ENVIRONMENTAL ASSESSMENT

FOR THE IMPLEMENTATION OF EIELSON AIR FORCE BASE'S INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN

354 Fighter Wing
Eielson Air Force Base, Alaska
January 2003

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Finding of No Significant Impact (FONSI)
For the
Implementation of Eielson Air Force Base's (Eielson AFB)
Integrated Natural Resource Management Plan

Introduction

As mandated by the Sikes Act (16 U.S.C. 670a et seq.) as amended, the Secretary of Defense is authorized to carry out a program of planning for, and the development, maintenance, and coordination of, wildlife, fish, and game conservation and rehabilitation on each military reservation. This would be accomplished in accordance with a cooperative plan agreed upon by the Secretary of Defense, the Secretary of the Interior, and the appropriate agency for the state in which the reservation is located. Each cooperative plan shall provide for fish and wildlife habitat improvements or modifications; range rehabilitation where necessary to support wildlife; control of off-road vehicle traffic; specific habitat improvement projects and related activities and adequate protection for species of fish, wildlife and plants considered threatened or endangered. As a general rule, once a cooperative plan is agreed to, no sale or lease of land on a military reservation, or sale of forest products from the land, may be undertaken unless the effects of the sale or leasing are compatible with the purposes of the plan. Cooperative plans are to be reviewed at least every five years. The current plan expires on 31 May 2003.

Proposed Action

Under the Proposed Action, the USAF proposes to implement the INRMP at a level that strives for a healthy balance between natural resource enhancement and stewardship, complimenting the military mission, and availability of resources required to accomplish the stated management goals and objectives. The Proposed Action is similar to the level of implementation under the existing INRMP, implementing 100 percent of the goals identified as high priority, 75 percent of medium priority goals, and 36 percent of low priority goals.

Alternatives to the Proposed Action

In addition to the Proposed Action, this EA considers two other action alternatives as well as the No Action Alternative. Alternative 1 would implement 100 percent of high, medium, and low priority goals identified in the INRMP and would result in a more comprehensive management approach of natural resources on Eielson AFB lands. Selection of this alternative would require additional personnel and fiscal resources over current operating levels in order to be implemented. Alternative 2 would implement portions of the INRMP with emphasis being placed only on those actions required for compliance with federal and state regulations and mandated Air Force initiatives. Selection of this alternative would result in a less proactive approach to resource management as opposed to the Proposed Action or Alternative 1.

No Action Alternative

Under the No Action Alternative no INRMP would be implemented. All programs included in the management plan would be discontinued, causing Eielson AFB to be out of compliance with several federal, state, and Air Force regulations.

Anticipated Environmental Effects

Most, if not all actions proposed under the INRMP would have some benefit on the natural and human environment at Eielson AFB. These benefits would occur because the INRMP emphasizes an ecosystem management approach whereby planning decisions consider the interrelationships of the natural resources of Eielson AFB and the surrounding lands, and the relationship between the natural resources and the military mission. The goal of this plan is to integrate all management activities in a way that sustains and restores the health and integrity of ecosystems on Eielson AFB lands. This overall goal would be implemented to varying degrees depending on whether the Proposed Action or Alternatives 1 or 2 were selected. The highest level of implementation would occur under Alternative 1, with the least under Alternative 2. The Proposed Action implements the INRMP to the greatest extent possible within the constraints provided by the level of funds and manpower available at the present time. Under the Proposed Action, 100 per cent of all goals identified as high priority would be implemented.

Findings

Taking into consideration the benefits for Eielson AFB managed lands that will result from implementation of the INRMP at the Proposed Action level, I find that selection of this alternative will give the highest possible level of resource management within the constraints of currently available manpower and funding. In addition, I find that the positive environmental impacts resulting from the implementation of the Proposed Action warrant a FONSI and make it unnecessary to prepare an Environmental Impact Statement for this action.

TIMOTHY B. VIGIL
Colonel, USAF
Vice Commander

Date

Table of Contents

Environmental Assessment for Implementation of Integrated Natural Resources Management Plan Eielson Air Force Base, Alaska

1.0 Purpose and Need for Action

Section 1.0 provides a description of the purpose and need for the proposed action.

1.1 Background and Objectives for the Proposed Action

1.1.1 As mandated by the Sikes Act (16 U.S.C. 670a et seq.) as amended, the Secretary of Defense is authorized to carry out a program of planning for, and the development, maintenance, and coordination of, wildlife, fish, and game conservation and rehabilitation on each military reservation. This would be accomplished in accordance with a cooperative plan agreed upon by the Secretary of Defense, the Secretary of the Interior, and the appropriate state agency for the state in which the reservation is located. Each cooperative plan shall provide for fish and wildlife habitat improvements or modifications; range rehabilitation where necessary to support wildlife; control of off-road vehicle traffic; specific habitat improvement projects and related activities and adequate protection for species of fish, wildlife and plants considered threatened or endangered. As a general rule, once a cooperative plan is agreed to, no sale or lease of land on a military reservation, or sale of forest products from the land, may be undertaken unless the effects of the sale or leasing are compatible with the purposes of the plan. Cooperative plans are to be reviewed at least every five years.

1.1.2 The Secretary of each military department (Army, Navy, Air Force) shall manage the natural resources of each military reservation under the Secretary's jurisdiction, to the extent not inconsistent with the military mission of the reservation, so as to provide for sustained multipurpose uses of those resources and to provide the public access necessary or appropriate for those uses. To the extent feasible, the services necessary for developing, implementing and enforcing fish and wildlife management on military reservations are to be provided by Department of Defense personnel with professional training in those services. The proposed implementation of the Eielson Air Force Base Integrated Natural Resource Management Plan would fulfill the stated requirements under the Sikes Act.

1.1.3 The United States Air Force (USAF) is committed to the wise use and prudent stewardship of lands entrusted to them. These lands are critical to fulfilling the USAF's military mission and the environmental health of the region. The USAF is proposing to implement the Eielson Air Force Base's Integrated Natural Resource Management Plan (INRMP) for a five-year period from 2003 through 2008. The INRMP provides the necessary framework and general guidance for management activities and long-range planning on Eielson Air Force Base (Eielson AFB) managed lands. The proposed INRMP emphasizes an ecosystem management approach whereby planning decisions consider the interrelationships of the natural resources of Eielson AFB and the

surrounding lands, and the relationship between the natural resources and the military mission. The goal of this plan is to integrate all management activities in a way that sustains and restores the health and integrity of ecosystems on Eielson AFB lands.

1.1.4 Under this management plan, resource management goals and objectives are prioritized taking into consideration factors such as federal and state regulatory requirements and Air Force initiatives, impact to natural resources and ecosystems, military mission, and availability of funding and personnel. The Proposed Action and Alternatives 1 and 2 would result in varying levels of implementation of the stated resource management goals described in the plan.

1.2 Location of the Proposed Action

The plan addresses natural resource management on Eielson AFB, C-Battery, Chena River Research Site, Blair Lakes Bombing Range, and Birch Lake Recreation Area (**Figure 1**).

