x	x	
	Hunting											
	Camping	x					x					
	Floatplane	x	x				x				x	x
	Walking/hiking										x	x
	Swimming	x	x	x	x	x		x	x	x	x	x
	Motorized watercraft	x	x	x				x			x	x
	Non-motorized watercraft	x	x	x	x	x	x	x	x	x	x	x
	Bird and wildlife viewing	x		x		x		x	x	x	x	x
	Commerical recreation	x									x	
	Recreation cabins	x	x	x	x	x	x	x	x	x	x	x
	Recreation sites/ parks	x					x				x	x

Table A-2 Water Bodies Features, Uses, and Activities

	Name/Location	Alexander Creek	Alexander Lake	Chulitna River	Deshka River	Judd Lake	Kahiltna River	Kroto Creek
Protected Features	Trails							
	Fish habitat	X	X	X	X		X	X
	Visual point of interest	X	X		X			X
	Beach	X		X				
	Wildlife habitat				X			
	Cultural and Historic Features	X	X		X			X
Uses and Activities	Fishing	X	X		X			
	Hunting	X	X		X	X		
	Camping	X	X		X			
	Floatplane	X	X		X	X		X
	Walking/hiking		X			X		
	Swimming							
	Motorized watercraft							
	Non-motorized watercraft	X			X			X
	Bird and wildlife viewing	X	X		X	X		X
	Commerical recreation				X			
	Recreation cabins	X	X	X	X	X		X
	Recreation sites/ parks	X	X	X	X	X		X

Table A-2 Water Bodies Features, Uses, and Activities (continued)

	Name/Location	Lake Creek	Little Susitna River	Little Willow Creek	Kashwitna Creek	Matanuska River	Montana Creek	Moose Creek	Nancy Lake
Protected Features	Trails								
	Fish habitat	X	X	X	X	X		X	X
	Visual point of interest	X	X				X	X	
	Beach	X	X			X			
	Wildlife habitat								
	Cultural and Historic Features	X	X					X	
Uses and Activities	Fishing	X	X			X			
	Hunting	X	X	X			X	X	X
	Camping	X	X					X	
	Floatplane	X	X			X		X	X
	Walking/hiking	X							
	Swimming		X		X	X			X
	Motorized watercraft	X							
	Non-motorized watercraft	X	X						
	Bird and wildlife viewing		X			X		X	X
	Commerical recreation		X						
	Recreation cabins	X	X			X	X		
	Recreation sites/ parks	X	X					X	

Table A-2 Water Bodies Features, Uses, and Activities (continued)

	Name/Location	Nancy Lake Creek	Sheep Creek	Skwentna River	Susitna River	Talkeetna River	Talachulitna River	Willow Creek	Yentna River
Protected Features	Trails								
	Fish habitat	X	X	X	X	X	X	X	X
	Visual point of interest					X	X		
	Beach				X	X			
	Wildlife habitat						X		
	Cultural and Historic Features					X	X		
Uses and Activities	Fishing			X	X	X	X		
	Hunting	X	X			X	X	X	
	Camping					X	X		
	Floatplane	X				X	X		
	Walking/hiking						X		
	Swimming								
	Motorized watercraft								
	Non-motorized watercraft				X	X	X	X	X
	Bird and wildlife viewing	X				X	X		
	Commerical recreation					X			
	Recreation cabins		X	X		X	X	X	X
	Recreation sites/ parks			X	X	X	X		X

DEFINITIONS

A number of the terms used in coastal management have specific regulatory or procedural meaning. To clarify the intent of the coastal management polices, the following definitions apply to language used in the plan policies.

ACMP is the Alaska Coastal Management Program.

Adjacent has the same meaning as in State law.

> ***11 AAC 112.990 (a) (2) "adjacent"*** *means near but not necessarily touching; (Eff. 7/1/2004, Register 170; am 10/29/2004, Register 172)*

AMSA has the same meaning as in State law.

