MINTO FLATS
STATE GAME REFUGE
MANAGEMENT PLAN

March 1992

Prepared by the Divisions of
Habitat and Restoration
and
Wildlife Conservation

Alaska Department of Fish and Game
1300 College Road
Fairbanks, AK 99701-1599

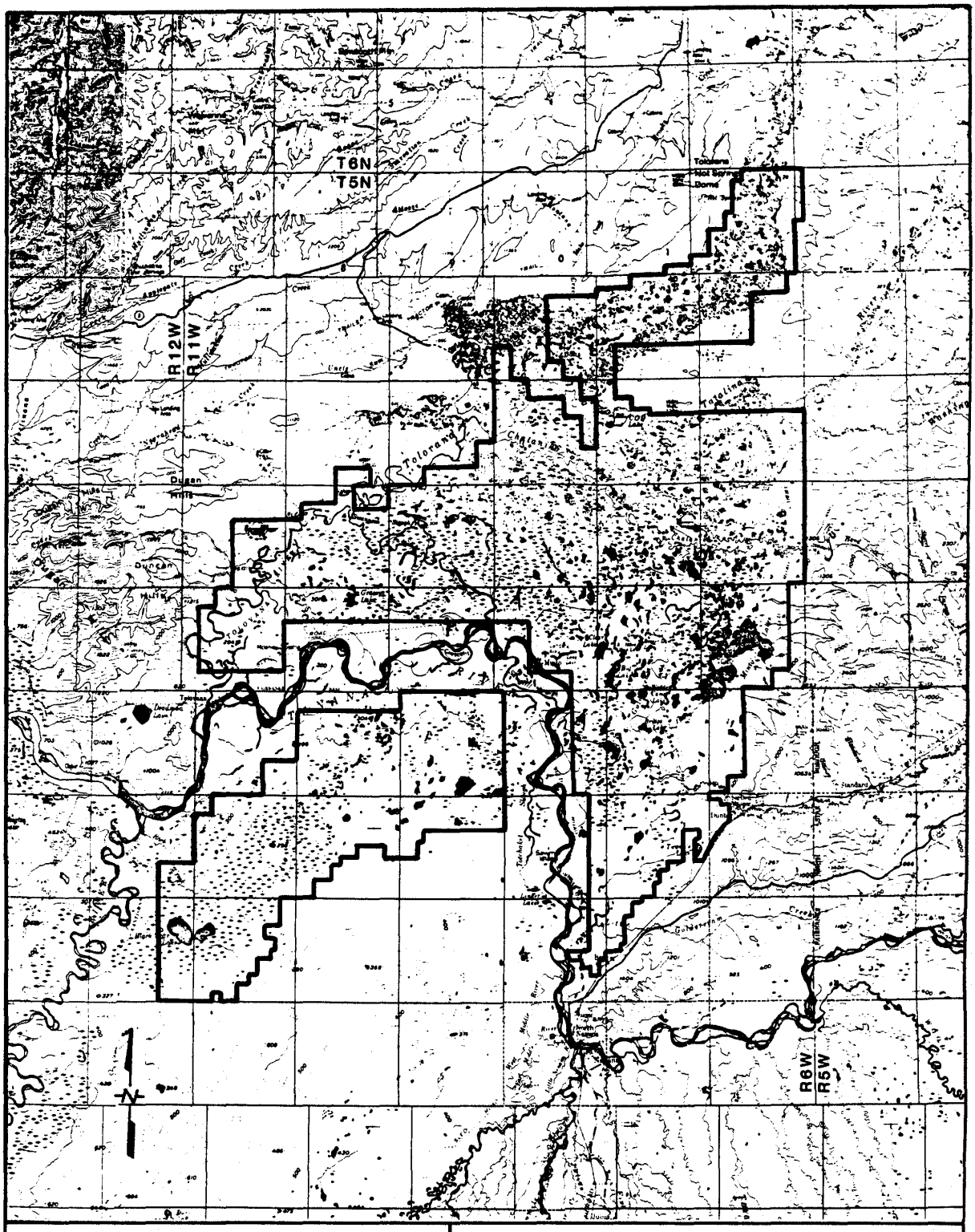
Carl L. Rosier, Commissioner

ACKNOWLEDGEMENTS

The Minto Flats State Game Refuge Management Plan has been prepared by Alaska Department of Fish and Game (ADF&G) biologists Debra Clausen and Matt Robus (Division of Habitat) and Margo Matthews (Division of Wildlife Conservation) with cartographic support from Frances Inoue. The cover photo was taken by Bruce Baker.

The plan has been developed with the aid of an interagency planning team composed of representatives from state and federal agencies with resource management responsibilities within the refuge and representatives from major adjacent village and borough land managers. The planning team has participated in the plan's development from its inception. Planning team members who participated in development of the plan are as follows: Gary Schultz, Alaska Department of Natural Resources; Norm Piispanen, Department of Transportation and Public Facilities; Elizabeth Andrews, Alaska Department of Fish and Game, Subsistence Division; Jerry Hallberg, Alaska Department of Fish and Game, Sport Fish Division; Ervin McIntosh, U.S. Fish and Wildlife Service; Tom Duncan, Fairbanks North Star Borough; and Robert Charlie, Seth-de-ya-ah Corporation. Also named to the planning team were Joyce Beelman, Department of Environmental Conservation; and Mitch Demientieff, Toghottele Corporation. Scott Heidorn, Fairbanks Snow Travelers, and Bill Hagar, Alaska Outdoor Council, were regular participants at planning team meetings.

TABLE OF CONTENTS



MINTO FLATS
State Game Refuge

INTRODUCTION

The Minto Flats State Game Refuge, located about 35 miles west of Fairbanks between the communities of Minto and Nenana, was established by the Alaska Legislature in 1988 to ensure the protection and enhancement of habitat, the conservation of fish and wildlife, and to guarantee the continuation of hunting, fishing, trapping and other compatible public uses within the Minto Flats area. The Minto Flats State Game Refuge, encompassing approximately 500,000 acres, traditionally has been and remains an important area for harvesting fish, wildlife, and other resources for Athabaskan Indians and others living in Minto and Nenana and also serves as an important fish and wildlife use area for Fairbanks North Star Borough residents.

The purpose of the Minto Flats State Game Refuge Management Plan is to provide consistent long-range guidance to the Alaska Department of Fish and Game, the Alaska Department of Natural Resources, and other agencies involved in managing the refuge.

The plan presents management goals for the refuge and its resources and identifies policies to be used in determining whether proposed activities within the refuge are compatible with the protection of fish and wildlife, their habitats, and public use of the refuge. The plan will be reviewed every five years and, if appropriate, updated every ten years, as funding permits. Public participation will be solicited during the update process. The plan affects state lands only, and has no force on private lands. The plan does not address hunting or fishing regulations which are the authority of the Boards of Fisheries and Game.

This document is the result of a public planning process led by the Alaska Department of Fish and Game. The plan has been developed by a planning team representing state, federal, and municipal agencies, including: the Alaska Departments of Environmental Conservation, Fish and Game, Natural Resources, and Transportation and Public Facilities; the United States Fish and Wildlife Service; the Fairbanks North Star Borough and the villages of Minto (Seth-de-ya-ah Corporation) and Nenana (Toghottele Corporation).

At the outset of the public planning process, public meetings were held in Fairbanks, Nenana and Minto to explain the planning process and solicit citizens' opinions regarding the issues, interests, and concerns pertinent to refuge management. The meeting results were used by the planning team to identify a list of issues to be addressed in the plan. At the same time, resource information on refuge fish and wildlife populations and their habitats, other natural resources, existing land use, and land ownership was being collected and synthesized. This information, presented in both map and narrative form, comprises the plan's resource inventory.

Management goals and policies for the refuge were developed by the planning team to address the identified issues. All policies were developed with consideration of their ability to meet the management goals. The draft plan was distributed for public review, and comments received during the public review process were used to develop final policies. The goals and policies were then adopted by the Commissioner of Fish and Game.

The plan is implemented by the Alaska Department of Fish and Game in several ways. A Special Area Permit is required for any habitat altering activity, including any construction work, in a designated State Game Refuge (5 AAC 95). A Special Area Permit application form can be obtained from any Alaska Department of Fish and Game office and should be submitted to the Habitat Division Regional Office in Fairbanks. The Habitat Division will review all proposed activities for consistency with the goals and policies outlined in this plan. Activities will be approved, conditioned, or denied based on the direction provided in this plan as well as other state laws and regulations.

Future refuge management activities of the Alaska Department of Fish and Game will also be directed by this plan. Research programs, public use facilities, and other department projects will be consistent with the goals and policies presented in this plan.

Other state, federal, and local agencies have management responsibilities on refuge lands as well. Any use, lease, or disposal of land or resources on state land in the refuge requires Alaska Department of Natural Resources authorization. Activities affecting air or water quality require authorization from the Alaska Department of Environmental Conservation. The U. S. Army Corps of Engineers (COE) evaluates applications of the Department of the Army permits for discharging dredged and fill material in waters of the United States including wetlands. Federal and state agencies, including the United States Fish and Wildlife Service and National Marine Fisheries Service, along with local governments, review proposals for COE permits, pursuant to the Fish and Wildlife Coordination Act (16 USC 661-666 et.seq.). U. S. Coast Guard approval is required for certain kinds of work in navigable waters.

STATUTES

AS 16.20.037 Minto Flats State Game Refuge. (a) The following state-owned land and water is established as the Minto Flats State Game Refuge:

(1) Township 1 North, Range 6 West, Fairbanks Meridian
Sections 2 - 11
Sections 14 - 23
Sections 26 - 34;

(2) Township 1 North, Range 7 West, Fairbanks Meridian
Sections 1 - 36;

(3) Township 1 North, Range 8 West, Fairbanks Meridian
Sections 1 - 16
Sections 21 - 28
Section 35: E1/2
Section 36;

(4) Township 1 North, Range 9 West, Fairbanks Meridian
Sections 1 - 12;

(5) Township 1 North, Range 10 West, Fairbanks Meridian
Sections 1 - 12;

(6) Township 1 North, Range 11 West, Fairbanks Meridian
Sections 1 - 4
Sections 8 - 17
Sections 20 - 29;

(7) Township 2 North, Range 6 West, Fairbanks Meridian
Sections 1 - 36;

(8) Township 2 North, Range 7 West, Fairbanks Meridian
Sections 1 - 36;

(9) Township 2 North, Range 8 West, Fairbanks Meridian
Sections 1 - 36;

(10) Township 2 North, Range 9 West, Fairbanks Meridian
Sections 1 - 36;

(11) Township 2 North, Range 10 West, Fairbanks Meridian
Section 3
Sections 8 - 10
Section 11: S1/2N1/2, S1/2
Section 12: S1/2N1/2, S1/2
Sections 13 - 36;

(12) Township 2 North, Range 11 West, Fairbanks Meridian
Sections 13 - 15
Sections 22 - 27
Sections 34 - 36;

(13) Township 3 North, Range 6 West, Fairbanks Meridian
Sections 13 - 36;

(14) Township 3 North, Range 7 West, Fairbanks Meridian
Sections 6 - 8
Section 9: S1/2S1/2
Section 13 - 36;

(15) Township 3 North, Range 8 West, Fairbanks Meridian
Section 1
Sections 5 - 10
Sections 14 - 23
Sections 25 - 36;

(16) Township 3 North, Range 9 West, Fairbanks Meridian
Section 24: S1/2
Section 25
Sections 33 - 36;

(17) Township 3 North, Range 10 West, Fairbanks Meridian
Sections 34 - 35;

(18) Township 4 North, Range 6 West, Fairbanks Meridian
Sections 2 - 9
Sections 16 - 21;

(19) Township 4 North, Range 7 West, Fairbanks Meridian
Sections 1 - 4
Section 5: S1/2
Section 6: S1/2
Sections 7 - 24
Sections 30 - 31;

(20) Township 4 North, Range 8 West, Fairbanks Meridian
Sections 10 - 15
Sections 22 - 27
Sections 30 - 31
Sections 35 - 36;

(21) Township 5 North, Range 5 West, Fairbanks Meridian
Section 6: W1/2
Section 7: W1/2
Section 18: W1/2;

(22) Township 5 North, Range 6 West, Fairbanks Meridian
Sections 1 - 3
Section 4: SE1/4
Section 9: E1/2
Sections 10 - 15
Section 16: E1/2, SW1/4
Section 20: S1/2
Sections 21 - 29
Sections 31 - 36;

(23) Township 5 North, Range 7 West, Fairbanks Meridian
Section 35: SE1/4
Section 36: S1/2;

(24) Township 1 South, Range 6 West, Fairbanks Meridian
Sections 5 - 8
Sections 17 - 20
Sections 29 - 31;