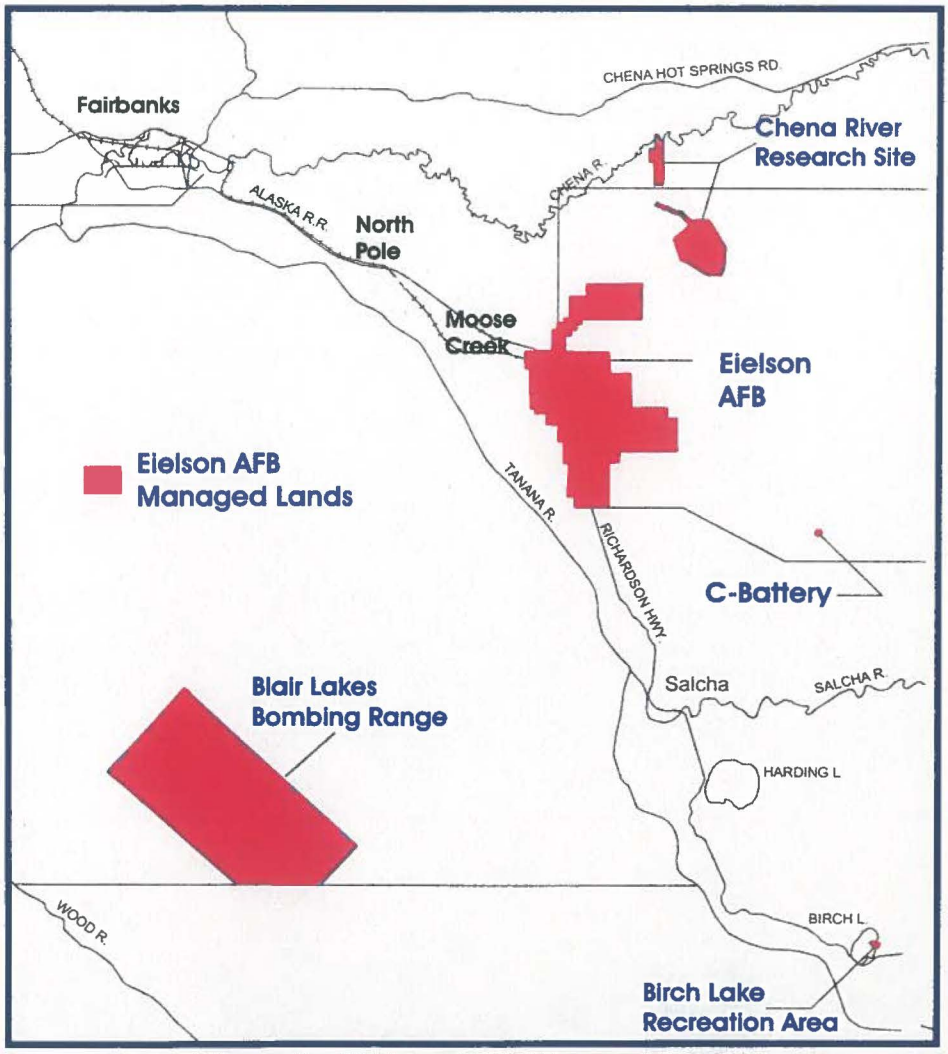

Figure 1 – Eielson AFB Managed Lands

Eielson AFB is located in the interior of Alaska within the Fairbanks North Star Borough. The base lies approximately 120 miles south of the Arctic Circle, 23 miles southeast of Fairbanks, and 9 miles southeast of the city of North Pole. C-Battery is located within the Fort Wainwright Yukon Training Area approximately 12 miles southeast of the Eielson AFB. The Chena River Research Site is comprised of the Chena River Annex, the Air Force Technical Applications Center (AFTAC) Remote Operating Facility, and the access road to these sites (Transmitter Road). This site is located approximately 10 miles northeast of the main base within the Fort Wainwright Yukon Training Area. The Blair Lake Air Force Bombing Range is located approximately 17 air miles southwest of Eielson AFB in the Fort Wainwright Tanana Flats Training Area.

1.3 Proposed Action – Substantial Implementation of the INRMP

1.3.1 Under this alternative, the USAF proposes to implement the INRMP at a level that strives for a healthy balance between natural resource enhancement and stewardship, complimenting the military mission, and availability of resources required to accomplish the stated management goals and objectives. The Proposed Action is similar to the level of implementation under the existing INRMP. The Proposed Action would implement 100 percent of the goals identified as high priority, 75 percent of medium priority goals, and 36 percent of low priority goals.

1.3.2 This plan serves as the primary guidance document for management of natural resources at Eielson AFB. The plan provides base personnel a management tool to use when making decisions about natural resources, activities and development at Eielson AFB. The plan also provides mitigation for environmental effects from actions in support of the military mission. The INRMP would be in effect for a five-year period from 2003 through 2008.

1.4 Alternatives to the Proposed Action

In addition to the Proposed Action, the following alternatives, including the No Action Alternative, are considered for analysis in this Environmental Assessment (EA).

1.4.1 Alternative 1 – Full Implementation of the Integrated Natural Resource Management Plan

This alternative would implement 100 percent of high, medium, and low priority goals identified in the INMRP and would result in a more comprehensive management approach of natural resources on Eielson AFB lands. Selection of this alternative would require additional personnel and fiscal resources over current operating levels in order to be implemented.

1.4.2 Alternative 2 – Minimal Implementation of the Integrated Natural Resource Management Plan

This alternative would implement portions of the INRMP with emphasis being placed only on those actions required for compliance of federal and state regulations and mandated Air Force initiatives. Selection of this alternative would result in a less proactive approach to resource management as opposed to the Proposed Action or Alternative 1.

1.4.3 No Action Alternative

This alternative would result in no implementation of any aspect of the INRMP for Eielson AFB lands. A wide variety of laws and executive orders addressing issues such as environmental quality, federal land management, wildlife, wetlands, floodplains, as well as, Department of Defense and USAF policies and initiatives would not be complied with if the INRMP is not implemented.

1.5 Decision to be Made

1.5.1 In order to comply with environmental laws, manage natural resources, and support the military mission, the USAF is required to implement an INRMP. A decision must be made which supports this action.

1.5.2 As required by Air Force Instruction 32-7061, an *Environmental Impact Analysis Process* (EIAP) must be completed to evaluate potential environmental consequences of the proposed implementation of the INRMP. The completion of this EA is intended to satisfy these requirements. The Proposed Action and alternatives listed in Section 1.3 are addressed in detail in Chapter 2.0 of this document. A description of the resources is described in Chapter 3.0 and the impacts that could result from each alternative are discussed in Chapter 4.0.

1.5.3 Based on the information presented in this analysis, a decision must be made by the Eielson Air Force Base Commander (354 FW/CC) whether or not to implement the Proposed Action or one of the listed alternatives. A Finding of No Significant Impact (FONSI) will be published if it is determined that no significant environmental impacts will result from the selected course of action. If it is determined that the selected alternative will have significant environmental impacts, another alternative will be chosen for which impacts will not reach the threshold of significance.

1.6 Project Scoping

The Environmental Impact Analysis Process involved the review of resource management data collected by USAF, federal, state, and local government agencies, and private organizations. The process included interviews with USAF personnel involved with natural resource management, environmental planning, and the Installation Restoration Program. Interviews were also conducted with personnel from outside agencies with interests, responsibilities, and/or expertise regarding natural resource management of Eielson AFB lands. The USAF, U.S. Fish and Wildlife Service, and

Alaska Department of Fish and Game are signatory partners in implementation of the INRMP. Chapter 5.0 lists all agencies contacted as part of the assessment.

1.7 Federal and State Permits or Licenses Needed to Implement the Project

The INRMP addresses and incorporates numerous federal and state laws, regulations, Executive Orders, Department of Defense Directives, and USAF policies in the formulation of the natural resource management plan. However, no federal and state permits or licenses are needed to implement the INRMP.

2.0 Description of the Proposed Action and Alternatives

Section 2.0 provides a description of alternatives considered to achieve the purpose and need described in Section 1.0. The Proposed Action, Alternative 1, Alternative 2, and the No Action Alternative will be addressed.

2.1 Proposed Action – Substantial Implementation of the INRMP

2.1.1 Under this alternative, the USAF proposes to implement the INRMP at a level that strives for a healthy balance between natural resource enhancement and stewardship, complimenting the military mission, and availability of resources required to accomplish the stated management goals and objectives. The Proposed Action is similar to the level of implementation under the existing INRMP. The Proposed Action would implement 100 percent of the goals identified as high priority, 75 percent of medium priority goals, and 36 percent of low priority goals.

2.1.2 This plan serves as the primary guidance document for management of natural resources at Eielson AFB. The plan provides base personnel a management tool to use when making decisions about natural resources, activities and development at Eielson AFB. The plan also provides mitigation for environmental effects from actions in support of the military mission. The INRMP would be in effect for a five-year period from 2003 through 2008.

2.1.3 The INRMP is a proactive management plan that emphasizes an interdisciplinary approach to ecosystem management. This approach is a process that considers the environment as a complex system functioning as a whole unit. The overall goal of this plan is to bring together and integrate all management activities in a way that sustains and restores the health and integrity of ecosystems on Eielson managed lands. The USAF seeks the effective partnership of private, local, state, and federal interests to accomplish this goal.

2.1.4 The INRMP describes the general physical and biotic environments to include the following: climate, landforms, water resources, geology, soils, vegetation, wetlands, floodplains, fish and wildlife species and their habitat requirements, threatened and endangered species, outdoor recreation, and public land resources. Operational component plans focusing on specific management units and inventory of resources are also included.

2.1.5 The primary issues and concerns facing natural resources management at Eielson AFB were identified during the development of this plan. For each issue and concern, specific goals and objectives were developed to guide the direction of management over the next 5 years. All goals are intended to contribute to promoting ecosystem health, while still meeting the military mission of the base. The issues and concerns, goals, and objectives form the foundation of the INRMP. The issues and concerns are divided into nine major categories for management purposes as follows:

- Natural Resource Constraints to Installation Planning and Missions
- Wetlands and Floodplains
- Lake and Watershed Protections
- Fish and Wildlife Management
- Threatened and Endangered Species and Critical Habitats
- Forest Management
- Grounds Maintenance
- Outdoor Recreation and Public Access
- Geographic Information System (GIS)

2.1.6 The issues, concerns, and goals are prioritized taking into consideration factors such as laws and regulations, directives, military mission, and funding. The specific objectives developed to implement and achieve each goal are listed in Section 6 of the INRMP. **Table 2.3** summarizes the goals and priority for each management category and the actions that would be taken under this alternative.

