# FINAL

# INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN

**GRAND FORKS AIR FORCE BASE**

**NORTH DAKOTA**

**2004-2008**

*Original prepared by*
**AFCEE/ECS**
**SEPTEMBER 2004**

*Update Prepared by*
**319 CES**
**DECEMBER 2005**

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# 2004-2008 UPDATE FOR
# INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN
# GRAND FORKS AIR FORCE BASE, NORTH DAKOTA

## APPROVAL PAGE 1 of 3

"Consistent with the use of military installations to ensure the preparedness of the Armed Forces, the Secretaries of the military departments shall carry out the program required by this subsection to provide for ---

- The conservation and rehabilitation of natural resources on military installations;
- The sustainable multipurpose use of the resources, which shall include hunting, fishing, trapping, and nonconsumptive uses; and
- Subject to safety requirements and military security, public access to military installations to facilitate the use"

Sikes Act (16 USC 670a)

This Updated Integrated Natural Resources Management Plan meets the requirements of the Sikes Act (16 U.S.C. 670 *et seq.*) as amended and the Air Force Instruction 32-7064.

William J. Bender, Col

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Commander, 319 Air Refueling Wing
Grand Forks Air Force Base, North Dakota

3/21/2006

Date

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Date

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# FINDING OF NO SIGNIFICANT IMPACT (FONSI) FOR THE IMPLEMENTATION OF THE INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN (INRMP) UPDATE FOR YEARS 2004-2008 For Grand Forks AFB, North Dakota

**AGENCY:** 319th Air Refueling Wing (ARW), Grand Forks Air Force Base, North Dakota

**ACTION:** Finding of No Significant Impact

**BACKGROUND:** Pursuant to the Council on Environmental Quality regulations for implementing the procedural provisions of the National Environmental Policy Act (NEPA) (40 CFR 1500-1508), Department of Defense (DoD) Instruction 4715.9, and Air Force Instruction 32-7064, the 319 ARW, Grand Forks AFB (GFAFB), ND, prepared an update to the Integrated Natural Resources Management Plan (INRMP). Chapter 8, Environmental Assessment, addressed potential environmental impacts to the implementation of the INRMP Update at GFAFB, ND.

The INRMP is the tool for managing natural resources in a coordinated manner within the context of the operational missions on DoD installations. In accordance with the 1997 amendments to the Sikes Act and AFI 32-7064, GFAFB is required to prepare an INRMP and update it every five years, including an annual revision if necessary. Based on an interdisciplinary approach to ecosystem management, this INRMP ensures the successful accomplishment of the military mission by integrating all aspects of natural resource management with each other and with the activities associated with the Base's mission. GFAFB prepared this INRMP Update using the interdisciplinary approach required by NEPA and the Sikes Act Improvement Act (SAIA) of 1997, and has evaluated the potential environmental impacts of the management actions identified in the INRMP Update. GFAFB, partnering with the U.S. Fish and Wildlife Service (USFWS) and the North Dakota Game and Fish Department (NDGFD) reviewed and approved the INRMP Update. The management actions identified and evaluated in the INRMP have been determined to be effective in integrating the management of natural resources on GFAFB properties so as to protect the environment and conserve biodiversity.

**DESCRIPTION OF THE PROPOSED ACTION:**

GFAFB proposes to implement the INRMP Update for the years 2004-2008 to ensure the successful accomplishment of the military mission and environmental stewardship by integrating all aspects of natural resource management with each other and with the activities associated with the five installations' missions. Through this INRMP Update, GFAFB supports the U.S. Air Force's affirmative policy of being a good steward of the environment, while still meeting its mission.

The INRMP Update identifies management goals and objectives, a funding budget, and an implementation plan to establish and continue the strong GFAFB environmental stewardship program consistent and integrated with the Base's mission. Chapter 8 of the INRMP is an Environmental Assessment, identifying the potential environmental impacts that may occur as a result of implementing the INRMP projects.

**ALTERNATIVES TO THE PROPOSED ACTION:**

Under the No Action Alternative, current management actions at Grand Forks would be continued without the benefit of any further improvement in protection, function, or restoration of sensitive habitats.

**SCOPE OF THE INRMP AND ITS UPDATE:**

Chapters 1 and 2 provide general information and installation location and mission information. Chapters 3 and 4 provide general physical environment information and general biotic environment information for GFAFB. Chapter 5 provides the natural resources program management and natural resource concerns for GFAFB. Chapter 6 lists the goals, objectives, and identifies specific projects to implement the objectives. Chapter 7 is an Implementation Plan identifying the project, the funding and level of funding, and the office of responsibility to make it happen. This Plan can be used as a stand-alone document for the natural resources program manager. Many of the specific projects are designed to improve protection, function, or restoration of sensitive habitats, to monitor changes, and to ensure ongoing compliance with permitting requirements. Several projects are focused on expanding or enhancing recreation opportunities and incorporating environmental education. Chapter 8 is an environmental assessment that identifies the proposed projects and evaluates the potential mission impacts. Chapter 9 provides a listing of all the references used for both the Update and the original 1997 INRMP and all the preparers for the 2004 INRMP Update and the original 1997 INRMP.

**PROCESS FOR EVALUATING FUTURE NEPA-RELATED PROPOSED ACTIONS:**

The specific plans and actions identified in the INRMP have been determined not to cause any adverse environmental impacts. Site-specific environmental impact analysis may or may not be needed at the time of implementation of any project. If any future proposed INRMP-related project or actions have issues or extraordinary circumstances, which are not evaluated in Chapter 8 of the INRMP and cannot be categorically excluded, the proposed activity shall be evaluated in an independent environmental assessment.

**DECISION:**

**Selection of Alternative:** Based on the information and environmental impact analyses provided in Chapter 8 of the INRMP, the Proposed Action, Implementation of the 2004-2008 INRMP is selected.

This alternative, rather than the No Action Alternative, is selected because the INRMP was developed using a systematic, comprehensive, and interdisciplinary approach that included the participation of subject matter experts and included the cooperation and reviews of the USFWS and the NDGFD. In addition, the general public was also provided an opportunity to review the INRMP. The management actions identified in the INRMP will be effective in integrating the management of GFAFB's natural resources with its military mission. The actions will improve protection, function, or restoration of sensitive habitats, monitor changes, and ensure ongoing compliance with permitting requirements. This alternative is consistent with NEPA, the SAIA of 1997, as amended, and U.S. Air Force policy.

**Finding of No Significant Impact (FONSI):**

This FONSI provides the rationale for the actions described and evaluated in the INRMP and also provides rationale why they are not considered "major federal actions" having significant impacts, pursuant to the NEPA (40 CFR 1508.18 and 40 CFR 1508.27), and, therefore, why an Environmental Impact Statement (EIS) is not necessary.

The evaluation in Chapter 8 of the INRMP provides the following analysis:

- **Impacts on Health and Safety**

  The INRMP identifies actions that would not add to the use of chemical herbicides for noxious plants that can directly impact the health of applicators and people in the vicinity. All activities would be conducted with a focus on protection of health and implementation of all appropriate safety precautions.

  None of the proposed INRMP projects would likely have any foreseeable adverse impacts on public health, safety, or the environment. Most of the activities proposed would improve the natural resources on Base and the quality of the human environment.

  No significant adverse impacts on health and safety are therefore foreseen.

- **Unique Geographic Characteristics, Degree of Environmental Controversy, and Degree of Highly Uncertain Effects or Unique or Unknown Risks**

  All unique areas and special natural resources, such as wetlands, recreational areas, prime and unique farmland, threatened/endangered and rare species, would be protected and managed consistent and integrated with mission objectives. No significant adverse impacts to unique geographic areas are foreseen. No activities would cause unique or uncertain environmental risks. No environmental controversy or unique or unknown risks are foreseen.

- **Setting a Precedent for Future Actions**

  No action within this analysis would set a precedent for future actions that would have the potential for significant environmental impacts, individually or cumulatively. The INRMP sets direction for systematic integration of natural resources management on GFAFB with the mission, which is consistent with Federal law and U.S. Air Force policy.

- **Potential to Adversely Affect Historic or Archaeological Resources, or Threatened or Endangered Species and Critical Habitat**

  Limited cultural resources exist at GFAFB. All protocol for the inadvertent discovery of cultural resources will be followed. No cultural resources or threatened or endangered species would be adversely affected, and inventories and protective management actions would be funded and implemented on a priority basis.

- **Potential to Violate Federal, State, or Local Environmental Law**

  Through the cooperative efforts with the U.S. Fish and Wildlife and the North Dakota Game and Fish Department, compliance with the **Endangered Species Act, the Fish and Wildlife Conservation Act, and Fish and Wildlife Coordination Act** was completed.

  The INRMP identified goals and objectives to protect and preserve precious natural resources (plants and animals) in a meaningful manner. No violations of federal, state and local environmental laws are foreseen.

  Several historic Cold War Era buildings and structures exist at GFAFB. Natural resource enhancement will not affect these structures. No actions identified and evaluated in the INRMP are likely to have an adverse impact on historic or cultural resources and would not therefore violate the **National Historic Preservation Act.**

  Management of wetlands according to the INRMP objectives would have no adverse impacts on wetlands or floodplains and would be in compliance with **Executive Order 11988, Management of Floodplains, and Executive Order 11990, Protection of Wetlands.**

  All activities identified and evaluated in the INRMP would take place entirely within the boundaries of GFAFB, and in cooperation with other appropriate Federal and state agencies. No activity in the INRMP would disproportionately adversely impact the health and environmental quality of any minority or low-income population. Therefore, no Environmental Justice analyses are required under **Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.**

  The management of noxious plants would be in full compliance with the **Federal Insecticide, Fungicide, and rodenticide Act (FIFRA).**

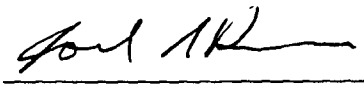
  GFAFB is within Region VIII of the EPA. Within this region, air quality is considered good. The Base has a Title V permit to operate; this permit complies with the Clean Air Act (CAA). Grand Forks is in compliance with the **General Conformity Rule Determination Pursuant to the CAA Amendments of 1990.**

**FONSI CONCLUSION:**

Chapter 8, Environmental Assessment, to the INRMP Update, was prepared to identify and evaluate potentially significant impacts to the implementation of the goals and objectives to the 2004-2008 INRMP Update. This analysis was prepared in accordance with the requirements of the NEPA, its implementing regulations at 40 CFR 1500-1508 and U.S. Air Force policy, and the requirements of the SAIA of 1997, for development of INRMPs. All cooperating agencies and the general public reviewed the Draft INRMP Update for a 30-day period and all review comments were integrated into the document.

I conclude that the environmental effects associated with implementing the 2004-2008 INRMP Update are not significant effects. The INRMP would improve the quality and management of natural resources on GFAFB. The INRMP is consistent and compatible with the mission, and meets Federal law and requirements and U.S. Air Force policy. Therefore, an EIS will not be required for this action.

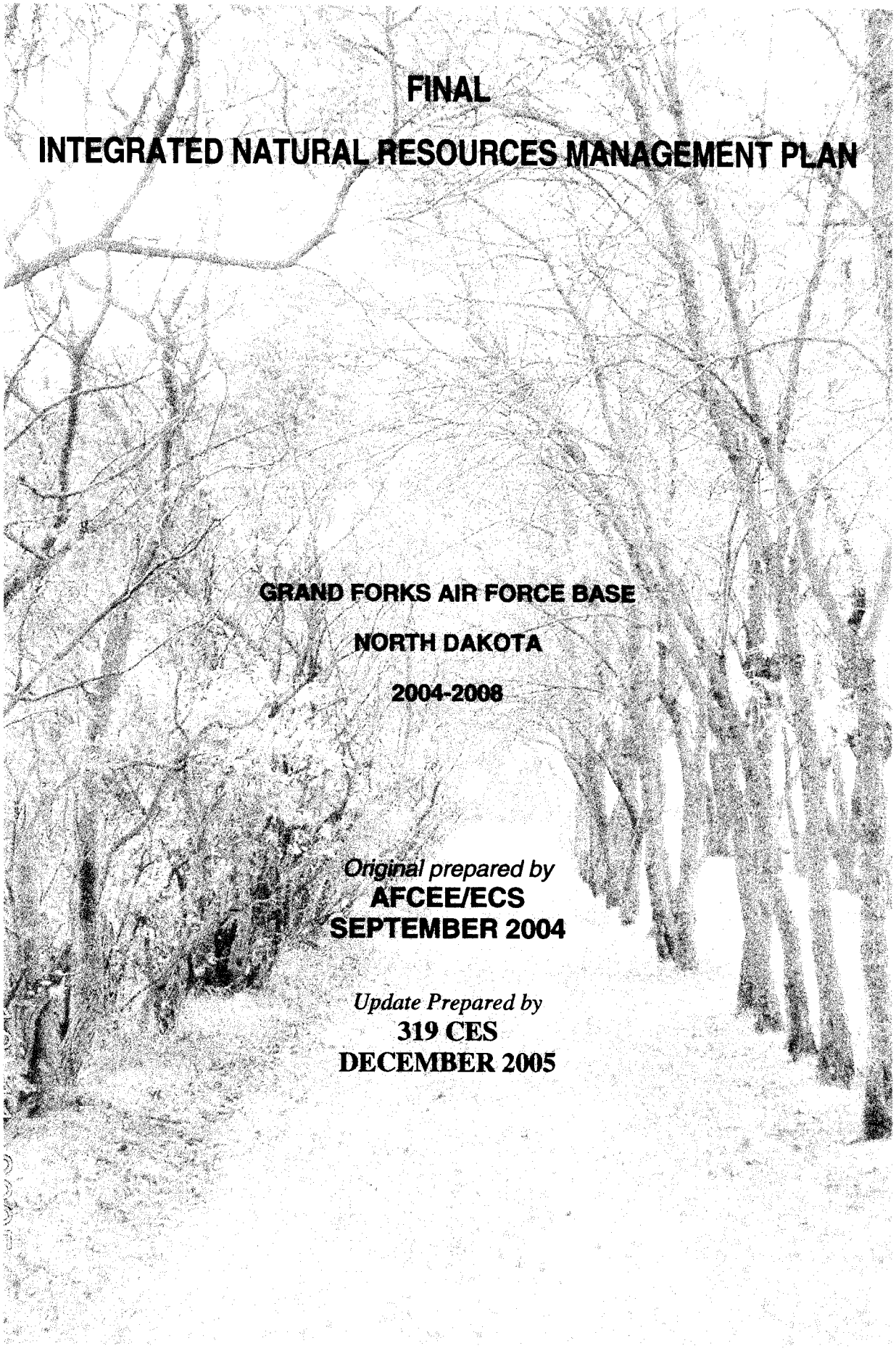
Department of the Air Force



**JOEL S. REESE, Colonel, USAF**
Commander, 319 Air Refueling Wing
Grand Forks Air Force Base, North Dakota

20 Dec 04

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Bear Educational Board
Grounds Maintenance Contract and Landscaping IDIQ Contract
Prairie View Nature Preserve Management Document
Landscape/Architectual Plan
1994 Biological Survey and Updated Biological Survey 2004
Noxious Weed Inventory and Noxious Weed Control Plan
Wetlands 2000 Delineation Report, Wetland Assessment 2004, Fire Station Wetlands 2005
Breeding Bird Survey of 2001, 2004, and Migration and Breeding Bird Survey 2005
Natural Heritage Program and USFWS T&E list and species of concern
ICRMP

## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| 319 CES/CEV | 319th Civil Engineer Squadron/Environmental Management |
| ACES-PM | Automated Civil Engineer System Project Management |
| ACC | Air Combat Command |
| ADC | Air Defense Command |
| AFB | Air Force Base |
| AFCCC | Air Force Combat Climatology Center |
| AFCEE | Air Force Center for Environmental Excellence |
| AFI | Air Force Instruction |
| AFPD | Air Force Policy Directive |
| AMC | Air Mobility Command |
| AMU | Aircraft Maintenance Unit |
| ARW | Air Refueling Wing |
| ATV | All-Terrain Vehicle |
| BASH | Bird-Aircraft Strike Hazard |
| BMX | Bicycle Motocross |
| BMP | Best Management Practice |
| CADD | Computer Aided Drafting and Design |
| CE | Civil Engineering |
| CWA | Clean Water Act |
| DoD | Department of Defense |
| DoDD | Department of Defense Directive |
| DoDI | Department of Defense Instruction |
| ECAMP | Environmental Compliance and Management Programs |
| EIAP | Environmental Impact Analysis Process |
| EPA | Environmental Protection Agency |
| EPC | Enviromental Protection Committee |
| ESA | Endangered Species Act |
| FAMCAMP | Family Camping |
| FONSI | Finding Of No Significant Impact |
| GFAFB | Grand Forks Air Force Base |
| GIS | Geographic Information Syste |
| GP | General Plan |
| GPM | Gallons Per Minute |
| gpd | Gallons Per Day |
| gpd/ft | Gallons Per Day/Foot |
| HQ USAF | Headquarters United States Air Force |
| IICEP | Interagency and Intergovernmental Coordination for Environmental Planning |
| INRMP | Integrated Natural Resources Management Plan |
| IRP | Installation Restoration Program |
| MAJCOM | Major Command |
| MFH | Military Family Housing |
| MILCON | Military Construction |
| mph | Miles Per Hour |
| MSL | Mean Sea Level |

| | |
|---|---|
| NDFGD | North Dakota Fish and Game Department |
| NDSU | North Dakota State University |
| NEPA | National Environmental Policy Act |
| NOI | Notice of Intent |
| NORAD | North American Aerospace Defense Command |
| NPDES | National Pollution Discharge Elimination System |
| NWI | National Wetlands Inventory |
| NWR | National Wildlife Refuge |
| O&M | Operation and Maintenance |
| ppm | parts per million |
| RTE | Rare, Threatened and Endangered |
| SAS | Safety Automated System |
| SHSND | State Historical Society of North Dakota |
| SMW | Strategic Missile Wing |
| START | Strategic Arms Reduction Treaty |
| STRAD | Strategic Aerospace Division |
| TCE | Trichloroethylene |
| USACE | United States Army Corps of Engineers |
| UND | University of North Dakota |
| USDA | United States Department of Agriculture |
| USFWS | United States Fish and Wildlife Service |
| WMA | Wildlife Management Area |

## TERMS AND DEFINITIONS

**Agricultural Outleasing**: The use of DoD lands under a lease to an agency, organization, or person for growing crops or grazing animals.
**Agricultural Land Improvements**: Improvements that add potential value to an agricultural outgrant such as irrigation features, fences, cattle guards, water developments, livestock enclosures and other structural improvements, as well as non-structural improvements such as seeding, fertilizing, and vegetation management.
**Airfield**: The area comprised of runways, taxiways, aprons and other adjacent land areas of an airport which are dedicated to aircraft operations.
**Alien Species**: Any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to a respective ecosystem.
**Biodiversity**: Also stated as 'Biological Diversity'. The variety of life forms, the ecological roles they perform, the genetic variability among them, and their interactions in the communities and ecosystems in which they live. Biodiversity Conservation is a land management practice whereby maintaining and establishing viable populations of all native species is a primary goal.
**Commercial Forest Land**: Land under management capable of producing at least 20 cubic feet of merchantable timber per acre a year. It must be accessible and programmed for silvicultural prescriptions. The smallest area for this classification is 5 acres. Roadside, streamside, and shelterbelt strips of timber must have or be capable of producing a crown width of at least 120 cubic feet to be classified as a commercial forest.
**Cooperative Agreement**: A written agreement between an AF organization and one or more outside agencies (federal, state, or local), conservation organizations, or individual for the planning and implementation of natural resources program requirements.
**Critical Habitat**: Any air, land, or water area and constituents thereof that the USFWS has designated as essential to the survival and recovery of an endangered or threatened species or a distinct segment of its population.
**Cropland**: Land primarily suitable for producing farm crops, including grain, hay, and truck crops.
**Ecosystem Management**: An approach to natural resources management that focuses on the interrelationships of ecological processes linking soils, plants, animals, minerals, climate, water, and topography.
**Endangered Species**: Any species which is in danger of extinction throughout all or a significant portion of its range, and has been designated for special protection and management by the Federal government pursuant to the Endangered Species Act.
**Exotic Species**: Any plant or animal not native or indigenous to a region, state, or country.
**Floodplains**: Lowland or flat areas adjoining inland and coastal waters, including areas on offshore islands, that are prone to flooding.
**Forest Land**: Land on which forest trees of various sizes constitute at least 10 percent of the area. This category includes open land that is capable of supporting trees and is planned for forest regeneration and management.
**Forest Products**: Plant materials in wooded areas that have commercial value, such as sawlogs, veneer (peeler) logs, poles, pilings, pine needles, cordwood (for pulp, paper, or firewood), fence posts, mine timber, Christmas trees (from unsheared trees cut during intermediate harvests), and similar wood or chemical products.
**Fossils**: Fossils are the hardened remains or traces of plant or animal life of some previous geological period, preserved in rock formations in the earth's crust.

**Game**: Any species of fish or wildlife for which state or federal laws and regulations prescribe hunting seasons and bag or creel limits.

**Habitat**: An area that provides the environmental elements of air, water, food, cover, and space necessary for a given species to survive and reproduce.

**Improved Grounds**: A grounds maintenance land use category used to indicate scope and intensity of land management (see Chapter 11). Includes land occupied by buildings and other permanent structures as well as lawns and landscape plantings on which personnel annually plan and perform intensive maintenance activities. Improved Grounds include the cantonment area, parade grounds, drill fields, athletic areas, golf courses (excluding roughs), cemeteries, and housing areas. Grass in these areas is normally maintained at a height of 2-4 inches during the growing season.

**Integrated Natural Resources Management Plan (INRMP)**: A plan based on ecosystem management that describes and delineates the interrelationships of the individual natural resources elements in concert with the mission and land use activities affecting the basic land management plans. Defines the natural resources elements and the activities required to implement stated goals and objectives for those resources.

**Integrated Pest Management (IPM)**: A planned program incorporating continuous monitoring, education, record-keeping, and communication to prevent pests and disease vectors from causing unacceptable damage to operations, people, property, materiel, or the environment. IPM includes methods such as habitat modification, biological control, genetic control, cultural methods, mechanical control, physical control, regulatory control, and the judicious use of least-hazardous pesticides.

**Invasive Species**: An alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health.

**Land Management Unit**: The smallest land management division that planners use in developing specific strategies to accomplish natural resources management goals. Land management units may correspond to grazing units on agricultural outleased lands, stands or compartments on commercial forest lands, various types of improved grounds (for example, athletic fields, parks, yards in family housing, or landscaped areas around administrative buildings), or identifiable semi-improved grounds (for example, airfield areas, utility rights-of-way, or roadside areas).

**Land-Use Regulation**: A document that prescribes the specific technical actions or land use and restrictions with which lessees, permittees, or contractors must comply. It derives from the grazing or cropland management plan and forms a part of all outleases, land use permits, and other contracts.

**Livestock**: Domestic animals kept or raised for food, by-products, work, transportation, or recreation.

Natural Resources Management Professional: A person with a degree in the natural sciences who manages natural resources on a regular basis and receives periodic training to maintain proficiency in that job.