> ***AS 46.40.210 (1) "area which merits special attention"*** *means a delineated geographic area within the coastal area which is sensitive to change or alteration and which, because of plans or commitments or because a claim on the resources within the area delineated would preclude subsequent use of the resources to a conflicting or incompatible use, warrants special management attention, or which, because of its value to the general public, should be identified for current or future planning, protection, or acquisition; these areas, subject to council definition of criteria for their identification, include:*
> *(A) areas of unique, scarce, fragile or vulnerable natural habitat, cultural value, historical significance, or scenic importance;*
> *(B) areas of high natural productivity or essential habitat for living resources;*
> *(C) areas of substantial recreational value or opportunity;*
> *(D) areas where development of facilities is dependent upon the utilization of, or access to, coastal water;*
> *(E) areas of unique geologic or topographic significance which are susceptible to industrial or commercial development;*
> *(F) areas of significant hazard due to storms, slides, floods, erosion, or settlement; and*
> *(G) areas needed to protect, maintain, or replenish coastal land or resources, including coastal flood plains, aquifer recharge areas, beaches, and offshore sand deposits;*

Avoid has the same meaning as in State law.

> ***11 AAC 112.900. Sequencing process to avoid, minimize, or mitigate.*** *(a) As used in this chapter and for purposes of district enforceable policies developed under 11 AAC 114, "avoid, minimize, or mitigate" means a sequencing process of*
> *(1) avoiding adverse impacts to the maximum extent practicable; (2) where avoidance is not practicable, minimizing adverse impacts to the maximum extent practicable; or (3) if neither avoidance nor minimization is practicable, conducting mitigation to the extent appropriate and practicable; for purposes of this paragraph, "mitigation" means*
> *(A) on-site rehabilitation of project impacts to affected coastal resources during or at the end of the life of the project; or*
> *(B) to the extent on-site rehabilitation of project impacts is not practicable, substituting, if practicable, rehabilitation of or an improvement to affected coastal resources within the district, either on-site or off-site, for a coastal resource that is*
> *unavoidably impacted.*
> *(b) For a project that requires a federal authorization identified under 11 AAC 110.400, the coordinating agency shall consult with the authorizing federal agency during that federal agency's authorization review process to determine whether the mitigation requirements proposed by the federal agency for that federal authorization would satisfy the mitigation requirements of (a)(3) of this section. If the coordinating agency determines that the mitigation requirements proposed by the federal agency would not satisfy the mitigation requirements of (a)(3) of this section, the coordinating agency shall require appropriate mitigation in accordance with (a)(3) of this section.*
> *(c) For purposes of (a)(3) of this section, a determination of practicability includes the consideration of the following factors, as applicable: (1) the magnitude of the functional values lost by the impacted coastal resources;*
> *(2) the likelihood that the mitigation measure or improvement will succeed in actually rehabilitating the impacted coastal resources; and*
> *(3) the correlation between the functional values lost by the coastal resources impacted and the proposed mitigation measure or improvement.*
> *(d) To the extent feasible and not otherwise addressed by state or federal law, any requirements imposed under (a)(3) of this section for mitigation through on-site or off-site rehabilitation of project impacts shall be established by the coordinating agency at the time of the project's consistency review under 11 AAC 110.*
> *(e) In applying the mitigation process described in (a)(3) of this section, unless required by a federal agency issuing an authorization identified under 11 AAC 110.400 for the project, the coordinating agency may not require*
> *(1) that no net loss of impacted coastal resources occur; or*
> *(2) monetary compensation. (Eff. 7/1/2004, Register 170; am 10/29/2004, Register 172)*

Base Flood means the flood having one percent chance of being equaled or exceeded in any given year. Also referred to as the 100-year flood.

Coastal Processes are the collective results of physical, oceanographic, and meteorologic influences on the geographic landforms and nearshore waters of the Matanuska Susitna Borough. Coastal processes are also influenced by freshwater discharges from major river drainage systems and suspended sediments transported by rivers to coastal waters. Key features of coastal processes are shoreline erosion and accretion.

Coastal Waters has the same meaning as in state law.