2.2 Alternative 1 – Full Implementation of the Integrated Natural Resource Management Plan

This alternative would implement 100 percent of high, medium, and low priority goals identified in the INMRP and would result in a more comprehensive management approach of natural resources on Eielson AFB lands. Selection of this alternative would result in an increase of resource management actions over current levels under the existing INRMP and would require additional personnel and fiscal resources in order to be implemented. **Table 2.3** summarizes the goals and priority for each management category and the actions that would be taken under this alternative.

2.3 Alternative 2 – Minimal Implementation of the Integrated Natural Resource Management Plan

This alternative would implement portions of the INRMP with emphasis being placed only on those actions required for compliance of federal and state regulations and mandated Air Force initiatives. This alternative would result in a decrease of resource management actions over existing levels and would take a less proactive approach to resource management as opposed to the Proposed Action or Alternative 1. Selection of this alternative would implement 44 percent of goals identified as high priority, 1 percent of medium priority goals, and 0 percent of low priority goals. **Table 2.3** summarizes the goals and priority for each management category and the actions that would be taken under this alternative.

Table 2.1 Summary of INRMP Management Goals and Priority for Proposed Action and Alternatives

Management Category	Goals	Priority	Proposed Action	Alter-native 1	Alter-native 2
Natural Resource Constraints to Installation Planning and Missions	Provide base planners with up-to-date tools necessary to comply with natural resource constraints	High	X	X	X
Wetlands and Floodplains	Maintain up-to-date delineated wetlands maps	High	X	X	X
	Maintain up-to-date floodplain maps	High	X	X	X
Lake and Watershed Protections	Minimize the impacts to erosion, sedimentation, and point and nonpoint water pollution to watersheds and water bodies	High	X	X	X
Fish and Wildlife Management	Maintain Moose Lake/Polaris Lake, Bear Lake, and Mullins Pit dikes	High	X	X	
	Develop fish habitat in new gravel borrow pits	High	X	X	
	Develop Bear Lake fish habitat	High	X	X	
	Develop Mullins Pit fish habitat	High	X	X	
	Develop Cathers Lake fish habitat	High	X	X	
	Bird harassment/Dep-redation program	High	X	X	X

Management Category	Goals	Priority	Proposed Action	Alter-native 1	Alter-native 2
	Waterfowl habitat removal in airfield Bird Exclusion Zone	High	X	X	X
Fish and Wildlife Management	Grass height manipulation	High	X	X	X
	Resolve nuisance beaver problems	High	X	X	
	Maintain moose passage openings in perimeter fence	High	X	X	
	Conduct annual waterfowl nesting survey	Medium		X	
	Conduct annual goose survey	Medium	X	X	
	Conduct annual winter dissolved oxygen inventory	Medium	X	X	
	Conduct ecosystem monitoring to measure the quality of habitat	Medium	X	X	
	Collect trapping harvest data	Low	X	X	
	Collect bow and arrow moose harvest data	Low	X	X	
	Construct Mullins Pit habitat development/ watch able wildlife display	Low		X	

Management Category	Goals	Priority	Proposed Action	Alter-native 1	Alter-native 2
Fish and Wildlife Management	Conduct creel census	Low		X	
Threatened and Endangered Species and Critical Habitats	Monitor for presence of T&E Species	Medium	X	X	X
Forest Management	Fire Protection	High	X	X	
	Personal Use Firewood Sales	Medium	X	X	
	Insect and Disease Protection	Medium	X	X	
	Purchase Aerial Photography	Medium	X	X	
	Manage Arctic Survival Field Training Area	Medium	X	X	
Forest Management	Christmas Tree Sales	Low	X	X	
	Forest Road Construction and Maintenance	Low	X	X	
Grounds Maintenance	Update urban forest map	Medium	X	X	
	Update Landscape · Development Plan	Medium	X	X	
Outdoor Recreation and Public Access	Annually Maintain Outdoor Recreation Facilities and Trails	High	X	X	
	Expand Heritage Park	Low		X	

Management Category	Goals	Priority	Proposed Action	Alter-native 1	Alter-native 2
Outdoor Recreation and Public Access	Establish Canoe Route on French Creek	Low		X	
	Establish Canoe Route on Piledriver Slough	Low		X	
Geographic Information System (GIS)	Maintain natural/cultural resources maps on the Eielson GeoBase to assist in the environmental management decision-making process and ongoing implementation of the INRMP.	Medium	X	X	

2.4 No Action Alternative

The No Action Alternative would result in no INRMP being implemented for Eielson AFB. A wide variety of laws and executive orders addressing issues such as environmental quality, federal land management, wildlife, wetlands, floodplains, etc., as well as Department of Defense and USAF policies and initiatives require the management of natural resources and implementation of an INRMP.

2.4 Other Alternatives Considered

The options available for management of individual natural resources (i.e. forestry, fish and wildlife, wetlands, etc.) are numerous resulting in various combinations each of which could be presented as possible alternatives. Development of the Eielson AFB INRMP however, is based on an interdisciplinary approach to natural resource management that considers the environment as a complex system functioning as a whole, not a sum of the individual components. Professional resource managers concur that this is the most comprehensive approach to natural resource management.

3.0 Affected Environment

Chapter 3 describes the existing environment and resource components that would be impacted by the proposed action and the alternatives. The resources discussed in this section are presented as a baseline for comparisons of environmental consequences. Resource descriptions provided in Chapter 3 are given in a regional context, as well as specific descriptions that characterize Eielson AFB as a subset of the interior Alaska region that it resides. For additional detail of the environment affected by this plan, please refer to resource descriptions provided in the INRMP for Eielson AFB. Resources discussed in the section are as follows:

- Physical resources, which include general site location, topography, geology, soils and permafrost, climate and air quality, noise, ground and surface water, floodplains, and wetlands.
- Biological resources, which include vegetation, wildlife, fish, and threatened or endangered species.
- Cultural resources including Archeological or Historical Resources.
- Recreational Resources

3.1 Regional Resources

3.1.1 Physical Resources

3.1.1.1 General Site Location

3.1.1.1.1 Eielson AFB is located in the interior of Alaska, north of the Alaska Range in the Tanana Valley Basin. The base lies within the Fairbanks North Star Borough approximately 120 miles south of the Arctic Circle, 23 miles southeast of Fairbanks, and 9 miles southeast of the city of North Pole.

3.1.1.1.2 The main base encompasses approximately 19,790 acres. The base manages an additional 37,824 acres at four other locations as follows:

- C Battery (18 acres) is located on a ridgeline within the Ft Wainwright Yukon Training Area approximately 12 air miles east-southeast of the base.
- The Chena River Research Site is comprised of the Chena River Annex (690 acres), the Air Force Technical Applications Center (AFTAC) Remote Operating Facility (2,995 acres), and the access road to these sites (106 acres). This site is located approximately 10 miles northeast of the main base within the Ft Wainwright Yukon Training Area.
- The Blair Lake Air Force Range (33,964 acres) is located approximately 17 air miles southwest of Eielson AFB in the Ft Wainwright Tanana Flats Training Area.
- The Birch Lake Recreation Area (51 acres) is located on the western shore of Birch Lake approximately 35 miles southeast of the main base along Highway 2.

Table 3.1 summarizes the state of development of the various land management areas.

Table 3.1 Acreages of Lands Managed by Eielson AFB (Acres Estimated)

Land	Total	Improved	Semi-Improved	Unimproved	Under Facilities
Eielson AFB	19,790	598	1,364	16,676	1,152
C Battery	18		2.6	7.7	7.7
Chena River Research Site					
Chena River Annex	690		6	677	7
Access Road (Transmitter Road)	106		27	52	27
AFTAC Remote Operating Facility	2,995		38	2,954	3
Blair Lake Air Force Range	33,964		1,248	32,655	61
Birch Lake Recreation Area	51		11.3	35.5	4.2
TOTAL	**57,614**	**598**	**2,696.9**	**53,057.2**	**1,261.9**

3.1.1.2 Regional Topography

3.1.2.1 The project area is within the Yukon–Tanana Upland of the Northern Plateau physiographic province. Eielson AFB managed lands are located in Interior Alaska, which is comprised of a vast plateau that stretches from the Brooks Range in the north to the Alaska Range in the south. The principal river systems draining the interior are the Yukon and Tanana Rivers. The Yukon River, located approximately 120 miles northeast of Eielson AFB, dominates the landscape of interior Alaska, flowing some 2,000 miles from the Canadian Yukon to the Bering Sea. The Yukon River and its tributaries, of which the Tanana River is one, form the largest river system in Alaska.