**Noxious Weed**: Any plant or plant product that can directly or indirectly injure or cause damage to crops (including nursery stock or plant products), livestock, poultry, or other interests of agriculture, irrigation, navigation, the natural resources of the United States, the public health, or the environment.

**Outdoor Recreation**: Recreation that relates directly to and occurs in natural, outdoor environments.

**Outdoor Recreation Resources**: Land and water areas and associated natural resources that provide, or have the potential to provide, opportunities for outdoor recreation for present and future generations.

**Rangeland**: Land on which the native vegetation is predominantly grasses, grass-like plants, herbs, or shrubs suitable for grazing or browsing use. It includes lands revegetated naturally or artificially to provide a forage cover that is managed like native vegetation. It also includes natural grasslands, savannas, shrubland, most deserts, tundra, alpine communities, coastal marshes, and wet meadows.

**Reforestation**: The renewal or regeneration of a forest by natural or artificial means.

**Semi-Improved Grounds**: A grounds maintenance land use category used to indicate scope and intensity of land management. Grounds where periodic maintenance is performed primarily for operational reasons (such as erosion and dust control, bird control, and visual clear zones). This land use classification includes areas adjacent to runways, taxiways, and aprons; runway clear zones; lateral safety zones; rifle and pistol ranges; picnic areas; ammunition storage areas; antenna facilities; and golf course roughs. Semi-improved grounds areas are mowed less often to maintain grass height between 7-14 inches.

**Stewardship**: The management of a resources base with the goal of maintaining or increasing the resources' value indefinitely into the future.

**Threatened Species**: Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range, and has been designated for special protection and management by the federal government pursuant to the Endangered Species Act.

**Unimproved Grounds**: A grounds maintenance land use category used to indicate scope and intensity of land management. Unimproved grounds are areas not classified as 'improved' or 'semi-improved'. Unimproved grounds include weapons firing and bombing ranges; forest lands; croplands and grazing lands; grasslands or ranges; lakes, ponds, and wetlands; and any areas where natural vegetation is allowed to grow unimpeded by maintenance activities.

**Urban Forests**: Planted or remnant native tree species existing within urbanized areas such as parks, tree-lined residential streets, scattered tracts of undisturbed woodlands, and cantonment areas.

**Watchable Wildlife Areas**: Areas identified under the Watchable Wildlife Program as suitable for passive recreational uses such as bird watching, nature study, and other nonconsumptive uses of wildlife resources.

**Wetlands**: Areas inundated or saturated by surface or ground water at a frequency and a duration to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Also stated as 'Biological Diversity'. The variety of life forms, the ecological roles they perform, the genetic variability among them, and their interactions in the communities and ecosystems in which they live. Biodiversity Conservation is a land management practice whereby maintaining and establishing viable populations of all native species is a primary goal.

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# EXECUTIVE SUMMARY

This Integrated Natural Resources Management Plan (INRMP) represents a commitment by the U.S. Air Force to protect the integrity and value of the natural resources of Grand Forks Air Force Base (GFAFB).

This updated INRMP is prepared according to Air Force Instruction 32-7064, Integrated Natural Resources Management (USAF, draft July 2002), and supports the Department of Defense's (DoD) policy of managing natural resources to support the base mission while practicing the principles of multiple use and sustained yield. The INRMP integrates an interdisciplinary approach to ecosystem management with planning for the military mission. The predominating goal for natural resources planning and management is:

> *Over the long term, bring together and integrate all management activities in a way that sustains, promotes, and restores the health and integrity of ecosystems and that enhances the human environment at GFAFB, North Dakota.*

This INRMP is an integral part of the Air Force's ecosystem management program for GFAFB. The main goal of ecosystem management on GFAFB is to maintain and improve the sustainability and biological diversity of unique native ecosystems while supporting the specific military mission at GFAFB. In addition, this plan is focused on the achievement of 9 main goals found in chapter 6, and are listed below.

These goals were formulated from a comprehensive analysis of regulatory requirements, the condition of natural resources on GFAFB, and a consideration of the issues expressed by personnel during site visit interviews. This plan identifies specific objectives and projects that, if implemented, contribute to the achievement of each goal. Further implementation of the INRMP will help ensure that the military installations continue to support present and future mission requirements while preserving, improving and enhancing ecosystem integrity. Guidance from the INRMP shall improve the installation and training areas while benefiting natural resources through improvement to the flora, fauna, habitats, and protection of wetland ecosystems. General objectives of the GFAFB INRMP are:

- To outline the military mission and its effects on the natural resources on the installation;
- To recommend guidelines for the management and protection of natural and cultural resources on the installation;
- To maintain biological diversity and sustainability of the training site for mission use;
- To describe the physical characteristics of the installation; and
- To recommend solutions or procedures available to assist in the resolution of natural resource concerns as expressed by base personnel.

Chapter 7 contains a work plan to implement the goals/objectives/projects of this document, and an update of annual progress and funding shall be entered into this database. In addition, performance requirements are provided for each goal and they establish appropriate monitoring for project oversight. Monitoring the success (or failure) of INRMP projects provides an opportunity to use adaptive management on all proposed goals and objectives.

## SUMMARY OF INRMP

GFAFB has several valuable natural resource areas with the potential for protection and enhancement under the INRMP. These include the Turtle River area (Civil Engineer or CE Park), numerous wetlands, Prairie View Nature Preserve and arboretum, the sewage lagoon, and non-airfield hay leases. It also lies beneath two major migratory pathways, the Central and the Mississippi Flyways. These two flyways carry a huge percentage of all the breeding birds of North America along their routes. Migratory birds are protected by the Migratory Bird Treaty Act of 1918. GFAFB is obliged to comply with this and other laws designed to protect migratory birds, threatened and endangered species, wetlands and other natural resources while balancing the requirements of its military mission.

This INRMP describes constraints to the military mission such as Bird Aircraft Strike Hazard (BASH) and obstructions including trees on the airfield. The INRMP also describes constraints to natural resource management at GFAFB, for example, limitations to enhancement of natural areas on the base due to BASH hazards. In addition, GFAFB has degraded hay leases and a major noxious and invasive weed problem. GFAFB would also like to implement many of the natural resource and outdoor recreation programs as mandated by Air Force Instruction (AFI) such as watchable wildlife and natural resource educational projects.

Based upon the data collected from personnel interviews, document reviews, and field inspections; a list of management concerns was developed. These issues and concerns include natural resource/mission conflicts, required natural resource inventories, resource preservation or enhancement needs and opportunities, and actions dictated by Air Force natural resource management policies. The management issues and concerns were then used to develop goals and objectives for natural resource management. Each goal was subdivided into a series of objectives or practical recommendations to achieve the goal. The goals are ideals for resource management. As natural resource management is dependent upon Air Force mission, policy, available funding, and available manpower; achievement of goals is not necessarily bound to a specific schedule. Management concerns and the goals and objectives are categorized into the various areas of natural resource management, such as wildlife program management, grounds maintenance, and outdoor recreation.

The concept of ecosystem management is integral to all natural resource planning at GFAFB. Provided below are the nine major goals for implementation:

**Wetlands -** Enhance and restore wetlands and other surface waters (away from the flight line) including delineations and baseline data gathering and monitoring;

**Noxious and Invasive Species** - Eliminate noxious and invasive plant species in hay leases and other areas at GFAFB;

**Improve Efficiency and Grounds Maintenance** - Convert as much area as possible to semi-improved and unimproved to lower maintenance costs and save energy;

**Hay leases** - Improve quality of hay leases to attract lessees, increase revenue for GFAFB and be in compliance with Executive Orders requiring elimination of noxious and invasive species;

**Outdoor Recreation -** Enhance outdoor recreation opportunities to include expanding the multiuse trail, snowmobiling, all-terrain vehicles, paintball and others;

**Enhancing the Outdoor Experience** - Reduce numbers of pest species such as mosquitoes;

**Airfield Safety** - Eliminate tall-stature plant species (and noxious and invasive plants), treat and seed with airfield-compatible grass seed mixture to increase safety and biodiversity in the airfield area;

**Environmental Awareness** - Promote natural resources awareness, educational opportunities and appreciation of native wildlife and plants at GFAFB; and

**GIS/GeoBase** - Enhance and update GIS data for natural resources at GFAFB, provide annual training opportunities for GIS personnel, and update of software and equipment.

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# 1.0 GENERAL INFORMATION

## 1.1 Purpose

The purpose of the Integrated Natural Resources Management Plan (INRMP) is to serve as guidance for natural resources management at Grand Forks Air Force Base (GFAFB). The INRMP enables managers to:

- Be aware of the past, present, and projected future condition of installation natural resources;
- Identify management issues and specific concerns for each type of natural resource present;
- Understand the installation goals and objectives for the protection and enhancement of these resources; and
- Assure integration of the natural resource conservation program with the Air Force mission.

This approach to resource management attempts to balance human-centered multiple uses of the natural environment such as direct mission support, agriculture production, and outdoor recreational uses with the preservation and enhancement of ecosystem functions and the preservation of biological diversity. When fully coordinated with appropriate federal and state agencies, this INRMP fulfills the Sikes Act (16 U.S.C. 670 et. seq.) definition of a cooperative plan.

## 1.2 Authority

This INRMP, which has been approved and signed by the Wing Commander, was prepared under authority of Department of Defense Instruction (DoDI) 4715.3 (Environmental Conservation Program). It implements the requirements of Draft July 2002 Air Force Instruction (AFI) 32-7064 (Integrated Natural Resources Management) and Air Force Policy Directive (AFPD) 32-70 (Environmental Quality).

Guidance for the development of the INRMP is provided by AFI 32-7064, Integrated Natural Resources Management, which explains how to manage natural resources on Air Force property in compliance with federal, state and local legislation and requirements. AFI 32-7064 implements the following directives:

- AFPD 32-70, *Environmental Quality*
- DoDI 7310.5, Accounting for Production and Sale of Forest Products (25 January 1988)
- DoDI 4715.3, *Environmental Conservation Program*
- The Sikes Act, P.L. 99-561 as amended, and 16 USC 670 *et seq.*
- AFI 32-7064, Integrated Natural Resources Management, August 1997
- AFI 32-7064, Integrated Natural Resources Management, July 2002 (Draft)

AFPD 32-70, *Environmental Quality* (20 July 1994) and DoDI 4715.3, *Environmental Conservation Program* (3 May 1996) states that natural resources at military installations will be managed through effective planning. In AFPD 32-70, the Deputy Undersecretary of Defense (Environmental Security) states "ecosystem management of natural resources draws on a collaboratively developed vision of desired future ecosystem conditions that integrates ecological, economic, and social factors." To effectively integrate ecological, economic, and social factors along with the military mission into an effective ecosystem management program, the policy directive further states: "On installations, ecosystem management will be achieved by developing and implementing INRMPs and insuring that they remain current." AFI 32-7064,

Integrated Natural Resource Management, implements these directives by establishing the INRMP as the primary planning document for natural resources at Air Force Installations.

Figure 1.2-1 is an overview of the integrated natural resources planning process summarized from AFI 32-7064, beginning with identification of resources and concluding with plan implementation and monitoring. For this INRMP, a similar process was used and is shown in Figure 1.2-2.

## 1.3 Plan Development Philosophy

This INRMP is based on existing information on the biotic and abiotic environments, mission activities, and environmental management practices on GFAFB. Information was obtained from a variety of base documents, interviews with base personnel, and on-site observations. Management issues and concerns as well as goals and objectives detailed in this INRMP were developed from an analysis of all the gathered information, and they were reviewed by base personnel involved with and/or responsible for various aspects of natural resources management. Throughout the INRMP, emphasis is placed on the role of GFAFB in maintaining healthy and functional ecosystems at the local as well as regional level. Regulatory requirements such as those associated with the Endangered Species Act (ESA), the Clean Water Act (CWA), and other natural resource legislation were primary considerations in establishing management practices. However, in keeping with the guidance of AFI 32-7064, management recommendations moving beyond basic regulatory compliance were also developed to enhance ecosystem functioning as well as to enhance human use of the natural environment on GFAFB.

This INRMP was developed through an interdisciplinary approach that included interviewing various GFAFB personnel knowledgeable about base operations and collaborating with natural resource specialists familiar with the existing ecology and other quality of life aspects. Inputs during INRMP development were obtained from state and federal agencies involved in natural resources and other environmental regulatory areas to ensure comprehensiveness.

## 1.4 Plan Maintenance Implementation and Revisions

The office of primary responsibility for maintaining this INRMP is the Environmental Management Flight. The Environmental Protection Committee (EPC) has reviewed and approved this document, and the Wing Commander has signed it. Wing Commander must approve changes to the INRMP. Major Command (MAJCOM) reviews drafts. The overall INRMP is effective for five years from the date of approval; however, as a living document, the designated natural resources manager within the Environmental Management Flight will review this plan annually. In addition, 16 U.S.C. § 670a(1)(B) of the Sikes Act states:

"Integrated natural resources management plan - to facilitate the program, the Secretary of each military department shall prepare and implement an integrated natural resources management plan for each military installation in the United States . . ."

Individual projects described in Chapter 7 will be revised annually during preparation of the GFAFB environmental budget. Annual updates of this INRMP will be coordinated with all appropriate base organizations through the EPC.

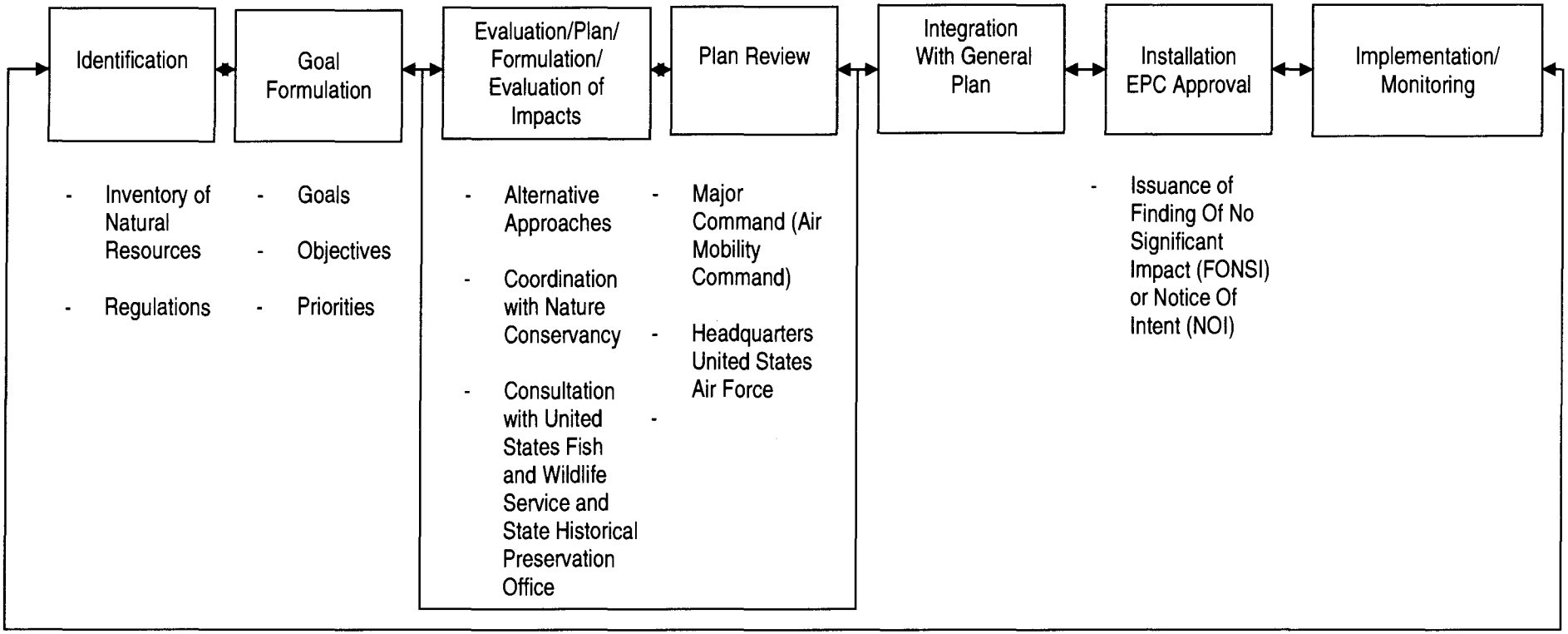



**Figure 1.2-1 Integrated Natural Resources Planning Process**

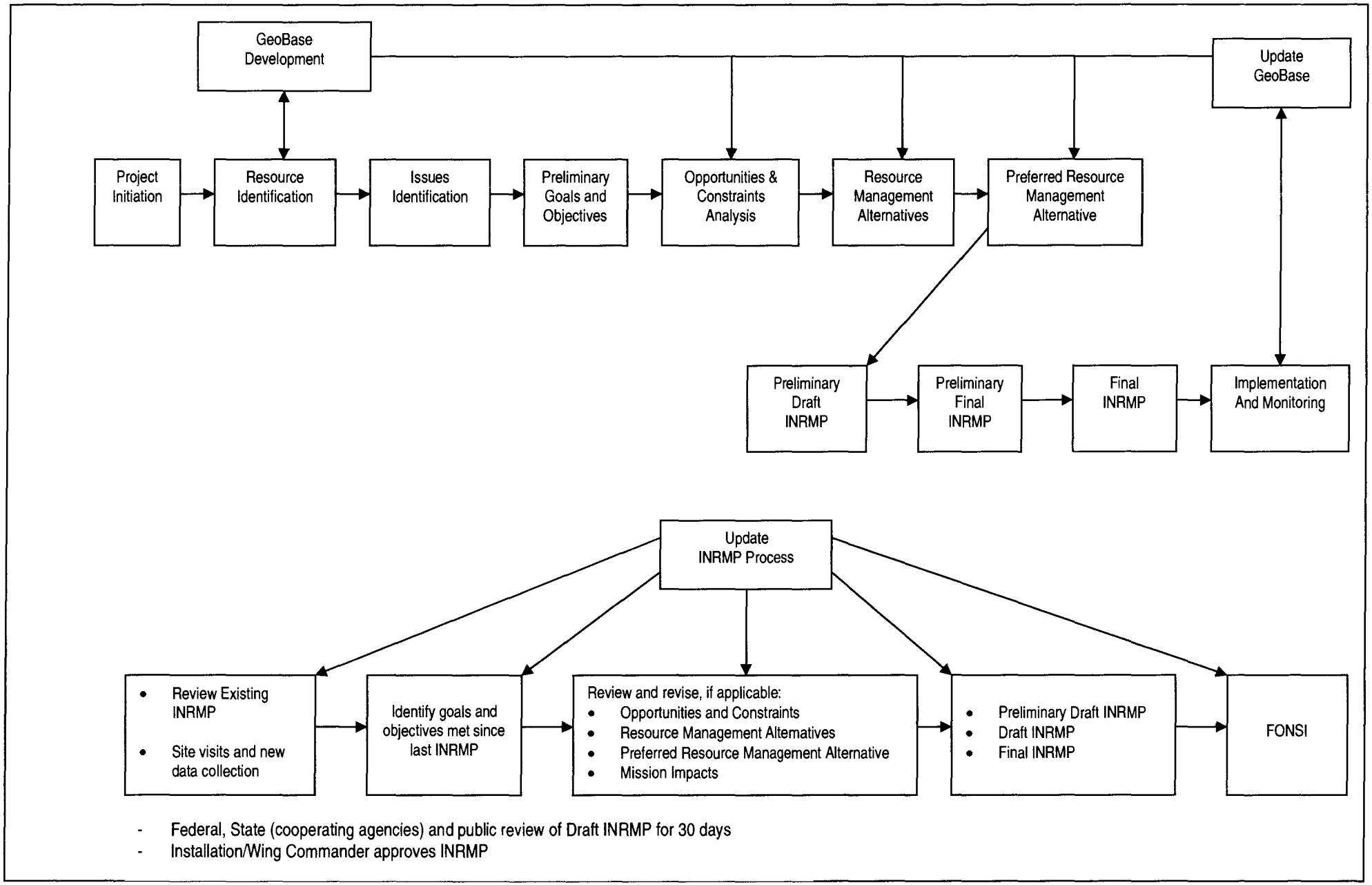





**Figure 1.2-2 INRMP Preparation and Update Process for GFAFB, ND**

## 1.5 Integration of the INRMP with the General Plan

INRMPs are prepared in cooperation with the United States Fish and Wildlife Service (USFWS) and appropriate state fish and wildlife agencies that have jurisdiction in the state in which the installation is located. The USFWS and the state of North Dakota should be involved early in the scoping, design and preparation of the INRMP. After the draft INRMP has received initial Air Force approval, it goes out to the USFWS and state agencies for their review and comments. The INRMP will reflect the mutual agreement of the USFWS and the state concerning the conservation, protection and management of fish and wildlife and other natural resources. In addition, the INRMP is made available to the public for a 30-day review and comment period. After receiving all comments and the incorporation of relevant edits, the final INRMP is signed by the installation or Wing Commander, the regional director of the USFWS and the commissioner of the North Dakota Game and Fish Department.

The INRMP is a component of the General Plan for GFAFB. This integration process enables a commander to logically and comprehensively analyze factors affecting the development of the base and evaluate alternative solutions to identified limitations. As stated in AFI 32-7064, "comprehensive planning incorporates operational, environmental, urban planning, and other Air Force programs to identify and address development alternatives and ensure compliance with applicable federal, state and local laws, regulations and policies." The INRMP is not intended to supercede existing detailed plans but is designed to augment and consolidate the information contained in those plans, and be an integral part of the Base General Plan. The INRMP presents the various natural resource management issues and a management approach to protecting resources while accommodating land uses and activities vital to the base mission.

This plan is a dynamic document that strives to integrate all aspects of natural resources management with each other and the rest of the installation's mission. Its goals and specific objectives must be given consideration early in the planning process to accommodate potential project and mission changes that may occur on the installation. To achieve this end, the INRMP will be incorporated by reference into the GFAFB General Plan (GP). Ideally this INRMP will be integrated with the GP such that whenever the INRMP maps and associated databases are updated, the GP maps will also be updated.

The INRMP is to be considered in all planning at GFAFB, and is intended to provide guidance for natural resource management for the 5-year period 2004 through 2008.

The goals and objectives of the plan will be reviewed and taken into account by the Air Force whenever planning or development projects and mission changes are proposed. The INRMP is to be reviewed regularly and updated as new information and policies that apply to natural resource management are made available. This INRMP is to be comprehensively reviewed and updated at least once every 5 years. This process will allow the plan to remain up to date and effective in managing natural resources at GFAFB. Additionally, the INRMP relies upon the GIS, which contains resource and planning maps prepared specifically for GFAFB and this INRMP. This data should likewise be kept up to date to further enhance the plan's effectiveness.

Updates will also be required in the event of a major mission change or in the event that a significant new resource is identified on the base, such as the discovery of a protected species. Interim requests for a plan revision may be submitted at any time to the natural resources manager within the Environmental

Management Flight. The natural resource manager has primary responsibility for natural resources management and coordinated the development of this plan. The natural resource manager will also review the proposed revisions to the INRMP and, when necessary, recommend changes to the Installation Commander. All changes to the plan over the 2004-2008 period are to be circulated for review and comment to all users of the INRMP. Appendix 1, Annual Updates to the INRMP, provides a worksheet to keep track of all updates to the INRMP.