> ***11 AAC 112.990. Definitions. (6) "coastal water"*** *means those waters, adjacent to the shorelines, that contain a measurable quantity or percentage of sea water, including sounds, bays, lagoons, ponds, estuaries, and tidally influenced waters; (Eff. 7/1/2004, Register 170; am 10/29/2004, Register 172)*

Consistency means compliance with the standards of the ACMP, including the enforceable policies of this approved coastal plan.

Consistent to the maximum extent practicable means that federal government activities or uses, including development projects affecting the coastal zone of Alaska, are fully consistent with the standards of the ACMP unless compliance would violate another federal law (15 CFR 930.32.(a)).

Cumulative Impacts has the same meaning as in State law.

> ***11 AAC 110.990. Definitions. (a) (19) "cumulative impacts"*** *means reasonably foreseeable effects on a coastal use or resource that result from the incremental impact of an individual project when viewed together with the impacts of past and currently authorized projects; (Eff. 7/1/2004, Register 170)*

DEC is the Alaska Department of Environmental Conservation.

DF&G is the Alaska Department of Fish and Game.

Direct and significant impact has the same meaning as in State law.

> ***11 AAC 114.990. Definitions. (13) "direct and significant impact"*** *means an effect of a use, or an activity associated with the use, that will proximately contribute to a material change or alteration of the coastal waters, and in which*
> *(A) the use, or activity associated with the use, would have a net adverse effect on the quality of the resources;*
> *(B) the use, or activity associated with the use, would limit the range of alternative uses of the resources; or*
> *(C) the use would, of itself, constitute a tolerable change or alteration of the resources but which, cumulatively, would have an adverse effect; (Eff. 7/1/2004, Register 170; am 10/29/2004, Register 172)*

Development means any man-made change to improved or unimproved lands and coastal waters, including but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling.

DNR is the Alaska Department of Natural Resources.

Due deference has the same meaning as in State Law.

> ***11 AAC 110.990. Definitions. (a) (25) "due deference"*** *means that deference that is appropriate in the context of*
> *(A) the commentor's expertise or area of responsibility; and*
> *(B) all the evidence available to support any factual assertions of the commentor; (Eff. 7/1/2004, Register 170)*

Environmentally Responsible means consistent with coastal resource protection and performance standards of this plan, and incorporating current best management practices with protection measures commensurate with the values of habitats affected.

Eolian mean applied to deposits arranged by the wind, as the sands and other loose materials along shores, etc.

Estuary has the same meaning as in State law.

> ***11 AAC 11.990 Definitions. (11) "estuary"*** *means a semiclosed coastal body of water that has a free connection with the sea and within which seawater is measurably diluted with freshwater derived from land drainage; (Eff. 7/1/2004, Register 170; am 10/29/2004, Register 172)*

Facilities related to commercial fishing and seafood processing has the same meaning as in State law.

> ***11 AAC 114.990. Definitions. (17) "facilities related to commercial fishing and seafood processing"*** *includes hatcheries and related facilities, seafood processing plants and support facilities, marine industrial and commercial facilities, and aquaculture facilities; (Eff. 7/1/2004, Register 170; am 10/29/2004, Register 172)*

Feasible and prudent means consistent with sound engineering practice and not causing environmental, social, or economic problems that outweigh the public benefit to be derived from compliance with the standard which is modified by the term "feasible and prudent".

Floodway means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height, usually one foot, at any point.

Fluted ridge means smooth, gutterlike channels, or deep smooth furrows worn in the face of ridges by glacial action.

Fluvial means of, found in, or produced by a river.

Geomorphology means the study of the formation of 'the earth's topographic features.

Glaciolacustrine means produced by or belonging to glacially formed lakes.

Important fishing areas are areas used consistently over time for commercial, sport, or subsistence fishing. Fishing includes harvesting marine invertebrates and plants.

Important habitats has the same meaning as in State law.