3.1.2.2 The Eielson AFB managed lands lie more specifically in the Tanana River Valley. The Tanana River Valley is very broad with relatively flat or gently sloped terrain. In a 50-mile radius to the west and south of Eielson, the valley floor ranges in elevation from 400 to 1,000 feet above sea level. Hills rise sharply to the east to form the valley edge. Here the slopes become quite steep and elevations rise to peaks and ridge tops over 3,000 feet. These hills are dissected by the Chena and Salcha Rivers and their numerous

tributaries, which flow in an east-west direction. The Eielson AFB managed lands are situated primarily in the valley floor, with some portions extending into the adjacent foothills.

3.1.1.3 Regional Geology, Soils, and Permafrost

3.1.1.3.1 Most of the subsurface geologic formations of the central plateau of Alaska date primarily from the Permian and Devonian periods of the Paleozoic era (Hulten 1968). The oldest rock known to occur in interior Alaska is a formation known as the Yukon-Tanana Terrane that comprises most of the Tanana Valley area from just west of Fairbanks east to the Yukon Territory of Canada. The formation dates back to the Precambrian Period of the Paleozoic era, and consists of metamorphic rocks including muscovite-quartz schist, micaceous quartzite, and graphitic schist (Connor and O'Haire 1988). Overlying this bedrock formation are deep deposits of fluvial and glaciofluvial sediments originating primarily from the Alaska Range. Windblown and glaciofluvial deposits are up to 750 feet thick in an area south of Fairbanks (Pewe and Reger 1983).

3.1.1.3.2 Soils in the Tanana River Valley consist of unconsolidated silty sands and gravels, organic silts, sandy silts, and clays. Floodplain soils nearest the active channel are sandy with a thin silt loam layer on the surface. On higher terraces the soils are predominately silt belonging to the Salchaket series (Van Cleve *et al.* 1993). On older river terraces, silt loam soils of the Goldstream series dominate and often have a significant organic component (Van Cleve *et al.* 1993). These soils tend to be cold and wet and are generally underlain by permafrost. Clays, sandy silts, and sandy gravelly loams may be found in upland areas of the Tanana River Valley.

3.1.1.3.3 In Interior Alaska, the areas that are generally underlain by permafrost in the Yukon-Tanana uplands include north aspects, valley floors, and poorly drained lower slopes (Van Cleve *et al.* 1993). Well-drained south aspects and sediments adjacent to and beneath active river channels are typically permafrost free.

3.1.1.4 Regional Water Resources

Wetlands and low gradient alluvial streams comprise most of the surface water resources within the area. Wetland areas dominate the flat, low-lying areas within and surrounding Eielson AFB. The largest river system to the base is the Tanana River drainage. The major tributaries are the Salcha, Chena, and Wood Rivers. Surface drainage is generally north-northwest. There are three large, natural lakes (Harding, Birch, and Blair) located within 35 miles of the base. The general area has numerous natural and constructed lakes and ponds.

3.1.1.5 Regional Climate and Air Quality

3.1.1.5.1 The Yukon-Tanana subregion has the northern continental climate of Interior Alaska, which is characterized by short, moderate summers, long cold winters, and low precipitation and humidity. The mean annual temperature is 26° F. The average annual precipitation at Eielson AFB is 13.1 inches, with approximately 60 percent of the annual

precipitation occurring during the warmer months of June through September. The average annual snowfall is 73.5 inches.

3.1.1.5.2 Eielson AFB is considered a major facility because the base has the potential to emit more than 100 tons per year of criteria air pollutants. Due to the bases potential to emit, a Title V air operating permit application was prepared and submitted to the Alaska Department of Environmental Conservation in December 1997. The permit application outlines emission sources subject to Title V, a summary of facility wide potential and actual emissions, hazardous air pollutants (HAPS) status, and requirements for an Accidental Release Prevention Program (ENSR 1997). To support the permit application, an air emissions inventory was completed.

3.1.1.5.3 The Central Heat and Power Plant (CH&PP) is the primary source of electrical power and heat for all base facilities. The CH&PP has six coal-fired boilers, which are the largest air emission sources. Other emission sources include emergency fire pumps, backup generators, compressor engines, painting and fueling operations, aircraft engine testing, and incinerator emissions. The most significant HAPs emissions are hydrochloric acid and hydrofluoric acid from the coal fired boilers.

3.1.1.5.4 Ozone depleting substances (ODCs) are used on a limited basis at Eielson and include chlorofluorocarbons (CFCs) and hydro chlorofluorocarbons (HCFCs). CFCs and HCFCs are contained in some of the chemicals and products used in recharging air conditioning and compressor equipment, solvents used in cleaning parts and precision instruments, and sterilization equipment at the hospital.

3.1.1.6 Noise

The most recent calculations of noise contours for Eielson AFB were completed during the 2001 US Air Force Air Installation Compatible Use Zone (AICUZ) Study. Air Force land use recommendations suggest residential areas be located outside of the 65 decibels (dB) contour. All of Eielson's accompanied housing areas fall outside of the 65 dB areas. There are no residential areas located off the installation that fall into the 70 dB contour. Moose Creek, which has low-density housing, is within the 65 dB contour off the north end of the runway. The highest Day-Night Average Weighted Sound Levels occur on the runway and taxiways and were measured at 85 decibels (dB).

3.2 Eielson AFB Physical Resources

3.2.1 Eielson AFB Topography

Eielson AFB (19,790 acres) is located along the eastern edge of the Tanana River Valley. The eastern portions of the base extend into the foothills along the eastern edge of the valley. About 89 percent of the base is flat alluvial floodplain with elevations ranging from 520 to 550 feet. The remaining 11 percent of the base occurs in the hills. The highest point at 1,125 feet occurs on Quarry Hill in the southeast corner.

3.2.1.1 Eielson AFB Geology, Soils, and Permafrost

3.1.7.2.1 The geology of the area consists of Precambrian and Paleozoic-age metamorphic rocks of the Yukon-Tanana crystalline complex, formally known as Birch Creek Shist. The rocks have been intruded by igneous rocks consisting of granodiorite and quartz monzanite of Mesozoic and Cenozoic age and have been overlain by younger sedimentary Pleistocene and Holocene fluvial gravel and loess deposits. Unconsolidated sediments are approximately 200 feet to 300 feet thick beneath Eielson AFB. Glacial outwash plains at the base of the Alaska Range provided wind-blown silts that have been transported northward and deposited as loess mantles along the crystalline uplands. Silt has also accumulated at lower elevations in organic muck deposits in combination with plant debris (EA 1995).

3.1.7.2.2 In 1998, the US Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) completed a soils survey of Eielson AFB. Soils and miscellaneous land types were mapped and are described in INRMP.

3.1.7.2.3 Discontinuous permafrost can be found throughout Eielson AFB, and is typically found in low-lying areas and north aspects of slopes.

Photo 1 – Mullins Pit

3.2.1.2 Eielson AFB Water Resources

3.1.7.3.1 Eielson AFB was constructed within the floodplain of the Tanana River. Surface drainage at Eielson AFB is generally north-northwest, parallel to the Tanana River. Surface water resources include numerous creeks, sloughs, lakes, and ponds. Man-made lakes and ponds were created during the excavation of gravel deposits for use as fill material for construction projects on base. Lake development, through gravel extraction, is still occurring at Mullins Pit (**Photo 1**), Bear Lake, and Cathers Lake. A summary of water resources is shown in **Table 3.2.**

3.1.7.3.2 The low-lying, developed portions of Eielson AFB are underlain by a shallow, unconfined aquifer comprised of 200 to 300 feet of loose alluvial sands and gravel overlying bedrock of relatively low permeability (Battelle PNL 1994). The groundwater table is typically less than 10 feet below the ground surface, but it can rise with seasonal variations to as shallow as 1.5 feet below grade. The direction of groundwater flow is generally north-northwest. Water supply for Eielson AFB is drawn from five wells capable of producing a total of 3,200,000 gallons per day.