## 1.6 Scope and Structure of the Plan

The INRMP includes 9 chapters, a list of acronyms, and 11 appendices. The scope and structure of the INRMP are described below.

Chapter 1, *General Information.* This chapter provides: the purpose of the INRMP; a description of the authority under which the INRMP was developed, including a description of the planning process involved in developing this INRMP and a description of the INRMP preparation and updating process; the plan development philosophy describing the manner in which the INRMP was developed; the INRMP maintenance implementation and revisions process, the interface of the INRMP and the General Plan and the compatibility requirements between these two documents; and a description of the scope and structure of this plan.

Chapter 2, *Installation Location and Mission.* This chapter provides: a description of the location of GFAFB in relation to its surroundings in North Dakota; the installation history of GFAFB since its establishment in 1956; GFAFB's current mission; a community profile of the base and its surroundings; and, a description of the local and regional natural areas within a 5-to-10 mile radius.

Chapter 3, *General Physical Environment.* This chapter provides: a comprehensive summary of the climate in the GFAFB area and region; information on the general distribution of GFAFB lands; a description of the Central Lowlands topography in which GFAFB is located; a description of the geology of the Grand Forks area; a comprehensive description of the soils at GFAFB; a description of the hydrology (groundwater, watersheds, wetlands, impoundments and surface drainage) in Grand Forks County and the immediate area of GFAFB.

Chapter 4, *General Biotic Environment.* This chapter provides: a description of both historic and current vegetative cover at GFAFB, which is within the Bluestem Prairie region; a description of the trees and other woody vegetation (the most prevalent is a floodplain species); a description of the turf and landscapes areas at GFAFB, including the base golf course; a brief description of the native fauna, which is minimal at GFAFB; a description of the bird-aircraft strike hazard (BASH) program and current BASH concerns; a description of vertebrate pest species potentially affecting aircraft operations, other than those discussed in the BASH program; a description of invertebrate pests and their current management approach; and a description of threatened, endangered and special interest species within Grand Forks County.

Chapter 5, *Natural Resources Program Management and Issues.* This chapter provides GFAFB natural resource goals and suggested management information and concerns associated with natural resource management of the following resources: water, wildlife management, threatened and endangered species, hunting, wildlife control, wildlife habitat improvement, watchable wildlife, grounds maintenance, agricultural outleasing, outdoor recreation; integrated pest management, BASH, natural resource education and

awareness; identification, classification and mapping of natural resource management and cultural resources.

Chapter 6, *Goals and Objectives*: This chapter provides a listing of all nine goals with objectives and projects identified for each goal to be implemented.

Chapter 7, *Implementation and Work Plan*: This chapter provides an implementation plan that addresses requirements necessary to implement those goals and objectives addressed in Chapter 6. The implementation plan may also be used as a work plan by the natural resources manager and other planners to obtain funding, prepare scopes of work, and to develop mitigation and monitoring plans for all projects.

Chapter 8, *Environmental Assessment.* This chapter provides a description of the Air Force's Environmental Impact Analysis Process (EIAP) which ensures that potential environmental concerns are considered as early as possible in the Air Force planning process; a description of the Purpose and Need for implementing the GFAFB INRMP; a description of the public and state and federal agency involvement process; a listing of relevant environmental laws and regulations, including AFIs; a description of the proposed action and alternatives, which includes a complete listing of all the proposed objectives of the GFAFB INRMP; and an environmental analysis of proposed impacts to the implementation of the GFAFB INRMP.

Chapter 9 *Bibliography and List of Preparers:* This chapter provides a bibliography for the initial 1997 INRMP and the 2004 INRMP Update; and a listing of GFAFB personnel, Air Force Center for Environmental Excellence (AFCEE) program manager, and contractor support involved in the development of the 1997 INRMP and the 2004 renewal.

The GFAFB INRMP provides 9 appendices:

- Appendix A: North Dakota State University, North Dakota Extension Service: Dutch Elm Disease Information
- Appendix B: Control of Beaver Damage
- Appendix C: Interagency and Intergovernmental Coordination for Environmental Planning (IICEP) Correspondence
- Appendix D: State and Federal Depredation Permits
- Appendix E: Prescribed Burning Guidelines
- Appendix F: Annual INRMP Update Worksheet
- Appendix G: Bow Hunting for Deer Instruction
- Appendix H: Air Force Hay Lease for GFAFB
- Appendix I: Bird-Aircraft Strike Hazard Plan

## 1.7 Air Force Natural Resource Management Responsibilities

| Group | Squadron | Flight/Staff | Responsibilities |
|---|---|---|---|
| Wing Staff | | Vice Commander | Chairman, EPC |
| | | Judge Advocate | Regulatory Interpretation<br>Off-Base Disputes/Complaint Resolution<br>Legal Representation |
| Medical Group | | Flight Safety | BASH Monitoring and Minimization (on and off base) |
| | | Bioenvironmental Engineer | NPDES* Storm Water Quality Monitoring<br>NPDES Wastewater Discharge Monitoring |
| | | Military Public Health | Zoonosis Monitoring<br>Mosquito Population Monitoring |
| Operations Group | Operations Support | Airfield Management | Airfields Grounds Maintenance (mowing)<br>Clear Zone Tree Removal<br>BASH Monitoring and Minimization |
| Mission Support Group | Civil Engineering | Base Civil Engineer | Secretary, Environmental Protection Committee |
| | | Engineering | Storm Water/Erosion Control and Landscaping<br>Specifications for New Construction |
| | | Housing | Grounds Maintenance in Housing areas |
| | | Operations | Oil/Water Separator Maintenance<br>General Grounds Maintenance<br>Environmental Controls |
| | | Environmental | Natural Resources Management<br>Hazmat/Hazwaste Management<br>Installation Restoration Program<br>Air Quality Monitoring/Compliance<br>Environmental Impact Assessment Process<br>Storm Water Management<br>Pollution Prevention |
| | Security Police | | Deer Removal From Airfield |
| | Services | Golf Course | Golf Course Grounds Maintenance |
| | | Outdoor Recreation | Family Camp (FAMCAMP)<br>Outdoor Recreation Equipment Rental/Check Out |

*National Pollutant Discharge Elimination System

# 2.0 INSTALLATION LOCATION AND MISSION

## 2.1 Location and Area

GFAFB is located on approximately 4,830 acres of land in the central portion of rural Grand Forks County, North Dakota (Figure 2.1-1 and Figure 2.1-2). The base occupies portions of Mekinock and Blooming Townships near the town of Emerado, North Dakota. The Mark Andrews Airport serving the City of Grand Forks is located eight miles to the east of the installation. The City of Grand Forks itself is approximately 15 miles east of the base. Primary highway access to the base consists of U.S. Highway 2, along the southern boundary of the base, and North Dakota County Road B-3, that borders the base on the east.

The rich black fertile farmland and commerce associated with the rivers made the area attractive to early settlers and thus the Red River Valley became one of the leading agricultural regions of the world and the City of Grand Forks became a crossroad for trade between the plains of North Dakota and the forests of Northern Minnesota.

The north to south aligned airfield divides GFAFB. The main cantonment area is located on the eastern side of the airfield. All housing, outdoor recreation spaces, medical facilities, community uses, and administration are located in this area. The primary land use west of the airfield is open space. Mission and industrial uses are found in close proximity to the airfield within both sections of the base.

## 2.2 Installation History

GFAFB was established in 1956, when a 4,830-acre agricultural area was chosen as the site of the base, west of the city of Grand Forks, North Dakota. It was during this Cold War period that the DoD announced plans to build an Air Defense Command (ADC) fighter-interceptor base in North Dakota. This new base was to also accommodate Strategic Air Command (SAC) bombers and tankers.

The 478th Fighter Group was activated at GFAFB in February 1957, serving as the host unit for the fighter-interceptor squadron, an air defense sector operation, and SAC units. Later during the same year, the ADC activated the Grand Forks Defense Sector of the North American Air Defense Command (NORAD) that, by 1959, was responsible for air space in three states and one Canadian province. During the same time that NORAD was being established, the 4133rd Strategic Wing was activated as a SAC tenant unit at Grand Forks, accompanied by the first KC-135 Stratotankers in the early 1960s.

During 1960, the 18th Fighter-Interceptor Squadron with F-101 Voodoo aircraft was transferred to GFAFB, and the 478th Fighter Group was redesignated the 478th Fighter Wing. In 1963, in response to receiving the first B-52 Stratofortresses and to the deactivations of the Grand Forks Air Defense Sector and the 478th Fighter Wing, the 4133rd Strategic Wing was deactivated and SAC assumed command of the base under the 319th Bombardment Wing (Heavy). With the new command, more changes occurred at the base, and the 804th Combat Support Group was activated, assuming host duty responsibilities. The nation's first Minuteman II intercontinental ballistic missile wing, 321st Strategic Missile Wing (SMW), was established at GFAFB, and began operations late in 1966 as part of the 4th Strategic Aerospace Division (STRAD).

Host duties for GFAFB were transferred to the 321 SMW in 1971 when construction began at the base to upgrade to Minuteman IIIs and the 804th Combat Support Group was deactivated. In the mid-1980s, the 319th Bombardment Wing phased out B-52s and began flying B-1B Lancer aircraft. The 42nd Air Division

was transferred to GFAFB, assuming host duty responsibilities until 1991. In 1991, the 42nd Air Division was inactivated and the 319th Bombardment Wing renamed the 319th Bomb Wing assumed host unit responsibilities when GFAFB was transferred to the newly established Air Combat Command (ACC). The 321st Missile Group remained as a tenant unit with responsibilities for the Minuteman III missiles.

In 1993, the base was transferred to the Air Mobility Command (AMC). This change resulted in activation of the 319th Air Refueling Wing as host unit, and redesignation of the 319 Bomb Wing to a tenant unit—the 319th Bomb Group which, in turn, was deactivated in 1994 when the last B-1B was transferred from GFAFB.

The 321st Missile Group was realigned in 1998. The Minuteman III missiles were transferred to Malmstrom AFB, Montana and Hill AFB, Utah. Currently the primary mission of GFAFB is air refueling under the 319th Air Refueling Wing. The last 321st Missile Group launch facility was demolished under the Strategic Arms Reduction Treaty (START) in August 2001. A launch facility, N-33, and a Missile Alert Facility, O-0, are being turned over to the State Historical Society of North Dakota for static display.

## 2.3 Current Military Mission



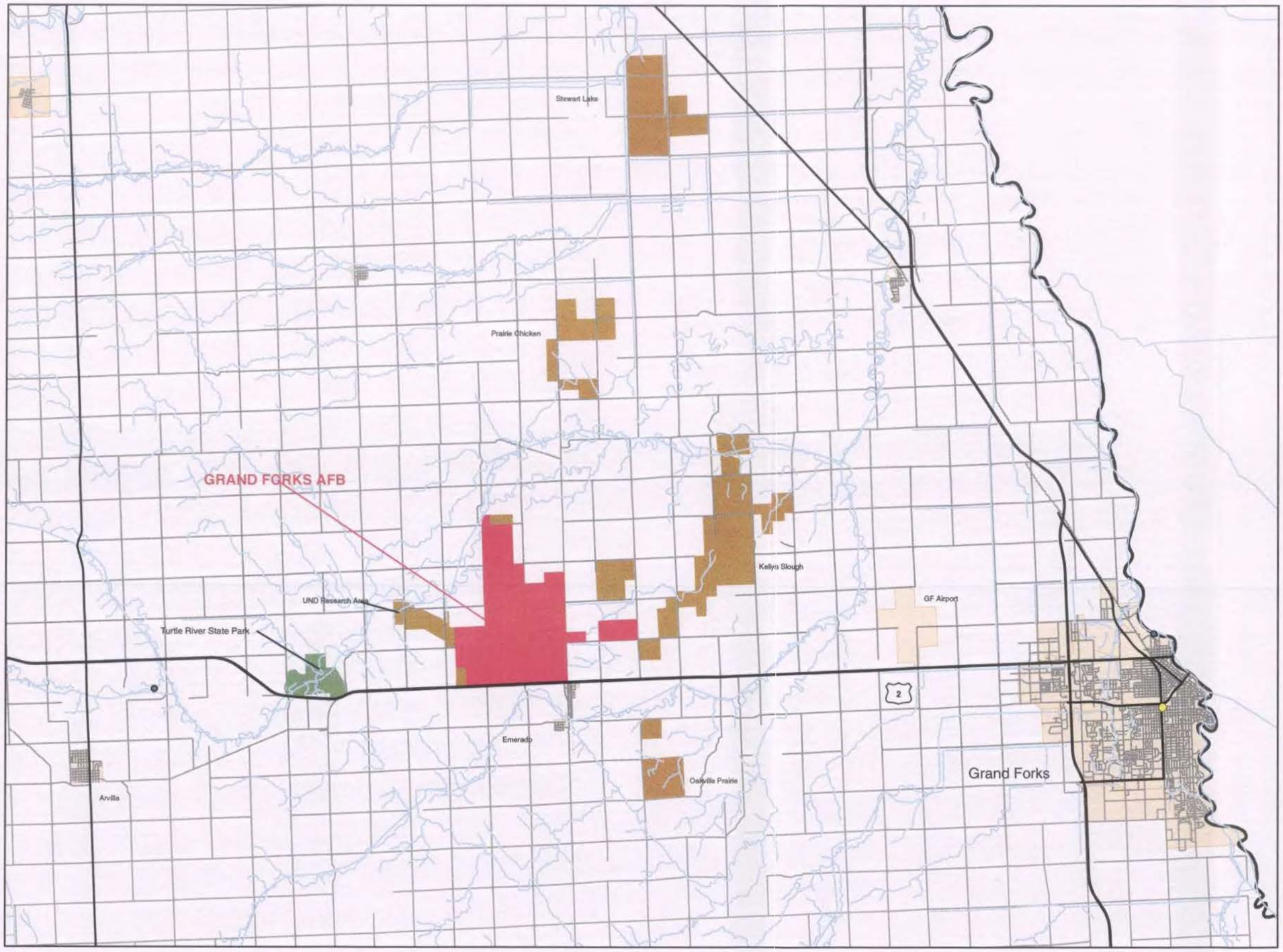

The 319th Air Refueling Wing (ARW), which serves as the host wing, maintains its mission as the first core-refueling wing in the AMC, and guarantees global reach and extended range in the air. The 319 ARW's worldwide mobility operation utilizes KC-135R Stratotankers and provides air refueling, airlift requirements and support to nuclear deterrent teams. The 319 ARW supports global contingency and conventional operations as well as support functions for the AMC's major weapon system. The host unit is comprised of a Mission Support Group, Medical Group, Maintenance Group and Operations Group.

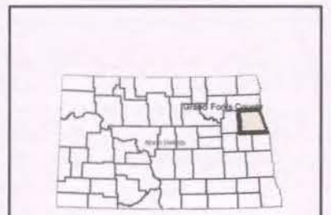
## 2.4 Community Profile

The area immediately surrounding the base is rural. Four small farming communities, Emerado, Arvilla, Honeyford, and Mekinock are located within 5 miles of the base. Of these communities, only Emerado (2000 Census population, 510) is incorporated. Grand Forks County had a 3.2 percent decrease in population since 1990, to a population of 66,109 (2001 census statistics). The decrease in population can be attributed in part to the major flood that occurred in the city of Grand Forks in 1997. Today, Grand Forks, ND (2000 population 49,321), is considered to be one of the most metropolitan areas in the state. The 2000 median household income for Grand Forks County is $34,194.

Cash crops in this agricultural region include sugar beets, soybeans, corn, barley, spring wheat, and oats. The valley ranks first in the nation in the production of potatoes, spring wheat, sunflowers, and durum wheat. Manufacturing in the Grand Forks area is predominately agriculturally related food-processing industries.

According to the *Grand Forks AFB Snapshot* dated 21 January 2004 and the *319 Air Refueling Wing Fact Card*, base population is 5,714 with approximately 70 percent (3,998) living on-base. The active duty strength is approximately 3000 with 300 civilian employees. There are about 417 officers and 2,526 enlisted personnel. Ethnic groups are white or Caucasian, 2,262, African-American, 293 and other groups




KEY MAP

N

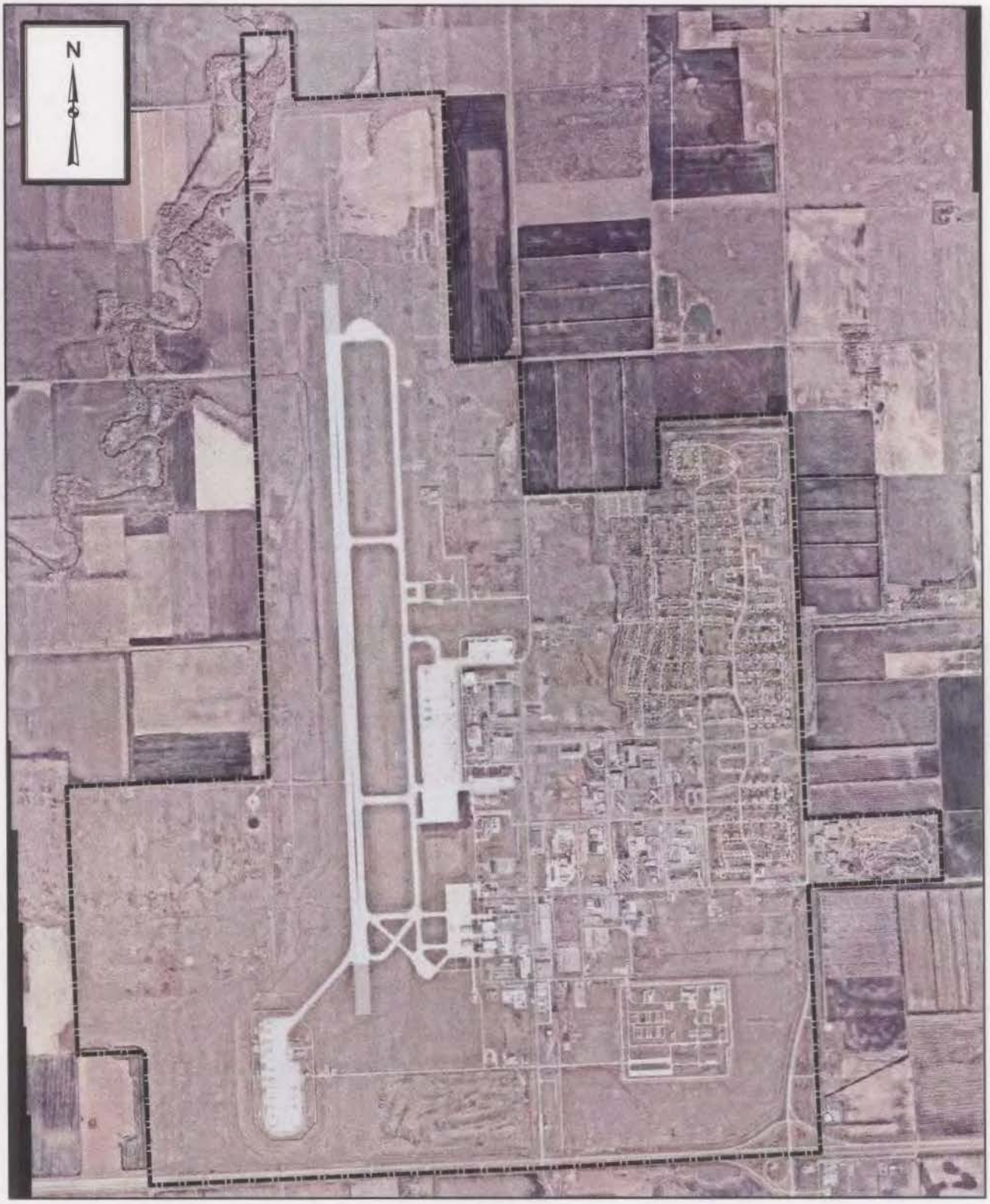
Installation Boundary
Wildlife Management Areas
Parks
Streams
Grand Forks County

0 0.5 1 2 3 Miles

FIGURE 2.1-1
VICINITY MAP

2004 INRMP
GRAND FORKS AFB, ND

| | |
|---|---|
| DATE: SEPTEMBER 2004 | |
| REV. No.: DECEMBER 2005--KR | DRAWN BY: MS |




| Date: September 2004 | Drawn By: MS | GRAND FORKS AFB INRMP | FIGURE 2.1-2 AERIAL PHOTOGRAPH OF GFAFB AND VICINITY |
|---|---|---|---|
| Contract No.: | | | 0 900 1,800 3,600 Feet |

225. About 20 percent of the active duty force is women. Capital assets are as follows: buildings and property are valued at $442,970,939; and land is valued at $588,677 for a total of $443,559,616. The base spends about $15,264,600 on maintenance and upkeep including snow removal, housing maintenance, refuse collection and utilities. The base's annual payroll by classification and housing location is approximately $141,569,512 million. Recent awards include Air Force Outstanding Unit, Solano Trophy for Best Active Duty Wing, Commander-in-Chief's Installation Excellence Award, Special Recognition Category and others.

## 2.5 Local and Regional Natural Areas

Several natural areas maintained by the state or federal government are located within 5 to 10 miles of GFAFB. The largest area is Kellys Slough National Wildlife Refuge (NWR) approximately 3 miles northeast of the main base. This 1,620-acre wetland area is managed by the USFWS and serves as a major stopover point for migratory waterfowl, provides breeding habitat for several bird species, and is an excellent bird watching location within the region. Birds observed at Kellys Slough NWR during the 2003 site visit include western and eastern kingbirds, barn and other swallow species, waterfowl such as white pelicans, geese and duck, and shorebirds. Treated lagoon-wastewater and storm water from eastern and southern portions of the installation discharge into a western reach of Kellys Slough NWR. The slough drains northeast to the Turtle River.

On 20 July 2003, a shorebird conservation group recognized Kellys Slough NWR west of the city of Grand Forks as a regional site of the Western Regional Shorebird Reserve Network. The designation is a result of the huge numbers of shorebirds that utilize the refuge. According to Kellys Slough NWR manager, the designation requires an area to host at least 20,000 shorebirds annually or five percent of a species' flyway population based on peak counts. University of North Dakota (UND) research studies have shown the population at Kelly's Slough NWR easily meets that minimum, providing habitat for 26,000 to 43,000 individuals of various species of shorebirds each year.

In addition to bird watching, other recreational opportunities at Kelly's Slough NWR have traditionally centered on waterfowl hunting within the waterfowl production areas surrounding refuge lands. New facilities currently under development at Kellys Slough include a self-guided auto tour with posted observation areas and two self-guided hiking trails within the refuge area. No significant fisheries are present although bow fishing for carp is popular in the waterfowl production areas.



***Turtle River State Park***

The UND owns a parcel of land adjacent to the western portion of the base in Mekinock Township. This parcel runs northwestward. DoD originally purchased this land when the base was first established and a northwest/southeast runway was planned in addition to the current north/south runway. When this alternate runway was not constructed, the land was sold to the UND. Currently, the land between the base boundary and West 28th Street to the west has been left to revert to "naturalized" grassland. It was not seeded nor is it managed for native tallgrass prairie species, and various invasive shrubs are scattered throughout the area. UND uses this land for field biology studies and leases the remainder west of West 28th Street for agricultural production.