> ***11 AAC 112.300. Habitats.*** *(c) For purposes of this section,*
> *(1) "**important habitat**" means habitats listed in (a)(1) – (8) of this section and other habitats in the coastal area that are*
> *(A) designated under 11 AAC 114.250(h);*
> *(B) identified by the department as a habitat*
> *(i) the use of which has a direct and significant impact on coastal water; and*
> *(ii) that is shown by written scientific evidence to be significantly more productive than adjacent habitat; or*
> *(C) identified as state game refuges, state game sanctuaries, state range areas, or fish and game critical habitat areas under AS 16.20; (Eff. 7/1/2004, Register 170; am 10/29/2004, Register 172)*

Lacustrine menas produced by or belonging to lakes.

Local knowledge has the same meaning given in State law except that "generally accepted by the local community" is that body of knowledge that is reflected in local plans, studies, policies and standards.

> ***11 AAC 114.990. Definitions. (22) "local knowledge"*** *means a body of knowledge or information about the coastal environment or the human use of that environment, including information passed down through generations, if that information is*
> *(A) derived from experience and observations; and*
> *(B) generally accepted by the local community; (Eff. 7/1/2004, Register 170; am 10/29/2004, Register 172)*

Maintain means to provide for continuation of current conditions and functions.

Major Energy Facility is defined in State law in 11 AAC 112.990.

Mariculture is the captive cultivation of plants and animals in marine and estuarine waters for human consumption.

Mean High Water has the same meaning as in State law.

> ***11 AAC 53.900 (14) "mean high water"*** *means the tidal datum plane of the average of all the high tides, as would be established by the National Geodetic Survey, at any place subject to tidal influence; (Eff. 3/27/80, Register 73; am 7/5/2001, Register 159)*

Mean Higher High Water is the average of all the daily higher high water recorded over a 19-year period or a computed equivalent period. It is usually associated with a tide exhibiting mixed characteristics.

Mean Lower Low Water has the same meaning as in State law.

> ***11 AAC 53.900 (17) "mean lower low water"*** *means the tidal datum plane of the average of the lower of the two low waters of each day , as would be established by the National Geodetic Survey, at any place subject to tidal influence; (Eff. 3/27/80, Register 73; am 7/5/2001, Register 159)*

Minimize has the same meaning as in State law (see Avoid, Minimize and Mitigate).

Mitigate has the same meaning as in State law (see Avoid, minimize and Mitigate).

Natural Hazard is a condition created by a geological process, topography, water drainage, or unique weather condition that presents a significant hazard to life and property. See State Standard.

> ***11 AAC 112.990. Definitions. (15) "natural hazards"*** *(A) means the following natural processes or adverse conditions that present a threat to life or property in the coastal area: flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, storm surges, ice formations, snow avalanches, erosion, and beach processes;*
> *(B) includes other natural processes or adverse conditions designated by the department or by a district in a district plan; (Eff. 7/1/2004, Register 170; am 10/29/2004, Register 172)*

One Hundred Year Flood is a flood of a magnitude, which can be expected to occur on an average of once every 100 years. It is possible for this size flood to occur during any year, and possible in successive years. It would have a one percent chance of being equaled or exceeded in any year. Statistical analysis of available stream flow or storm records, or analysis of rainfall or runoff characteristics of the watershed, or topography and storm characteristics are used to determine the extent and depth of the 100-year flood.

OPMP is the Office of Project Management and Permitting with the Department of Natural Resources.

Ordinary high water has the same meaning as in State law.

> ***11 AAC 53.900 (23) "Ordinary high water"*** *means the mark along the bank or shore up to which the presence and action of non-tidal water are so common and usual, and so long continued in all ordinary years, as to leave a natural line impressed on the bank or shore and indicated by erosion, shelving, changes in soil characteristics, destruction of terrestrial vegetation, or other distinctive physical characteristics. ; (Eff. 3/27/80, Register 73; am 7/5/2001, Register 159)*

Paludal means pertaining to swamps or marshes, and to deposits deposited in a swamp environment.

Practicable has the same meaning as in State law.

> ***11 AAC 112.990. Definitions. (18) "practicable"*** *means feasible in light of overall project purposes after considering cost, existing technology, and logistics of compliance with the standard; (Eff. 7/1/2004, Register 170; am 10/29/2004, Register 172)*

Proper and improper uses are the can-do and can't-do uses for the area.