(25) Township 1 South, Range 7 West, Fairbanks Meridian
Sections 1 - 36;

(26) Township 1 South, Range 8 West, Fairbanks Meridian
Sections 1 - 2
Sections 11 - 14
Sections 23 - 26
Sections 35 - 36;

(27) Township 1 South, Range 9 West, Fairbanks Meridian
Sections 1 - 36;

(28) Township 1 South, Range 10 West, Fairbanks Meridian
Sections 7 - 36;

(29) Township 1 South, Range 11 West, Fairbanks Meridian
Sections 25 - 26
Sections 35 - 36;

(30) Township 2 South, Range 6 West, Fairbanks Meridian
Section 6: S1/2NW1/4, S1/2
Section 7: all North and West of the Alaska Railroad right-of-way;
Section 18: all North and West of the Alaska Railroad right-of-way;
Section 19: all North and West of the Alaska Railroad right-of-way;

(31) Township 2 South, Range 7 West, Fairbanks Meridian
Sections 1 - 12
Section 13: NE1/4, E1/2NW1/4, NE1/4SW1/4, S1/2SW1/4, SE1/4
Section 14: W1/2
Sections 15 - 22
Section 23: W1/2
Section 24: all North and West of the Alaska Railroad right-of-way
Section 27: NW1/4
Sections 28 - 32
Section 33: NE1/4NE1/4, W1/2NE1/4, W1/2, W1/2SE1/4;

(32) Township 2 South, Range 8 West, Fairbanks Meridian
Section 1
Sections 12 - 13
Sections 24 - 25
Section 36;

(33) Township 2 South, Range 9 West, Fairbanks Meridian
Sections 1 - 12
Section 17: W1/2NW1/4, NW1/4SW1/4
Section 18
Section 19: N1/2, N1/2S1/2;

(34) Township 2 South, Range 10 West, Fairbanks Meridian
Sections 1 - 20
Section 21: NE1/4, W1/2
Section 22: NW1/4
Section 24: N1/2, N1/2S1/2
Sections 29 - 31;

(35) Township 2 South, Range 11 West, Fairbanks Meridian
Sections 1 - 5
Sections 7 - 36;

(36) Township 2 South, Range 12 West, Fairbanks Meridian
Sections 25 - 26
Sections 35 - 36;

(37) Township 3 South, Range 7 West, Fairbanks Meridian
Section 5: N1/2NE1/4, W1/2
Sections 6 - 7
Section 18: NE1/4, W1/2, N1/2SE1/4, SW1/4SE1/4;

(38) Township 3 South, Range 8 West, Fairbanks Meridian
Section 1
Section 12
Section 13
Section 22: NE1/4 (that portion above the ordinary high water mark right bank Tanana River)
Section 23: N1/2, SE1/4
Section 24: N1/2, SW1/4
Section 25: NW1/4;

(39) Township 3 South, Range 11 West, Fairbanks Meridian
Sections 2 - 10
Section 11: N1/2
Section 14: SW1/4NE1/4, S1/2NW1/4, SW1/4, W1/2SE1/4
Sections 15 - 21
Section 22: NE1/4, W1/2, W1/2SE1/4
Section 23: NW1/4
Section 27: W1/2NE1/4, NW1/4, W1/2SW1/4
Sections 28 - 31
Section 32: NE1/4, NW1/4, SE1/4
Section 33: W1/2;

(40) Township 3 South, Range 12 West, Fairbanks Meridian
Sections 1 - 2
Sections 11 - 14
Sections 23 - 26
Sections 35 - 36

(b) The Minto Flats State Game Refuge is established to (1) ensure the protection and enhancement of habitat; (2) ensure the conservation of fish and wildlife; and (3) guarantee the continuation of hunting, fishing, trapping, and other uses by the public compatible with the protection and enhancement of habitat and the conservation of fish and wildlife.

(c) The state may not acquire by eminent domain privately owned land within the Minto Flats State Game Refuge, but may acquire privately owned land by purchase, exchange, or otherwise for inclusion in the Minto Flats State Game Refuge.

(d) Management decisions under this section made by the commissioner of natural resources and the commissioner of fish and game are applicable only to land and water described in (a) of this section.

(e) Public access to the Minto Flats State Game Refuge by means of horse, boat, aircraft, dog team, snowmachine, ATV, or other means consistent with (b) of this section may not be prohibited.

(f) Access to and from private property within the Minto Flats State Game Refuge shall be guaranteed through access corridors established through agreement between the Department of Natural Resources, the Department of Fish and Game, and the private property owners involved.

(g) The Department of Fish and Game and the Department of Natural Resources shall exercise their respective authorities over the Minto Flats State Game Refuge consistent with a management plan prepared by the Department of Fish and Game in consultation with the Department of Natural Resources.

REGULATION

5 AAC 95.530 MINTO FLATS STATE GAME REFUGE MANAGEMENT PLAN. The goals and policies of the Minto Flats State Game Refuge Management Plan dated March 1992 are adopted by reference. The plan presents management goals and policies for the refuge and its resources that the department will use in determining whether proposed activities in the refuge are compatible with the protection of fish and wildlife, their habitats, and public use of the refuge. Under 5 AAC 95.420, a special area permit is required for certain activities occurring in a designated state game refuge. The department will review each special area permit application for consistency with the goals and policies adopted by reference in this section. A special area permit issued for Minto Flats State Game Refuge will be approved, conditioned, or denied based on the criteria set out in those goals and policies, and on the standards contained elsewhere in 5 AAC 95. (Eff. 4/8/93, Register #126 July 93).

Authority: AS 16.05.020
AS 16.05.050
AS 16.20.020
AS 16.20.037
AS 16.20.060

Editors Notes: A copy of the Minto Flats State Game Refuge Management Plan dated March 1992 is available at the Alaska Department of Fish and
Game, 1300 College Road, Fairbanks, Alaska 99701-1599

GOALS

Activities which occur within the Minto Flats State Game Refuge will reflect the following goals in accordance with the purposes for which the refuge was established (AS 16.20.037(b)). All management decisions in the Minto Flats State Game Refuge, whether affecting activities undertaken by the department, other agencies, or the public, will be in accordance with these goals.

I. FISH AND WILDLIFE POPULATIONS AND THEIR HABITAT

Manage the refuge to protect and enhance fish and wildlife habitat and conserve fish and wildlife populations and diversity.

A. Minimize harmful disturbance to fish and wildlife.

B. Maintain, protect, and where appropriate enhance or restore the quality and quantity of habitat for historically occurring resident and migrant wildlife, particularly nesting, rearing, and staging habitat for waterfowl; important moose winter and calving habitat; important black bear spring and fall feeding habitat; and important furbearer habitat.

C. Maintain, protect, and where appropriate enhance or restore:

1) the uninterrupted movements and migrations of historically occurring resident and migrant fish; and

2) important fish habitat including spawning, rearing, and overwintering areas.

D. Maintain water quality, water quantity, and circulation patterns necessary for the growth and propagation of fish and wildlife.

II. PUBLIC USE

Guarantee continued public use of the refuge in a manner consistent with protection and enhancement of fish and wildlife habitat and the conservation of fish and wildlife populations.

A. Maintain and where appropriate enhance opportunities for fishing, hunting, and trapping as allowed by statute and the Boards of Fisheries and Game; education and study of fish and wildlife; and other outdoor uses consistent with the goals of this management plan.

B. Maintain legal public access to and within the refuge consistent with the goals of this management plan.

C. Protect cultural and historical resources located within the refuge.

D. Provide information about the refuge to the public.

EXPLANATION OF TERMS

Following is an explanation of terms used in the goals of this management plan.

Harmful Disturbance: Activities which displace fish or wildlife from their natural habitat or interrupt their seasonal activities at a frequency or duration which causes significant impact to refuge fish and/or wildlife. Harmful disturbance does not refer to the legal harvest of fish and/or wildlife.

Minimize: To reduce harmful effects to a level which does not have significant adverse effect on fish and wildlife populations or their habitat in the refuge or significantly reduce public opportunity for successful harvest and/or non-consumptive use of fish and wildlife.

Where Appropriate: Includes but is not limited to consideration of legal constraints, safety, funding, feasibility, and disturbance to fish and wildlife and their habitat.

Restoration: Returning habitat to its original function and value.

Enhancement: Increasing habitat value by improving or diversifying habitat function.

POLICIES

The policies provided in this plan will be used to guide department decisions on management activities and Special Area Permits in the refuge. The policies have been analyzed for their ability to meet refuge management goals, their effect on major refuge uses and activities, and impact on department management responsibilities.

PUBLIC ACCESS FOR THE REFUGE

Maintain existing public access into and within the refuge in a manner that will maintain refuge resources and values and guarantee the continuation of hunting, fishing, trapping and other uses by the public compatible with the protection and enhancement of habitat and the conservation of fish and wildlife. Avoid additional development of public access for the refuge except where it will provide a positive benefit for the purposes for which the refuge was established. This policy is not intended to preclude transportation options available under other policies in this plan (e.g., Off-Road Use of Motorized Vehicles, Forest Management/Timber Harvest, Oil and Gas Exploration and Development, and Transportation and Utility Corridors).

OFF-ROAD USE OF MOTORIZED VEHICLES

An individual Special Area Permit is required for the off-road use of wheeled or tracked equipment, unless the Commissioner has issued a general permit for off-road use of motorized vehicles in the Minto Flats State Game Refuge under 5 AAC 95.770 (5 AAC 95.420(a)(7)). A general permit for the off-road use of motorized vehicles may be issued as follows:

> To ensure the protection of important habitats, avoid harmful disturbance of fish and wildlife, and accommodate a variety of refuge users, the department will, as appropriate, establish motorized vehicle use corridors and seasonal and vehicle use restrictions under a general permit. The off-road use of any wheeled, tracked, or other ground-effect motorized vehicle of limited weight or ground effect, including snowmachines, will, in the discretion of the Commissioner, be allowed in the refuge from October 1 through April 30. If snow and/or frost sufficient to protect soils and vegetation from damage does not exist, the refuge will be closed to use by these vehicles until sufficient snow and/or frost are present. It is the intent of this policy to authorize personal and recreational transit.

The Commissioner may, in his discretion, issue an individual Special Area Permit under 5 AAC 95 for the off-road use of a wheeled, tracked, or other ground-effect motorized vehicle if the use is consistent with the goals and policies of this management plan. Organized group events involving 20 or more individuals or use of industrial or construction type vehicles may, in the Commissioner's discretion, be authorized under an individual Special

Area Permit under 5 AAC 95.420(a)(7) if the use is consistent with the goals and policies of this management plan.

INFORMATION / EDUCATION

Inform the public about resource values, recreational opportunities, and rules on the refuge, including courtesy information on boating, aircraft, trail use, traplines, and respect for private inholdings. Encourage compatible educational programs and research of fish, wildlife, and habitat resources and their uses.

FISH AND WILDLIFE HABITAT ENHANCEMENT AND RESTORATION

As appropriate, allow wildlife or fish habitat enhancement or restoration projects that further refuge management goals.

LAND ACQUISITION

Purchase or trade to acquire private lands or conservation easements within the refuge from willing sellers as time and funding permit. Donation of lands for addition to the refuge will also be considered.

CABINS / TENT PLATFORMS / DUCK BLINDS

To maintain public use opportunities and experiences, protect refuge resources, and preclude proprietary use of refuge land, the department may allow public use cabins, administrative cabins, trapping cabins, or cabins leased to a non-profit organization for a youth encampment or similar recreational or educational purpose. Commercial cabins will not be allowed unless they meet a public need specific to the refuge purposes which can not otherwise be met (e.g., on adjacent public lands or private inholdings). A cabin permit or lease would be limited to the minimum acreage necessary to accommodate the structure and essential associated activities. The construction of new private or personal use cabins will not be allowed on refuge lands. Unauthorized cabins will not be allowed.

Duck blinds (made of natural materials) or temporary tent platforms which will not significantly preclude existing public use of the refuge may be allowed. Permanent tent platforms or duck blinds will not be allowed. Use of temporary structures does not convey any future or exclusive rights and may not exceed one season's use.

EXISTING PUBLIC USE

Avoid conflicts with continuation of existing public uses and archeological/cultural sites when approving new uses and activities within the refuge.

GEOTHERMAL

Do not allow development of geothermal resources in the refuge.

FOREST MANAGEMENT / TIMBER HARVEST

Forest management on the refuge will be generally passive. If a forest disease or insect population level in the area is judged to threaten commercial forests adjacent to the refuge, then forest management activities may be undertaken on the refuge to control forest diseases or insects in order to minimize damage to adjacent commercial forests, as long as the forest management activities are consistent with the goals of this plan and the purposes for which the refuge was established.