Table 3.2 Eielson AFB Water Resources

Eielson AFB Water Resources		
Lakes/Ponds (Total Number)	**Total Acres**	**Description**
115	584.2	Lily Lake – naturally occurring lake 11 man-made lakes 14 naturally occurring ponds 89 man-made ponds
Streams (Total Number)	**Total Length (Miles)**	**Description**
5	29.1	Piledriver Slough (12.6 Miles)
Streams (Total Number)	**Total Length (Miles)**	**Description**
		Garrison Slough (4.5) Moose Creek (1.3 Miles) French Creek (8.1 Miles) Knokanpeover Creek (2.4 Miles)
Floodplains	**Total Acres**	**Description**
	6,444	100-year floodplains located throughout base area

3.2.2 Physical Resources of Eielson AFB Managed Lands

At the beginning of this Chapter it was stated that Eielson AFB has 19,790 acres that is part of its base lands. In addition to this acreage, the base also manages another 37,824 acres of land that it is permitted to use by the U.S. Army. These lands are part of the U.S. Army's military withdrawal lands that belong to the Bureau of Land Management. These lands include C Battery (18-acres), Chena River Research Site (3,791-acres), Blair Lake Air Force Range (33, 964-acres), and the Birch Lake Recreation Area (51-acres). The following is a brief description of their physical resources.

3.2.2.1 C Battery

3.2.2.1.1 C Battery Topography

C Battery is a small, 18-acre site located on a ridge top to the east of the main base at an elevation of about 2,100 feet. The site is relatively flat with the ground to the north and south dropping sharply down the slopes of the ridge.

3.2.2.1.2 C Battery Geology, Soils, and Permafrost

The geology in the general vicinity of C Battery is described in Section 3.1.1.3. The soils at the site have not been inventoried, but general information is known for the area. Ridge topsoils are typically shallow gravelly silt (US Army 1994).

3.2.2.1.3 C Battery Water Resources

C Battery is located on a ridgeline with surface water from the site draining into two distinct drainage systems, the French Creek drainage to the north and the Little Salcha River drainage to the south. There are no wetlands, streams, ponds, or floodplains on the site. Currently there is no information available on groundwater resources at C Battery.

3.2.2.2 Chena River Research Site

3.2.2.2.1 Chena River Research Site Topography

The Chena River Research Site consists of two separate parcels, the Chena River Annex (690 acres) and the Air Force Technical Applications Center (AFTAC) Remote Operating Facility (2,995 acres). In addition, there are 106 acres of access roads into these two areas. The Chena River Annex is essentially flat, occurring within the floodplain and on old terraces of the Chena River at an elevation of roughly 600 feet. The AFTAC Remote Operating Facility lies to the south of the Chena River Annex in the foothills along the east edge of the Tanana Valley, and varies in topography with elevations ranging from 750 feet to 1,900 feet above sea level.

3.2.2.2.2 Chena River Research Site Geology, Soils, and Permafrost

The geology of the general vicinity of Chena River Research Site is described in Section 3.1.1.3. A soils survey of the Chena River Annex was completed in 1998 by the US Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS). Soil description and classification for Chena River Annex is described in INRMP. Soils in the AFTAC Remote Operating Facility have not been surveyed, however, a generalized soil survey for nearby Army lands provides information that can be applied to this site. The soils are generally silt loams. South slopes vary from shallow, gravelly silt near ridge tops to deep, moist silt loams on the lower slopes. North slopes have shallow, gravelly silt loams with thick vegetative cover. Drainage bottoms and depressions have shallow, gravelly silt loam overlain with a thick layer of peat and underlain with permafrost. Soils on the south-facing slopes are generally well drained and free of permafrost. The soils on the north slopes are usually underlain by permafrost and are poorly drained (US Army 1994).

3.2.2.2.3 Chena River Research Site Water Resources

3.2.2.2.3.1 The Chena River Annex lies within the floodplain of the Chena River, which forms the northern boundary of the site. There are no lakes, ponds, or perennial streams within the Annex. The portion of the parcel that lies within the 100-year floodplain of the Chena River is approximately 304 acres. Currently, there is no information available on groundwater resources within the site.

3.2.2.2.3.2 The AFTAC Remote Operating Facility lies to the south of the Chena River Annex in the foothills along the east edge of the Tanana Valley. Surface water drainage is split into two distinct drainage systems, both of which are tributaries to the Chena River. The eastern corner of the site drains into an unnamed tributary of Horner Creek. The remaining area drains into two branches of an unnamed watercourse. Approximately 2.7 miles of stream occur on this site. No lakes, ponds, and floodplains occur on the Remote Operating Facility. Currently, there is no information available on groundwater resources at the site. A summary of water resources is shown in **Table 3.3.**

Table 3.3 Chena River Water Resources

Chena River Water Resources		
Lakes/Ponds (Total Number)	**Total Acres**	**Description**
NA	NA	
Streams (Total Number)	**Total Length (Miles)**	**Description**
NA	2.7	Streams are located in AFTAC Remote Operating Facility area within the Chena River drainage.
Floodplains	**Total Acres**	**Description**
	304	100-year floodplains are located in Chena River Annex

3.2.2.2.4 Blair Lake Air Force Range

3.2.2.2.4.1 Blair Lake Air Force Range Topography

The Blair Lake Range lies on the floor of the Tanana River Valley in a very flat, low-lying area called the Tanana Flats. The site totals approximately 33,964 acres in size. The land has a very gradual slope to the northwest with elevations ranging from 600 feet to 900 feet above sea level.

3.2.2.2.4.2 Blair Lake Air Force Range Geology, Soils, and Permafrost

The geology of the area consists of very thick layers of river sediments and fluvioglacial drift deposits of unconsolidated silts, sands, and gravels. The primary sources of the sediments in the Blair Lakes region are the Totatlanika Schist and the Birch Creek Schist of the Alaska Range. The soils of the Blair Lake Range have not been inventoried, but exploratory borings show profiles consist of unconsolidated silty sands and gravels, organic silts, sandy silts, and clays (EA 1995).

3.2.2.2.4.3 Blair Lake Air Force Range Water Resources

3.2.2.2.4.3.1 Surface water within the Blair Lake Range is comprised of small creeks and several man-made ponds. Surface drainage is generally north-northwest and is dominated by 3 general drainage systems, each comprised of numerous perennial watercourses. Clear Creek, a tributary of Salchaket Slough, drains the eastern one third of the range. A series of unnamed, poorly defined, tributaries to the Tanana River drain the central portion of the range. Willow Creek, also a tributary to the Tanana River, drains the western-most corner of the range. A summary of water resources is shown in **Table 3.4.**

3.2.2.2.4.3.2 Groundwater at the Blair Lake Range is encountered above the permafrost in a shallow, unconfined aquifer of alluvial deposits, and again below the permafrost in highly transmissive, alluvial sand and gravel deposits. The depth to the shallow groundwater generally ranges between 6 and 10 feet below the surface and varies with the depth to permafrost. Groundwater movement is generally north to northwest. Water is supplied to the facilities at the range from a well drilled into the deeper aquifer. The well operates on a demand basis, and is estimated to pump at approximately 24 gallons/minute, for a total of between 500 and 1,350 gallons/day (EA 1995).

Table 3.4 Blair Lake Water Resources

Blair Lake Water Resources		
Lakes/Ponds (Total Number)	**Total Acres**	**Description**
3	6.7	Three (3) man-made ponds Numerous pockets of surface water due to permafrost
Blair Lake Water Resources		
Streams (Total Number)	**Total Length (Miles)**	**Description**
NA	111.1	Numerous unnamed tributaries for Clear Creek, Willow Creek, and Tanana River drainages
Floodplains	**Total Acres**	**Description**
	1,486	100-year floodplains located throughout the area

3.2.2.2.5 Birch Lake Recreation Area

3.2.2.2.5.1 Birch Lake Recreation Area Topography

The Birch Lake Recreation Area (51 acres) lies on the east side of Birch Lake on an east-west peninsula. The slope of the land varies from 10 to 27 percent slope. The elevation of most of the Birch Lake Recreation Area is approximately 850 feet.

3.2.2.2.5.2 Birch Lake Recreation Area Geology, Soils, and Permafrost

The geology of the general vicinity of the Birch Lake Recreation Area is described in Section 3.1.1.3. The soil in the Birch Lake Recreation Area is Steese silt loam to approximately 22 inches in depth followed by fractured schist bedrock.

3.2.2.2.5.3 Birch Lake Recreation Water Resources

The site has no permanent bodies of water or streams. Groundwater at the Birch Lake Recreation Area is encountered around lake level. There are two wells at this site that supply water for the facility. The static water table was encountered at 74 feet. The wells are 250-feet-deep and 600-feet-deep and capable of producing a flow of 9.2 gallons per minute.