Turtle River State Park, which is approximately 6 miles west of GFAFB on the Turtle River, contains approximately 784 acres of diverse habitat including upland hardwoods, wetlands, and prairie remnants. Turtle River State Park offers the greatest variety of outdoor recreational opportunities in the immediate GFAFB area. Facilities at the park include: campsites with hookups, picnic areas, a day-use lodge, rustic cabins for use during the summer months, nature trails, interpretive programs, trail biking, cross-country skiing, and sledding. Fishing for stocked rainbow trout in the Turtle River is available from spring through fall. An abundance of small mammals as well as deer make the area ideal for wildlife viewing.

Larimore Dam Recreation Area and Campground is located north of Turtle River State Park. This facility on the Turtle River has a swimming beach and provides opportunities for boating, fishing, camping, and picnicking. The Bremer Nature Trail and the Myra Arboretum are also a part of this outdoor recreational area.

Just north of Mekinock, there is a Prairie Chicken Wildlife Management Area (WMA) consisting of 1,160 acres. The WMA provides habitat not only for the uncommon and declining prairie chicken, but also for deer, sharp-tailed grouse, and other upland species. Its purpose is for the reestablishment of prairie chickens in the area. Due to the grouse's similarity in appearance to the prairie chicken, neither bird is hunted in the following areas: southeastern North Dakota east of State Highway 32, north of State Highway 11, and south of the Sheyenne River, and an area in Grand Forks County bordered on the east by the Red River, the south by US Highway 2, the west by State Highway 18 and the north by the Walsh and Grand Forks County line.



***Red-tailed Hawk***

From the standpoint of landscape ecology, the narrow, wooded Turtle River corridor, which extends from Turtle River State Park past GFAFB and on eastward past Kellys Slough, is probably the most important link connecting natural ecosystems in the immediate GFAFB area. The river and its wooded banks serve as both habitat and as a corridor for native wildlife, such as the red-tailed hawk shown at left, in an otherwise relatively inhospitable agricultural area.

# 3.0 GENERAL PHYSICAL ENVIRONMENT

## 3.1 Climate

GFAFB has a humid continental climate. The Northern Plains are characterized by frequent and drastic weather changes. The climate is typified by short, humid summers with frequent thunderstorms, and by long, severe winters associated with almost continuous snow cover. The spring and fall seasons are generally short transition periods. The average annual temperature for GFAFB is 40°F and monthly mean temperatures vary from 6°F in January to 70°F in July. The highest and the lowest daily temperatures ever recorded in North Dakota occurred in the same year and were 121°F in July and - 60°F in February of 1936. On the average there are 12 days per year with maximum temperatures greater than 90°F. The mean minimum temperature is -1°F occurring in January. The average number of days with freezing temperatures is 175 per year, of which 44 days are below 0°F. Table 3.1-1 provides climate data for GFAFB.

Mean annual precipitation recorded at GFAFB is 19.5 inches. Rainfall is generally well distributed throughout the year, with summer being the wettest season and winter the driest. The maximum rainfall recorded in a 24-hour period was 3.1 inches. An average of 34 thunderstorm days per year is recorded at GFAFB with some of these storms being severe and accompanied by hail and tornadoes. Mean annual snowfall recorded at GFAFB is 40 inches. Mean monthly snowfall ranges from 1.6 inches in October to 8.0 inches in March, while the maximum 24-hour snowfall record over the past 35 years is 12.4 inches.

**Table 3.1-1 Climate Data for GFAFB, ND**

| Month | Mean Temperature (°F) Daily | | | Precipitation (Inches) Monthly | | |
|---|---|---|---|---|---|---|
| | Maximum | Minimum | Monthly | Mean | Maximum | Minimum |
| January | 15 | -1 | 6 | 0.7 | 2.4 | 0.1 |
| February | 21 | 5 | 13 | 0.5 | 3.2 | 0.0 |
| March | 34 | 18 | 26 | 1.0 | 2.9 | 0.0 |
| April | 53 | 32 | 41 | 1.5 | 4.0 | 0.0 |
| May | 69 | 47 | 56 | 2.5 | 7.8 | 0.5 |
| June | 77 | 56 | 66 | 3.0 | 8.1 | 0.8 |
| July | 81 | 61 | 70 | 2.7 | 8.1 | 0.5 |
| August | 80 | 59 | 67 | 2.6 | 5.5 | 0.1 |
| September | 70 | 49 | 57 | 2.3 | 6.2 | 0.3 |
| October | 56 | 37 | 44 | 1.4 | 5.7 | 0.1 |
| November | 34 | 20 | 26 | 0.7 | 3.3 | 0.0 |
| December | 20 | 6 | 12 | 0.6 | 1.4 | 0.0 |

Source: Air Force Combat Climatology Center (AFCCC), October 1998

Relative humidity at GFAFB averages 58 percent annually. Highest humidities are recorded in the early morning with an average at dawn of 76 percent. The average humidity at midday in spring is generally less than 50 percent; and during the rest of the year it averages 52 percent. Mean cloud cover is approximately 48 percent during the summer and 56 percent in winter. On the average, some fog is encountered at GFAFB 72 days per year.

Wind speed at GFAFB averages approximately 10.4 miles per hour (mph); however, a maximum wind speed of approximately 73.7 mph has been recorded. Wind direction is generally from the northwest during the late fall, winter, and spring, and from the southeast during the summer.

For agricultural purposes, growing degree days (GDD) are heat units developed to more accurately rate crop and agricultural pest insect development and maturity. The growth rates of insects and plants are dependent upon the amount of heat the organism receives. Each species, whether a crop, weed, insect, or disease organism, is adapted to grow best over certain minimum temperatures and essentially ceases growth at its own maximum temperature. GDD are based on the number of growing degree days between emergence date and physiologic maturity of a species. Growing degree days vary in North Dakota from 2,400 GDDs in southeastern areas to 1,900 GDDs in the northern areas. GDDs vary for each type of crop and the part of the state in which it is grown.

## 3.2 General Distribution of Base Lands

The main base area encompasses 4,830 acres. The sewage lagoon consists of 320 acres. Improved grounds, consisting of all covered areas (under buildings and sidewalks), land surrounding base buildings, the 140-acre golf course, recreational ball fields, and the family housing area encompass 927.3 acres. Semi-improved grounds, including the airfield, fence lines and ditch banks, skeet range, and riding stables account for 971.9 acres. The remaining 1,574.7 acres of the installation consist of unimproved grounds. Unimproved areas include woodlands, open space, and wetlands. The four lagoons used for the treatment of base wastewater are also considered unimproved acreage. Agricultural outleased land is also classified as unimproved. Grounds maintenance categories are shown in Figure 3.2-1 and general land use is shown in Figure 3.2-2.

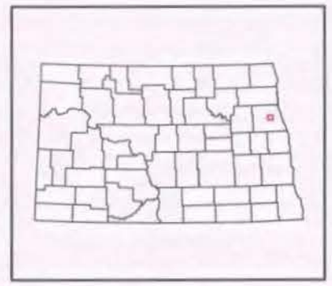
## 3.3 Topography

GFAFB is located within the Central Lowlands physiographic province. The topography of Grand Forks County and the entire Red River Valley is largely a result of the former existence of Glacial Lake Agassiz, which existed in this area during the melting of the last glacier about 12,000 years ago. The eastern four-fifths of Grand Forks County, including the base, lies in the Agassiz Lake Plain District, which extends westward to the Pembina escarpment in the western portion of the county. The escarpment separates the Agassiz Lake Plain District from the Drift Plain District to the west. Glacial Lake Agassiz occupied the valley in a series of recessive lake stages, most of which were of sufficient duration to produce shoreline features inland from the edge of the lake. Prominent physiographic features of the Agassiz Lake Plain District are remnant lake plains, beaches, inter-beach areas, and delta plains. Strandline deposits associated with fluctuating lake levels are also present, and are indicated by narrow ridges of sand and gravel that typically trend northwest to southeast in Grand Forks County. Figure 3.3-1 shows elevation at GFAFB.

The elevation of the lake plain district ranges from about 1,160 feet above mean sea level (MSL) along the escarpment to about 800 feet MSL in the northeast corner of the county.

GFAFB lies on a large lake plain in the eastern portion of Grand Forks County. The lake plain is characterized by somewhat poorly drained flats and swells separated by poorly drained shallow swales and sloughs. The plain is generally level with local relief being less than one foot. Land at the base is relatively flat, with elevations ranging from 880-920 feet MSL, and averaging about 890 feet MSL. The land slopes to the northeast at less than 12 feet per mile.



KEY MAP

N

Grounds Maintanence Watering Areas
Roads
Buildings/Structures
Installation Boundary
Improved
Land Fill Cap
Multi-use Trail
Semi-improved
Unimproved

0 1,000 2,000 3,000 Feet

FIGURE 3.2-1
GROUND MAINTENANCE AREAS

2004 INRMP
GRAND FORKS AFB, ND

DATE: SEPTEMBER 2004

REV. No.: | DRAWN BY: MS

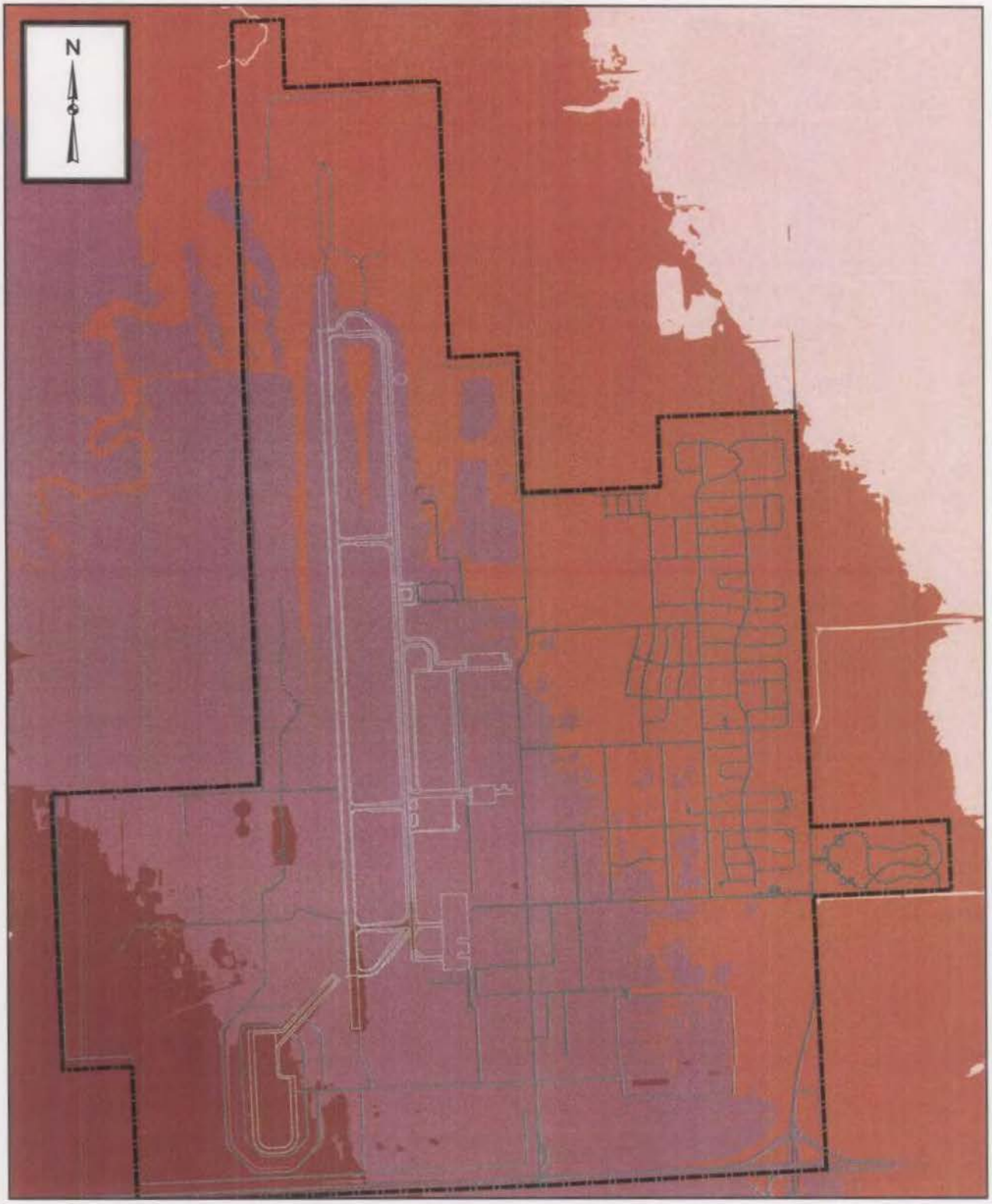



FIGURE 3.2-2
LANDUSE

2004 INRMP
GRAND FORKS AFB, ND

DATE: SEPTEMBER 2004

REV. No.: DECEMBER 2005–KR | DRAWN BY: MS




| | | |
|---|---|---|
| Drawn By: MS | **GRAND FORKS AFB INRMP** | **FIGURE 3.3-1 DIGITAL ELEVATION MODEL** |
| Date: APRIL 2004 | | 0 1,000 2,000 3,000 Feet |

## 3.4 Geology and Soils

### 3.4.1 Geology

Grand Forks County is located near the eastern edge of the Williston Structural Basin. The bedrock strata, underlying the county, dip gently to the west toward the center of the basin.

Surficial deposits at GFAFB are comprised of late Wisconsin glacial drift, and are approximately 225 feet thick beneath the base. The glacial deposits beneath the Agassiz Lake Plain consist of up to 95 feet of clay and silt-rich lake deposits, underlain by glacial till containing isolated deposits of sand and gravel. The glacial deposits are underlain by the sandstones, siltstones, and shales of the Lower Cretaceous Fall River and Lakota Formations, that in turn are unconformably underlain by the limestones and dolomites of the Ordovician Red River Formation. The oldest and deepest rocks underlying the area are Precambrian igneous and metamorphic granites, schists, and greenstones. The depth to these rocks is several hundred feet in eastern Grand Forks County, and increases rapidly to over 2,000 feet in the western portion of the county.

### 3.4.2 Soils

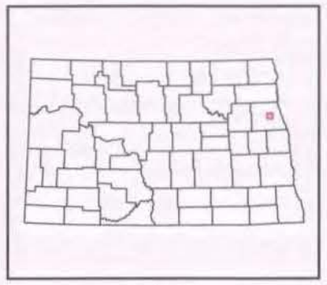
The soils at GFAFB generally formed in glaciolacustrine deposits overlying glacial till. Figure 3.4.2-1 depicts the various soil types at GFAFB. The following data was taken from the May 1981 Soil Survey of Grand Forks County, North Dakota, United States Department of Agriculture, Soil Conservation Service, in cooperation with North Dakota Agricultural Experiment Station. GFAFB is within prime and unique farmlands. This land is designated as prime farmland and is subject to the requirement of the Farmland Protection Policy Act. The following is a description of soil types at GFAFB:

**Antler-Gilby-Svea**

This association consists of deep, level to nearly level, somewhat poorly drained to moderately well drained, medium textured soils. It lies on broad flats in areas between old glacial beaches. This association makes up about 13 percent of the soils in Grand Forks County. Antler soils make up about 35 percent of the association, Gilby soils about 19 percent, the Svea soils about 12 percent, and the soils with minor extent about 34 percent. The somewhat poorly drained Antler and Gilby soils are located on broad flats, and the moderately well-drained Svea soils are found on higher plane and concave slopes. This association represents the most extensive group of soils at GFAFB. These soils occupy a significant area on flats and between old beach ridges in the northern, central and south-central, and western portions of the base. The association is widely used for cultivated crops, and is suited to small grains and sunflowers. Soil blowing and wetness are the principal agricultural constraints. Also, boulders and stones may restrict cultivation in Antler and Svea soils. This association is poorly suited to sanitary facilities and building site development due to wetness and slow absorption of liquid waste.

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KEY MAP

N

Roads
Buildings/Structures
Installation Boundary

**Soil Type**

- Antler silt loam
- Antler silty clay loam, saline
- Antler-Tonka silt loams
- Antler-Tonka silty clay loams
- Arveson loam
- Bearden silty clay loam, saline
- Borup silt loam
- Embden fine sandy loam, 1 to 6%
- Gardena silt loam, 0 to 3% slope
- Gilby loam
- Glyndon-Tiffany silt loams
- Grimstad fine sandy loam
- Hamar sandy loam
- Hecla fine sandy loam, 1 to 6% s
- LaDelle silt loam, 0 to 3% slope
- Ojata silty clay loam
- Rockwell fine sandy loam
- Sioux loam, 1 to 15%
- Svea loam, 0 to 3% slopes
- Towner fine sandy loam, 1 to 3%
- Vallers loam
- Velva sandy loam, 1 to 3% slopes
- Wyndmere sandy loam
- Wyndmere-Tiffany fine sandy loam
- Yemassee loamy fine sand
- Zell-Gardena silt loams, 1 to 6%
- Zell-LaDelle silt loam, 1 to 6%

0 1,000 2,000 3,000 Feet

FIGURE 3.4.2-1
SOIL TYPES

2004 INRMP
GRAND FORKS AFB, ND

DATE: SEPTEMBER 2004

REV. No.: | DRAWN BY: MS

### Bearden-Antler

These soils are deep, level, somewhat poorly drained, moderately fine textured, and saline. They occur on slight swells, in swales, and on broad flats on glacial lake plains and in areas between old glacial beaches. This association makes up about 18 percent of the soils in Grand Forks County, and consists of 64 percent Bearden soils, 17 percent Antler soils, and about 19 percent soils with minor extent. This association is present over the eastern two-thirds of the lagoon system and in the northern portions of the base where Antler and Bearden soils are closely associated.

Most areas of this soil are used for cultivated crops. Salinity, wetness, and soil blowing are the major cultivation-related management concerns, along with the presence of stones and boulders in the areas between old glacial beaches. This association is also poorly suited to sanitary facilities and building site development due to wetness and slow absorption of liquid waste.

### Glyndon-Gardens

These soils are deep, level to nearly level, somewhat poorly drained to moderately well drained, and medium textured. They occur as slight swells and swales on glacial lake plains. This association makes up about 9 percent of the soils in Grand Forks County, and consists of 56 percent Glyndon soils, 18 percent Gardena soils, and about 26 percent soils with minor extent. This association is present in sub-parallel northwest-southeast trending swells in the eastern and central portions of the base in the housing, operations, and airfield areas.

Most areas of this soil are used for cultivated crops. Wind blown soil erosion is the major cultivation-related management concern. This association is generally suited to sanitary facilities and building site development, with wetness being the main limitation.

### LaDelle-Cashel

These soils are deep, level to moderately steep, moderately well drained to somewhat poorly drained, and medium to fine textured. They occur on flood plains, bottomlands, and terraces along major streams. This association makes up about 3 percent of the soils in Grand Forks County, and consists of 47 percent LaDelle soils, 30 percent Cashel soils, and about 23 percent soils with minor extent. The extent of these soils is very limited, and occurs only at the northernmost end of the base.

Most areas of this soil are used for cultivated crops or support native hardwoods in level to gently sloping areas. Moderately sloping to steep areas are generally unsuited to cultivation due to erosion. Soil blowing and flooding are the major cultivation-related management concerns in gently sloping areas. This association is generally unsuited to sanitary facilities and building site development, with flooding being the main limitation.

### Ojata

These soils are deep, level, poorly drained, moderately fine textured, and very strongly saline. They occur on low-lying flats and in sloughs and swales on glacial lake plains and in areas between old glacial beaches. This association makes up about 5 percent of the soils in Grand Forks County, and consists of

78 percent Ojata soils and about 22 percent soils with minor extent. The extent of this association is limited primarily to the western portion of the lagoon system, Section 29, and the northernmost portion of the base.

Most areas of this soil are used for pasture or wildlife habitat. The association is generally unsuitable for most cultivated crops due to strong salinity. This association is also generally unsuited to sanitary facilities and building site development, with wetness and slow absorption of liquid wastes being the main limitations.

**Wyndmere-Tiffany-Arveson**

These soils are deep, level, somewhat poorly drained, and medium to moderately coarse textured. They occur as areas of broad flats, swales, and depressions on delta plains, and as seep areas on beaches. This association makes up about 7 percent of the soils in Grand Forks County, and consists of 34 percent Wyndmere soils, 15 percent Tiffany soils, 14 percent Arveson soils, and about 37 percent soils with minor extent. This association is most prevalent in the housing area in the northeast and east-central portion of the main base.

Most areas of this soil are used for cultivated crops. Wind blown soil erosion and wetness are the major cultivation-related management concerns in gently sloping areas. This association is generally unsuited to sanitary facilities and building site development, with wetness due to a seasonally high water table being the main limitation.

## 3.5 Hydrology

### 3.5.1 Groundwater

Groundwater in Grand Forks County occurs in unconsolidated glacial drift aquifers, and in rocks of Cretaceous and Ordovician age underlying the glacial deposits.

The Emerado Aquifer is a major glacial drift aquifer underlying GFAFB approximately 50 to 75 feet below ground surface. The aquifer consists primarily of medium to coarse-grained, poorly sorted sand, and has an area extent of about 15 square miles. The aquifer generally interfingers with overlying and underlying glacial deposits, that cause groundwater in the aquifer to be confined under artesian head. In most areas the aquifer is separated from bedrock by about 70 feet. Aquifer transmissivity at a production well owned by the U.S. Air Force may be on the order of 15,000 gallons per day per foot (gpd/ft), but also cited a degree of uncertainty due to highly variable pumping rates. Groundwater availability maps indicate that well yields in the Emerado Aquifer may vary from 50-500 gallons per minute (gpm).

Water quality in the Emerado Aquifer is generally poor, probably due to upward leakage of poor-quality groundwater from underlying bedrock aquifers. Two sampled wells exhibited dissolved solids concentrations of 1,890 parts per million (ppm) and 2,240 ppm with high salinity.

The principal bedrock aquifer in the area is the Dakota Aquifer, which is a widespread regional aquifer present in most of the Great Plains states. The aquifer is comprised of Lower Cretaceous strata, which are primarily the Fall River and Lakota Formations in the vicinity of GFAFB. Wells tapping the Dakota Aquifer in the vicinity of GFAFB are generally in the 100 to 200-foot depth range. The Dakota Aquifer is under confined pressure, and most wells tapping the formation in the eastern part of the county are flowing wells

with discharges ranging from 2-50 gpm. Many flowing wells have experienced reduced flow due to regional head decline caused by long-term groundwater withdrawals. An extended pumping test conducted by the Agricultural Research Service indicated an average transmissivity of 47,000 gpd/ft.

The primary use of groundwater from the Dakota Aquifer is reportedly livestock watering. Groundwater quality is very saline and generally unsuitable for domestic and most industrial uses. The average dissolved solids content is about 4,400 ppm, with excessive contents of iron, chloride, and sulfate. Agricultural use is "mining" water from this aquifer as evidenced by a drop in aquifer levels of nearly 20 feet over the past several years.

The limestones and dolomites of the Ordovician Red River Formation underlie the Lower Cretaceous strata. The water yield of this formation is not known, as it is highly dependent on the number and size of joints, fractures, and solution cavities penetrated by a well. Groundwater in this formation is generally very saline, dissolved solids concentrations may exceed 10,000 ppm, with sodium and chloride being the main constituents.