Timber harvest for commercial, scientific, or personal use may be allowed only if compatible with the goals of this plan and the purposes for which the refuge was established. It is the intent of this policy to allow the harvest of dead or down trees of any size and live trees up to six inches in diameter at breast height for personal use, except where determined inappropriate by ADF&G, to further public use and enjoyment of the refuge.

Construction of all-season roads for forest management or timber harvest is prohibited within the refuge. Winter ice roads will be allowed in Township 3 South, Ranges 7 and 8 West, Fairbanks Meridian, to access timber resources within Toghottele lands, as appropriate under a Special Area Permit. As agreed in the Tanana Valley State Forest Management Plan process, winter ice roads will be allowed across refuge lands south of the Tanana River under a Special Area Permit. All winter ice roads shall be constructed and maintained in a manner which avoids conflicts with continuation of existing public uses of the refuge and protects soils, vegetation, water quality, refuge habitats, and other refuge resources.

MINING

Close the open portions of the refuge to mineral entry.

OIL AND GAS EXPLORATION AND DEVELOPMENT

Oil and gas leasing for exploration and development may be allowed in the refuge on a case-by-case basis if it is determined by the department to be compatible with the purposes for which the refuge was established. Specifically, AS 16.20.037(b)(3) guarantees the continuation of hunting, fishing, trapping, and other uses by the public compatible with the protection and enhancement of habitat and the conservation of fish and wildlife. Authorized activities shall be subject to permit terms and conditions necessary to maintain the purposes for which the refuge was established, shall require minimal surface use and may be seasonally restricted.

TRANSPORTATION / UTILITY CORRIDORS THROUGH THE REFUGE

Transportation and utility corridors, including railroads, roads, powerlines, and pipelines may be sited on refuge lands if they are determined to be compatible with the purposes for which the refuge was established. Proposals will be evaluated for compatibility with the refuge purposes listed in legislation and reflected in the goals of this plan: 1) protection and enhancement of habitat resources; 2) conservation of fish and wildlife populations; and 3) the continuation of fishing, hunting, trapping and other public uses compatible with habitat protection and enhancement and fish and wildlife conservation. Additionally, corridor proposals must demonstrate that there is a significant public need for the corridor that cannot be reasonably met off-refuge, that the use of refuge lands and impacts to refuge resources are avoided or minimized to the maximum extent feasible, that public access to the refuge is maintained, and that all impacts to refuge resources are fully mitigated.

Given the distribution of habitats and public uses within the refuge, the potential for incompatibility between corridor development and resource values appears to be greater within the portion of the refuge north of the Tanana River. Therefore, the highest priority should be given to avoiding the future siting of transportation and utility corridors in the most valuable refuge habitats north of the Tanana River.

FIRE MANAGEMENT

Encourage study of fire effects within the refuge to clarify the benefits, impacts, and tradeoffs which result from wildland fire and to resolve disagreement over a return to a more natural fire regime within the refuge. Fire protection needs for the refuge will be identified, with public review, in the Alaska Interagency Fire Management Plan.

OTHER USES

To protect refuge habitat and fish and wildlife populations, the department may allow by permit only those activities compatible with the purposes for which the refuge was established, terms and standards of 5 AAC 95, and the goals and policies of the plan. Any activity which is not compatible with the purposes for which the refuge was established, terms and standards of 5 AAC 95, and the goals and policies of this plan will not be allowed.

IMPLEMENTATION

The Minto Flats State Game Refuge Management Plan will be implemented by the Alaska Department of Fish and Game through its day to day on-the-ground management activities, through its annual budgeting process, and through Special Area Permits issued for land use activities within the refuge.

Special Area Permits: A Special Area Permit is required for any habitat altering activity, including construction work, in the Minto Flats State Game Refuge. A Special Area Permit application form can be obtained from any Alaska Department of Fish and Game office and should be submitted to the Habitat Division regional office in Fairbanks (5 AAC 95).

Fish and Wildlife Protection: State fish and wildlife protection officers patrol the Minto Flats State Game Refuge and provide on-the-ground enforcement of harvest regulations, refuge regulations, and permit requirements.

Operational Management Plan: Subsequent to the adoption of this plan, the Alaska Department of Fish and Game will proceed to develop an operational management plan for the refuge. This operational management plan will detail implementation of the policies adopted in this plan and will provide details on the projects, their schedules, staffing requirements, and budgets necessary for management of the refuge. Participation by local, state, and federal agency representatives as well as interested citizens in the development of the plan will be solicited.

Habitat Enhancement Projects: Refuge habitat enhancement projects will be developed in accordance with the goals and policies of this management plan through a public decision making process.

Information/Education: In an effort to reduce refuge use conflicts and improve the quality of use opportunities within the refuge, education of refuge users regarding boating safety, hunting safety, non-harassment of wildlife, courtesy of private landowners and fellow refuge users, access rules and refuge regulations will be pursued through the refuge information/education program. Information on research activities, including those conducted by the University of Alaska, will be made available to interested parties, including affected adjacent landowners.

Cabin Inventory: An inventory of existing structures on the refuge will be conducted and unauthorized structures will be removed.

Access Corridors to Private Land: The department will work with private landowners to establish access corridors across state land to private inholdings on an as-needed basis as provided for in AS 16.20.037(f).

Old Minto: Securing the Old Minto site for Minto people through a long term lease or land exchange will be pursued.

Fire Management: To implement the fire management policy, the department will:

- Promote study of the effects of fire upon the refuge's habitats, fish and wildlife populations, and human uses to help resolve conflicting perceptions of its importance in maintaining the area's productivity and diversity.

- Evaluate the effects of employing a more natural fire regime on those portions of the refuge where the goal is to maintain natural diversity and productivity, for possible incorporation into the Interagency Fire Management Plan for the area.

- Evaluate the use of prescribed fire on those portions of the refuge where, through a public process, management goals for enhancing specific wildlife values have been derived that cannot be reasonably met by reliance on naturally occurring wildland fire.

Power Boat and Summer Off-Road Vehicle Use in the Refuge: Impact to refuge habitat and displacement of waterfowl by airboats, large horsepower outboard engines, jet boats, and summer off-road vehicle use have been identified as a growing concern in the refuge during the development of the management plan. The department will solicit information on, and to the extent possible, monitor use of power boats and summer off-road vehicle use in the refuge. The department will develop rules and regulations governing the use of power boats in the refuge to protect habitat and avoid disturbance of wildlife at such time as the information warrants.

Other Agencies' Actions: It is anticipated that this document will also be used by other state, federal, and local decision makers in planning for and making decisions under their respective statutory authorities regarding lands within the Minto Flats State Game Refuge.

APPENDIX

MINTO FLATS STATE GAME REFUGE

RESOURCE INVENTORY

RESOURCE INVENTORY TABLE OF CONTENTS

LIST OF TABLES

INTRODUCTION

Minto Flats is a large wetland complex lying along a northerly loop of the middle Tanana River in Interior Alaska west of Fairbanks. The area is fed by waters from the Tatalina, Chatanika, and Tolovana rivers and Goldstream and Washington creeks and drains into the Tanana River. The mosaic of ponds, oxbows, stream channels, and various wetland and upland vegetation types provides excellent habitat for waterfowl, big game and furbearers, as well as anadromous and resident fish species.

The Flats also support high levels of human use. The area's proximity to Fairbanks, Nenana, and the village of Minto makes it available to a large number of people representing diverse interests. Used by the Minto band of Athabaskan Indians since before white contact, the area now supports hunting, trapping, fishing, and non-consumptive uses by a variety of users.

In 1988 the Alaska Legislature created the Minto Flats State Game Refuge (MFSGR) specifically to protect and enhance habitat, conserve fish and wildlife, and to guarantee the continuation of hunting, fishing, trapping, and other compatible uses of the area. The refuge contains about 500,000 acres of state lands and is divided into two parts, straddling the Tanana River and the Tanana Valley State Forest.

HISTORY

Andrews (1988) discusses the history of human use in Minto Flats:

> The occupation and use of Minto Flats and vicinity during the historic period (late 1800s and early 1900s) and prehistoric times is evidenced in the historic and ethnographic literature (Crane 1916; Olson 1968; Andrews 1977, 1980) and in the archaeological materials recovered from prehistoric sites in the area (Olson and Schledermann 1969; Derry, 1974, 1976). Seasonal settlements were situated throughout Minto Flats, but most were located in the eastern and northern areas along the Tolovana and Chatanika rivers, and along Goldstream and Washington creeks. Even older settlements are reported east of Minto Flats along the Chatanika River. The primary seasonal settlements were situated on whitefish and salmon-bearing streams, where fish weirs and traps were constructed for harvesting these and other fish species. Other seasonal settlements along streams and lakes were used in the spring when the once plentiful muskrat and waterfowl were major subsistence resources.
>
> **1850-1900**
>
> During the early contact period the Minto people, like other Indian groups along the Tanana River, had little direct contact in their own area with non-

Natives. In his 1885 expedition along the Tanana River, Lieutenant Henry T. Allen did not report seeing any Indians along the river during the few days he traveled through the area customarily used by the Minto people (Allen 1900). As noted above, their primary settlements were located beyond the main river along the clearwater streams at that time. Oral accounts by elderly Minto residents note that some members of the Minto band traveled along inter-regional trails and the Tanana and Yukon rivers to settlements such as Tanana, Rampart, and Fort Yukon, where they traded furs in exchange for some manufactured goods and small amounts of imported food staples such as tea and flour. These trails continued to be used throughout the first half of the 20th century as Minto people continued to maintain contact with those settlements.

1900-1950

During this period a number of economic and social changes began to occur in the immediate homeland of the Minto people. Trading posts, roadhouses, telegraph stations, and commercial centers were established in the Tanana River valley. A telegraph line along the Tanana was in operation from 1902 to 1918. With the discovery of gold north of Fairbanks in 1902, steamboats began to navigate the Tanana River, bringing goods and new residents into the area. The people of Minto traded at posts on the Yukon River such as Fort Hamlin near present-day Stevens Village (Anonymous 1904), at Tanana, and at the newly-established posts at the mouth of the Tolovana River and at Nenana. Furs were traded, and as dog teams and steamboats increased in importance, dried fish and cordwood also were sold. The territory used by the Minto band remained essentially the same, as did the seasonal round of subsistence activities. These included fishing, trapping, large and small game hunting, and berry picking. Their land use area extended from near Livengood and Sawtooth Mountain in the north to the mouth of the Kantishna River in the south, and from Murphy Dome and the middle Chatanika River in the east to the Dugan Hills in the west (Fig. 3). Additionally, some people used other areas as far north as Beaver Creek and as far south as the Toklat River. During this period more intensive salmon fishing took place along the Tanana River. In 1917 some members of the Minto band began to settle along the Tanana at Old Minto, although most families did not reside there year-round until later in the middle of the 20th century. In 1938 there were 18 occupied cabins at Old Minto and in 1940 11 families continued to reside in canvas tents (Olson 1968).

During this same time period, development of natural resources for commercial purposes occurred on the periphery of Minto Flats, particularly to the north and east. For example, gold discoveries on two tributaries of the

Tolovana River resulted in the establishment of mining operations and communities at Fairbanks, Chatanika, and Livengood in 1902, 1904, and 1914 respectively (Orth 1967:201, 324, 590; Olson 1981). In the late 1920s Episcopal church officials began schooling on an irregular basis for three years, and in 1937 a federal Bureau of Indian Affairs day school was opened (Slaby 1981:28). This period marked the change from a mobile hunting and gathering band population to semi-permanent settlement in a village (Slaby 1981:28).

1950-1985

The Minto people, particularly since 1950, have continued to use the land and resources in much of their customary territory despite changes in resource abundance throughout this century. The community again relocated, this time to its current site on the Tolovana River in the northwestern portion of Minto Flats. This resettlement in a planned community occurred between 1969 and 1971 when repeated flooding and riverbank erosion at Old Minto necessitated relocation to more stable ground. New Minto serves as the primary base for hunting, fishing, trapping, and gathering activities. However, several families seasonally occupy settlements on the Tanana River and Goldstream Creek for fishing salmon, whitefish, and pike and for trapping. Numerous campsites throughout the Flats are still used during fall moose hunting, spring muskrat and waterfowl hunting, and spring and fall whitefish and pike fishing. Unlike earlier periods, imported and manufactured goods are obtained primarily from Fairbanks, which is reached either by air taxi services or by motor vehicle on the gravel road and paved highway that connects Minto with Fairbanks. As in the past, social relations are maintained with people of the Yukon River communities of Tanana, Rampart, Ruby, Stevens Village, and the Tanana River communities of Manley, Nenana, Fairbanks, and Tanacross. Frequent contact is maintained with former Minto residents who reside in Fairbanks, and a few families have residences in both communities. Former residents of Minto often return to the village and join their relatives in subsistence activities in Minto Flats.