3.2.2 Eielson AFB Wetlands

Wetlands are a dominant physical feature of Eielson AFB managed lands with approximately 78.5 percent of the total acreage managed by Eielson AFB classified as

wetlands (**Photo 2**). Typically they form in low-lying areas where permafrost underlays the soils and impedes surface drainage. About 97 percent of the wetlands are low

Photo 2 – Eielson AFB Wetlands

quality wetlands vegetated with black spruce and associated shrub species, although sedge and sedge/grass meadows are common also. The remaining wetlands are high quality and consist of lakes, ponds, streams, and marshes. Almost all of the high quality wetlands are located on the main base. About 46 percent of the high quality wetlands are man-made as a result of base development. A summary of wetlands on Eielson AFB managed lands is shown in **Table 3.5.**

Table 3.5 Wetlands

Management Area	Size of Area (Acres)	Wetlands (Acres)	Percentage of Area
Eielson AFB	19,790	10,227	51.7
C Battery	18	0	0
Chena River Research Site	3,791	1,099	29
Blair Lake AF Range	33,964	33,896	99.8
Birch Lake Recreation Area	51	8	16
Total	57,614	45,200	78.5

3.2.3 Recreational Resources

Eielson actively promotes the use of natural resources on Eielson managed lands to provide the maximum outdoor recreational benefits within the constraints of the military mission and the capability of the available resources, and to preserve these resources for future generations. Some of the most common activities are fishing, hunting, camping, picnicking, skiing, and off-road vehicle use. The Air Force provides and maintains a downhill skiing facility, cross-country ski trails, a parcours exercise trail, nature trail, campgrounds, shooting ranges, dog mushing trail, winter sports area, and other facilities.

3.2.4 Cultural Resources

A cultural resource survey for Eielson AFB was conducted in 1996. The purpose of the survey was to identify and evaluate prehistoric and historic archeological sites in terms of their location, significance, and eligibility for nomination to the National Register of Historic Places. The completed survey provides the basis for the Eielson AFB Cultural Resource Management Plan.

3.3 Eielson AFB Biological Resources

3.3.1 Vegetation

3.3.1.1 Due to the variations in the surrounding terrain on Eielson AFB managed lands, the plant communities vary based on slope, aspect, elevation, and fire history. Differences in vegetation are also influenced by spatial variations in soil temperature, moisture content, soil fertility, and presence of permafrost. The major plant community types include white and black spruce coniferous forests; paper birch and poplar broadleaf forests; mixed coniferous-broadleaf forests; tall scrub-shrub; herbaceous wetlands; and man made semi-improved and improved grounds. The Natural Resources vegetation inventory was last updated in 2002. A detailed vegetation inventory map for Eielson AFB lands including plant species list is included in the INRMP. A summary listing dominant vegetation cover types is provided in **Table 3.6.**

3.3.1.2 Open and closed mixed spruce/broadleaf forest tends to occur on well-drained sites with little permafrost. This forest type is commonly found on south-facing slopes throughout the area. Tree species include white spruce, paper birch, quaking aspen, and balsam poplar. Willows, alder, wild rose, blueberry, and high-bush cranberry are common shrubs. Lower elevation ridge tops usually consist of tall shrub communities characterized by dwarf birch and herbaceous species interspersed with widely scattered black spruce.

3.3.1.3 White and black spruce coniferous forests are common in the river valleys and are the predominant vegetation types along stream drainages. Spruce stands occur as open and closed forests with common associated shrubs and grasses consisting of dwarf birch, Labrador Tea, low-bush cranberry, blueberry, horsetail, and bluejoint grass.

3.3.1.4 Black spruce lowland forests tend to occur on poorly drained sites underlain by permafrost. Black spruce forests are common in low-lying areas, drainage basins, and north-facing slopes common throughout the area. Black spruce occurs in closed canopy stands and as scrubby open stands of dwarf trees. Other species commonly occurring in this forest type include tamarack, blueberry, low-bush cranberry, Labrador tea, and mosses. Closed canopy black spruce forest tends to return to its original composition after fire (Viereck et al., 1992). In the absence of fire, closed canopy black spruce may transition into scrubby open stands of black spruce as the moss layer thickens. A thicker mat of moss tends to better insulate soils, causing the permafrost level to rise and the soil to be colder and wetter over time.

3.3.1.5 Wetlands can be grouped as having high or low wildlife habitat value. High-value wetland habitat includes seasonally flooded open habitats suitable for waterfowl nesting and feeding. It generally occurs as lakes, ponds, slow-moving streams, and marshes. Almost all of the high quality wetlands are located in the main base area. Low-value wetland habitat is composed of scrubby stands of black spruce/tamarack, tall and low willows, dwarf birch, alder shrubs, and graminoids. About 97 percent of the wetlands on Eielson AFB managed lands are low quality wetlands that offer foraging habitat for relatively few species.

Table 3.6 Vegetation

Management Area	Vegetation Cover Type	Percent (of total vegetation)
Eielson AFB	Black Spruce/Tamarack	44
	Mixed Needleleaf/ Broadleaf	30
C Battery	Alder	75
Chena River Research Site	Paper Birch: Open	47
	Mixed Needleleaf/ Broadleaf: Closed	20
	Black Spruce/ Tamarack: Open/ Woodland	19
Blair Lake AF Range	Black Spruce/Tamarack: Open/Woodland	45
	Resin Birch/Willow Scrub	42
Birch Lake Recreation Area	Mixed Needleleaf/Broadleaf:Closed	51
	Man-made/Beach	25

3.3.2 Wildlife

3.3.2.1 Eielson AFB lands support a wide diversity of habitat types. Approximately 32 species of mammals play key roles in the ecosystems occurring in the vicinity of Eielson managed lands. Wildlife species in the surrounding areas are typical of those found in Interior Alaska. Large mammals that are likely to be found in nearby habitat include

moose and black bear. Small mammals present consist of gray wolf, red fox, wolverine, beaver, river otter, mink, snowshoe hare, red squirrel, lynx, marten, grouse, ptarmigan, passerines, and various waterfowl. A list of fish and wildlife species occurring on Eielson managed lands, along with descriptive habitat types, is included in the INRMP.

3.3.2.2 The main base area has four designated wildlife management areas consisting primarily of rehabilitated man-made gravel pits and wetlands. These areas are managed more intensely for biological diversity, limited wildlife production, wetlands restoration, and outdoor recreation opportunities. Wildlife management areas include Mullins Pit Wildlife Management Area (65.2 Acres); Bear Lake Wildlife Management Area (64.8 Acres); Scout Lake Wildlife Management Area (30.2 Acres); and Manchu Ponds Wildlife/Wetlands Management Area. Management plans for the various wildlife management areas are included in the INRMP.

3.3.3 Fish

Numerous species of fish occur naturally in the streams and lakes of interior Alaska. The Alaska Department of Fish and Game (ADF&G) stocks rainbow trout, arctic grayling, arctic char, and Chinook salmon in seven lakes and one stream on Eielson AFB. The ADF&G stocks Birch Lake, the location of the Birch Lake Recreation Area, with rainbow trout, grayling, arctic char, and Chinook salmon. Lakes and streams are stocked to enhance the sport fishing potential. Other fish on Eielson AFB managed lands include indigenous northern pike, burbot, whitefish, lake chub, and longnose sucker.

3.3.4 Threatened, Endangered Species, or Sensitive Species

3.2.4.1 In FY93, Eielson contracted a biological survey for all base managed lands. One objective of the survey was to inventory and map the occurrence of all federal and state listed and proposed threatened and endangered species and their habitats. A final report was published in August 1994. No listed or proposed threatened or endangered species and critical habitats were found to occur on base lands.

3.2.4.2 Several species of birds and mammals that occur in the area have been identified as a sensitive species or of particular concern. They have been classified as sensitive either because they are subject to special protection of the law (such as eagles) or because they have appeared in various listings of species of concern, most notably as former federal Category 2 candidate species or as state Species of Special Concern. Besides the American Peregrine Falcon, sensitive species known to occur in the area include the Bald Eagle, Golden Eagle, Northern Goshawk, Harlequin Duck, Olive-sided Flycatcher, and lynx. The population of these species in Alaska is considered healthy with the exception of the Olive-sided Flycatcher, which is declining across its range (ABR 2000).

4.0 Environmental Consequences

Chapter 4 is organized by resource, with the environmental consequences evaluated for each alternative. This discussion provides a scientific and analytic basis for the comparisons of the alternatives and describes the probable consequences (impacts and effects) of each alternative on selected environmental resources. The effects of each alternative upon each resource are discussed in the same order that they were presented in Chapter 3, beginning with the Proposed Action. Impacts that are common to all alternatives are stated as such and are addressed in the appropriate sections.