GFAFB obtains 20 percent of its potable water from groundwater sources via the Agassiz Water Users Association. The remainder of the base's potable water needs is supplied through the city of Grand Forks from the Red River and Red Lake River.

### 3.5.2 Watersheds and Floodplains

#### Watersheds

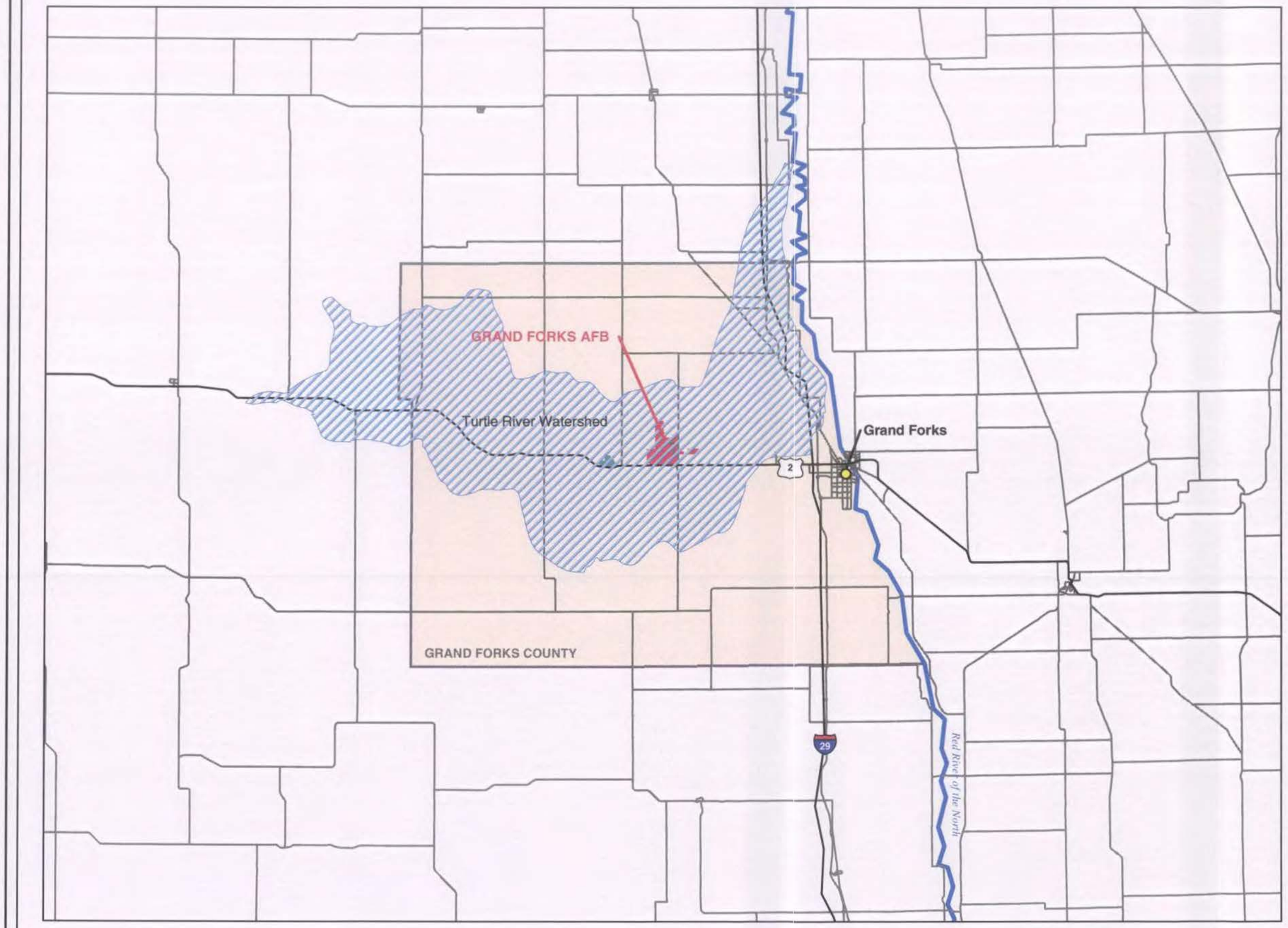
GFAFB and surrounding areas are located within the 30,100 square miles of Red River Basin. Land in this basin is very permeable and fertile. Nearly 90 percent of the basin is used for agriculture, while only three percent is deciduous forest. The Red River is located 25 miles east of the base. The Red River originates in northeastern South Dakota, drains nearly 28 percent of North Dakota, and flows northward forming the border between North Dakota and Minnesota. It eventually empties into Lake Manitoba near Winnipeg, Canada. Figure 3.5.2-1 shows local watersheds.

#### Floodplain

The shape of the Red River Valley has resulted from past glacial activity. The floodplain is poorly defined, and floods are frequent. Flooding usually lasts only for a short period because of a vast network of drainage ditches and channelized streams. The Red River has several basin characteristics that make it susceptible to flooding including an undersized main channel in relation to its floodplain, a small main channel gradient, and a northerly flow that synchronizes flooding with the northerly progression of the spring thaw. Floods typically occur during late spring resulting from quick temperature rise, spring rains, snowmelt, and soil-moisture content held over from the fall.

An exceptionally deep snow pack resulting from a series of blizzards during the 1996-97 winter rapidly melted in heavy spring rains and unusually warm early spring temperatures. The result was unprecedented flooding of the Red River Valley. The entire town of Grand Forks was evacuated as result of the floodwaters, which lingered in the area for several weeks before receding. GFAFB played a critical role in providing temporary shelter for the flood victims who were forced from their homes.

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KEY MAP

N

Turtle River Watershed
Installation Boundary
Grand Forks County
Red River of the North
Parks

0 5 10 15 Miles

FIGURE 3.5.2-1
WATERSHEDS

2004 INRMP
GRAND FORKS AFB, ND

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The Turtle River watershed, which includes the GFAFB area, falls within the Red River Basin. The Turtle River is a fourth order tributary to the Red River and drains approximately 311 square miles. The headwaters (North and South Branch) of Turtle River originate some 10 miles west of the western boundary of the base. It flows in an east-northeast direction joining the Red River approximately 25 miles northeast of GFAFB. The Turtle River accounts for only 1.5 percent of the total discharge to the Red River. Stream banks of the Turtle River tend to be steep (with the highest banks being 12-13 feet), highly eroded and subject to slumping. Riparian vegetation is confined to narrow strips consisting mostly of woody shrubs. Aquatic plants grow in shallow areas, but are limited in deeper or more turbid areas.

Based on a four-year period of record, mean annual discharge in the Turtle River ranges from 49.4 to 61.8 cubic feet per second (cfs). The highest daily mean discharge recorded was 800 cfs with the lowest daily mean being nearly 3 cfs. Annual runoff generated in this watershed for Water Year 1995 totaled 44,750 acre-feet. Surface water quality in the Turtle River often reflects a high saline content associated with discharge of groundwater from bedrock aquifers beneath Pleistocene sediments in the Red River Valley. In addition, an increase in dissolved solids occurs from drainage that interacts with saline soils and wetlands in the west-central portion of the valley. Surface waters of the Turtle River are characterized by hard, moderately buffered, alkaline waters (pH minimally varies from 7.57 to 7.43) of moderate productivity.

In 1998, the Turtle River (from its confluence with the Salt Water Coulee downstream to its confluence with the Red River of the North) was classified by the North Dakota Department of Health (NDDH) as being an impaired water body because of cadmium. It was later delisted and declared as fully supporting all recreational, municipal and biological uses because of the one of the following reasons:

- Based on recent data, use is fully supported,
- Use impairment due to a nonpollutant, or
- Lacks sufficient credible data or information to make a use determination.

The Turtle River's confluence with the Salt Water Coulee stream is downstream of GFAFB about one half mile due east of the Turtle's confluence with Kellys Slough stream.

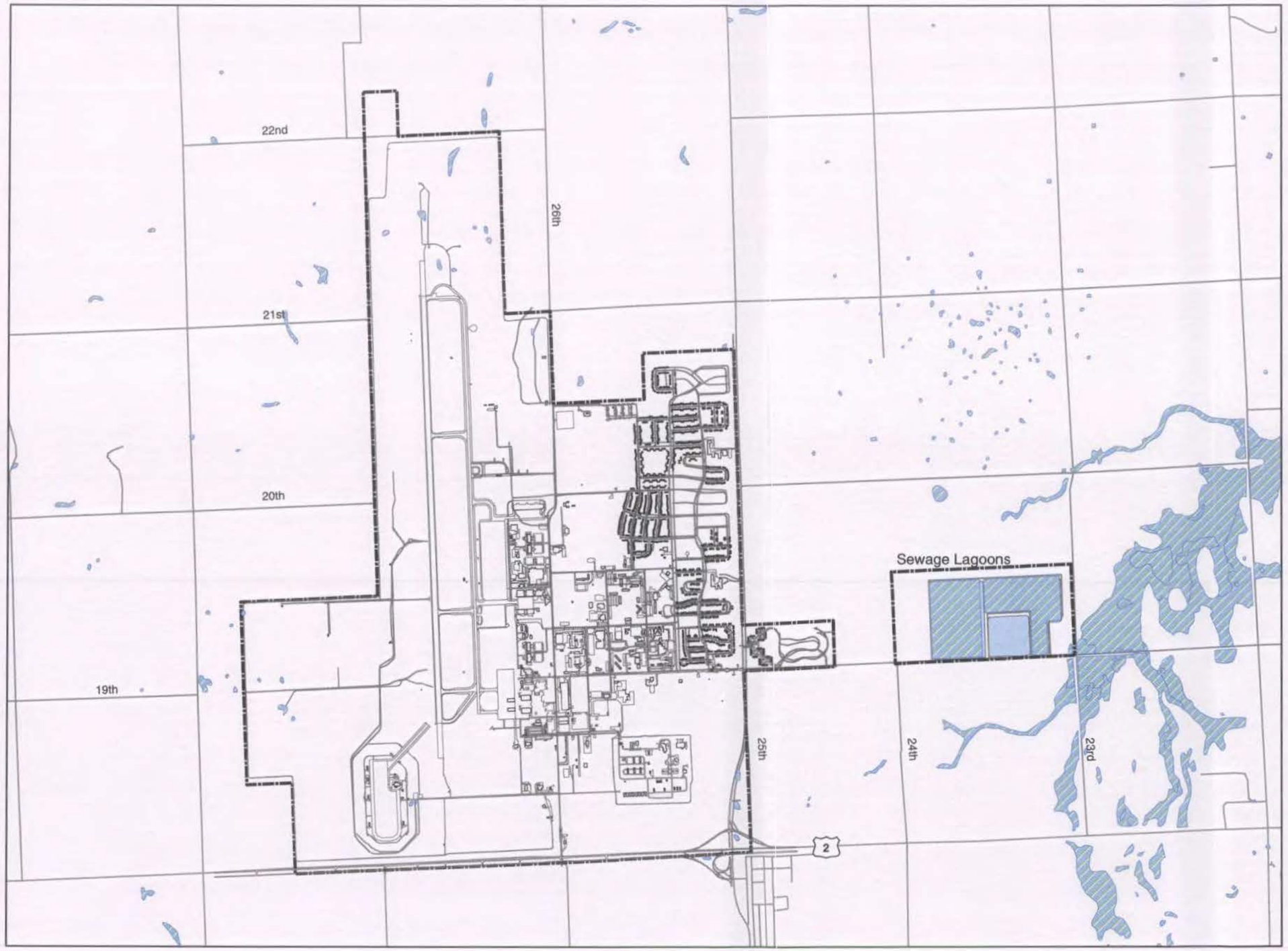
The Turtle River has a Class II stream designation from the NDDH, which means that the water is the same overall quality as Class I, but that it may require additional treatment to meet the requirements of drinking water. Streams in this category may be intermittent making them less beneficial to uses such as municipal water, fish life, or irrigation.

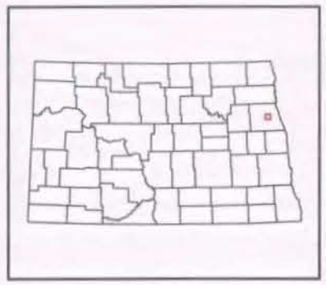
### 3.5.3 Wetlands

The Red River Basin contains thousands of natural wetlands and prairie potholes. These wetlands have a profound effect on the hydrologic flow regime of streams and the residence time of water within the basin. Wetlands found in Grand Forks, Barnes, Pembina, Ramsey, and Nelson Counties are mostly associated with USFWS properties including waterfowl production areas and easements. These wetland areas occur in areas of poorly drained soils in shallow depressions formed on glacial and lacustrine plains.

Wetlands on GFAFB occur frequently in drainage ways, low-lying depressions, and potholes. Figure 3.5.3-1 depicts wetlands and other bodies of water in the vicinity. Wetlands are highly concentrated in drainage

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KEY MAP

N

Installation Boundary
Buildings/Structures
NWI Wetlands
Lagoons
Roads

0 2,000 4,000 6,000 Feet

FIGURE 3.5.3-1
NATIONAL WETLANDS INVENTORY(NWI)

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DATE: SEPTEMBER 2004

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ways leading from the wastewater treatment lagoons to Kellys Slough NWR. These wetlands located immediately east of the base, contain extensive emergent marshes. The majority of other wetland areas occur in the northern and central portions of the base near the airfield, while the remaining areas are near the eastern boundary and southeastern corner of the base.

According to the February 2000 Final Wetland Identification and Jurisdictional Report, a total of 49 wetlands comprising 23.899 acres are found at GFAFB. There are 33 jurisdictionally delineated wetlands, comprising 12.221 acres west of the runway. Development in or near these areas requires coordination with the North Dakota State Water Commission and the U.S. Army Corps of Engineers. Any approved construction will require compliance with the "No-Net-Loss" policy. North of the runway are an additional 15 wetlands which may be jurisdictional, but need further evaluation. These wetlands make up 11.446 acres. There is one additional small (0.232 acres) wetland located adjacent to the flight line.



***Drainage Ditch along Base Perimeter***

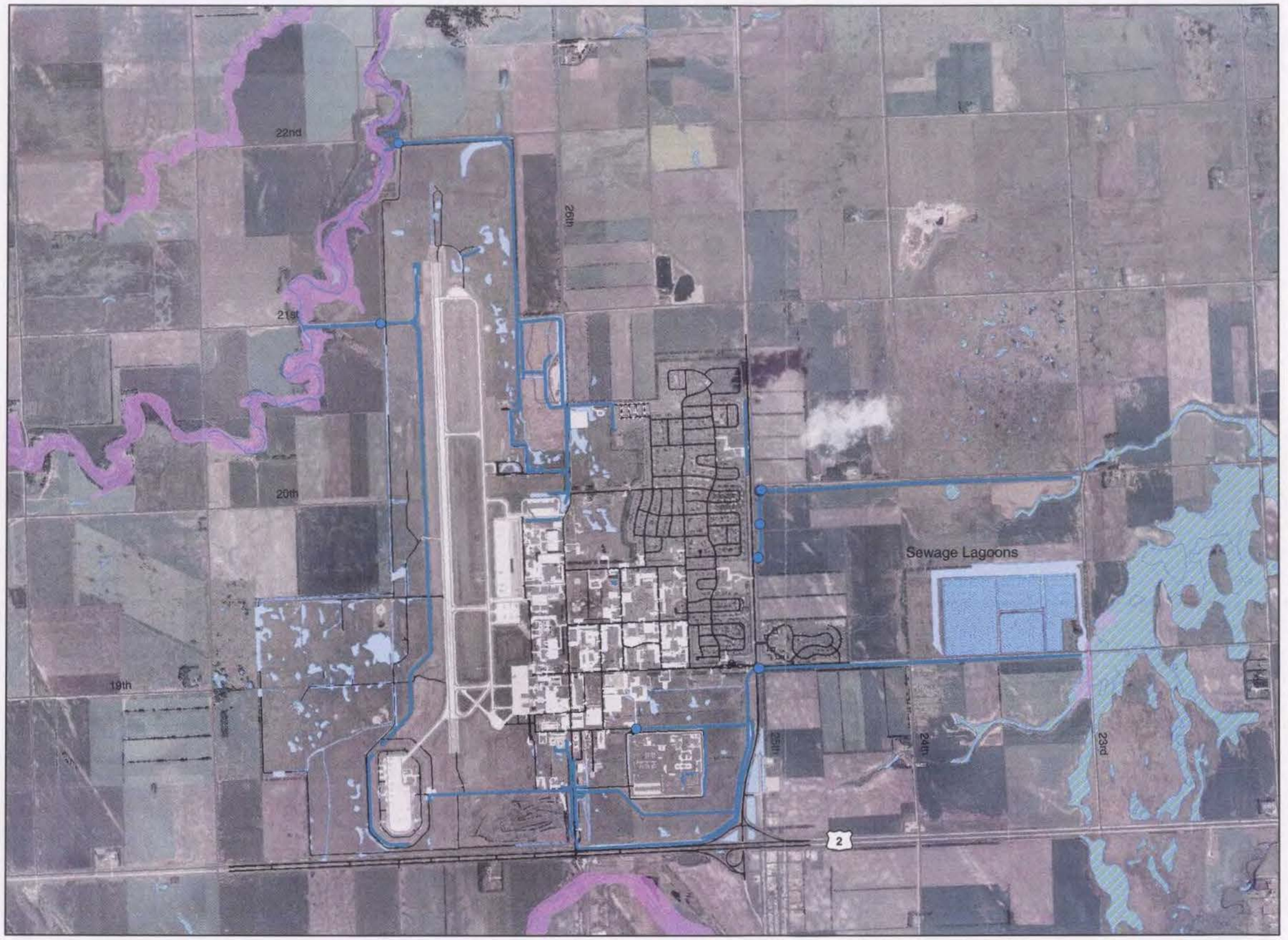
Drainage ways and low-lying depressions on GFAFB have limited and localized wetland habitat. Species most commonly associated with these wetland areas are hairy-fruit sedge (*Carex trichocarpa*), needle spike-rush (*Eleocharis acicularis*), flat-stem spike-rush (*Eleocharis compressa*), pale spike-rush (*Eleocharis palustris*), Baltic rush (*Juncus balticus*), grass-leaf rush (*Juncus marginatus*), knotted rush (*Juncus nodosus*), poverty rush (*Juncus tenuis*), Torrey's rush (*Juncus torreyi*), and chairmaker's bulrush (*Scirpus americanus*). The largest wetlands, totaling 173.5 acres, are lacustrine wetlands associated with the base sewage lagoons, (but are not the sewage lagoons). Approximately 19.9 acres are palustrine, persistent emergent wetlands. The remaining 2.8 acres are riverine wetlands found in the northwest corner of the base near the Turtle River. The majority of the wetlands are less than an acre in size.

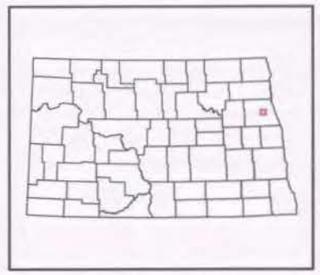
### 3.5.4 Impoundments and Surface Drainage

There are no surface water impoundments other than the sewage treatment lagoons on GFAFB. Underground concrete pipes and catchment basins collect storm water. Runoff is conveyed primarily by grassy drainage ditches located on the west, northwest, north, and south sides of the main base (Water Map, Figure 3.5.4-1). The Northwest Ditch collects drainage from the northern portion of the base; the West Ditch drains runways on the west side; the South Ditch drains vehicle maintenance, power production, and fuel storage; and the North Ditch receives storm water from hangers, selected aircraft maintenance areas, and nonindustrial areas. The Northwest Ditch and the West Ditch drain to the Turtle River. The South Ditch and North Ditch flow to Kellys Slough NWR. GFAFB was included as a part of the Air Force group storm water permit application.

The USFWS manages open wetland areas in Kellys Slough NWR primarily for the control of plant community succession for waterfowl habitat. Much of the drainage pattern in Kellys Slough NWR is managed through the manipulation of water levels by a multitiered diking system associated with the refuge's waterfowl production area. According to USFWS, a significant narrow-leaf cattail stand and bulrush community exists for nearly two miles beyond the base's wastewater treatment lagoons leading to Kellys Slough NWR. These nutrient-dependent communities gradually end where diluted brackish surface water is exposed to spring-fed saline groundwater.

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KEY MAP

N

- Storm Outfalls
- Ditches
- Flood Plain Zone
- Turtle River
- Buildings/Structures
- Wetlands
- NWI Wetlands
- Man-Made Pond
- Lagoons
- Roads
- Installation Boundary

0 1,000 2,000 3,000 Feet

FIGURE 3.5.4-1
WATER MAP

INRMP
GRAND FORKS AFB, ND

| DATE: NOVEMBER 2005 | |
|---|---|
| REV. No.: | DRAWN BY: KR |

# 4.0 GENERAL BIOTIC ENVIRONMENT

## 4.1 Historic Vegetative Cover

GFAFB lies within the Bluestem Prairie Region. Tallgrass and mixed grass prairie communities dominated this region and their deep roots formed a thick and continuous layer. Boundaries of the historic bluestem prairie are forested areas to the east and shortgrass plains to the west. Historically, trees and shrubs were limited in this region, although woodland patches are present in valleys and other depressions.

Bluestem prairie and western bluestem prairie are the two recognized tallgrass prairie types found in the region. Often referred to as the "true prairie," bluestem prairie typically occurs on flat and rolling plains. Bluestem prairies are dominated by big bluestem (*Andropogon gerardii*), wand panic grass (*Panicum virgatum*), and yellow Indian grass (*Sorghastrum nutans*). Bluestem prairie, once characteristic throughout the wetter areas of eastern North Dakota, has largely been converted to agriculture. Suppression of fire has encouraged the invasion of shrubs and trees into what few prairie remnants remain. West and south of the historic bluestem prairie where climatic conditions were somewhat drier, western-wheat grass (*Pascopyrum smithii*) and porcupine grass (*Stipa spartea*) were the dominant grasses. This tallgrass community originally covered an area from near GFAFB southward into South Dakota and Nebraska. By the time the land for GFAFB was acquired by DoD, the entire area had long been under intense cultivation and no native tallgrass prairie remained.

## 4.2 Current Vegetative Cover

When the initial construction of GFAFB was completed in the mid-1950s, most of the base was planted with a standard mixture of grasses established by DoD. Included in this mixture were two introduced grass species, smooth bromegrass (*Bromus inermis*) and Kentucky blue grass (*Poa pratensis*). These two introduced grasses are still predominant throughout the base.

Significant portions of the unimproved areas on base support the active cultivation of hay and alfalfa (Figure 4.2-1). Trees planted in housing areas are primarily spruce, green ash, and lombardy poplars (*Populus nigra*). There are no known prairie remnants on GFAFB; however, some prairie index species (such as coneflowers) are found in the unimproved and semi-improved areas mixed in with bromegrass and various herbaceous annuals such as goldenrod. Unfortunately, according to a study conducted in June 2003, nine species of noxious and invasive plants are also found on the base including absinth wormwood, Canada thistle, field bindweed, leafy spurge, musk thistle, spotted knapweed, bull thistle, perennial sowthistle and wavyleaf thistle. Infestations are greatest in areas that have been disturbed but are not mowed regularly. Compliance with federal and state law will require the development of a base-wide noxious weed control and monitoring program.