Shepherd and Matthews (1985) cite the late 1940's as the time when Minto Flats first began to support urban recreational uses. Waterfowl hunters from Fairbanks were the first to use the area in this manner, and moose hunting and pike fishing were other early activities. Air access was most commonly used, although a small number of hunters reached the Flats by boat.

Shepherd and Matthews go on to say that:

> Sportsmen from Fairbanks began to build permanent recreational cabins, largely in the Big Minto Lake area, in the late 1940s and early 1950s. Use of the Flats slowly increased before statehood and then began to exhibit a moderate change until early 1970 when a rapid climb to present user levels began . . . Many factors prompted the increase of users, including accelerated population growth in Alaska following statehood and again during the oil pipeline boom. By 1970 a road had been built into new Minto, improving the launching area for boats. In addition, a proliferation of private float-equipped aircraft increased the number of hunters with means of access to the Flats. Improved boats and larger, more reliable outboards made water trips via Nenana more practical and less time consuming than in the past. Construction of a road from Murphy Dome to the Chatanika River in 1982 allowed access to the Chatanika River and Minto Flats. Moreover, winter access by snowmachine became easier with this road.

During deliberations for the Alaska Department of Natural Resource's Tanana Basin Area Plan (TBAP), completed in 1985, a multi-disciplinary planning team agreed that the Minto Flats area represented one of the most important fish and wildlife habitat resources in the entire planning area. Additionally, the Flats' importance as a public use area was recognized. In order to minimize impacts to these characteristics, the state land in the area was classified as fish and wildlife habitat, and management guidelines were written to prevent activities which would conflict with the area's values. Additionally, in order to give recognition that the Minto Flats was a featured area for the production and use of fish and wildlife resources and should remain that way, the Tanana Basin Area Plan recommended the area for legislative designation as a state game refuge.

Shortly after the TBAP was signed, a coalition of people interested in the management of Minto Flats began drafting legislation that would carry out the plan's recommendation. Although the members of the group represented diverse and in some cases competing user groups, they agreed that there was a common interest in ensuring that the Minto Flats would continue to produce fish and wildlife resources over the long term. The support group decided to enlarge the area proposed for refuge designation, adding an area south of the Tanana River and an area in the upper Tolovana River drainage to the original TBAP proposal.

The support group's draft was introduced in the first session of the Fifteenth Legislature by Senators Johne Binkley and Jay Kerttula. After passing through several committees of the legislature and associated public hearings, the bill was passed in April 1988 near the end of the legislature's second session. The only major change made to the bill in its progress through the legislature was the deletion of language closing the newly-proposed portions of the refuge to mineral entry (the original proposal had been closed as a result of TBAP implementation).

Since the creation of the Minto Flats State Game Refuge, management has continued with little change from the past.

PHYSICAL ENVIRONMENT

Climate

Minto Flats exhibits most of the weather characteristics typical of Interior Alaska's continental climate. Low precipitation, warm summers, and intensely cold winters are the rule. The area is noted for its northerly and easterly winds, which are markedly stronger and more persistent than in surrounding areas. Low temperatures are similar to those experienced in Fairbanks, but severe wind chill factors often accompany them. Andrews (1988) reported that:

> For the recent five-year period average monthly temperatures ranged between -14.6 degrees Fahrenheit in December to 58.5 degrees in July . . . Average minimum daily temperatures were lowest in December 1980 at -39.8 degrees Fahrenheit (National Weather Service). The range in extreme temperatures is great. For example, in 1980 the lowest recorded temperature was -58 degrees (in December) and was 84 degrees (in August). Also typical of continental climates is low precipitation. Based on data from the Manley Hot Springs observer station, annual precipitation ranged from 11.5 inches in 1984 to 17.2 inches in 1982 . . . with snowfall ranging between 31.5 inches in 1983 to 63.8 inches in 1984. Average monthly precipitation for the five-year period was lowest in February and greatest in July whereas snowfall was greatest in December . . . breakup occurred as early as May 2 and as late as May 12 . . . Freezeup began as early as September 30 and as late as October 18 . . . Lakes in Minto Flats and portions of streams, such as the Tolovana River, melt at different rates depending on the depth of the stream or lake bed.

Geology

Discussing the geology within a study area larger than the refuge, BLM's environmental impact statement for placer mining in the Minto Flats vicinity (Bureau of Land Management 1989) stated that:

> Major portions of the principal drainage systems within the study area [Goldstream Creek, the Chatanika River, and the Tolovana River] lie within the Yukon-Tanana Upland physiographic province, which is in east-central Alaska, bounded by the Yukon and Tanana Rivers. The study area also includes the relatively low lying, marshy Minto Flats, toward which these principal streams flow in a generally southwest-west direction. The Minto

Flats are considered to be part of the Tanana-Kuskokwim Lowland physiographic province, a broad alluvial lowland of generally subdued topography. The Tanana River lies south of the study area and has been diverted northward in stages over a large area in which it meanders tortuously. This diversion likely is due to the influx of extensive deposits of glacial and glaciofluviatile material into the Tanana valley from the south by large glacial steams [sic] draining the north side of the Alaska Range.

This northward arc of the Tanana River may also, at least in part reflect and be controlled by structural trends in underlying bedrock. The Tanana River has been unable to effectively transport this sedimentary material downstream and has thus deeply aggraded its valley, and be thus raising the baseline of erosion it has caused its tributaries from the north (Tolovana River, etc.) likewise to aggrade their valleys (Mertie 1937) . . .

It has been suggested that the Minto Flats area is presently undergoing and/or has recently undergone uplift-upwarping directly due to tectonic activity, and/or "rebound" effects related to geomorphic and/or structural causes elsewhere in the region . . .

Barnes' (1971) discussion of a geophysical anomaly, a profound gravity low, at the Minto Flats area includes several particularly relevant comments. . . . Physiographic evidence (D.M. Hopkins, oral communication 1961) strongly suggests that the Minto Flats are actively subsiding, and that sediments are accumulating there at the present time . . . The suggested configuration assumes a layer of low-density alluvium overlying a thicker, intermediate-density, section which is separated from the basement rocks by a normal fault . . .

The alluvium-floored flats are dotted with numerous lakes and swamps, the remnants of former water courses. There are occasional low hills, probably vestiges of earlier gravel sheets, and/or dune and bar relicts of previous specific sitings of the Tanana River within the valley.

The Minto Flats is bounded on the north by a highland rim which, in general, rises rather steeply from the plain. This escarpment, in many places at least, seems to be the result of normal faulting-extensional tectonic effects recognized in the region . . .

Water Resources

According to the BLM environmental impact statement for placer mining in Minto Flats (Bureau of Land Management 1989):

> In their natural state, streams and rivers in this region of Alaska have generally good water quality. Dissolved solids average less than 200 mg/l and are typically of the calcium bicarbonate type with low iron content. Sediment loads range from 10 mg/l to 300 mg/l in the larger rivers, with small tributary streams general [sic] carrying less than 10 mg/l (Selkregg, 1974). Most of this sediment is introduced through bank and bed erosion from reworking of the valley deposits. However, the three water courses of concern in this analysis have been periodically inundated by sediment introduced from upstream placer mining operations. It is estimated that the amount of overburden and muck washed down Goldstream Creek in 1940 was 14.3 million cubic yards. Estimates of the combined amount of muck carried by the Chatanika River and Goldstream Creek from hydraulic stripping are as high as 100 million cubic yards. Heavy sediment loads in Goldstream Creek during the intense mining of the 1930's and 1940's caused the inlet channel to Minto Lake to fill in. Goldstream Creek then created a new channel, eventually combining with Little Goldstream Creek in Minto Flats. This channel migration caused some smaller lakes to completely or partially fill in (Weber and Robus 1987). Mining in the headwaters of the Tolovana River around Livengood introduced as much as four million cubic yards of muck to the stream system prior to 1981 (Shepherd, Matthews, and Andrews 1985) . . .
>
> Placer mining in the Chatanika River, Tolovana River, and Goldstream Creek has resulted in a number of impacts, including elevated turbidity levels and increased sedimentation of stream channels and Minto Flats. In the case of at least Goldstream Creek, changes in channel morphology have also occurred. Although these changes are not well documented, potential results include perched stream channels, changes in the piezometric surface, filling and eutrophication of lakes in the depositional areas, alteration of stream courses, and reduced primary productivity.
>
> Even though the rates of natural sedimentaion for these drainages cannot be adequately quantified, the dredging and hydraulic mining operations of the past undoubtedly accelerated the natural process. The sediments already deposited in the affected channels and, to a lesser extent, input from current operations will continue to deposit sediments in Minto Flats . . .

Water quality has generally improved in streams feeding Minto Flats in recent years. It is likely that, in general, the continued effects of past mining practices have a greater influence upon water quality in Minto Flats than current mining operations upstream of the refuge.

Pond and lake habitats within Minto Flats tend to be highly eutrophic. However, near-constant daylight during the summer limits diurnal oxygen depletion in these waterbodies, and allows them to be used by various species of fish (Weber Scannell pers. comm. 1991).

Soils

According to the BLM environmental impact statement for placer mining in Minto Flats (Bureau of Land Management 1989), the streams that feed Minto Flats change gradient abruptly as they flow from the steep highlands surrounding the Flats. As their slope flattens, the streams decrease in velocity and deposit sediments that they are carrying, and the Minto Flats act as a giant settling basin. The resulting alluvial silt and gravel deposits and tortuously meandering streams characterize the area.

According to BLM's environmental impact statement, there are three main soil associations present in the Minto Flats area. All of the soils are influenced by cold, as the entire area is underlain by discontinuous permafrost. In the lowlands contained within the Minto Flats State Game Refuge's boundaries only two main soil associations are present. Histic Pergelic Cryaquepts cover

> . . . a major portion of the Minto Flats drainage . . . Occupying the foot slopes, terraces, and broad floodplains of the Tolovana, Chatanika, and Tatalina Rivers, this poorly drained soil is derived from nonacid silty alluvium and is commonly associated with poorly drained organic soils. It is also found on the steep north-facing slopes of the hilly uplands . . . Elevations range from 300 to 3,000 feet. The permafrost is usually shallow and rich in ice.
>
> On nearly level terrain, this soil supports sedge tussocks, mosses, and shrubs. Black spruce forests with a dense understory of shrubs, forbs, mosses, and lichens are found on the more sloped sites.
>
> This soil presents severe restrictions for any intensive use or development . . . Due to its silty texture and the presence of extensive ice-rich permafrost, it is very susceptible to erosion when the insulating vegetative mat is disturbed or removed . . . In level areas, the thawing can produce thermokarsts . . . [which] . . . may eventually form lakes or ponds.
>
> [Pergelic Cryofibrists] . . . are found in association with Histic Pergelic Cryaquepts on the broad floodplains of the Tolovana, Chatanika, and Tatalina Rivers. The area is characterized by meandering sloughs, small rivers and streams, and undrained depressions. Elevations range from 300 to 1,000 feet. These are organic soils which have formed through the eutrophication of ponds and sloughs. They consist of layers of fibrous moss and sedge peat. Under this soil, the permafrost table is shallow.

> In broad wet depressions, mosses, sedges, shrubs, and forbs cover the ground in a thick, dense mat. Low mounds covered with black spruce may occur in or adjacent to the depressions.
>
> Because of wetness and permafrost, this soil presents severe restrictions for any intensive use or development . . . Many areas provide excellent habitat for nesting waterfowl.

BIOLOGICAL RESOURCES

Vegetation

The complicated pattern of vegetation types in Minto Flats provides a variety of habitats for fish and wildlife populations using the area. The proximity to one another of complementary vegetation types tends to make for rich habitat values for a number of species.

Shepherd and Matthews (1985) state that once established, vegetation types in Minto Flats tend to be stable, until altered by physiographic forces such as inundation, fire, river cutting, thawing of permafrost, and addition of silts.

Because of the way the boundaries of the refuge are drawn, landcover types within it are restricted almost entirely to wetland, riparian, and aquatic categories. Riparian areas support narrow bands of closed and open canopied forest (conifer, deciduous, and mixed), stands of shrubs, and wet herbaceous areas. Wetland types include broad areas of low shrub/sedges, shrubland, and wet herbaceous vegetation. Aquatic areas include lakes, ponds, streams, and emergent vegetation.

A vegetation type map has been prepared for the MFSGR and adjacent lands. This map relies upon information gathered for the Tanana River Basin Study, a joint project of the Division of Forestry, ADNR and the Soil Conservation Service, USDA to inventory timber and vegetation resources in the Tanana Valley State Forest. A draft report entitled "Timber and Vegetation Resource Statistics of the Tanana Valley State Forest", dated December 1989, contains a vegetation classification scheme fairly equivalent to Level III of the classification system developed at the Institute of Northern Forestry, University of Alaska (Viereck and Dyrness 1980). The report also contains sampling information on species composition, percent cover, and acreages for each type. Maps were made of much of the Tanana River Valley using the vegetation classification described above, including the area later designated as the MFSGR.