Public need has the same meaning as in State law except that "documented" includes those needs expressed in locally adopted plans, studies, policies and standards.

> ***11 AAC 114.990 (35) "public need"*** *means a documented need of the general public and not that of a private person; (Eff. 7/1/2004, Register 170; am 10/29/2004, Register 172)*

Resource agency has the same meaning as in State law.

> ***Sec. 46.39.010. (2) "resource agency"*** *means*
> *(A) the Department of Environmental Conservation;*
> *(B) the Department of Fish and Game; or*
> *(C) the Department of Natural Resources.*

Saltwater wetlands has the same meaning as in State law. (see also "wetlands")

> ***11 AAC 112.990. Definitions. (25) "saltwater wetlands"*** *means those coastal areas along sheltered shorelines characterized by halophilic hydrophytes and macroalgae extending from extreme low tide to an area above extreme high tide that is influenced by sea spray or tidally induced water table changes; (Eff. 7/1/2004, Register 170; am 10/29/2004, Register 172)*

Shall means mandatory; it requires a course of action or set of conditions to be achieved.

Should states intent for a course of action or set of conditions to be achieved. This implies that case-specific discretion may be applied for achieving the intent of the action.

Significant adverse impact means an impact as indicated in state law by "direct and significant impact".

Subject uses is a description of the land and water uses and activities which are subject to the district plan.

Subsidence is a lowering in elevation of ground surface due to underground geologic or hydrologic change. It can be a common occurrence in areas susceptible to seismic activity and where excessive water table depletion occurs.

Subsistence Use Areas are coastal habitat areas, used traditionally or occasionally in response to seasonal or cyclic resource abundance, where subsistence harvests of fish, wildlife, and other biological resources are conducted.

Subsistence uses has the same meaning as in State law.

> ***AS 16.05.940 (33) "subsistence uses"*** *means the noncommercial, customary and traditional uses of wild, renewable resources by a resident domiciled in a rural area of the state for direct personal or family consumption as food, shelter, fuel, clothing, tools, or transportation, for the making and selling of handicraft articles out of nonedible by-products of fish and wildlife resources taken for personal or family consumption, and for the customary trade, barter, or sharing for personal or family consumption; in this paragraph, "family" means persons related by blood, marriage, or adoption, and a person living in the household on a permanent basis; (Eff. ///; Register)*

Surface Waters include streams, rivers, ponds, lakes, and contiguous open water wetlands.

Tsunami is a great sea wave produced by submarine earth movements or volcanic eruption.

Uses of state concern has the meaning as in State law.

> ***AS 46.40.210 (12) "uses of state concern"*** *means those land and water uses that would significantly affect the long-term public interest; "uses of state concern" include*
> *(A) uses of national interest, including the use of resources for the siting of ports and major facilities that contribute to meeting national energy needs, construction and maintenance of navigational facilities and systems, resource development of federal land, and national defense and related security facilities that are dependent upon coastal locations;*
> *(B) uses of more than local concern, including those land and water uses that confer significant environmental, social, cultural, or economic benefits or burdens beyond a single coastal resource district;*
> *(C) the siting of major energy facilities, activities pursuant to a state or federal oil and gas lease, or large-scale industrial or commercial development activities that are dependent on a coastal location and that, because of their magnitude or the magnitude of their effect on the economy of the state or the surrounding area, are reasonably likely to present issues of more than local significance;*
> *(D) facilities serving statewide or interregional transportation and communication needs; and*
> *(E) uses in areas established as state parks or recreational areas under AS 41.21 or as state game refuges, game sanctuaries, or critical habitat areas under AS 16.20.*

Water-Dependent has the same meaning as in State law.

> ***11 AAC 112.990. Definitions. (31) "water-dependent"*** *means a use or activity that can be carried out only on, in, or adjacent to a water body because the use requires access to the water body;*
> ***(32) "water-related"*** *means a use or activity that is not directly dependent upon access to a water body, but which provides goods or services that are directly associated with water-dependence and which, if not located adjacent to a water body, would result in a public loss of quality in the goods or services offered; (Eff. 7/1/2004, Register 170; am 10/29/2004, Register 172)*

Waterfront means the area along the coastline between mean higher high water and mean high sea level.