Although no true prairie remnants remain on GFAFB, an effort has been made to recreate one. Prairie View Nature Preserve is located in the northeast corner of the base. It is near a housing area and adjacent to North Dakota County Road B3. It is a combination of improved, semi-improved, and minimal maintenance. It is planted with native tallgrass prairie species and was designed to resemble a tallgrass prairie association of different species and to provide base personnel with a taste of what a true grassland ecosystem is like.

Grass heights within semi-improved areas, including airfield areas within 300 feet of the runway centerline, are maintained at 7 to 14 inches. Beyond the 300-foot border on the airfield, hay cutting dictates the height of the vegetation.

Some former landfill areas have been seeded with native grasses and sweet clover (*Melilotus* species). Grasses include western wheatgrass (*Agopyron smitthii*), thickspike wheatgrass (*A. dasystachum*), and slender wheatgrass (*A. trachycaulum*). For locations of landfills, see Figure 8.7-1.

Various researchers, mostly associated with the UND, have studied current native floras in the vicinity of the base. Prior to 1993 field investigations, ten natural communities occurring in Grand Forks County were identified in the Natural Heritage Inventory Database. Of these, only one community (Lowland Woodland), the wooded riparian corridor of the Turtle River is represented within the base boundaries (Figure 4.3-1). Dominant trees in this community are elm, cottonwood, and green ash. Dutch elm disease has killed many of the elms. European buckthorn (a highly invasive exotic species), chokecherry, and wood rose (*Rosa woodsii)* are common in the understory in this area. Wood nettle (*Laportea canadensis*), stinging nettle (*Urtica dioica*), beggars-ticks (*Bidens frondosa*), and waterleaf (*Hydrophyllum viginianum*) are typical forbs.

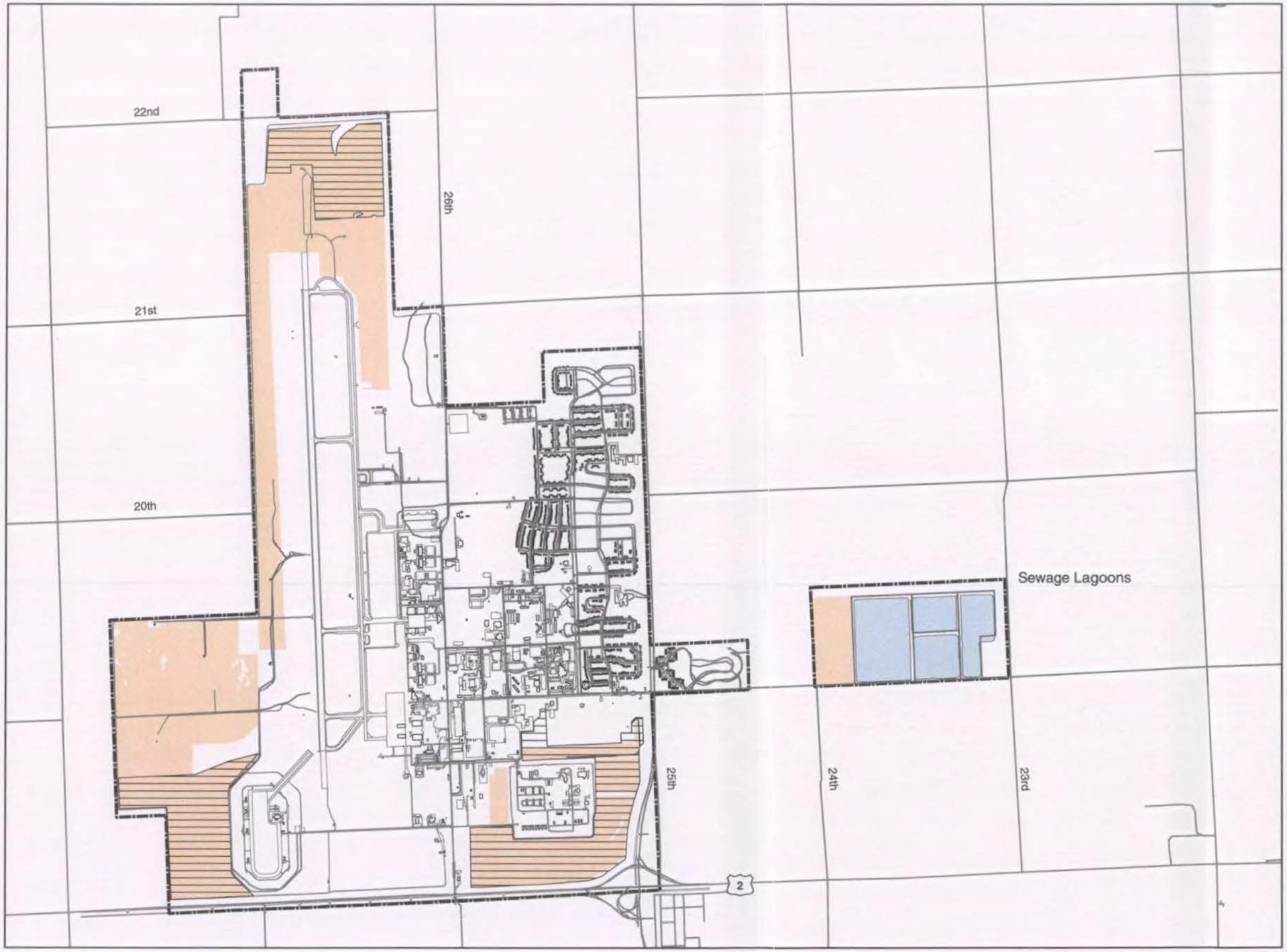
The North Dakota Parks and Recreation completed an inventory of protected and rare plant communities on GFAFB in 1994. During this study, 142 total taxa representing less than a third of the known Grand Forks County plant taxa were identified. No rare plants species are known to exist on GFAFB.

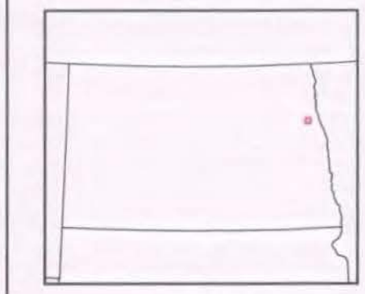
## 4.3 Forest Land

Forests are not a dominant feature of North Dakota's rolling prairie landscape, as only one of every 100 acres is naturally forested. Many rivers dissect the eastern Great Plains region. Included in this region is the Red River, which supports much of the northern floodplain forest. Floodplain species that can tolerate both flooding and drought are prevalent. Common species comprising these communities include cottonwood (*Populus deltoides*) box elder (*Acer negundo*), red maple (*Acer rubrum*), silver maple (*Acer saccharinum*), river birch (*Betula nigra*), common hackberry (*Celtis occidentalis*), white ash (*Fraxinus americana*), green ash (*Fraxinus pennsylvanica*), honey locust (*Gleditsia triacanthos*), black walnut (*Juglans nigra*), American sycamore (*Platanus occidentalis*), chokecherry (*Prunus virginana*), burr oak, (*Quercus macrocarpa*), and slippery elm (*Ulmus rubra*). Prominent woody and herbaceous understory species include false indigo-bush (*Amorpha fruticosa*), American bittersweet (*Celastrus scandens*), Virginia creeper (*Parthenocissus quinquefolia*), smooth sumac (*Rhus glabra*), sandbar willow (*Salix interior*), riverbank grape (*Vitus riparia*), Virginia wild rye (*Elymus virginus*), sticky-willy (*Galium aparine*), shrubby cinquefoil (*Potentilla fruticosa*), and Canadian wood-nettle (*Laportea canadensis*).

The bottomland hardwood community is one of the most prevalent forest communities in North Dakota. A small area of oak woodland occurred north of the runway along the Turtle River. Historically, trees in the vicinity of the base with the highest values were American elm (*Ulmus americana*), green ash, box elder, and bur oak. In 1982, a North Dakota forest resource evaluation completed by the United States Department of Agriculture (USDA) Forest Service mapped the wooded areas northwest of the base as elm-ash-cottonwood.

The upland areas immediately bordering the Lowland Woodland community are generally above the high-flood level. In this more upland portion of the woodland, species such as bur oak, green ash, basswood or American linden (*Tilia americana*), and common hackberry are dominant. The understory in this area




N

Roads
Installation Boundary
Buildings/Structures
Active Hay Lease (within past 5 years)
Sewage Lagoons
Proposed Hay Sites

0 1,250 2,500 3,750 Feet

FIGURE 4.2-1
HAY LEASES

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includes American plum (*Prunus americana*), European buckthorn (*Rhamnus cathartica*), chokecherry, and Juneberry (*Amelanchier alnifolia*), Missouri gooseberry (*Ribes missouriensis*), wolfberry (*Symphoricarpos occentalis*), red raspberry (*Rubus ideus*), and prickly ash (*Zanthoxylum americanum*). Forbes in this area include Meadow anemone (*Anemone canadensis*), downy yellow violet (*Viola pubescens*), tall white violet (*Viola canadensis*), false solomon's seal (*Polygonatum biflorum*), wild-lily-of-the-valley (*Maianthemum canadense*), burdock (*Arctium minus*), golden glow (*Rudbeckia lacinata*), and Canada goldenrod (*Solidago candensis*). Figure 4.3-1 shows the vegetation types in the GFAFB area.

GFAFB has a small stand of Scotch pines that have recently been thinned out. North Dakota scotch pines are one of the most common woody plants attacked by borers and are highly susceptible to pine wilt. These trees are the most commonly planted and most popular Christmas tree species in the state of North Dakota and are plentiful in the market. There are many tree plantations across the state that offer a "choose and cut" service.

Common diseases of Scotch pines include Cyclaneusma needle cast. Western gall rust and Lophodermium needle cast are locally common. Common insect pests include tip moth, sawfly, pine needle scale, and giant conifer aphid. Scotch pines are used extensively for conservation and windbreaks, providing excellent nesting sites and winter cover for wildlife.

Appendix A provides information on Dutch Elm Disease provided by the North Dakota State University (NDSU) Extension Service.

## 4.4 Turf and Landscaped Areas

Improved turfgrass areas on GFAFB are dominated by red fescue (*Festuca rubra*), and Kentucky bluegrass (*Poa pratensis*). Shelterbelts comprised mostly of American elm, green ash, Russian olive and cottonwoods are planted in a number of locations to help protect housing and other main cantonment areas from wind, cold, and snow.

The grounds maintenance contractor maintains turf in most common or community areas. Military Family Housing (MFH) residents maintain their own lawns up to 50 feet from their units. Pest management personnel at the base are responsible for weed, insect, and disease control in all turf areas maintained under the grounds maintenance contract. Herbicides are applied to sidewalks, roadways, and airfield pavements when necessary to control weeds.



***Landscape Trees on Golf Course***

Golf course fairways are comprised primarily of ryegrass (*Lolium* spp.) and fescue. Tees are planted with Kentucky 31 bluegrass, and bentgrass (*Agrostis* spp.). Common turfgrass pest species include pythium, dollar spot, brown patch, cutworms, armyworms, wild onion, goosegrass, and crabgrass. The need for continual tree cutting and replacement is a concern on the golf course. Many of the poplars on the course are in decline. In the 1990s, blue spruce (*Picea pungens*) and Green Ash were planted and are growing well. More recently, Colorado blue spruce (*P. Pungens Engelm.*), Rocky Mountain juniper (*Juniperus scopulorum*), laurel leaf willow (*Salix pentandra*), Japanese lilac tree (*Syringa reticulata*), Amur chokecherry (*Prunus maackii*), spring snow crabapple (*Malus 'Spring Snow'*) and Redmond linden (*Tilia americana 'Redmond'*) were also planted. Lightning and other weather-related damage to trees is fairly common on the golf course.



***Tree and Shrub Encroachment in Old Fields***

The spread of noxious weeds remains a serious problem in North Dakota. Millions of acres are infested with noxious weeds costing the state's farmers and ranchers tens of millions of dollars. The current list of noxious weeds includes absinth wormwood (*Artemisia absinthium* L.), Canada thistle (*Cirsium arvense* (L.) Scop.), diffuse knapweed (*Centaurea diffusa* Lam.), field bindweed (*Convolvulus arvensis* L.), leafy spurge (*Euphorbia esula* L.), musk thistle (*Carduus nutans* L.), purple loosestrife (*Lythrum salicaria* L., *Lythrum virgatum* L., and all cultivars), Russian knapweed (*Centaurea repens* L.), spotted knapweed (*Centaurea maculosa* Lam.), and yellow starthistle (*Centaurea solstitialis* L.) (North Dakota Department of Agriculture). For a list of noxious weeds at GFAFB, see the summary table in Section 5.7.2.

## 4.5 Native Fauna

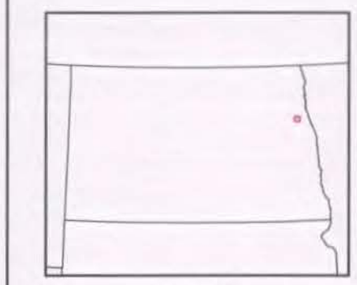
### 4.5.1 Overview

Due to extensive development, terrestrial and aquatic wildlife habitats are very limited on the base. A complete list of mammals, birds, reptiles, mollusks, oligochaetes, and arthropods observed on GFAFB during recent surveys by the North Dakota Natural Heritage Inventory is available in the GFAFB Biological Survey. For a list of common wildlife in the area, see Table 4.5.2-1.

Primary game species present on GFAFB include ring-neck pheasant, mourning doves, whitetail deer, and eastern cottontail. Bow hunting for deer is permitted, and instruction for this activity can be found in Appendix H.

State and federal hunting areas near GFAFB include Kellys Slough NWR for deer, waterfowl and Huns (Hungarian partridge); Prairie Chicken WMA for deer, and sharp-tailed grouse; and Ed Bry WMA for deer, sharp-tailed grouse, and waterfowl. Due to their similarity to the prairie chicken, the hunting of sharp-tailed grouse is prohibited in the following areas: an area in southeastern North Dakota east of ND No. 32, north of ND No. 11, and south of the Sheyenne River; and an area in Grand Forks County bordered on the east by the Red River, the south by US Highway 2, the west by ND Highway 18 and the north by the Walsh and Grand Forks County line.




LANDSCAPED VEGETATION
MIXED GRASS PRAIRIE MOWED 7-14 IN
MIXED GRASS PRAIRIE
WATER
WOODED/SHELTERBELTS/TREES
WET MEADOW
PLANTED TREES/TREE FARM
BAREGROUND/MIXED GRASS
WETLANDS
PAVEMENTS
INSTALLATION BOUNDARY

0 1,000 2,000 3,000 Feet

FIGURE 4.3-1
VEGETATION

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According to North Dakota Game and Fish Department (NDGFD), no fish species are associated with GFAFB. Non-point source pollution from upstream areas along the Turtle River has created water quality problems in the section of river in the GFAFB vicinity. However, some game fish species are located in portions of the Turtle River. Primary species are northern pike, white sucker, rock bass, black bullhead, and channel catfish. The State of North Dakota stocks the Turtle River with brown and rainbow trout each spring near Turtle River State Park.

There are hunting opportunities at GFAFB. Deer may be bow hunted in the CE Park or Turtle River Area by acquiring a North Dakota Deer Bow Hunting license and a GFAFB Deer Bow Hunting permit.

### 4.5.2 Vertebrate and Invertebrate Species

Table 4.5.2-1 provides a list of wildlife that have the potential to occur in the Grand Forks area.

**Table 4.5.2-1 Wildlife of the Grand Forks, North Dakota Area**

| Mammals | Birds | Fish | Invertebrates<br>Butterflies | Reptiles and amphibians |
|---|---|---|---|---|
| Badger, *Taxidea taxus* | Canada goose,* *Branta canadensis* | Bluegill, *Lepomis macrochirus* | Silver spotted skipper, *Epargyreus clarus* | Grey tree frog, *Hyla versicolor* |
| Short-tailed weasel, *Mustela erminea* | Common Goldeneye,* *Bucephala clangula* | Northern Pike, *Esox lucieus* | Northern cloudy wing, *Thorybes pylades* | Northern leopard frog, *Rana pipiens* |
| Long-tailed weasel, *Mustela frenata* | Ruddy Duck, *Oxyura jamaicensis* | Walleye, *Stizostedion vitreum vitreum* | Dreamy dusky wing, *Erynnis icelus* | Wood frog, *Rana sylvatica* |
| Least weasel, *Mustela nivalis* | Wood duck (Turtle River), *Aix sponsa* | Crappie, *Poxomis* species | Sleepy dusky wing,. *E. brizo* | Western chorus frog, *Pseudacris triseriata* |
| Striped skunk, *Mephites mephites* | Mallard*, *Anas platyrhynchos* | Small-mouthed bass, *Micropterus dolomieu* | Common checkered skipper, *Pyrgus communis* | American toad, *Bufo americanus* |
| Mink, *Mustela vision* | Gadwall,* *Anas strepera* | Large-mouthed bass, *M. salmoides* | Black swallowtail, *Papilio polyxenes* | Canadian or Dakota toad, *B. hemiophys* |
| Racoon, *Procyon lotor* | Lesser scaup,* *Athya affinis* | Pugnose shiner *Notropis anogenus* (a rare species) | Canadian Tiger swallowtail, *Pterourus canadensis* | Plains spadefoot toad, *Scaphiopus bomifrons* |
| Red fox, *Vulpes vulpes* | Redhead* *A. americana* | | Eastern tiger swallowtail, *P. glaucus* | Woodhouse's toad, *B. woodhousei* |
| Coyote, *Canis latrans* | Blue-winged teal,* *Anas discors* | | Checkered white, *Pontia protodice* | Great Plains toad, *B. cognatus* |
| Jackrabbit, white-tailed, *Lepus townsendii* | Common Merganser, *Mergus merganser* | | Mustard white, *Artogeia napi oleracea* | Tiger salamander, *Ambystoma tigrinum tigrinum* |
| Rabbit, cottontail, *Silvilagus floridanus* | Pintail,* *Anas acuta* | | European cabbage butterfly, *A. rapae* | Grey tiger salamander, *A. tigrinum diaboli* |
| Moose, *Alces alces* | Canvasback,* *Aythya valiseneria* | | Clouded sulfur, *Colias philodice* | Blotched tiger salamander, *A. tigrinum* |

| Mammals | Birds | Fish | Invertebrates<br>Butterflies | Reptiles and amphibians |
|---|---|---|---|---|
| | | | | *melanostictum* |
| White-tailed deer, *Odocoileus virginianus* | American Coot,* *Fulica americana* | | Orange sulfur, *C eurythene* | Mudpuppy, *Necturus maculosus* |
| Beaver, *Castor canadensis* | Wild turkey *Meleagris gallapavo* (Turtle River) | | Great copper, *Gaides xathoides* | Short-horned lizard, *Phrynosoma douglassi* |
| White footed mouse, *Peromyscus leucopus* | Sharp-tail grouse,** *Tympanuchus phasianellis* | | Bronze copper, *Hyllolycaena hyllus* | Sagebrush lizard, *Scelopus graciosus* |
| Deer mouse, *P. maniculatus* | Greater prairie chicken,** *Tympanuchus cupido* | | Purplish copper, *Epidemia helloides* | Northern prairie skink, *Eumeces septentrionalis* |
| Meadow jumping mouse, *Zapus hudsonius* | Woodcock, *Scolopax minor* | | Coral Hairstreak, *Harkenclenus titus* | Common garter snake, *Thamnophis sirtalis* |
| Meadow vole, *Microtus pennsylvanicus* | Gray partridge, *Perdix perdix* | | **Mussels** | Plains garter snake, *T. radix* |
| Northern pocket gopher, *Thomomys talpoides* | Spotted sandpiper, *Actitis macularia* | | *Anodonta grandis* | Red belly snake, *Storeria occipitomaculata* |
| Muskrat, *Ondatra zibethica* | Common Snipe, *Gallinago gallinago* | | *Anodontoides ferrusacianus* | Smooth green snake, *Opheodrys vernalis* |
| Chipmunk, *Tamius striatis* | Upland sandpiper,** *Bartramia longicauda* | | *Lampsilis ovata* | Western hognose snake, *Heterdon nasicus* |
| Grey squirrel, *Scirius carolinensis* | Kildeer,* *Charadrius vociferous* | | *L. radiata* | Bullsnake, *Pitophis catenifer* |
| Fox squirrel, *S. niger* | Mourning Dove, *Zenaida macroura* | | *Lasmigona complanata* | Racer, *Coluber constrictor* |
| Red squirrel, *Tamiascirius hudsonicus* | White pelican,* *Pelicanus erythrorhynchos* | | Pink heelsplitter, *Potamilus alatus* (a rare species) | Prairie rattlesnake, *Crotalus viridis* |
| Richardson's ground squirrel, *Spermophilus richardsonii* | Ring-billed gull,* *Larus delawarensis* | | **Pill clams** | Western painted turtle, *Chrysemys picta belli* |
| Franklin's ground squirrel, *S. franklinii* | Barn swallow,* *Hirundo rustica* | | *Pisidium compressum* | |
| Thirteen-lined ground squirrel, *S. tridecemlineatus* | Cliff swallow,* *H. pyrrhonata* | | *Sphaerium striatinum* | |
| Northern short-tailed shrew, *Blarina brevicauda* | Tree swallow,* *Tachycineta bicolor* | | **Snails** | |
| Masked shrew, *Sorex cinereus* | Northern rough-winged swallow,* *Stelgidopteryx serripennis* | | *Cincinnatia cincinatiensis* | |

| Mammals | Birds | Fish | Invertebrates<br>Butterflies | Reptiles and amphibians |
|---|---|---|---|---|
| Artic shrew, *S. artica* | Purple martin,* *Progne subis* | | *Ferrissia rivularis* | |
| Pygmy shrew, *S. hoyi* | Western meadowlark, *Sturnella neglecta** | | *Physa gyrina* | |
| Little brown bat, *Myotis lucifugus* | Brewers Blackbird, *Euphagus cyanocephalus* | | | |
| Silver haired bat, *Lasionycteris noctivagans* | Brown-headed cowbird, *Molothrus ater* | | | |
| Big brown bat *Eptesicus fuscus* | Red-winged blackbird, *Agelaius phoeniceus* | | | |
| Red bat, *Lasiurus borealis* | Western kingbird, *Sialia mexicana* | | | |
| Hoary Bat, *L. cinereus* | Eastern bluebird, *S. sialis* | | | |
| | American robin, *Turdus migratorius* | | | |
| | Horned lark,** *Eremophila alpestris* | | | |
| | Crow, *Corvus branchyrhynchos* | | | |
| | Dark-eyed Junc, *Junco hyemalis* | | | |
| | Baird's sparrow,** *Ammodramus bairdii* | | | |
| | Harris' sparrow, *Zonotrichia querula* | | | |
| | White-throated sparrow, *Zonotrichia leucophrys* | | | |
| | Song sparrow, *Melospiza melodia* | | | |
| | Loggerhead shrike,** *Lanius ludovicianus* | | | |
| | Sprague's pipit, *Anthus spragueii* | | | |
| | Cedar waxwing, *Bombycilla cedrorum* | | | |
| | Black-capped chickadee, *Parus atricapillus* | | | |
| | Red-tailed hawk, *Buteo jamacensis* | | | |
| | Feruginous hawk,** *B. regalis* | | | |
| | Swainson's hawk, *B swainsonii* | | | |
| | Bald eagle, *Haliaeetus leucocephalus* | | | |

| Mammals | Birds | Fish | Invertebrates<br>Butterflies | Reptiles and amphibians |
|---|---|---|---|---|
| | Northern harrier,** *Circus cyaneus* | | | |
| **Mammals** | **Birds** | **Fish** | **Invertebrates** | **Reptiles and amphibians** |
| | Yellow rail,* *Coturnicops noveboracensis* | | | |
| | Sora,* *Porzana carolina* | | | |

Information on reptiles and amphibians derived from 1992 North Dakota Outdoors Article by Cully Gause and Ted Hoberg; information on butterflies from: http://www.npwrc.usgs.gov/; mammals and birds from NDGFD
*Possibly utilizes sewage lagoon
**Grassland species

In addition, to native resident wildlife, other valuable natural resources are also present in the vicinity. For example, there are four major North American Flyways, the Atlantic, the Mississippi, the Central and the Pacific. Except along the coasts, the Flyway boundaries are not always sharply defined and overlap with one another. In Panama, parts of all flyways merge into one. In North Dakota, the Mississippi, and the Central flyways overlap. The western boundary of the Mississippi Flyway is not as sharply defined as the eastern boundary and they merge in eastern Nebraska and western Missouri and Arkansas. In addition, both of these Flyways cross North Dakota. The Mississippi Flyway is used by a large number of ducks, geese, shorebirds, blackbirds, sparrows, warblers and thrushes.