The number of categories in the classification scheme and the complicated mosaic of vegetation polygons within Minto Flats combine to form an almost unreadable map. For

this reason, vegetation classes that seemed to have similar ecological functions were combined. After reducing 94 categories (not all of which occurred within the refuge) to 16, a new vegetation map of the MFSGR was produced by the Division of Forestry, ADNR at the request of Habitat Division. This map, drawn at a scale of 1:63,360 and color coded by type, is on file at the ADF&G regional office in Fairbanks and is the basis for the vegetation maps associated with this resource report.

Fish and Wildlife Resources

Minto Flats' productive habitats support a diverse array of fish and wildlife populations. The MFSGR contains an area that is good habitat for big game species such as moose and black bear, furbearers such as beaver, muskrat, marten, and mink, fish such as northern pike and whitefish, and birds, including waterfowl, game birds, raptors, and passerines. A partial list of fish and wildlife species that use Minto Flats is presented in Table 1.

Waterfowl

Minto Flats constitutes one of the highest quality waterfowl nesting and staging habitats in Alaska, and possibly in North America (Conant 1985). Waterfowl arrive in the area during April or May prior to spring breakup and remain through freezeup (BLM 1989). Breeding population surveys have shown Minto to support duck densities equal to or greater than other important production areas such as the Yukon Flats or the North American prairies. During the eight year period from 1978-1985 the U.S. Fish and Wildlife Service estimated average nesting densities on Minto Flats of 213.2 ducks per square mile (Conant and Hodges 1985). Many species of ducks use Minto Flats, including gadwall, green-winged teal, blue-winged teal, redhead, ring-necked duck, goldeneye, bufflehead, oldsquaw, scoter, ruddy duck, and mergansers (BLM 1989), but the area is especially important for mallards, pintails, and canvasbacks--all species of international concern. Other ducks exhibiting high densities within the MFSGR include wigeon, shoveler, and scaup.

The area is also used by other waterfowl species, including Canada geese, sandhill cranes, and loons. According to Conant and Hodges (1985) Minto Flats seems to be especially important for white-fronted geese.

Minto Flats is one of the best habitats in Alaska for the trumpeter swan (*Cygnus buccinator*). During the last two decades the population of these birds in Alaska has steadily increased. For example, swans in the "Lower Tanana" unit surveyed by the U.S. Fish and Wildlife Service have increased from 476 in 1968 to 3,880 in 1990 (USF&WS 1990). Of these, approximately 2,500 birds were counted on Minto Flats (King pers. comm. 1990). Minto Flats will continue to be an essential component of the trumpeter swan's nesting, rearing, and staging habitat nationwide, although numbers will probably not continue to increase much higher than current densities.

Table 1.
Common Names of Fish and Wildife Species Found Within the Minto Flats State Game Refuge

FISH

Northern pike
Sheefish
Burbot
Arctic grayling
Broad whitefish
Least cisco
Humpback whitefish
Blackfish
Longnose suckers
Brook lamprey

MAMMALS

Black bear
Brown bear
Moose
Wolf
Coyote
Red fox
River otter
Wolverine
Marten
Mink
Lynx
Beaver
Muskrat
Snowshoe hare
Red squirrel

BIRDS

Common loon
Pacific loon
Horned grebe
Red-necked grebe
Trumpeter swan
Tundra swan
Canada goose
White-fronted goose
Mallard
Green-winged teal
Shoveler
Pintail
American wigeon
Canvasback
Lesser scaup
Greater scaup
Common goldeneye
Bufflehead
Oldsquaw
White-winged scoter
Common scoter
Surf scoter
Red-breasted merganser
Goshawk
Sharp-shinned hawk
Northern harrier
Rough-legged hawk
Red-tailed hawk
Harlan's hawk
Swainson's hawk
Bald eagle
Osprey
Gyrfalcon
Peregrine falcon
Merlin
Kestrel
Spruce grouse
Ruffed grouse
Sharp-tailed grouse
Willow ptarmigan
Sandhill crane
American golden plover
Semipalmated plover
Spotted sandpiper
Lesser yellowlegs
Pectoral sandpiper
Northern phalarope
Common snipe
Herring gull
Mew gull
Bonaparte's gull
Arctic tern
Great horned owl
Short-eared owl
Great gray owl
Hawk owl
Boreal owl
Belted kingfisher
Bank swallow
Tree swallow
Lapland longspur
Snow bunting
Black-capped chickadee
Boreal chickadee
Dark-eyed junco
Common raven
Gray jay
Rosy finch
Pine grosbeak
Northern shrike
American pipit
Bohemian waxwing
White-winged crossbills
Common redpoll
Hoary redpoll
Sparrows
Thrushes
Woodpeckers
Warblers

As prairie habitats in Canada and the Lower 48 states shrink or suffer drought, Minto Flats and other Alaska wetland complexes become even more important for all waterfowl species that use the area.

Big Game

The Minto Flats moose population has increased substantially in recent years, due in part to wolf control activities in the late 1970's and early 1980's. Surveys conducted in the fall of 1989 revealed moose densities of 1.6 per square mile, roughly equivalent to those found in the Chena and Salcha drainages (McNay pers. comm. 1990). There is probably some seasonal exchange of moose between Minto Flats and the surrounding highlands, although most animals collared with radios have remained resident within the Flats. The area contains good calving and feeding habitats and can fulfill the needs of moose year round. Within the MFSGR, Goldstream Creek and the Chatanika River downstream of Goldstream Creek contained particularly high moose densities in fall of 1989. Despite deep snows during the winter of 1989-90, calf:cow ratios indicated a good rate of winter calf survival. Bull:cow ratios in Minto Flats are higher than in surrounding areas, probably due in part to restricted hunting opportunities (see big game hunting section).

Black bear are common and widely distributed in the Minto Flats, taking advantage of the varied vegetation types and the abundance of other wildlife species, especially in riparian and wetland areas. Much of the moose calf mortality that occurs during summer is probably attributable to black bear. Brown-grizzly bear are also present in Minto Flats, but in low numbers. Caribou occured in Minto Flats within memory of elders of Minto, but are not found there at the present time.

Furbearers

The mix of aquatic, wetland, and upland landcover types in the Minto Flats supports a full complement of furbearer species, including wolf, coyote, red fox, lynx, wolverine, river otter, marten, weasels, mink, beaver, and muskrat. Wolf densities are moderate and increasing after control efforts had depressed the population in the late 1970's. Red fox and beaver are abundant, as are river otter relative to other areas in Alaska's Interior. Mink are fairly abundant. Lynx densities vary widely during a 10-year period, largely in response to changes in snowshoe hare populations. Muskrat populations are generally thought to be well below historical levels. Shepherd (1987) attributed muskrat declines to a combination of environmental factors, including repeated years of high water levels, climatic changes, possible tectonic changes, and siltation.

Fish

Minto Flats is well known for its large northern pike (*Esox lucius*) and provides an abundance of feeding habitat for this species. According to Shepherd (1987), habitat

changes in the past (i.e., infilling of the Big Minto Lakes with mining silts) have probably tended to increase rearing and feeding areas for pike while decreasing overwintering habitat, although this opinion is not shared by others working with pike in the area (Burkholder pers. comm 1990). Studies have identified only a few overwintering areas within Minto Flats: the Chatanika River above Goldstream Creek, the lower Tolovana River, and the Tanana River. The lack of more areas deep enough to remain unfrozen and oxygenated is possibly the limiting factor for the Minto Flats pike population.

A winter fishery in the Chatanika River is thought to have contributed to a decline in pike numbers in the mid-1980's. Gravid adult females were taken from this small area in large numbers and low numbers of small fish were observed in subsequent years. Harvest restrictions were imposed late in the 1980's to address this conservation problem, including the closure of the winter sport fishery. Work is presently underway to evaluate the current status of Minto Flats pike.

Minto Flats is also an important habitat for whitefish. The Flats serve as rearing and feeding areas for populations of least cisco (*Coregonus sardinella*) and humpback whitefish (*C. pidschian*) that, combined, total over 100,000 fish when they spawn in the Chatanika River upstream of the MFSGR. Broad whitefish (*C. nasus*) also inhabit Minto Flats, although little is known about the population.

Arctic grayling (*Thymallus arcticus*) use streams within the refuge and migrate through the area in spring and fall. Burbot (*Lota lota*) and longnose suckers (*Catastomus catastomus*) are common throughout the area. Sheefish (*Stenodus leucichthys*) are found primarily at confluences of streams in deep water (Hallberg pers. comm. 1991). Chinook salmon (*Onchorhynchus tshawytscha*) and chum salmon (*O. keta*) migrate through the Flats to spawning areas in the Chatanika River and other Tolovana tributaries, and coho salmon (*O. kisutch*) have been seen migrating through Grassy Slough on their way up the Tanana River (DeCicco pers. comm. 1990). Blackfish (*Dallia pectoralis*) are also found in the lakes and streams within the MFSGR.

Habitat Quality

Shepherd and Matthews (1985) summarized the effects of factors contributing to formation, change, and maintenance of Minto Flats habitat:

> Minto Flats overlays deep sedimentary rock deposits that are decidedly faulted to the east and northwest. Tectonic movements in this geologically active area are credited for land subsidence over several locations on the Flats. These . . . have served as settling basins for suspended material, including those introduced during recent times by hydraulic stripping and placer mining.

There is no question that millions of cubic yards of hydraulic muck reached Minto Flats via Goldstream Creek. The Minto Lake area was visibly affected by deposition of silts. Restructuring of this entire complex changed a series of deep, clear, and tree-lined lakes into eutrophic, shallow bodies of water, surrounded by grass and shrub Flats. Lesser but significant changes were inflicted by mining silts transported by the Tolovana and Chatanika rivers. This sudden and traumatic change accelerated processes that normally would have taken many generations.

The shallow, eutrophic lakes created by this introduction of silts seems to have benefited waterfowl and fish, but has destroyed the overwintering capacity of Minto Lake waters. Channel changes, pirated lakes, and abandoned meanders of the silt laden and aggrading Goldstream Creek were soon invaded by grasses and willows. These stands of willow still provide prime winter habitat for moose. Muskrat habitat appears to have been affected adversely in areas adjacent to Goldstream Creek and to some extent near the Tolovana and Chatanika rivers. However, the amount of prime muskrat habitat unaffected by mining silts is considerably greater . . .

The hydrologic cycle of alternating high and low water is one of the major factors affecting the regulation of natural processes occurring on Minto Flats. Persistent flooding of some Minto Flats habitats has adversely affected moose, muskrats, and waterfowl. However, maintenance of plant associations favoring wildlife is closely tied to water level fluctuations.

Wildfire continues to play an important role in recycling of nutrients and restructuring the plant associations on Minto Flats. Fire can create more variations in both plant and animal communities than any other natural force. Abundance and diversity of animal life is tied into periodic burning which, in conjunction with other natural events, can maintain a diverse mozaic [sic] of productive habitat on Minto Flats.

The diverse mozaic [sic] of plant associations on Minto Flats is primarily a result of periodic fire and flooding. Rapid infilling of Minto Lake and adjacent areas by Goldstream Creek created conditions that led to development of additional diversity in plant associations. Plant associations on Minto were established, maintained, modified, and changed by interactions between and including, land subsidence, climate, water level fluctuations, silt depositions, wildfire, and biological activities . . .

The perpetuation of the Minto Flats plant and animal communities is partially dependent upon annual water level fluctuation. Deviations from this annual cycle of hydrologic replenishment and gradual runoff temporarily results in

> environmental stresses. Persistent high or low water will adversely affect segments of the Minto Flats ecosystem. This adversity may lead to prolonged reproductive failures in some plants and animals. Recovery from such events requires an adaptive flexibility inherent in most species, but may require favorable environmental conditions over many years to attain previous levels of abundance.

LAND OWNERSHIP

All of the submerged land and most of the uplands within the Minto Flats State Game Refuge are state-owned. In several areas within the refuge, especially along its northern edge, ANCSA Native corporation selections and state land selections overlap. To the extent that the adjudication of these selections results in conveyance of land to the state, additional acreage will be added to the refuge. Lands conveyed to Native corporations in these areas will become additional private inholdings within the refuge.

There are a number of private inholdings within the refuge belonging to individuals. Table 2 summarizes information on private inholdings found during a title search performed for the refuge by the Alaska Department of Natural Resources. Table 3 lists authorized cabins and structures within the refuge.