Water-Related has the same meaning in State law.

Wetlands has the same meaning as in State law.

> ***11 AAC 112.990. Definitions. (33) "wetlands"*** *means saltwater wetlands and those freshwater wetlands that have a direct drainage to coastal waters; (Eff. 7/1/2004, Register 170; am 10/29/2004, Register 172)*

APPENDIX B

Enforceable Policy Cross Reference Table

APPENDIX B

ENFORCEABLE POLICES CROSS REFERENCE TABLE

Enforceable Policy Number & Name	Resource Inventory & Analysis	Issues, Goals, & Objectives	Maps
Shoreline Development Requirements:			**See Volume III for Boundary and Designation and Resource Maps**
RDA-1	p.19, 20,21,23,24,52,53,54,55	p.9, 11,12,15	
Waterbody Setback:			
RDA-2	p.19,20,22,28,31,32,33,34,35,36,37, 38,39,40,41,42,49,51,52,53	p. 9, 10,12,13,	
RDA-3	p.19,20,22,28,31, 32,33,34,35,36,37, 38,39,40,41,42,49,51,52,53	p.9, 10, 11, 12, 13,15,16	
RDA-4	p.19,20,22,28,31,32,33,34,35,36,37, 38,39,40,41,42,49,51,52,53	p.9, 10,11,12, 13,15,16	
RDA-5	p.19,20,22,28,31,32,33,34,35,36,37, 38,39,40,41,42,49,51,52,53	p.9,10,12, 15,16	
In-Water Development Requirements:			
RDA-6	p.19,20,29,30, 32,33,34,35,36,37, 38,39,40,41,42,51,52,53	P.9,10,11,13,	
Access Requirements:			
RDA-7	p.19,20, 21,28,29,30,32,33,34,35, 36,37, 38,39,47,49,50,51,52,53	p.9,10,11,13,	
RDA-8	p.19,20, 21,28,29,30,32,33,34,35, 36,37,38,39,47,49,50,51,52,53	p.9,10,11,13,14,	
Specific Waterfront Development Requirements:			
RDA-9	p.19,20, 21,28,29,30,32,33,34,35, 36,37, 38,39,40,42,43.44,47,49, 50,51,52,53	p.9,10,12,13,1516	
Sequencing of Sand and Gravel Extraction and Practicable Alternatives:			
RDA-10	p.19,20,21,23,24,54	p.9,10,11,12,1516	

APPENDIX C

List of Abbreviations and Acronyms Used

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AAC	Alaska Administrative Code
ACMP	Alaska Coastal Management Program
ADEC	Alaska Department of Environmental Conservation
ADFG	Alaska Department of Fish and Game
ADNR	Alaska Department of Natural Resources
ADOL	Alaska Department of Labor
ADOT&PF	Alaska Department of Transportation and Public Facilities
AHRS	Alaska Heritage Resources Survey
Air Force	U.S. Air Force
AMSA	Area Meriting Special Attention
AS	Alaska Statute
ATV	all-terrain vehicle
CEA	Chugach Electric Association
CEDS	Comprehensive Economic Development Strategy
CFR	Code of Federal Regulations
CMP	Coastal Management Plan
DCCED	Alaska Department of Commerce, Community, and Economic Development
Designated HPA	Designated Historic, Prehistoric, and Archaeologic Area
Designation	Designated Recreation and Tourism Area
DGGS	Alaska Department of Geological and Geophysical Survey
FEMA	Federal Emergency Management Agency
FNSB	Fairbanks North Star Borough
gpm	gallons per minute
HPA	History, Prehistory, and Archaeology
ISER	Institute for Social and Economic Research
LRTP	Long Range Transportation Plan
mg/L	milligrams per liter
MOA	Municipality of Anchorage
mph	miles per hour
MSB	Matanuska-Susitna Borough
MSB CMP	Matanuska-Susitna Borough Coastal Management Plan
MSBCVB	Matanuska-Susitna Borough Convention and Visitors Bureau
NRHP	National Register of Historic Places