Another valuable natural resource in the vicinity is prairie potholes. Prairie pothole marshes spread from New York and New Jersey to North Dakota and eastern Montana. Formed by glacial action, they are greatest in abundance in moraines of undulating glacial till especially west of the great lakes in Wisconsin, Minnesota, and the Dakotas. They are a rich and very important habitat type particularly in regard to their value as the sole breeding habitat for many waterfowl species and stopover sites for resting and feeding for all types of birds. Not only are they very important to birds, but also they provide vital habitat to many other animals including shrews, voles, muskrats, mice and predators like weasels and foxes.

The sewage lagoons provide habitat for many species of waterfowl, black terns, shorebirds like Wilson's phalarope, swallow species and others. Fortunately this "loafing" area serves as an attractant that the birds appear to prefer over the airfield area where they would be a BASH concern.

Partners in Flight (PIF) is a voluntary, international coalition of government agencies, conservation groups, academic institutions, private businesses and individuals dedicated to the preservation of migratory birds. PIF considers the following birds to be priority species: black tern, northern flicker, vesper sparrow, clay-colored sparrow, grasshopper sparrow, Wilson's phalarope, marsh wren, bobolink, sedge wren and Nelson's sharp-tailed sparrow. Most of these birds are grassland or wetland species that have suffered from reduction of wetlands and native grassland by agriculture and development.

Many mammalian predators are common in the GFAFB area including coyote, red fox, skunk, mink, badger, raccoon and bobcat. These are important furbearers in North Dakota. Much less common are black bear and mountain lion. Black bear are thought to be breeding in northeast North Dakota. According to the Northern Prairie Wildlife Research Center, two black bears were killed near the small towns of Pembina and Cavalier in northeastern North Dakota. While resident populations of mountain lions or bears

are not confirmed in North Dakota, the western badlands and Turtle Mountains might be hospitable for lions, while the Turtle Mountains and Pembina River Valley contain suitable bear habitat. Members of the weasel family include mink, skunk and badger. Mink occur throughout North Dakota but are most common in the Prairie Pothole Region, the Turtle Mountains and along the larger streams. They only weigh two or three pounds. Although they are associated with aquatic habitat, these little predators may wander up to ten miles. They kill their own food and do not scavenge. Skunks are found in all habitats, but they prefer marshes, grasslands or brush. They weigh six to eight pounds and will eat almost anything, which they kill themselves or scavenge. The badger is a powerful member of this family and is an excellent digger. In light of this fact, trappers are urged to exercise caution with a trapped badger inside his den. Badgers prefer prairie, although they are found throughout the state. They may weigh anywhere from 14 to 26 pounds and will eat almost anything, but prefer ground squirrels, which makes them valuable in the control of this rodent.

North Dakota canids include the coyote and the red fox. Wolf extermination campaigns in the 20th century were successful in removing this large predator from the landscape resulting in an increase in the numbers of coyotes. Coyotes are in turn successful in reducing the numbers of any fox species and there is an inverse relationship in the numbers of coyote and fox. Coyotes occur statewide but are most numerous in southwest North Dakota, Turtle Mountains and Pembina Hills. The coyote's weight range is from 18 to 40 pounds.

Raccoons are also found throughout the state. They prefer prairie potholes but also are found along wooded streams. Their weight ranges from 12 to 30 pounds. Their curiosity and propensity to be found around water is well known to trappers and naturalists. They also will eat nearly anything.

The bobcat is not abundant anywhere in the state except counties adjoining the Little Missouri, Cannonball and Missouri Rivers with an occasional occurrence near the Red River in eastern North Dakota. Rare in the Prairie Pothole Region, they prefer rough country with heavy brush or timber. They may weigh from 11 to 30 pounds and while they generally eat rodents and rabbits they will occasionally take birds, young livestock or fawns, or carrion.

According the NDGFD, white-tailed deer are very common particularly if there are more than one or two mild winters in a row. White-tailed deer are a problem when they enter the airfield at GFAFB and must be driven away. Though limited in number, elk can be found in the northeastern part of the state, in the Pembina Hills approximately 80 miles to the north. On rare occasions, even moose have entered the airfield at GFAFB. The NDGFD has reported that bear sightings are on the increase in North Dakota.

Invertebrates are also important in wildlife management. Only a few insect species are harmful or destructive to crops. Insects, spiders and others are a very important part of the food chain and provide food to many other species. Predatory insects like the preying mantis and the dragonfly are important in keeping the numbers of smaller insects and other invertebrates in check. Migratory birds rely heavily on insect and other invertebrate food sources all year long but this food source is especially important during breeding season when energy demand of youngsters is high.

As Tallgrass Prairie is successively lost, butterflies and other plants and animals that are obligate to the prairie ecosystem are rare and primarily restricted to prairie preserves. The Dakota skipper (*Hesperia dacotae*) and the regal fritillary (*Speyeria idalia*) are federal candidates for listing under the Endangered Species Act, and additional prairie butterfly species are on state lists as officially threatened or endangered.

These and other rare butterflies, dependant on native grassland habitat, have the potential to be present and managed to enhance their numbers at GFAFB.

Aquatic invertebrates are also important in the food chain. One example is the non-biting midge, family Chironomidae. Adult midges often swarm in large numbers near lakes and streams, though swarms can occur at a considerable distance from the nearest water. Midge larvae are an important food item for all types of small fish, which in turn are preyed upon by larger fish like pike and walleye. Protecting water quality by reducing and preventing erosion with BMPs during ground disturbing activities, and by keeping vehicles out of bodies of water will ensure that aquatic ecosystems are protected.

Tiger salamanders are a common amphibian found in prairie wetlands. Tiger salamanders are benthic and fed primarily on Gammarus, a type of amphipod, and also consume Cladocera (a crustacean), chironomids (midges), amphipods, ephemeropterans (mayflies), and hemipterans (true bugs). These amphibians prefer larger prey, such as large amphipods and chironomids, over smaller prey, such as cladocerans and copepods. Other amphibians utilizing wetlands at GFAFB are wood and leopard frogs and the Dakota toad.

Conditions in most prairie wetlands are not favorable for fish. Frequent drying, nonintegrated watersheds, and harsh winter conditions generally prevent fish from establishing permanent populations. However, they can become established through deliberate introductions. For example, fathead minnows (*Pimphales promealas*) are released in wetlands for rearing by the baitfish industry (Hanson and Riggs 1995), and rainbow trout (*Salmo gairdneri*) are released for sport and commercial harvest. As in other aquatic habitats, fish can be very important predators of aquatic invertebrates and potentially compete with waterfowl and other marsh birds for food. Researchers have reported marked reductions in invertebrate abundance, biomass, and taxa richness in wetlands stocked with fathead minnows. It appears that fish in wetlands that never had fish are incompatible with objectives established for waterfowl management, primarily due to the negative impact of fish on invertebrate communities.

### 4.5.3 Threatened, Endangered, and Special Interest Species

In an August 20, 2004 letter, the USFWS updated information on federally endangered and threatened species that may be present in Grand Forks County. These species include the gray wolf (*Canis lupus*), and bald eagle *(Haliaeetus leucocephalus*). The wolf is most frequently observed in the Turtle Mountains. The eagle migrates spring and fall statewide, but primarily along the major river courses. Individuals concentrate along the Missouri River during winter and are known to nest in the floodplain forest. The bald eagle is a transient in the GFAFB area and has been documented harassing waterfowl in the sewage lagoons during the fall 2003 migration and is occasionally seen feeding on road kills in the area. No critical habitat for this species or other species has been designated in Grand Forks County. The USFWS updated list and information on listed species is found in Appendix C.

The NDFGD is currently developing a comprehensive state sensitive species listing that is due for completion in 2005.

### 4.5.4 Bird Aircraft Strike Hazard (BASH)

The GFAFB BASH Plan discusses general environmental modifications to reduce the attractiveness of the airfield to birds. In the past cliff swallows (*Hirundo pyrrhonota*) were the most frequent birds involved in low altitude bird strikes. However, in recent years the use of a commercial repellant has curbed this problem. Their abundant mud nests were built on the sides of hangars and other base buildings causing aircraft operations and nuisance problems.

Sea gulls also present a seasonal BASH at GFAFB. These birds frequently loaf on warmer airfield pavements during the fall season. Gas cannons, screamer cartridges shot from flare guns, and audio recordings of herring gull distress calls are used with some success to disperse birds from the immediate airfield area.

Migratory waterfowl such as Canada geese and ducks are attracted to open water wetlands such as Kellys Slough NWR, GFAFB sewage lagoons and small prairie potholes in the vicinity and on GFAFB. These larger birds present a potential hazard to aircraft should a strike occur. Airfield operations and flight safety personnel monitor populations of these waterfowl in the region around GFAFB so that flight crews can be advised of bird watch conditions as defined in the BASH Plan (Appendix J). Besides the sewage lagoons east of the main base, there are no surface water impoundments (including storm water detention basins) on GFAFB and there is very little open water area associated with natural wetlands or with drainage ways. In addition, deer present a strike hazard. They are occasionally shot and removed when they persist in occupying the airfield area.

### 4.5.5 Wetlands and Floodplains

There are many wetlands, including potholes, in the Red River Basin. Wetlands found in the counties of Grand Forks, Barnes, Pembina, Ramsey and Nelson Counties are mostly associated with the USFWS-managed waterfowl production and conservation areas.

Wetlands on GFAFB occur in drainage ways, low-lying depressions (natural or manmade) and potholes. Most are found in the areas draining the wastewater treatment lagoons leading to Kellys Slough NWR. Wetlands immediately east of the Base are emergent wetlands containing plants like cattail (*Typha latifolia*), that grow with their roots submerged, and their tops protruding from the water.

As stated in Chapter 3, according to the February 2000 Final Wetland Identification and Jurisdictional Report, a total of 49 wetlands comprising 23.899 acres are found at GFAFB. There are 33 jurisdictionally delineated wetlands, comprising 12.221 acres west of the runway. Development in or near these areas requires coordination with the North Dakota State Water Commission and the U.S. Army Corps of Engineers. Any approved construction will require compliance with the "No-Net-Loss" policy. North of the runway are an additional 15 wetlands which may be jurisdictional, but need further evaluation. These wetlands make up 11.446 acres. There is one additional small (0.232 acres) wetland located adjacent to the flight line. In addition, a new survey will be conducted in 2004 that will include wetland and floodplain delineation. Concurrent with this project will be the creation of educational wetland brochures.

Floodplains of the Turtle River are under the jurisdiction of the U.S. Army Corps of Engineers (USACE) and the North Dakota State Water Commission. The North Dakota State Water Commission requires that any structure in the floodplain have its lowest floor above the identified 100-year flood level. The North Dakota Department of Health provides guidance to protect water in Appendix C. In regard to other aspects of floodplain management the State Water Commission defers to USACE. USACE recommends:

- Improve system-wide coordination of floodplain management activities among local, state, and federal entities
- Improve other beneficial uses (i.e. creating green space) related to flood damage reduction
- Increase and improve riparian, floodplain, flood basin, and riverine habitats throughout flood management systems using an ecosystem approach
- Promote stability of native species populations, and the recovery of threatened and endangered species in the systems
- Promote natural, dynamic hydrologic and geomorphic processes in the flood management systems,
- Reduce the impacts of past and current floodplain land use activities on hydrologic, geomorphic, and biological attributes of the river systems
- Preserve agricultural productivity while promoting the ecological value of agricultural land
- Incorporate ecosystem restoration features into the design of federal, state, and local flood management programs.

# 5.0 NATURAL RESOURCES PROGRAM MANAGEMENT

## 5.1 Introduction

This chapter describes current natural resource goals and proposed management and other land management programs at GFAFB, which have a direct affect upon natural resources. This chapter also includes a compendium of issues and observations related to the program that have been raised by Base personnel, and various planning studies. Emphasis is placed upon identifying those natural resources that have the potential to pose a constraint to future development and mission expansion.

The information provided in the following sections was gathered during literature review and various site visits during the initial INRMP and the 2004 Update INRMP.

Ecosystem management as opposed to single species wildlife and habitat management will be employed at GFAFB. Single species management generally geared toward only one or two game species will generally not benefit all members of an ecological community. For example, modifying habitat to favor species that prefer an edge effect, like quail or deer, may have detrimental effects on species that need large expanses of grassland or undisturbed mature forest. Very little natural resource habitat improvement could occur at GFAFB without first reducing, with the intent of eliminating, noxious/invasive species including Russian olive and leafy spurge from GFAFB.

According to the Grand Forks Air Force Base Biological Survey (1994), the only relatively undisturbed natural ecosystem present is the first order stream and oak woodland associated with The Turtle River in the northwestern corner of the Base. The Turtle River is considered a stream for this analysis. Numerous small wetlands are also present on the Base.

In addition to the Turtle River and associated oak woodlands, and wetlands on Grand Forks, hay leases containing "tame" grass species, mainly smooth brome and Kentucky bluegrass (both exotic grass species), are present around the airfield. Some of these former leases are programmed to have noxious and invasive species removed and shall be restored to naturalized grassland suitable for forage. Chapter 5 contains management recommendations for the different types of ecosystems, wildlife, and plants found at GFAFB.

## 5.2 Water Resources

### 5.2.1 Watersheds

As stated in Chapter 3, in the past (1998), the Turtle River (from its confluence with the Salt Water Coulee downstream to its confluence with the Red River of the North) was classified by the North Dakota Department of Health (NDDH) as being an impaired water body because of cadmium. It was later delisted and declared as fully supporting all recreational, municipal and biological uses because of one of the following reasons:

- Based on recent data, use is fully supported,
- Use impairment due to a non-pollutant, or
- Lacks sufficient credible data or information to make a use determination.

The Turtle River's confluence with the Salt Water Coulee stream is downstream of GFAFB about one half mile due east of the Turtle's confluence with Kellys Slough stream.

The Turtle River has a Class II stream designation from the NDDH, which means that the water is the same overall quality as Class I, but that it may require additional treatment to meet the requirements of drinking water. Streams in this category may be intermittent making them less beneficial to uses such as municipal water, fish life or irrigation. There is no natural resource inventory for the Turtle River area.

**Monitoring Wells**

Monitoring wells are located in many areas throughout GFAFB, but most are concentrated in a few areas (Figure 5.2.1-1). There are clusters located southwest of the runway, northeast of the runway near the perimeter and the northeast corner of the base, near the center of the airfield area, and due east of the southern end of the runway.

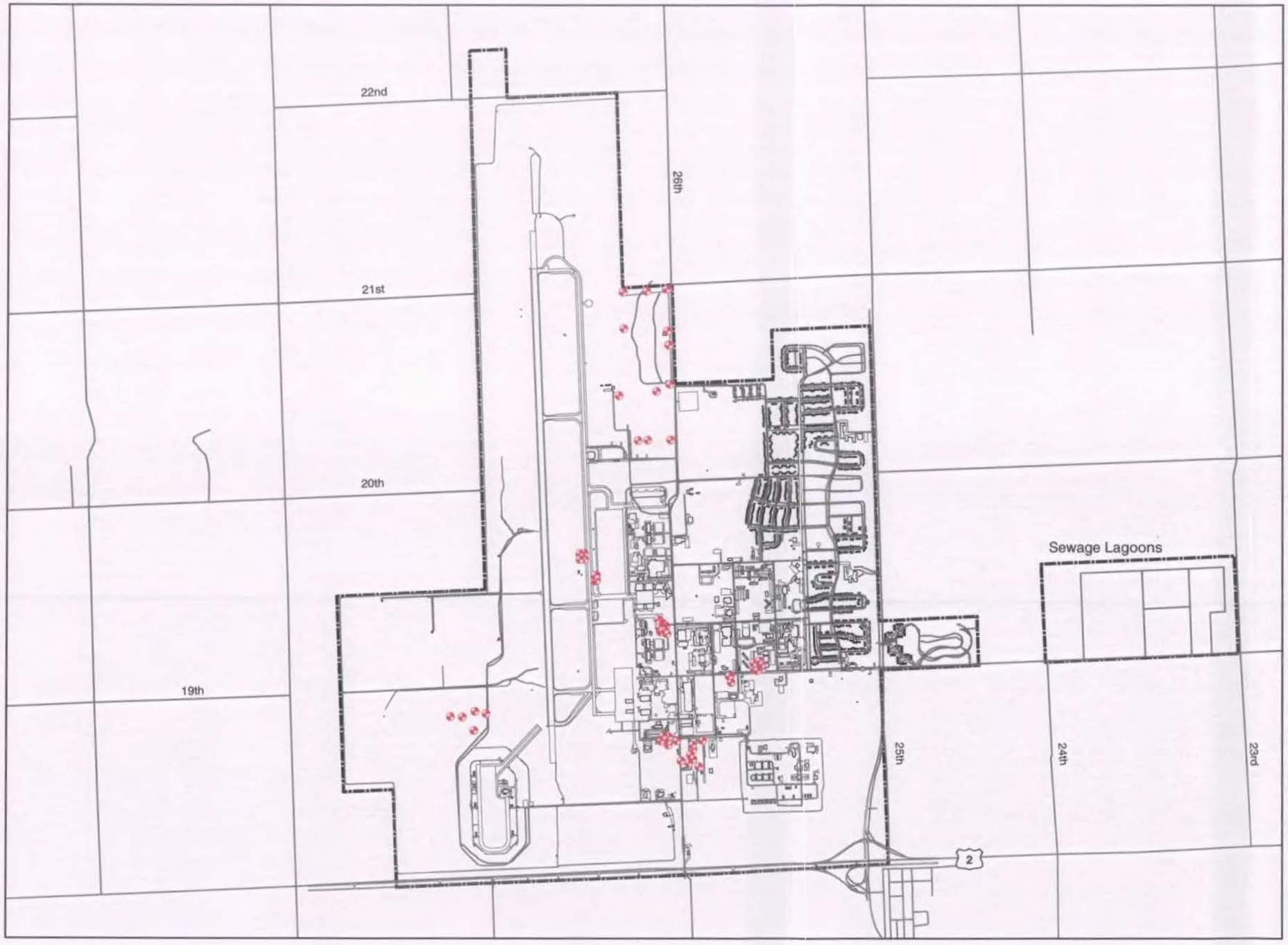
Groundwater containing contaminants has the potential to affect surface water, depending on the depth of groundwater and possible hydrological connections. There are two areas on GFAFB where ground water is monitored. One area is the landfill treatment facility where five monitoring wells are located. These wells are checked for the presence of benzene, toluene, ethyl benzene and xylene (BTEX), diesel range organics (DRO), and gasoline range organics (GRO). The other area, Building 201, the former filling station, has eight wells, which are checked for the presence of total lead, sulfides, various inorganics, BTEX, DRO and GRO.

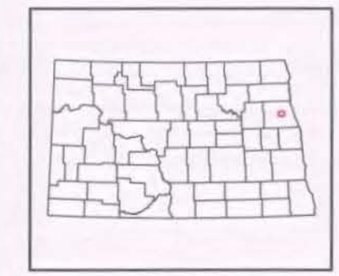
**Storm Water Run Off**

Storm water run off has the potential to affect surface and ground water quality. There are four ditches conveying industrially affected storm water from a variety of individual storm water outlets at the base. The ditches are man-made and discharge at the property boundary to receiving waters in the immediate vicinity of the facility. Discharges to the northwest and west of the base flow into the Turtle River, located to the northwest of the main base. Discharges to the east of the base, via the remaining two ditches, flow into Kellys Slough, which is also a tributary to the Turtle River.

The four industrially affected storm water outfalls are designated the Northwest Ditch, West Ditch, South Ditch, and North Ditch. The Northwest Ditch collects drainage from the old sanitary landfill area, the new sanitary landfill area (both closed and capped), the base small arms range, the northern-most end of the airfield and the eastern flowing drainage of the north half of the parallel taxiway. Under typical working conditions the entire area would not pose a storm water contamination threat, however, the potential exists. The West Ditch collects drainage from the majority of the airfield runway and taxiway areas (including associated pavement underdrain systems), the two largest aircraft parking aprons, the area of and around the now closed Explosive Ordnance Detonation Area (EODA), and the western perimeter area of the base.

Storm water discharging to surface waters via the Northwest, West, South, and North Ditches have the potential to contain significant materials. The following significant materials (based on the definition of General Storm Water Permit, Part VI) that may be present in surface-discharged storm water are: propylene glycol, fuels (jet fuel, diesel, motor vehicle gasoline), oils and lubricants, used oils, and hazardous chemicals under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Section 101 (14) (40 CFR 302).



KEY MAP

N

Groundwater Monitoring Well
Roads
Buildings/Structures
Installation Boundary

0 1,000 2,000 3,000 Feet

FIGURE 5.2.1-1
MONITORING WELLS

2004 INRMP
GRAND FORKS AFB, ND

DATE: SEPTEMBER 2004

| REV. No.: | DRAWN BY: MS |
|---|---|
| | |

Because GFAFB is not a manufacturing facility, the raw materials and finished materials categories do not pertain to the base. Similarly, the Base is currently not required to report chemicals inventories as defined by Superfund Amendments and Reauthorization Act (SARA), Title III, Section 313, as designated quantities of regulated chemicals are not exceeded (USAF, 1994b).

Pesticides applied outdoors on an as-needed basis include the materials. These materials are used on the open areas at the facility and on the golf course. Fertilizer and dandelion control herbicide are to be applied once a year to lawns in the improved/industrial area; however, housing area occupants may fertilize lawns more than once per year. Storm drainage from the grassed areas that drain to the outfalls could contain quantities of these chemicals, the concentration of which would be dependent on application quantities. Additionally, GFAFB Military Family Housing occupants are allowed to purchase pesticides from outside sources and use those pesticides in and around their homes. An inventory of those pesticides and records of use are not available, although, the quantities used are most likely similar to any other North Dakota residential area.