HUMAN USE OF REFUGE RESOURCES

Due to its productivity and seasonal importance to many species of fish and wildlife, Minto Flats is used by many consumptive users of natural resources. As Andrews (1988) has documented, the harvest by Minto village within the area is substantial (see Table 4). In addition, hunters, trappers, and fishermen from more urban areas have long been attracted to Minto Flats. A brief summary of activities relating to fish and wildlife harvest follows.

Waterfowl Hunting

The Minto Flats region is considered to be one of the best migratory waterfowl habitats in Alaska, especially along its eastern edge around the Big Minto Lakes. The lakes are used for staging by migrants from other areas as well as for breeding and molting by local populations. As a result, the area becomes a focus for waterfowl hunting activities by the people of Minto (Andrews 1988):

> Waterfowl are harvested from the village as well as from spring muskrat hunting and fishing camps and fall moose hunting camps temporarily set up in the Minto Lakes area. They are intentionally hunted, but also harvested as an adjunct to other harvest activities such as fishing, muskrat hunting, berry picking, and moose hunting. At these times, waterfowl are taken either in close proximity to the camping site or while in transit to other hunting,

gathering, or fishing areas. Waterfowl hunting areas are accessed primarily by riverboat or canoe . . . Some harvest occurs beginning in mid-April with the first arrival of geese in the Flats. Prior to their arrival, snowmachines and snowshoes are used to break a trail into a customary

Table 2
Private Inholdings In Minto Flats State Game Refuge as Shown on Land Status Map

Map # *	Location	Parcel #	Name	Type	Status
3)	T.1N. R.6W. F.M.	F016328	Emil Usibelli	ST	Patent Issued
4)	T.1N. R.6W. F.M.	F034711-(USS4466A)	Lena Peters	NA	Certificate of Allotment
5)	T.1N. R.6W. F.M.	F034702-(USS4457A)	Ellen Frank	NA	Certificate of Allotment
6)	T.1N. R.6W. F.M.	F034718-(USS4473C)	Matilda Titus	NA	Survey Pending
7)	T.1N. R.6W. F.M.	F007638-(USS3034)	Urban Eugene Rahoi	TM	Patent Issued
8)	T.1N. R.6W. F.M.	F030433-(USS4328)	Minto Lake Duck Shack	TM	Patent Issued
9)	T.1N. R.6W. F.M.	F025242-(USS4332)	John C. Haggland	SR	Patent Issued
10)	T.1N. R.6W. F.M.	F028431-(USS4193)	James Magoffin	TM	Patent Issued
11)	T.1N. R.6W. F.M.	F014528-(USS9978)	John Alfred Jr.	NA	Survey Pending
12)	T.1N. R.6W. F.M.	F014536-(USS9979)	Lee Titus	NA	Survey Pending
13)	T.1N. R.6W. F.M.	F014773-(USS9977)	Patrick L. Carter	NA	Survey Pending
14)	T.1N. R.6W. F.M.	F016441-(USS9980)	Josephine Riley	NA	Survey Pending
15)	T.1N. R.6W. F.M.	F023729-(USS4263)	Fred Bast et al.	HQ	Patent Issued
16)	T.1N. R.7W. F.M.	F027069B-(USS9980)	Charlie Titus	NA	Survey Pending
17)	T.1N. R.7W. F.M.	F001042-(USS5610B)	Alfred Wright	NA	Certificate of Allotment
18)	T.1N. R.7W. F.M.	F001042-(USS5610C)	Alfred Wright	NA	Certificate of Allotment
19)	T.1N. R.7W. F.M.	F027048-(USS9985)	James Alexander	NA	Survey Pending
20)	T.1N. R.7W. F.M.	F027068-(USS9980)	Louie Silas (Deceased)	NA	Survey Pending
21)	T.1N. R.7W. F.M.	F015282-(USS9981)	Ruth Grant	NA	Survey Pending
22)	T.1N. R.7W. F.M.	F034710-(USS4465)	Susie Jimmie	NA	Certificate of Allotment
23)	T.1N. R.7W. F.M.	F034715-(USS4470B)	Walter Titus (Deceased)	NA	Survey Pending
24)	T.1N. R.7W. F.M.	F027045-(USS9982)	George Titus (Deceased)	NA	Survey Pending
25)	T.1N. R.7W. F.M.	F034706-(USS4461B)	Steven Jimmie (Deceased)	NA	Certificate of Allotment
26)	T.1N. R.7W. F.M.	F022750-(USS5096)	Doyon, Inc.	HP	Pending
27)	T.1N. R.7W. F.M.	F034703-(USS4458B)	Alfred Frank	NA	Certificate of Allotment
28)	T.1N. R.7W. F.M.	F034703-(USS4458D)	Alfred Frank	NA	Survey Pending
29)	T.1N. R.7W. F.M.	F016293-(USS4443B)	Jonathon David	NA	Survey Pending
30)	T.1N. R.7W. F.M.	F016293-(USS4443A)	Jonathon David	NA	Survey Pending
31)	T.1N. R.7W. F.M.	F027071-(USS4448A)	Peter Solomon	NA	Certificate of Allotment
32)	T.1N. R.7W. F.M.	F027073-(USS4472)	Cora John Smith	NA	Certificate of Allotment
33)	T.1N. R.7W. F.M.	F034709-(USS4464B)	Elsie John	NA	Certificate of Allotment
34)	T.1N. R.8W. F.M.	F027047-(USS4356A)	Robert Titus	NA	Certificate of Allotment
35)	T.2N. R.6W. F.M.	F001823-(USS2201)	William Jimmie (Deceased)	NA	Certificate of Allotment
36)	T.2N. R.6W. F.M.	F002098-(USS2001)	Anthony Lyden	HE	Patent Issued
37)	T.2N. R.6W. F.M.	F034715-(USS4470A)	Walter Titus	NA	Certificate of Allotment
38)	T.2N. R.6W. F.M.	F12377A-(USS10026)	Pearl Chanar (Charlie)	NA	Survey Pending
39)	T.2N. R.6W. F.M.	F14531C-(USS10024)	Lindred Jimmie	NA	Certificate of Allotment
40)	T.2N. R.6W. F.M.	F027067-(USS5607)	Andrew Jimmie	NA	Certificate of Allotment
41)	T.2N. R.6W. F.M.	F015471B-(USS10028)	Floyd Alexander	NA	Survey Pending

Map #	Location	Parcel #	Name	Type	Status
42)	T.2N. R.6W. F.M.	F023498-(USS4037)	George Cooper	ST	Patent Issued
43)	T.2N. R.6W. F.M.	F034694A-(USS4452A)	Evelyn Alexander	NA	Certificate of Allotment
44)	T.2N. R.6W. F.M.	F034694B-(USS4452B)	Evelyn Alexander	NA	Certificate of Allotment
45)	T.2N. R.6W. F.M.	F034704-(USS10027)	Rosie David	NA	Survey Pending
46)	T.2N. R.6W. F.M.	F017456B	Clarence Smelcer	NA	Pending
47)	T.2N. R.6W. F.M.	F002422-(USS10025)	John William (Deceased)	NA	Survey Pending
48)	T.2N. R.7W. F.M.	F014531B-(USS10038)	Lindred Jimmie	NA	Survey Pending
49)	T.2N. R.7W. F.M.	F034706-(USS4461C)	Steven Jimmie	NA	Certificate of Allotment
50)	T.2N. R.7W. F.M.	F034706-(USS4461D)	Steven Jimmie	NA	Certificate of Allotment
51)	T.2N. R.7W. F.M.	F034703-(USS4458A)	Alfred Frank	NA	Certificate of Allotment
52)	T.2N. R.7W. F.M.	F034703-(USS4458C)	Alfred Frank	NA	Certificate of Allotment
53)	T.2N. R.7W. F.M.	F028118-(USS4446A)	Eldrane Jimmie (Deceased)	NA	Certificate of Allotment
54)	T.2N. R.8W. F.M.	F027061-(USS4444B)	Lige Charlie	NA	Certificate of Allotment
55)	T.2N. R.9W. F.M.	F026337B-(USS4225B)	Cerosky Charlie	NA	Certificate of Allotment
56)	T.2N. R.9W. F.M.	F014536A-(USS9979)	Lee Titus	NA	Survey Pending
57)	T.2N. R.10W. F.M.	F016293-(USS9984)	Jonathon David	NA	Survey Pending
58)	T.3N. R.7W. F.M.	F027069-(USS4137A)	Charlie Titus	NA	Survey Pending
59)	T.4N. R.7W. F.M.	F027049B-(USS4257B)	Chris Charlie	NA	Certificate of Allotment
60)	T.4N. R.7W. F.M.	F016318-(USS10052)	Eugene Roberts	NA	Survey Pending
61)	T.4N. R.8W. F.M.	F027070-(USS4233A)	Harry Riley	NA	Certificate of Allotment
62)	T.4N. R.8W. F.M.	F030254-(USS5074)	Edward Harrison	HQ	Patent Issued
63)	T.1S. R.7W. F.M.	F034713-(USS4468A)	Orrin John (Deceased)	NA	Certificate of Allotment
64)	T.1S. R.7W. F.M.	F034713-(USS4468B)	Orrin John (Deceased)	NA	Certificate of Allotment
65)	T.1S. R.7W. F.M.	F034709-(USS4464A)	Elsie John	NA	Certificate of Allotment
66)	T.1S. R.7W. F.M.	F027047-(USS4356B)	Robert Titus	NA	Certificate of Allotment
67)	T.1S. R.7W. F.M.	F034714D-(USS10455)	Dorothy Titus	NA	Certificate of Allotment
68)	T.1S. R.8W. F.M.	F027071-(USS4448B)	Solomon Peter	NA	Certificate of Allotment
69)	T.1S. R.9W. F.M.	F027046-(USS4442C)	Mathew Titus (Deceased)	NA	Certificate of Allotment
70)	T.1S. R.9W. F.M.	F028620	Lawrence Titus	NA	Pending (not shown on map)

NA - native allotment
ST - small tract disposal
TM - trade and manufacturing site
HQ - headquarter site
SR - soldier grant land
HE - homestead entry
HP - historical place application

*Map #'s 1- 3 are unassigned

Table 3.

Known Cabin Permits In Minto Flats State Game Refuge

ADL 411965	Parrish Nelson	Sec. 32, T2N, R6W, FM	Active
ADL 412025	Galen King	Sec. 31, T2N, R6W, FM	Active
ADL 412058	William Langley	Sec. 24, T2N, R6W, FM	Active
ADL 412065	Dale Ranstead	Sec. 32, T2N, R6W, FM	Active
ADL 412053	Marvin Hassebroek	Sec. 26, T2N, R7W, FM	Active

Table 4. Levels of Household Harvest and Per Capita Harvests of Fish, Game, and Plant Resources, Minto, July 1983-June 1984 (From Andrews 1988)

	Percent of Households Harvesting	Mean Harvesting Household Harvest in Pounds	Mean Household Harvest In Pounds (N=45)	Per Capita In Pounds (N=176)	Total Pounds	Percent of Total Pounds	Total Village Harvest Numbers
Moose	40	738.89	295.56	75.57	13,300.0	7.4	19
Bear	20	291.67	58.33	14.91	2,625.0	1.5	15
Hare	60	37.85	22.71	5.81	1,022.0	0.6	365
Beaver	36	241.50	85.87	21.95	3,864.0	2.2	138
Muskrat	40	20.73	8.29	2.12	373.1	0.2	533
Marten	44	n/a	n/a	n/a	n/a	n/a	280
Red Fox	20	n/a	n/a	n/a	n/a	n/a	19
Otter	11	n/a	n/a	n/a	n/a	n/a	15
Mink	11	n/a	n/a	n/a	n/a	n/a	24
Weasel	9	n/a	n/a	n/a	n/a	n/a	17
Lynx	7	n/a	n/a	n/a	n/a	n/a	4
Wolf	2	n/a	n/a	n/a	n/a	n/a	1
Wolverine	0	n/a	n/a	n/a	n/a	n/a	0
Porcupine	18	29.40	5.23	1.34	235.2	0.2	12
Ducks	82	50.88	41.83	10.70	1,882.5	1.0	1,255
Geese	64	81.90	52.78	13.49	2,375.0	1.3	475
Ptarmigan/Grouse	71	8.53	6.07	1.55	273.0	0.1	546
Blueberries (gal)	80	17.22	13.78	3.52	620.0	0.4	155
Lowbush Cranberries (gal)	60	16.59	9.96	2.55	448.0	0.3	112
Highbush Cranberries (gal)	33	8.27	2.76	0.70	124.0	0.1	31
Rhubarb (bunches)	38	8.71	3.29	0.84	148.0	0.1	37
King salmon	53	411.88	219.67	56.16	9,885.0	5.3	659
Summer chum salmon	58	3,046.54	1,760.22	450.06	79,210.0	44.3	15,842
Fall chum and coho salmon	53	1,322.50	705.33	180.34	31,740.0	17.8	6,348
Whitefish sp.	69	391.74	269.87	69.00	12,144.0	6.8	6,072
Pike	60	500.50	300.30	76.78	13,513.5	7.6	3,003
Sucker	40	127.67	51.07	13.06	2,298.0	1.3	1,532
Sheefish	27	178.50	47.60	12.17	2,142.0	1.2	357
Burbot ("lush")	31	34.49	10.73	2.74	482.8	0.3	142

n/a not eaten

> stopover area. These areas subsequently are accessed on snowmachine until lake andriver ice conditions become hazardous for travel . . . The harvest of "black ducks" [transient migrating scoters] essentially concludes "spring" waterfowl harvest as Minto residents cease hunting when waterfowl begin nesting in late June and early July . . .
>
> A second waterfowl hunting period tends to commence with the state established season opening on September 1, though often numerous birds flock together prior to that date and people prefer to hunt at that time in late August . . .