The No Action Alternative would not implement an INRMP for Eielson AFB. As mandated by the Sikes Act (16 U.S.C. 670a et seq.) as amended, the Secretary of Defense is authorized to carry out a program of planning for, and the development, maintenance, and coordination of, wildlife, fish, and game conservation and rehabilitation in each military reservation. Selection of the No Action Alternative will result in the Air Force's noncompliance with this federal law in addition to noncompliance with other regulatory acts.

4.1 Physical Resources

4.1.1 Geology, Soils, and Permafrost

4.1.1.1 Impacts Common to all Action Alternatives

The INRMP provides protection and guidance for the development and use of areas with permafrost and areas classified as moist tundra. The INRMP includes plans to minimize erosion and sedimentation of soils and for the repair of damaged soil structure particularly that caused by the military mission.

4.1.1.2 Impacts Common to Proposed Action-Substantial Implementation of INRMP and Alternative 1-Full Implementation of INRMP

The Proposed Action would implement 100 percent of goals identified as high priority, 75 percent of medium priority goals, and 36 percent of low priority goals. Alternative 1 would implement 100 percent of high, medium, and low priority goals identified in the INRMP. Under these alternatives, the Geographic Information System (GIS) would be maintained. The GIS is a resource tool used to assist base planners in the environmental management decision-making process and is useful in evaluating land use effects.

4.1.1.3 Alternative 2-Minimal Implementation of INRMP

This alternative would take a less proactive approach to resource management and would implement 44 percent of goals identified as high priority, 1 percent of medium priority goals, and 0 percent of low priority goals. This alternative would place emphasis only on those actions required for compliance of federal and state regulations and mandated Air Force initiatives. The GIS would not be maintained under this alternative.

4.1.1.4 No Action Alternative

Although Natural Resource personnel are not the only staff on base that provide guidance and oversight for issues related to minimizing impacts to soils from base activities, they do provide an important source of local resource information and expertise that is extremely important in the protection and management of soil resources. It is likely that without the guidance provided by the INRMP and Natural Resources staff that increased impacts to soil resources from erosion, sedimentation, and inadequate soil resource protection would occur.

4.1.2 Climate and Air Quality

4.1.2.1 Impacts Common to all Alternatives

The Central Heat and Power Plant (CH&PP) located on main base has six coal-fired boilers, which are the largest air emission sources on Eielson AFB. The Air Force continues to monitor air quality in accordance with Eielson's ADEC Title V Air Quality operating permit. There would be no changes in air quality under the Proposed Action or alternatives.

4.1.3 Noise

4.1.3.1 Impacts Common to all Alternatives

In July 2001, the Fairbanks North Star Borough began restructuring the comprehensive land use plan. The plan provides the framework for the community to make decisions related to land use, future development, and preservation of natural resources. Although planning within the base boundaries is not under the borough's jurisdiction, the Air Force will continue coordination with the Fairbanks North Star Borough in order to avoid land use and noise conflicts between the air base and the surrounding community.

4.1.4 Ground and Surface Water

4.1.4.1 Impacts Common to all Action Alternatives

The INRMP includes management practices designed to minimize the impacts to erosion, sedimentation, and point and nonpoint water pollution in order to protect watersheds and water bodies on Eielson AFB managed lands. Management practices include the following:

- Revegetating disturbed areas.
- Monitoring the water quality of discharges from the industrial and sanitary wastewater treatment plant as required under the Alaska Department of Environmental Conservation Wastewater Disposal Permit at the outfall sampling station.

- Incorporation of a Storm Water Pollution Prevention Plan to prevent nonpoint water pollution in storm water runoff from urban developed areas.

4.1.4.2 No Action Alternative

The INRMP provides for management of all surface water systems that are located on base lands. If the INRMP is not implemented, significant impacts could result to surface water systems as a result of a lack of management and oversight that is provided for in the plan. This would include monitoring for water quality as well as implementing best management practices that would protect water systems from impacts that may occur as a result of base activities.

4.1.5 Wetlands

4.1.5.1 Impacts Common to all Action Alternatives

About 79 percent of the total acreage managed by Eielson AFB is wetlands and approximately 51.7 percent of the main base is wetlands. Eielson AFB recognizes the importance of floodplains and wetlands for natural moderation of floods, water quality maintenance, groundwater recharge, fish and wildlife habitat, recreation, and other functions. The Air Force places a high priority on wetlands and seeks to minimize the amount of wetlands impacted and comply with required mitigation. The INRMP includes mitigation measures and best management practices to protect wetlands. Wetlands and floodplain maps would be up-dated on an annual basis to aid base planners in the decision making process.

4.1.5.2 Impacts common to Proposed Action and Alternative 1

4.1.5.2.1 Under these alternatives, fish habitat would be developed in Bear Lake, Mullins Pit, and Cathers Lake and in new gravel borrow pits. The development of fish habitat creates a higher value wetland offering wildlife production and enhancing sport fishing potential. The GIS system would be updated and maintained with these alternatives and would assist base planners in land use planning.

4.1.5.3 Alternative 2

Fish habitat would not be developed in Bear Lake, Mullins Pit, and Cathers Lake or in new gravel borrow pits. The GIS would not be maintained with this alternative.

4.1.5.4 No Action Alternative

Due to the preponderance of wetlands on Eielson AFB lands, it has been necessary to encroach on wetlands to provide additional facilities needed to meet the mission of the base. When a Corps of Engineers wetlands permit is obtained for these wetland fills, Eielson has provided for mitigation for wetland losses by incorporating into the design of gravel borrow pits the creation of enhanced wetland systems. The design and

implementation of this mitigation for wetland losses is provided for in the INRMP. If no INRMP is implemented, this mitigation would not be undertaken and completed and Eielson AFB would be out of compliance with their permits.

4.2 Biological Resources

4.2.1 Vegetation

4.2.1.1 Impacts Common to Proposed Action and Alternative 1

Selection of these alternatives would include forestry resource management practices such as clearing and thinning for fire protection, insect and disease protection, personal use firewood sales, and Christmas tree sales. These actions would help protect base facilities in event of wildfire, enhance the overall health of the forest, and provide resources for base residents. Construction and maintenance of forest roads, forestry management of Arctic Survival Field Training Area, and updating urban forest map would also occur under these alternatives. These actions would contribute to the long-term health and sustainability of forest resources on base.

4.2.1.2 Alternative 2

The forestry resource management practices stated above would not be implemented. Benefits such as increased wildfire protection, improvement in overall health of forest, and personal use of forest products would be limited.

4.2.1.3 No Action Alternative

If the INRMP is not implemented numerous management programs and plans would not be undertaken that could have an effect on vegetation. Those programs listed in Sections 4.2.2.1 and 4.2.2.2 would not be accomplished. In addition, benefits associated with activities completed annually with the Tree City USA program would not be available.

4.2.2 Fish and Wildlife

The differences between the various alternatives are most noticeable in the management of fish and wildlife resources on Eielson AFB managed lands. Alternative 1 would offer the most comprehensive approach to management of fish and wildlife resources and would require additional funding in order to implement. Alternative 2 is the least comprehensive and takes a less proactive approach in the management of natural resources. The Proposed Action is the alternative that most closely resembles current resource management practices on Eielson AFB lands and is achievable with the funding that is annually available for the Natural Resources program.

4.2.2.1 Impacts Common to all Action Alternatives

4.2.2.1.1 Fish and wildlife practices would be incorporated into natural resource management of base lands as required by Air Force Initiative AFI 32-7064.

4.2.2.1.2 The airfield has about 21 surface acres of man-made ponds and a 20-surface-acre marsh attractive to waterfowl and shorebirds. Waterfowl and shorebirds on the airfield are a possible threat to aircraft. Annually, Eielson conducts a bird harassment/depredation program in the bird exclusion zone and adjacent areas in accordance with Air Force policy. The harassment program consists of sound cannons, pyrotechnics, mylar tape, and bird detection and dispersal teams. The depredation program is conducted within the confines of the airfield, but only after obtaining the required federal and state permits. There has not been a survey of the extent to which this program of bird harassment reduces annual bird nesting productivity; however there is no doubt that it has an affect. This is an acknowledged tradeoff that must be made to ensure the safety of military aircraft at Eielson AFB.