List of Abbreviations and Acronyms Used (continued)

OHW	Ordinary High Water
OPMP	Office of Project Management and Permitting
P.L.	Public Law
Port District	Port MacKenzie District
ppm	parts per million
ppsf	pounds per square foot
RTA	Recreation, Tourism, and Coastal Access
SG	Sand and Gravel extraction
SHPO	Sate Historic Preservation Office
STIP	Statewide Transportation Improvement Program
TF	Transportation Routes and Facilities
TSA	Tourism Satellite Account
TSP	total suspended particulates
Valley	Matanuska-Susitna Valley

APPENDIX D

References

APPENDIX D

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APPENDIX E

Advisory Policies

APPENDIX E

GUIDANCE POLICIES

Under AS 46.40.210(7), a district coastal management plan is a plan that sets out policies and standards "to guide public and private uses of land and water within that district ...". Guidance policies are policies that may not meet one or more tests of enforceability contained in state statute but that can help guide coastal uses within the district. Guidance policies are not enforceable and cannot be used to require conditions or stipulations on projects during the project consistency review process. The following are the guidance policies for the Matanuska-Susitna Borough Coastal District.

ALTERATIONS TO SURFACE WATER

A Channelization or obstructions of natural water flows are prohibited when such action would lead to dewatering or the inundation of wetland areas within the Designation, or unfavorable changes to aquatic, wetland, or shoreline vegetation that would decrease use of the area by desirable fish species, swans, and other waterfowl.

INSTREAM MATERIAL EXTRACTION

B Extraction of sand and gravel from all stream floodplains shall be located and conducted to avoid changes to channel hydraulics and the potential for channel diversion through the extraction site.

BEST MANAGEMENT PRACTICES FOR ANADROMOUS WATERS

C In streams and their floodplains that provide habitat for anadromous fish, the following best management practices (BMPs) shall be incorporated into the siting, design, and operation of sand and gravel extraction activities:

A. Clearing of riparian vegetation and disturbance of natural banks shall be minimized;

B. To the extent practicable, sand and gravel extraction site configurations shall be shaped to blend with physical features and surroundings;

C. Settling ponds shall be adequately diked or set back from active channels to avoid breaching by a 25-year frequency flood. Effective use of recycled water shall minimize water withdrawal and subsequent discharge of effluent to adjacent lands or waters; and

D. Equipment storage and operation shall be conducted in a manner that does not release fuel and lubricants into the environment.

REHABILITATION

Upland and Floodplain Requirements

D Rehabilitation of all upland and floodplain extraction sites shall be required unless such rehabilitation would cause greater adverse impact to the environment than leaving the area unrehabilitated. At a minimum, rehabilitation shall include the following elements, as applicable:

A. Topsoil and overburden shall be segregated and stored separately above the 25-year floodplain of watercourses.

B. At the end of each extraction season, all disturbed areas shall be re-graded to stable slopes. Within mean annual floodplains, re-grading to ground contours that will not entrap fish nor significantly alter stream hydraulics shall occur at the end of each operating season. Tailings used in the construction of settling ponds and other essential facilities may be retained in place until completion of their use.

C. At the completion of extraction, all disturbed areas shall be stabilized and re-vegetated, as appropriate. Restoration shall include the following:

   1. All disturbed areas shall be graded to stable slopes that blend with the natural topography;

   2. Erosion control measures shall be implemented as appropriate to stabilize the site;

   3. Areas designated for revegetation shall be covered with topsoil to encourage establishment of native plant species; and

   4. Where material sites, that are excavated below groundwater, may have value as habitat for waterfowl or fish, the resource agencies shall be consulted on the final design and schedule of the restoration plan.

Excluded from these requirements is the portion of a gravel extraction site required to provide materials for continuing maintenance and operation. Maintenance sand and gravel sites shall comply with the requirements of part (B) of this policy.