Minto residents concentrate spring and fall waterfowl hunting along the Tolovana, Tatalina, and Chatanika rivers and Goldstream Creek (Andrews 1988). Using these and other waterways in the Flats, they access surrounding lakes, ponds, and sloughs. In the year from July 1983 through June 1984 Minto hunters from 39 households harvested a total of 1,255 ducks and 475 geese (See Table 4). Fewer than five cranes were taken and no swans were harvested (Andrews 1988). Virtually all harvest reported in this study is in addition to the calculated harvest obtained through hunter surveys and shown in Table 5.

Table 5. Calculated sport hunting activity and duck harvest for Minto Flats, 1984-1989. (Data from Annual Report of Survey-Inventory Activities, Div. of Wildlife Conservation, ADF&G, Vols. XVI - XX).

	Ducks		Hunter Days	
Year	Calculated harvest	% of state total	Calculated days	% of state total
1984-85	11,685	11.5	5,094	6.7
1985-86	(State Waterfowl-Hunter Survey Not Conducted)			
1986-87	6,950	8.7	1,945	3.7
1987-88	6,004	7.9	2,825	4.9
1988-89	7,559	9.0	2,149	4.8

Minto Flats has long been a popular destination for waterfowl hunters in the fall. The area's accessibility from Fairbanks, Minto and Nenana by boat or airplane and its status as high quality nesting and staging habitat for ducks and geese combine to attract large numbers of users, especially during the first few days of the hunting season in September. Minto Flats has consistently rated among the top areas in Alaska in terms of waterfowl taken and hunter days reported. For example, in 1984 Minto Flats had the highest harvest of all areas in the state and the third highest number of hunter days. In 1986, the area had the second highest

harvest and the fourth highest number of hunter days. In both 1988 and 1989, Minto Flats had the second highest sport harvest and the third highest hunting pressure.

Big Game Hunting

Big game animals hunted in Minto Flats include moose, black bear, wolf, and brown bear, although most hunting is for the first two species.

In response to concerns about increasing hunting pressure and declining moose populations, moose harvest on Minto Flats was restricted from earlier liberal seasons in the mid 1970's. By 1978 the moose season was reduced to 11 days. In 1979, the Minto Flats Management Area (roughly equivalent to the area of the MFSGR) was established, and registration permits were required to hunt there. The following year, the number of permits was set at 100, with 25 being issued in Fairbanks, 25 in Nenana, and 50 in Minto (Andrews 1988), and a harvest quota of 15 moose was established. In 1984 the registration hunt was modified to establish a winter hunt in January and February.

Moose hunting regulations for the Minto Flats Management Area have repeatedly changed in recent years as a result of court rulings and Board of Game decisions pertaining to subsistence laws. In 1985 the Board determined that the area could sustain only a subsistence hunt and established a "Tier II" season for hunters who could qualify for a permit based upon criteria established by the state's 1978 subsistence priority statute. In 1986, legislative action limited subsistence to residents of rural areas, and Minto Flats moose permits were restricted to residents of Minto and Nenana. Harvest quotas still applied, although the number of permits was not limited.

In 1990-91, a state Tier II hunt was held in October on Minto Flats. Permits for this hunt were issued to both urban and rural residents, as a court ruling had prohibited the use of residency as a way to define subsistence users. Prior to the state hunt, a federal subsistence season was held on federal lands in Minto Flats, which consisted of uncertificated Native Allotments.

Shepherd (1987) states that:

> Black bear hunting on rivers and lakes of Minto Flats is popular with urban hunters during the spring and summer, while fall hunting is more productive in upland areas surrounding the flats. Black bear sealing records from the Alaska Department of Fish and Game (1985c) suggest that hunters have taken an average of 10 bears annually since 1974 on Minto Flats. An additional 20 to 30 bear each year (ADF&G 1985c) are taken during the spring and fall along the highway systems surrounding the area. Estimates of black bear population densities on Minto Flats are not available, but should be adequate to support both urban and Minto resident harvest.

Trapping

Shepherd (1987) discusses trapping as an activity on Minto Flats:

> Fur trapping, especially for wetland furbearers including beaver, otter, mink, and muskrat has been periodically important to the Minto resident economy. The effort expended to harvest these furbearers has varried [sic] with fluctuations in numbers and value. Minto trappers were extremely active trapping and hunting fur animals following the first World War and on into the second World War, periods when fur prices were high. Minto Flats was recognized as an excellent muskrat area and provided thousands of muskrats annually until the late 1950's when populations began declining. This decline occurred during a period of very low fur prices lasting until the early 1970's, and created a significant change in trapping and hunting effort. Concurrently, mink populations have been generally low since early 1960, and with accompanying low fur balure, provide little incentive to trap. Interactions between mink and muskrat populations . . . are of significance since these declines have been noted elsewhere in the Tanana Valley and other portions of Interior Alaska . . .

Elsewhere in the same paper, Shepherd states:

> . . . Fluctuating fur prices normally affect trapping effort, especially for beaver since considerable work is required to make sets, remove snared animals, and care for pelts. Therefore, when prices are low, travel conditions poor, and other food plentiful, beaver trappers extend less effort. This situation is pertinent to the low harvest of beaver on Minto Flats.

Trappers from urban areas also use Minto Flats, accessing their sets largely via snowmachine and aircraft. Effort is currently rather low for the same reasons affecting Minto.

Fishing

There is a long history of subsistence use of fish in Minto Flats. Ten species other than salmon were harvested in varying degrees (Andrews 1989). Most fishing took place at strategic locations where seasonal fish migrations could be intercepted and where other wildlife was available. Most pike fishing occurred in late fall and in the spring (Andrews 1989), with important use areas being along the Tolovana River near the present site of New Minto and several locations in the eastern part of Minto Flats.

Sport fishing is a relatively recent activity in Minto Flats, with a pike fishery developing in the 1960s (Andrews 1989). For most of the years since then, recreational pike fishing took

place largely in the summer, in lakes and streams with good air or boat access, or near cabins. With the advent of improved winter access to the Chatanika River in the early 1980s, winter fishing for pike intensified. A substatial decline in catches followed, leading to regulatory restrictions on the fishery. At present, the sport fishing season for pike runs from June through mid-October. According to Andrews (1989) the potential for compatibility between a summer sport season and a winter subsistence fishery is high, since they overlap in neither time nor space.

Cultural and Archeological Sites

Minto Flats contains many sites of cultural and/or archeological importance. An effort is currently underway by the Interior Athabaskan Cultural Heritage and Education Institute to document locations and native names for these. Three major sites of importance are the cemetery plots at Old Minto and along Goldstream Creek, and the caches on lower Goldstream Creek.

Public Access

Athabaskan ancestors of Minto and Nenana residents lived and travelled throughout the flats on foot, snowshoe, and by dog team. Historically, access to Minto Flats was gained via the Dunbar-Livengood trail and the Fairbanks-Manley Hot Springs trail, as well as the main waterways. Road access to the refuge is available from an extension of the Murphy Dome Road on the east and the Minto Village access road on the north. Water access is available at the boat launch on the Chatanika River at the end of the Murphy Dome Road extension, the Tolovana River at Minto Village, and via the Tanana River. Winter access is by snowmachine and dog sled. Air access is available year-round by ski- or float-equipped aircraft.

Timber Harvest

Small-scale timber harvest has historically occurred on forested portions of Minto Flats and along the Tanana River for cabins, shelters, caches, and firewood. In the early 1960s, the Department of Natural Resources proposed a commercial sawmill for the village of Old Minto, but it was never constructed. State timber sales are currently proposed within the Tanana Valley State Forest (TVSF) adjacent to the refuge at the mouth of the Kantishna River and along the Tanana River. Access to these areas could involve overland routes through the portion of the refuge south of the Tanana River. Based upon the TVSF Management Plan, winter access across the refuge will be allowed, but will be controlled through the department's Special Area Permit process. Elsewhere within the TVSF, harvest is proposed during the next 20 years for the ridge to the east of Minto Flats and the Tanana River floodplain between the northern and southern blocks of the refuge. There have been no state timber sales within the refuge and none are currently proposed. Timber from sales on private land is presently being harvested along the Tanana River downstream of Nenana.

Transportation/Utility Corridors

There are no platted railroad, road, utility corridors, or rights-of-way existing on refuge lands. Regular overland vehicle use continues on several historic trails including the Livengood-Dunbar trail, the Fairbanks-Manley Hot Springs trail, and the North Commission Line. Public easements exist along all section lines. The Alaska Railroad Corridor is located just to the south of the refuge between Nenana and Dunbar. In the past, an extension of the railroad to the Yukon River had been proposed, with a preferred route running through wetlands south of Tanana River along the trail known as the North Commission Line in what is now the southern portion of the Minto Flats State Game Refuge. Alternate routes run through the Minto Flats north of the Tanana River. However, there are no railroad right-of-way (ROW) permits or ROW permit applications pending on refuge lands at this time. Although no utility lines cross the refuge and none are currently proposed, the Trans Alaska Pipeline System corridor does cross the Tolovana, Tatalina, and Chatanika rivers and Washington Creek upstream of the refuge. Route alternatives for natural gas pipeline projects have also been identified within or adjacent to the refuge.

Fire Management

Currently, most of the refuge is protected under the Modified and Full categories of the interagency fire plans. The "Full" category is used to protect human life and property from damage from fire, and calls for aggressive attack and suppression of all detected fires. The "Modified" category also results in initial attack followed by suppression activities. Only in cases where fire-fighting resources are limited is this category used to help set suppression priorities. It is conceivable that during a "fire bust" where fire-fighting personnel and/or equipment become overextended, a fire in an area labeled "Modified" might receive less than a full suppression effort. In all other cases, however, suppression of fires is a requirement. There have been proposals to change the status of some parts of the Minto Flats State Game Refuge to "Limited" fire protection, where fires can be allowed to burn as long as they do not threaten other areas with higher suppression priorities. These proposals have met with favor with wildlife professionals and some segments of the public, but have been strongly opposed by some people particularly within the village of Minto.

Adjacent Development

While there are a variety of developments outside the refuge which could affect it, two (besides roads accessing the refuge) are of major importance. The Trans Alaska Pipeline System (TAPS) crosses several drainages flowing into the Minto Flats upstream of the refuge's boundaries. The Alaska Railroad right of way forms a portion of the refuge's southeastern boundary, and crosses Goldstream Creek upstream of the refuge. Both of these systems have the potential to release toxic products into drainages flowing through Minto Flats. In May, 1990 a train derailment near Dunbar caused a spill of refined petroleum products adjacent to Goldstream Creek, and while only a small proportion of the spilled

material entered the creek, detectable levels of the products were documented within the refuge.

The Alyeska Pipeline Service Company has recently completed and received agency approval for an oil spill contingency plan for the TAPS. The Alaska Railroad has prepared a contingency plan for spills occurring along its route.

Other Uses

The Minto Flats State Game Refuge is used for a variety of uses other than the harvesting of fish and wildlife. Camping, boating, wildlife-watching, sight-seeing, berry-picking, wood gathering, and general recreation activities occur, often in association with hunting or fishing trips or the use of inholdings, but also as primary activities in their own right. Historic trails within the refuge are used for access and for trail-related activities. Access for uses other than hunting and trapping via snowmachine, dog sleds, and ski planes is probably increasing. Information on where and to what extent these uses take place is even more limited than for fish and wildlife harvest. The remoteness of the refuge relative to other, more easily accessed areas around Fairbanks tends to keep the number of users low.

INFORMATION NEEDS

Hydrological and Geological Studies

The geology and hydrology of the Minto Flats area are the underpinnings of the valuable wetlands within the refuge, and significantly affect the values and management objectives for the refuge. Information on water quality and quantity, drying trends, uplift, and other related topics is needed. The department lacks resources to gather these data except for the possibility that water quality samples may be taken if circumstances warrant. Research by other organizations should be encouraged as long as their activities fall within management guidelines developed for the refuge.