4.2.2.2 Impacts Common to Proposed Action and Alternative 1

4.2.2.2.1 The goal with these alternatives is to manage game and nongame fish and wildlife species for long-term sustainability, diversity, and productivity of the ecosystem considering the needs of other natural resources. To achieve these goals, the INRMP uses an integrated ecosystem approach to resource management that includes the following management practices:

- Conduct ecosystem monitoring to measure the quality of habitat. Annual studies and surveys help evaluate the success of management goals and objectives, document habitat trends, and assist base planners and resource managers in the decision making process. Surveys and data collection would include items such as annual goose survey, trapping and hunting harvest data, monitoring fish populations in lakes and streams, and inventory of winter dissolved oxygen in lakes.
- Development and improvement of fish habitat conditions favorable to the production of indigenous and stocked species. The Alaska Department of Fish and Game stocks rainbow trout, arctic grayling, arctic char, and Chinook salmon in seven lakes and one stream on Eielson AFB. Lakes and streams are stocked to enhance the sport fishing potential.
- Maintain Moose Lake/Polaris Lake, Bear Lake, and Mullins Pit dikes. Maintenance of dikes is necessary to protect fish habitat.
- Resolve wildlife conflicts/problems such as nuisance beaver problem and maintenance of moose passage openings in base perimeter fence. Beaver populations need to be controlled as beaver dams can cause flooding of underground utilidors on base and cause problems in the waterways draining the main base area. Maintenance of moose passage openings help decrease moose fatalities on the Richardson Highway and allow moose passage during migratory periods.

4.2.2.3 Alternative 1

4.2.2.3.1 Management practices resulting in additional surveys and data collection would occur with this alternative. Additional surveys would include annual waterfowl nesting survey, avian survey, and conducting a creel census. The data collected from surveys would be used as a basis for making resource management decisions. The creel census would provide information on fishing use of lakes (total fisherman and hours spent fishing per lake), fish size, and fishing success (fish caught and kept per man-hour fished). A creel census provides a barometer by which to evaluate fish stocking.

4.2.2.3.2 The construction of Mullins Pit habitat development/wildlife display would also be accomplished under this alternative. This would be an interpretative resource display informing recreational users of the various habitat types located in the Mullins Pit Wildlife Management Area.

4.2.2.4 Alternative 2

Emphasis would be placed only on actions required for compliance of federal and state regulations. As a result, fish and wildlife management practices stated in Section 4.2.2.2 would not be implemented with selection of this alternative. This would result in decreased long-term sustainability, diversity, and productivity of the ecosystem compared to the Proposed Action and Alternative 1. In addition, related activities such as sport fishing would diminish due to lack of stocked fish in selected lakes and gravel pits.

4.2.2.5 No Action Alternative

Under the No Action Alternative none of the fish and wildlife management programs listed in the INRMP would be implemented. Numerous beneficial, habitat enhancing programs would not be undertaken with a resulting loss in productivity of Eielson AFB managed lands. In addition, several actions required by Corps of Engineers wetlands permits would not be completed, putting Eielson AFB out of compliance with their wetland permits.

4.2.3 Threatened or Endangered Species

4.2.3.1 Impacts Common to all Action Alternatives

In FY93, Eielson contracted a biological survey for all base managed lands. A final report was published in August 1994. No listed or proposed threatened or endangered species and critical habitats were found to occur on base lands. The Air Force will continue to monitor for the presence of listed or proposed threatened and endangered species and critical habitats on Eielson managed lands. Should any threatened or endangered species become resident to Eielson managed lands, consultation with the US Fish and Wildlife Service will be initiated.

4.2.3.2 No Action Alternative

No impacts to Threatened or Endangered Species would result if an INRMP were not implemented.

4.3 Cultural and Historic Resources

4.3.1 Impacts Common to all Alternatives

There would be no impact to cultural or historic resources with the implementation of these alternatives.

4.4 Recreational Resources

4.4.1 Impacts Common to Proposed Action and Alternative 1

Annual maintenance of outdoor recreation facilities and trails would be accomplished, thus providing continued use of facilities. Outdoor recreation facilities on Eielson AFB lands include a downhill skiing facility, cross-country ski trails, a parcours exercise trail, nature trail, campgrounds, shooting ranges, dog mushing trail, winter sports area, and other facilities.

4.4.2 Alternative 1

Selection of this alternative would result in an increase in outdoor recreation facilities and recreational opportunities and would include expansion of Heritage Park, and the establishment of canoe routes on French Creek and Piledriver Slough. Heritage Park contains static displays of various aircraft that have been assigned to Eielson AFB, several memorials, and a pavilion. The park could be expanded to the south as aircraft are made available for the display. The establishment of canoe routes would provide recreational boating opportunities, and opportunity for fishing and wildlife observation for base and public users.

4.4.3 Alternative 2

There would be no annual maintenance of outdoor recreational facilities with this alternative. Facilities such as nature trials, dog mushing trials, and cross-country ski trails would eventually revegetate and become unusable over time. Outdoor recreational opportunities would decrease with this alternative.

4.4.4 No Action Alternative

Selection of this alternative would have an immediate impact on recreational resources available on base. The activities that are routinely undertaken under the direction of the INRMP are significant. Such activities as skiing, fishing, hiking, trapping, and hunting would either be eliminated or greatly diminished under this alternative.

4.5 Environmental Justice

4.5.1 Impacts Common to all Alternatives

4.5.1.1 Environmental justice, as it pertains to the NEPA process, requires federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. To accomplish these requirements the Air Force must conduct an environmental justice analysis of all potential impacts that may result from the proposed actions.

4.5.1.2 The residential populations of Eielson AFB are not distributed in such a manner that there are areas or neighborhoods that are low income or have concentrated within them minority populations. As a result, there would be no disproportionate impact to minority or low-income populations as a result of implementation of any of the actions associated with the Proposed Action or Alternatives 1 and 2.

4.6 Cumulative Impacts

Cumulative impact is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Individual actions may result in minor impacts but collectively may result in significant actions taking place over a period of time. In general, nearly all the actions that would result from implementation of the INRMP would be cumulatively beneficial. Many of the programs that are described in the document either maintain existing resource values, or even enhance them, as is the case with the wetland enhancement projects at the gravel borrow pits. The greatest degree of cumulative benefits would result from Alternative 1and the Proposed Action. A lesser degree of cumulative benefits would result from Alternative 2. Selection of the No Action Alternative would likely result in some cumulative impacts as many of the monitoring programs that identify environmental impacts such as water quality monitoring and applying best management practices to base related construction activities, would not occur.

4.7 Unavoidable Adverse Impacts

The goal of INRMP plan is to integrate all management activities in a way that sustains and restores the health and integrity of ecosystems on Eielson AFB lands. Implementation of these alternatives would not result in adverse impacts. However, selection of the No Action Alternative would likely result in some unavoidable adverse impacts. These would be in the form of unmitigated wetland losses resulting from base activities and a lack of monitoring and oversight of base resources that could be in jeopardy from these activities.

4.8 Relationship of Short-Term Uses and Long-Term Productivity

4.8.1 Proposed Action and Alternative 1

The short-term uses and benefits with the substantial or full implementation of the INRMP is that all compliance regulations would be met and the USAF would achieve a healthy balance between natural resource enhancement and stewardship, while supporting the military mission. Proper management of natural resources would provide long-term sustainability, diversity, and productivity for the ecosystem on Eielson AFB managed lands.

4.8.2 Alternative 2

The short-term uses and benefits associated with this alternative are that the USAF would remain in compliance with federal and state regulations. Long-term sustainability, diversity, and productivity of the ecosystem would however, diminish with this limited approach to resource management.

4.9 Irreversible and Irretrievable Commitments of Resources

Irreversible commitments are those that cannot be reversed, except perhaps in the extreme long term. Irretrievable commitments are those that are lost for a period of time. There are no identifiable irreversible commitments associated with the Proposed Action, Alternative 1, or Alternative 2. The only irretrievable commitments of resources may be the loss of suitable habitat, fish and wildlife productivity, and outdoor recreation opportunities if Alternative 2, and to a greater extent, the No Action Alternative, were selected.

4.10 Mitigations

No mitigation would be required with the implementation of the Proposed Action or other alternatives. The INRMP does however include mitigation measures and best management practices to protect wetlands that are required by state and federal permits.

5.0 List of Preparers

5.1 Writers

The Environmental Assessment (EA) was prepared by Lyle Gresehover, Boreal Environmental Services and Technology, Fairbanks, Alaska
In addition Eielson CEV staff edited and produced the final document.

5.2 List of Agencies Consulted

Alaska Department of Fish and Game
Habitat Protection Division

Eielson AFB
Base Development
Environmental Quality
Environmental Planning
Horizontal Construction
Installation Restoration Section
Maintenance Engineering
Services Squadron

Fort Wainwright
Environmental Section

US Fish and Wildlife Service
Ecological Services - Fairbanks

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