Shoreline Development Requirements

E Within the designated recreational use area, uses and activities that are economically or physically dependent on a shoreline location are given higher priority when compared to uses and activities that do not economically or physically require a shoreline location. Priority shall be given in the following order:

(1) water-dependent uses and activities;

(2) water-related uses and activities; and

(3) uses and activities that are neither water-dependent nor water-related, for which there is no practicable inland alternative to meet the public need for the use or activity.

   a. Water-dependent uses include: fish hatcheries; floatplane ramps, boat launches, docks; water-based tourism facilities and accessory attached housing; and remote recreational cabins dependent on water access.

   b. Water-related activities include: retail stores and commercial activities such as lodges, hotels, restaurants, and other similar uses that provide views and access to the shoreline.

Exceptions: Non-water-dependent and non-water-related uses and activities shall be permitted when it is not practicable to develop a site with a water-dependent or water-related use or activity, due to shallow bathymetry or unusual lot characteristics, such as substandard size, frontage, or steep topography, or such uses would be inconsistent with zoning.

Waterbody Setback Requirements

F Within the designated recreational use area, cutting or eradication of natural vegetation, occurring within the 75-foot setback from OHW, that would cause losses of shoreline cover, losses of desirable wetland vegetation, erosion of soils, or losses of the natural capacity of the shoreline vegetation to provide filtration and buffering from adjacent land uses is not allowed.

G Within the designated recreational use area, within the 75-foot setback from OHW, visually important backdrops and visual points of interest along the shoreline shall be protected by minimizing site clearing and re-grading to the extent practicable.

TRANSPORTATION ROUTES AND FACILITIES

Access Requirements

H Within the designated recreational use area, access shall be increased, maintained, or enhanced. An access management plan detailing how the access route will be protected from adverse physical impacts as a result of public use shall be required for all public access routes.

I Within the designated recreational use area, routes through or adjacent to scenic areas shall be designed to maximize multi-modal access and views, and shall incorporate promenades, bike lanes, rest-stops, cultural and geographic interpretive signage, picnic facilities to the extent practicable, along with other amenities to enhance public enjoyment of coastal and recreational resources.

J Within the designated recreational use area, transportation development shall be required to maintain a high aesthetic appeal and prevent unsightly incompatible development through careful selection of siting and design elements including height, orientation, surface treatment, color and materials. Aesthetic values include scenic corridors, area, vistas, open space, parks, and recreation.

K Where practicable, transmission lines shall be located in a manner that does not block or interfere with access to scenic vistas.

L Where practicable, transmission lines shall be located in a manner that does not block or interfere with access to scenic vistas.

Corridor Consolidation and Integration

M In accordance with the requirements set forth in 11 AAC 112.240, utility corridors shall, wherever practicable, be consolidated or integrated with transportation corridors. In establishing corridors, adequate space shall be reserved to allow additional use where it is projected. In evaluating options for consolidation of utility corridors, the applicant shall document said options during the planning process. A visual impact analysis shall also be required.

Recreational Value Mitigation

N Where practicable, important fish and wildlife habitat, scenic, and recreational values shall be retained when establishing utility corridors. A documented mitigation plan for these resources shall be required.

HISTORY, PREHISTORY AND ARCHAEOLOGY

Cultural and Historic Resource Areas

O The evaluation and protection of historic and archaeological values of an area within the Designated HPA proposed for development shall be part of project planning. The developer shall:

A. Evaluate the potential for encountering historic and archaeological resources, by contacting the MSB Cultural Resources Division and the SHPO;

B. Prepare a plan based on the evaluation for protecting historic and archaeological resources found on the site during construction and incorporate it into the project description; and

C. Report observations of undocumented cultural resources to the landowner, SHPO, and the MSB.

Resource Protection

P Uses and activities, which may adversely affect the Designated HPA, shall comply with the following standards:

A. To the extent practicable, archaeological, prehistoric, and historic resources shall be protected from significant adverse impacts caused by surrounding uses and activities;

B. Cultural resources of significant historic, prehistoric, or archaeological importance shall not be disturbed during project development unless the SHPO, in consultation with the landowner, authorizes such disturbance; and,

C. Where disturbance is authorized, an artifact curation agreement shall be prepared by the developer, in consultation with the landowner, the MSB, and the SHPO.