Fire Effects

Fire also has a role in maintaining the nature and quality of wetlands within the refuge. To resolve disagreement over the importance and specific effects of fire within the refuge, additional information on fire's effects upon habitat, preferably with the MSFGR, is needed.

Cabin Inventory

To carry out policies regarding private inholdings, unauthorized use of refuge lands, and management of various uses of the refuge, agencies managing resources within the MFSGR need additional information on cabin locations within the refuge. An inventory of structures within the refuge should endeavor to determine ownership as well as location.

Refuge User Survey

A 1985 report by Shepherd, Paine, and Andrews, "Impacts of Resource Development and Use on the Athabaskan People of Minto Flats, Alaska" presents information on use patterns of the refuge. In addition, current information is needed regarding how, when, and where users access the MFSGR. Apart from hunter harvest reports, no systematic method of gathering user data is currently available. To augment this, information on route and method of access, season of use, type of use, and nature of conflicts between uses is needed.

REFERENCES CITED

Alaska Department of Fish and Game. 1985a. Alaska Habitat Management Guide. Juneau.

Alaska Department of Fish and Game. 1985b. Fish and wildlife element. Tanana Basin Area Plan. Prepared for Alaska Dept. of Natural Resources. Fairbanks.

Alaska Department of Fish and Game. 1985c. Big game data index files. Division of Game. 1974-1985.

Andrews, Elizabeth F. 1988. The harvest of fish and wildlife for subsistence by residents of Minto, Alaska. Juneau, AK. Ak. Dept. of Fish and Game. Technical Paper No. 137. 334 pages.

_____ 1989. A low-profile subsistence fishery: Pike fishing in Minto Flats, Alaska. Arctic. Vol. 42 No. 4. pp. 357-361.

Bureau of Land Management. 1989. Minto Flats placer mining. Final cumulative environmental impact statement. USDI BLM Alaska State Office. BLM-AK-ES-89-004-3809-918. Anchorage.

Burkholder, Alan. 1990. Sport Fish Biologist, Sport Fish Division, ADF&G. Fairbanks, AK.

Campbell, Bruce H. and T. C. Rothe. 1986. Annual report of survey-inventory activities. Part XIV. Waterfowl. Vol. XVI. Ak. Dept. of Fish and Game. Fed. Aid in Wildl. Rest. Proj. W-22-4. Job 11.0. Juneau. 36 pp.

_____ 1989. Annual report of survey-inventory activities. Part XIII. Waterfowl. Vol. XIX. Ak. Dept. of Fish and Game. Fed. Aid in Wildl. Rest. Proj. W-23-1. Study 11.0. Juneau. 42 pp.

_____ 1990. Annual report of survey-inventory activities. Part XIII. Waterfowl. Vol. XX. Ak. Dept. of Fish and Game. Fed. Aid in Wildl. Rest. Proj. W-23-2. Study 11.0. Juneau. 42 pp.

Campbell, Bruce H., D. H. Rosenberg, and T. C. Rothe. 1987. Annual report of survey-inventory activities. Part XIII. Waterfowl. Vol. XVII. Ak. Dept. of Fish and Game. Fed. Aid in Wildl. Rest. Proj. W-22-5. Job 11.0. Juneau. 55 pp.

_____ 1988. Annual report of survey-inventory activities. Part XIII. Waterfowl. Vol. XVIII. Ak. Dept. of Fish and Game. Fed. Aid in Wildl. Rest. Proj. W-22-6. Job 11.0. Juneau. 75 pp.

Conant, Bruce. 1985. December 20 Letter to Tom Rothe, Waterfowl Program Coordinator, ADF&G. U.S. Fish and Wildlife Service, Waterfowl Investigations.

_____, and J. I. Hodges. 1985. Minto Flats waterfowl resources. Anchorage. U.S. Fish and Wildlife Service, Waterfowl Investigations. 7 pages.

DeCicco, Alfred. 1990. Sport Fish Biologist, Sport Fish Division, ADF&G. Fairbanks, AK.

Hallberg, Jerry. 1990. Area Biologist, Sport Fish Division, ADF&G. Fairbanks, AK.

King, Rodney J. 1990. Biologist, U.S. Fish and Wildlife Service, Migratory Bird Management. Fairbanks, AK.

McNay, Mark. 1990. Summary of moose surveys conducted on Minto Flats 7 and 11 May 1990. Ak. Dept. of Fish and Game. Fairbanks. 3 pp.

_____ 1990. Area Biologist, Div. of Wildlife Conservation, ADF&G. Fairbanks, AK.

Shepherd, Peter E. K. 1987. Relationship of environmental change to the Minto Flats subsistence resource base. Anchorage, AK. Prepared for USDI Bureau of Land Management. 34 pages.

_____, M. P. Matthews, and E. F. Andrews. 1985. Impacts of resource development and use on the Athabaskan people of Minto Flats, Alaska. Fairbanks, AK. Tanana Chiefs Conference, Inc. 158 pages.

U.S. Fish and Wildlife Service. 1990. Alaska trumpeter swan census - 1990. Preliminary Report. U.S. Fish and Wildlife Service, Migratory Bird Management. Juneau. 4 pp.

Viereck, Leslie A. and C.T. Dyrness. 1980. A Preliminary classification system for vegetation of Alaska. Institute of Northern Forestry, Pacific Northwest Forest and Range Experiment Station, U.S.D.A. Forest Service. General Technical Report PNW-106. 38 pp.

Weber Scannell, Phyllis. 1991. Habitat Biologist. Div. of Habitat, ADF&G. Fairbanks, AK.

Weber, P.K., and M.H. Robus. 1987.

ADDITIONAL BIBLIOGRAPHICAL REFERENCES

Alaska Department of Fish and Game. 1987. Aquatic habitat and fisheries information for seven drainages affected by placer mining: Chatanika River, Tolovana River, Goldstream Creek, Birch Creek, Fortymile River, Beaver Creek, Minto Flats. Prepared for: U.S. Dept. of Interior, Bureau of Land Mangement. Habitat Division, Fairbanks, AK. 158 pp.

Barnes, David F. 1961. Gravity low at Minto Flats, Alaska Geology Research. Menlo Park, CA P D-254 - D-257.

Kearns, Frank Wm. and Lado A. Kozely. 1965. Resource analysis of Minto Flats are, Alaska. Institute of Business, Economic, and Government Research. For the B.I.A. Univ. of Alaska, College, AK.

Mertie Jr., J.B. 1937. The Yukon-Tanana region, Alaska. U.S. Dept. of Interior, Geological Survey. U.S. Geol. Survey Bull. 872. Washington, D.C. 276 pp.

Péwé, Troy L., Clyde Wahrhaftig, and Florence R. Weber. Geologic map of the Fairbanks quadrangle, Alaska. Dept. of the Interior, U.S.G.S.

Selkregg, Lidia L. 1974. Alaska regional profiles: Yukon region. University of Alaska - Fairbanks. Arctic Environmental Informantion and Data Center. 346 pp.

Yarber, Yvonne and Curt Madison. 1986. Al Wright--Minto--A biography. Spirit Mountain Press.

_____ 1986. Peter John--Minto--A biography. Spirit Mountain Press.

MINTO FLATS STATE GAME REFUGE MANAGEMENT PLAN

Distribution of Anadromous and Selected Freshwater Fish A

BB,GR(r),NP

CH,K

BB(r),
GR(r),
NP(r)

CH;K
BB,NP
GR(r)

NPr

CH,CO,K

BB(r)(s),GR(r),NP(r)(o)

NP

BB(r),GR(r),NP(r)

CH,CO,K

BB,NP

BB,NP

NP(o)

NP

CH,CO,K

BB,GR,NP

GR

GR(r)

Kr

Kr

Kr

Kr

CH,CO,K
BB,GR,NP

CH,CO,K
BB,GR,
NP

BB,GR,NP

NP

NP

Crescent Island

Black Bear Lake

Clear Lake

Big Lake

Wooden Clamp Lake

Tanana Lake

Minto Flats Refuge Office

Minto Municipal Airport

Minto

Minto Landing

Minto Ferry Crossing

Old Minto Ferry Crossing

Dredge Lake

Caribou Crossing

Tatonduk River

Yukon River

Tanana River

Goldstream Creek

Fairbanks

Base Line

Fairbanks Meridian

R12W R11W R10W R9W R8W R7W R6W R5W

T6N T5N T4N T3N T2N T1N T1S T2S T3S T4S

LEGEND

Documented Presence In Stream or Lake

Site Specific

BB,GR,NP — General Distribution

r	Known Rearing Areas
s	Known Spawning Areas
o	Known Overwintering Areas
(s)(r)(o)	Spawning, Rearing, and/or Overwintering Occurs In An Unspecified Portion of Stream or Lake

CH	- Chum Salmon
CO	- Coho Salmon
K	- King Salmon
BB	- Burbot
GR	- Arctic Grayling
NP	- Northern Pike

Note: Upper points document limits of fish surveys and usually not the extent of fish habitat.

0 1 2 3 4 Miles
SCALE

State of Alaska
Dept. of Fish and Game

MINTO FLATS STATE GAME REFUGE MANAGEMENT PLAN

Distribution of Ducks

LEGEND

- Present
- Known Nesting Concentrations
- Known Spring Concentrations
- Known Molting Concentrations
- Known Fall Concentrations

SCALE 0 1 2 3 4 Miles

State of Alaska
Dept. of Fish and Game

MINTO FLATS STATE GAME REFUGE MANAGEMENT PLAN

Distribution of Geese (Canada and Whitefront)

LEGEND

- Present
- Known Spring Concentrations
- Known Fall Concentrations

0 1 2 3 4 Miles

SCALE

State of Alaska
Dept. of Fish and Game

MINTO FLATS STATE GAME REFUGE MANAGEMENT PLAN

Distribution of Mammals and Game Birds

LEGEND

MOOSE
Calving, Rutting and Winter Concentrations

BLACK BEAR
General Distribution

MINK AND MUSKRAT
General Distribution

PRESENT THROUGHTOUT AREA

Beaver
Coyote
Flying Squirrel
Land Otter
Lynx
Marten
Porcupine
Red Fox
Red Squirrel
Snowshoe Hare
Weasel

Ruffed Grouse
Sharp-Tailed Grouse
Spruce Grouse
Willow Ptarmigan

0 1 2 3 4 Miles
SCALE

State of Alaska
Dept. of Fish and Game

MINTO FLATS STATE GAME REFUGE MANAGEMENT PLAN

Distribution of Selected Freshwater Fish B

LEGEND

Documented Presence In Stream or Lake

SW,WF — General Distribution

(r)(s)(o) — Spawning, Rearing, and/or Overwintering Occurs In An Unspecified Portion of Stream or Lake

BWF – Broad Whitefish
HWF – Humpback Whitefish
LCi – Least Cisco
RWF – Round Whitefish
SF – Sheefish
WF – Whitefish (Species Not Identified)

Note: Upper points document limits of fish surveys and usually not extent of fish habitat.

0 1 2 3 4 Miles
SCALE

State of Alaska
Dept. of Fish and Game

MINTO FLATS STATE GAME REFUGE MANAGEMENT PLAN

Land Status

LEGEND

- Private Inholdings
- Closed To Mineral Entry
- Seth-de-ya-ah Village Land
- State Patent/T.A.
- State of Alaska - U. of A.
- State Selected
- Seth-de-ya-ah Village Selected Lands
- Tanana Valley State Forest Boundary
- Refuge Boundary
- Archaeological/ Historical Site
- Cabin
- Public Easement
- Navigable Waters (Legally Determined)

Note: Many waters in the refuge are, in fact, navigable which have not yet been determined by the federal government to have the legal status of "navigable".

0 1 2 3 4 Miles
SCALE

State of Alaska
Dept. of Fish and Game

MINTO FLATS STATE GAME REFUGE MANAGEMENT PLAN

Vegetation

LEGEND

- Conifer Forest (Closed and Open)
- Deciduous Forest (Closed and Open)
- Mixed Forest (Closed and Open)
- Willow Shrubland
- Low Shrubs
- Wet Herbaceous
- Miscellaneous (Alder Shrubland, Alpine Shrubs, Dry Herbaceous, Barren, Cultural Features)
- Lakes, Ponds, and Streams

SOURCE: Tanana River Basin Study: Timber and Vegetation Resource Statistics of the Tanana Valley State Forest, U.S. Dept. of Agriculture Soil Conservation Service and Forest Service, ADNR Division of Forestry, Oct. 1990.

0 1 2 3 4 Miles
SCALE

State of Alaska
Dept. of Fish and Game