### Storm Water Management Controls

As previously noted, the potential for releases of significant materials to storm water is confined primarily to spills or leaks. By storing all significant materials under roof or in closed containers, contact with storm water is minimized. Oil-water separators and tank containment areas are provided at strategic points within each drainage area to capture accidental releases of tank contents and non-water-soluble materials. The installation has contracted with consultants to evaluate additional controls on storm drainage systems and to ensure all cross connections with sanitary sewers have been eliminated.

GFAFB has employed Best Management Practices (BMP's) such as promptly installing sod and hay bale silt fences to reduce erosion, and some structural controls such as dikes to prevent accidental spills from reaching the environment. GFAFB also has a Spill Prevention Control and Countermeasures Plan in place.

As part of its National Pollutant Discharge Elimination System (NPDES) permit, GFAFB is required to monitor its storm water discharge. The following storm water parameters are monitored:

- Oil and grease (visual) – if a sheen is observed, a grab sample is obtained
- Total Suspended Solids
- Total Phosphorus
- Nitrogen, Total Kjeldahl
- Nitrates as Nitrogen
- 5-day Biochemical oxygen demand
- Chemical oxygen demand
- Any pollutant that is limited in an effluent guideline to which the facility is or may be subject

All discharges from GFAFB have met storm water permit regulations, and thus discharges to environmentally sensitive areas such as Kelly's Slough NWR are acceptable. Each ditch has a control device that can handle any accidental spill, to contain the affected waters until appropriate treatment has been made.

### Wastewater Treatment System

Wastewater has the potential to affect off-base waters. For wastewater generation purposes, GFAFB is in effect a city, approximately the 10th largest in the State of North Dakota when based on a daytime population of greater than 10,000 (employees plus housing residents), and one of the 20 largest cities in the state based on its full-time residents alone. The base wastewater collection system, which consists of more than 50 miles of sanitary mains, services the base industrial, administrative, community support (churches, stores, child care center, recreation facilities, etc.), elementary schools, and family housing facilities. GFAFB shall comply with the North Dakota Department of Health's guidance to protect water as provided in Appendix C.

Base water flow reaches the wastewater treatment facility (sewage lagoons) through two main lift stations. Facility 1336 located in the family housing area in the north central portion of the base serves predominately family housing and an elementary school, but also serves the most northern section of the base flightline including a large aircraft hangar. Facility 801 is the other main lift station, and it passes wastewater to the treatment facility from a large part of the housing area, an elementary school, base administrative facilities, community support facilities, as well as the majority of the base industrial-type facilities.

The base's wastewater treatment facility currently consists of 4 wastewater stabilization lagoons (or cells) without mechanical treatment or aeration. The primary cell is 75 acres in size. The north secondary cell is 26 acres. The south secondary cell is 35 acres. The tertiary cell is 38 acres. Typically, waters from these lagoons are discharged to Kellys Slough 4 times per year.

**Soil Erosion Prevention Measures**

Because the topography at the GFAFB is relatively flat, there are no significant soil erosion problems in the drainage areas served by the industrial outfalls unless the ground is disturbed due to construction or maintenance. The base requires hay bale silt fences to be installed in drainage ditches during construction projects that could discharge sediment to storm ditches. Silt fences are currently not required for projects of one acre or less. Additional measures to prevent sediment discharges are outlined in the Grand Forks Air Force Base Construction Permit guidance and EPA Stormwater Management for Construction Activities, EPA 832-R-92-005, 1992.

All section 404 permits obtained at GFAFB through USACE always have BMP's associated with them to curtail any soil erosion or potential sediment discharges downstream. GFAFB currently has five open 404 permits with USACE. All are current, and contain appropriate BMP's.

### 5.2.2 Wetlands

A wetlands survey, "Wetland Assessment Summary Report 2004 for the Grand Forks Air Force Base" was finalized in December of 2004. Wetlands were also surveyed during the environmental assessment for the demolition of the alpha ramp, and added to the Base inventory. A total of 196 wetlands were identified comprising 301 acres. Most wetlands at GFAFB are less than an acre in size, and are typical of the prairie pothole region that extends from Iowa to central Alberta in Canada. Prairie potholes generally receive the majority of their water from snowmelt runoff in the spring with secondary sources emanating from warm season precipitation. Of the wetland Base inventory, palustrine wetlands compose most of the total at 251 acres. Palustrine wetlands include all nontidal wetlands dominated by trees, shrubs, emergents, mosses or lichens. There is a palustrine emergent/lacustrine wetland north of the Base sewage lagoons of 47 acres. Lacustrine wetlands are situated in a topographic depression or a dammed river channel and lacks trees, shrubs, persistent emergents, emergent mosses or lichens. The remaining 3 acres is a riverine wetland found

in the northwest corner of the Base in Turtle River. Riverine wetlands are those that occur within the river channel and are dominated by emergent vegetation. In 2005, a wetlands delineation of the Fire Station Milcon project was completed, the final report, and associated inventory map, have not been submitted to GFAFB as of yet.

The 2004 wetland report was submitted to USACE for jurisdictional determination, and it was ruled that 16 wetlands comprising 145 acres were jurisdictional. Many of the jurisdictional wetlands are associated with man-made ditches created during installation establishment. The ditches now exhibit all three wetland characteristics to include the presence of water, hydric soils, and wetland vegetation. The ditches discharge directly into Turtle River and Kelly's Slough NWR, therefore the USACE has taken authority.

**Issue** - In compliance with Executive Order 11990, Protection of Wetlands, May 24, 1977, the AF will preserve the natural values of wetlands while carrying out its mission on both AF lands and non-AF lands. To the maximum extent practicable, the AF will protect the natural values of wetlands and avoid actions, which would either destroy or modify their existence or function.

Wetlands are defined as areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support the type of vegetation that is specifically adapted to living in saturated soil. Section 404 of the Clean Water Act authorizes the USACE to regulate the placement of fill or dredged material into the waters of the United States. In addition, Executive Order 11990 requires that federal agencies avoid construction in wetland areas unless the head of the agency determines that there is no practicable alternative to the construction and that the construction is performed in such a way that minimizes the harm to wetlands that are affected by the proposed activity.

To help preserve wetlands, the North Dakota, Grand Forks County regional office of the Natural Resource Conservation Service (NRCS) recommends a 100-foot vegetated (grass) buffer with a perimeter filter strip. A filter strip is an area of permanent herbaceous vegetation used to reduce sediment, organics, nutrients, pesticides, and other contaminant loadings in runoff. Native shrubs and trees are ideal. In general, any activity that destroys the vegetated cover is unacceptable within the buffer. For information on operation, maintenance and constraints on activities within vegetated buffers, refer to the publication, USDA Filter strips, Conservation Plan (ver 05/02), CP-21.

AFI 32-7064 recommends that an installation with jurisdictional wetlands conduct long-term monitoring of the trends in water quality and habitat values, and create plans for the restoration and enhancement of wetlands habitats. A project is programmed to gather data regarding water quality and habitat values of Base wetlands, and anticipated funding should be received FY07. This project will establish a baseline regarding wetland health and viability. GFAFB has created two brochures describing illegal activities in wetlands, and the benefits of wetlands at GFAFB. Generally, speaking wetland benefits include the ecological importance in reducing flooding, trapping sediments, recharging ground water, and providing habitat for wildlife. No waste dumping of any kind is allowed at GFAFB. Types of dumping can range from lawn waste, tree pruning, old landscape materials, building rubble, and road embankment fill.

Future land development planning efforts use base-wide wetland survey information developed in GIS from 2004 and 2005 surveys to affectively plan for new structures and facilities. This effort was prepared for planning purposes and is conducted in conjunction with the USFWS National Wetlands Inventory through a Memorandum of Understanding between the U.S Air Force and the USFWS. This survey and associated delineation were prepared from aerial photographs and wetland site visits to determine the presence and

extent of visible hydrology, wetland vegetation and topography. Continued wetland delineation and jurisdictional updates shall be programmed for O&M and Milcon project areas to practice avoidance, minimization, and mitigation to protect wetland areas, and to complement base development by ensuring effective planning and no delays to the mission.

GFAFB shall ensure proper wetland protection there through proper permitting procedures of the clean water act and coordination with the North Dakota State Water Commission and USACE. In addition, brochures developed that illustrate the benefits of wetlands and the associated legalities shall be disseminated appropriately to further wetland protection efforts. Any approved construction will require compliance with the "No-Net-Loss" policy. Wetland signs potentially can provide good permanent markers for marking gross wetland boundaries. If installed, ensure that signs comply with Base instructions. These signs should not be true "street signs." Signs could read "Designated Waters of the United States, U.S. Army Corps of Engineers, All Authorization Required for Discharge of Dredge or Fill Material in this Area."

It is recommended that water quality in wetlands be protected and enhanced in semi-improved and unimproved areas of the Base as long they do not impose mission constraints or BASH problems. Water quality shall be improved by using avoidance, educational brochures and markers, protective buffers, control of invasive/exotic species, proper permitting procedures, and by preventing potentially contaminated runoff from reaching wetlands.

## 5.3 Wildlife Management

### 5.3.1 Threatened & Endangered Species

**Issue -** Public Law 93-205, the Endangered Species Act, as amended, requires protection and conservation of federally listed threatened and endangered plants and animals and their habitats.

The following table presents a list of threatened and endangered species that are present in North Dakota and have the potential to be present at GFAFB. The table below and some of the following information on threatened and endangered species were provided courtesy of the NDGFD.

**Table 5.3.1- 1 Threatened or Endangered Species**

| Threatened or Endangered Species in North Dakota | Type of Species | Status |
|---|---|---|
| Least Tern (*Sterna antillarum*) | Avian | Endangered (summer residents) |
| Bald Eagle (*Haliaeetus leucocephalus*) | Avian | Threatened (year round residents in portions of the state; has nested at Kellys Slough; occasionally seen at road kills) |
| Whooping Crane (*Grus Americana*) | Avian | Endangered (migrates through the state) |
| Piping Plover (*Charadrius melodus*) | Avian | Threatened (summer resident) |
| Black footed ferret (Mustela nigripes) | Mammal | Endangered (not sure if any are left in the state) |
| Gray Wolf (*Canis lupus*) | Mammal | Endangered (rare visitor to ND) |
| Pallid Sturgeon (*Scaphirhynchus albus*) | Fish | Endangered (maybe only a few hundred left in the ND section of the Missouri River) |
| Western Prairie Fringed Orchid (*Platanthera praeclara Shev. & Bowls*) | Plant | Threatened |

Proper breeding habitat for the least tern is probably not present on the base as the bird prefers open, unaltered and natural streams or rivers with sandbars or islands for nesting. It may appear as a transient at GFAFB. Least terns utilize breeding habitat along the rivers in the western part of North Dakota.

Piping plovers are migratory shorebirds that use isolated beaches and sandflats in central and eastern North America. They prefer alkaline shorelines of prairie lakes and sloughs (those with heavy concentrations of mineral salts). The beaches in areas used by piping plovers are usually open and clear of vegetation. It is possible they may pass through GFAFB. Potholes on GFAFB should remain undisturbed from mid-April until mid-August. The ground nesting plover is particularly vulnerable to off-road vehicles during the nesting season and to introduced-predators like cats and dogs, and native wildlife including skunks or foxes that have a high tolerance for living in close proximity to people. However, suitable habitat is probably not present at GFAFB.

Habitat for the pallid sturgeon is not present at GFAFB, due to a lack of a natural river system. It prefers streams or rivers with meandering, braided channels and backwaters that provide different depths and flow velocities. In all potential habitats including North Dakota, the pallid sturgeon's habitat is diminished by the presence of dams and channelization that modify flows, reduce turbidity and lower water temperatures. Artificially created channels and construction of dikes that narrow the rivers and cut-off backwater areas have altered former river habitats in the Missouri and Mississippi Rivers. In North Dakota the fish is present in the Williston Reach of the Missouri River near Lake Sakakawea in the western portion of the state near Montana (NDGFD).

Habitat for the western prairie fringed orchid is found in Grand Forks County, but due to the disturbed nature of the Base, habitat for the orchid is probably not present at GFAFB. Historically, it was found throughout tall grass regions of North America. Today there are 172 sites remaining in six states and one population complex in Manitoba, Canada. North Dakota has the largest population left in the world numbering over 2,000 individuals located in the Sheyenne National Grasslands in the southeastern corner of the state.

The whooping crane and gray wolf may occur as transients or migrants at GFAFB. The cranes may stop to feed or rest at GFAFB, but winters at the Aransas National Wildlife Refuge on the Texas Gulf Coast. The bald eagle occasionally occurs at GFAFB, and prefers large expanses of open water for feeding and tall trees for breeding. Nesting eagles have been documented at Kellys Slough NWR to the east of GFAFB. No breeding bald eagle pairs have been documented at GFAFB.The chance of the wolf or the black-footed ferret occurring at GFAFB is very unlikely because of the small numbers of these animals remaining in North Dakota.

According to the North Dakota Natural Heritage Inventory, there are several rare species and significant ecological communities surrounding GFAFB. Types of communities are mainly fresh and saltwater marshes/wet meadows and the like. Two terrestrial communities lie on the perimeter of GFAFB. They are the Turtle River Creek itself, and the ash-hackberry-basswood upland forest associated with the Turtle River. Rare species identified in this area include birds, black tern (*Chilodonias niger*), Canada warbler (*Wilsonia canadensis*), chesnut-sided warbler (*Dendroica pensylvanica*), orange-crowned warbler (*Vermivora celata*), osprey (*Pandion haliaetus*), pileated woodpecker (*Dryocopus pileatus*), common loon (*Gavia immer*) scarlet tanager (*Piranga olivacea*), whip-poor-will (*Caprimulgus vociferus*), red-breasted nuthatch (*Sitta Canadensis*), white-throated sparrow (*Zonotrichia albicollis*), a mussel, the Pink Heelsplitter (*Potamilis alatus*), a fish, pugnose shiner (*Notropis anogenus*), and a species of tiger beetle (*Cicindela circumpicta*).




***Kelly Slough NWR. Note white pelicans near far shoreline.***

Bird surveys conducted in 1994, 2001, 2004, and 2005 have documented the following 56 threatened/ endangered and special species of concern birds at GFAFB.

**Table 5.3.1-2**

| Species | FED T&E | BCC 2002 | STATE T&E | STATE SSC | PIF |
|---|---|---|---|---|---|
| Alder Flycatcher | | | | X | |
| American Bittern | | X | | | X |
| American Woodcock | | | | X | |
| Baird's Sparrow | | X | | X | |
| Bald Eagle | X | | X | | X |
| Black-billed Cuckoo | | X | | | X |
| Bobolink | | | | | X |
| Bufflehead | | | | X | |
| Canada Warbler | | | | X | |
| Chesnut-collared Longspur | | X | | X | |
| Chesnut-sided Warbler | | | X | | |
| Clay-colored Sparrow | | | | | X |
| Common Merganser | | | X | | |
| Common Tern | | | | X | |
| Cooper's Hawk | | | | X | |
| Eastern Bluebird | | | | X | |
| Ferruginous Hawk | | X | | X | |

| | | | | | |
|---|---|---|---|---|---|
| Forster's Tern | | | | X | |
| Franklin's Gull | | | | X | X |
| Grasshopper Sparrow | | X | | | X |
| Green Heron | | | X | | |
| Hooded Merganser | | | | X | X |
| House Wren | | | | | X |
| LeConte's Sparrow | | X | | X | |
| Loggerhead Shrike | | X | | | X |
| Marbled Godwit | | X | | X | X |
| Marsh Wren | | | | | X |
| Mourning Warbler | | | | X | |
| Nelson's Sharp-tailed Sparrow | | X | | X | X |
| Northern Flicker | | | | | X |
| Northern Harrier | | X | | | |
| Northern Pintail | | | | X | |
| Northern Waterthrush | | | | X | |
| Olive-sided Flycatcher | | | | X | |
| Orange-crowned Warbler | | | | X | |
| Osprey | | | | X | |
| Pied-billed Grebe | | | | | X |
| Pileated Woodpecker | | | X | | |
| Red-breasted Nuthatch | | | | X | |
| Scarlet Tanager | | | | X | |
| Sedge Wren | | | | | X |
| Solitary Sandpiper | | X | | | |
| Sora | | | | | X |
| Swainson's Hawk | | X | | X | |
| Swamp Sparrow | | | X | | |
| Turkey Vulture | | | | X | |
| Upland Sandpiper | | X | | X | |
| Vesper Sparrow | | | | | X |
| Virginia Rail | | | | | X |
| Whip-poor-will | | | X | | |
| White-rumped Sandpiper | | X | | | |
| White-throated sparrow | | | X | | |
| Willet | | X | | X | |
| Wilson's Phalarope | | X | | | X |
| Wood Duck | | | | | X |

FED T&E = federally threatened or endangered
BCC 2002 = Birds of conservation concern 2002, US Fish and Wildlife, Division of Migratory Bird Management
STATE T&E = state threatened or endangered, North Dakota Natural Heritage Inventory, Nature Preserves Program
STATE SSC = state special species of concern, North Dakota Natural Heritage Inventory, Nature Preserves Program
PIF = partners in flight, bird conservation plan for the northern tallgrass prairie, American Bird Conservancy

The Base supports a remarkable diversity of plant and wildlife species given its size and location within an agricultural matrix (Biological Survey Update, 2004). Regardless of the condition of habitat found on the base, many species are found nesting and using the space. It is recommended these identified rare species be conserved for where it does not impose on the mission. In particular, projects shall be programmed and funding sought: 1) to restore native prairie near the MSA fields, adjacent to the lagoons, and west of the airfield security fence to provide improved habitat grounds; 2) stabilize the Turtle River riparian area from bank slumping and improve with native shrubs and trees; and 3) protect wetlands as suggested in section 5.2.2 to improve water quality and provide habitat. Recent legislation (June 2, 2004) changes allow incidental taking of migratory birds on DoD lands during military readiness training as directed by the 2003 National Defense Authorization Act. Therefore, it is further recommended that continued monitoring be completed to identify any population and/or species changes as a result of this ruling.

### 5.3.2 Wildlife Program Management

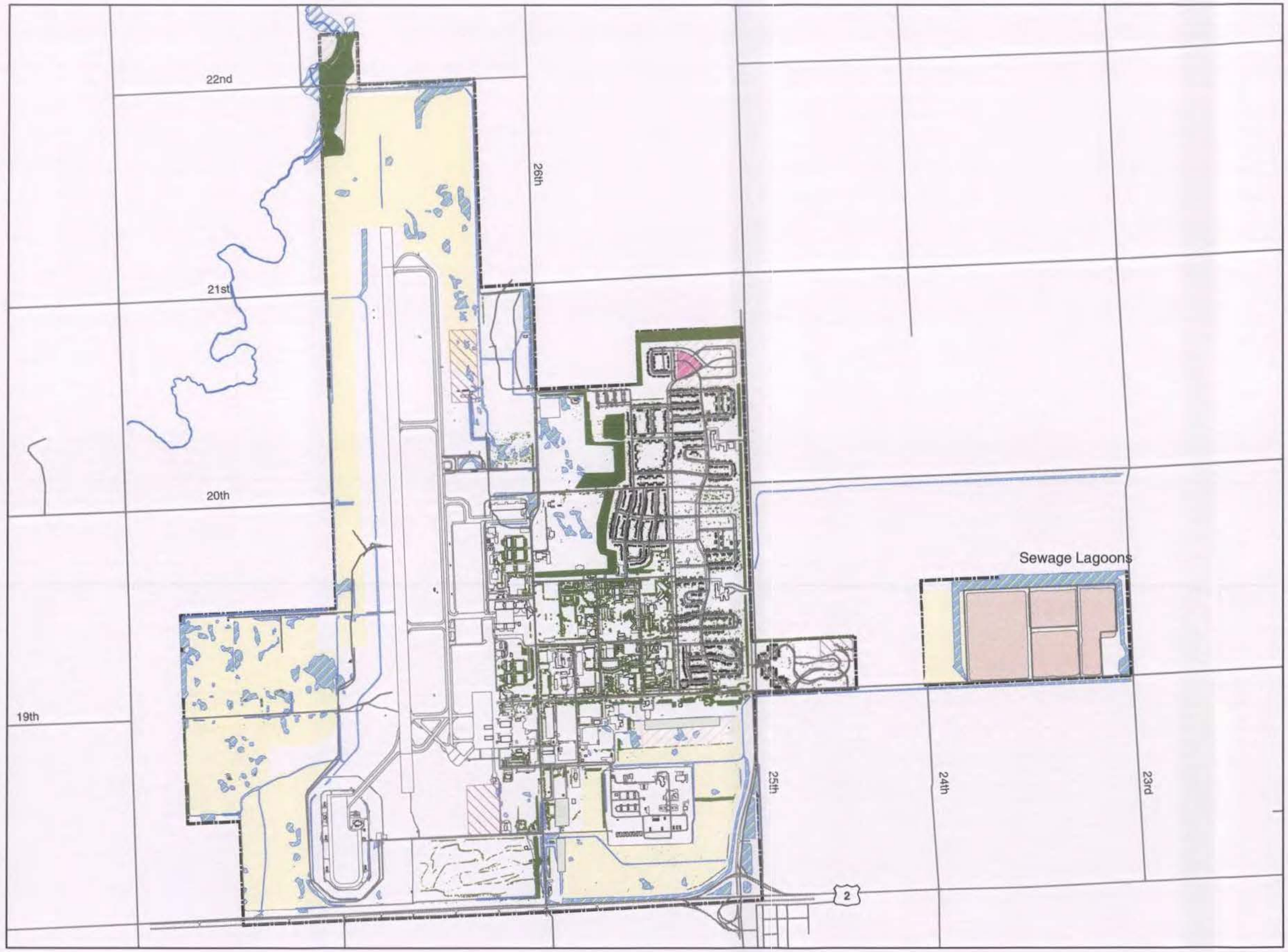
This section describes the current status of natural resource management programs for each program area in the INRMP. Current management describes recent and on-going initiatives, activities and inventories to assist in the management of natural resources at GFAFB. Proposed management objectives describe program activities for the 2004-2008 period. Figure 5.3.2-1 shows natural resources located at GFAFB.

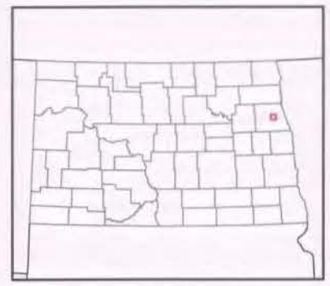
A biological survey update for 2004 has been completed at GFAFB. In November of 2001, a survey was conducted entitled "*Spring Migration and Summer Breeding Bird Surveys on Grand Forks Air Force Base.*" Figure 5.3.2-2 shows bird survey points at GFAFB. The purpose of the study was to document distribution and abundance of birds, identify important habitat areas, provide recommendations for maintaining and enhancing habitat, and to address mission-related concerns such as BASH. A follow on BASH survey in 2004 was conducted to complement original efforts in 2001. The first biological survey was conducted in 1994 on the base. In addition, a 2005 migratory and breeding bird survey was completed along with a paired-count waterfowl survey by the USFWS of the sewage lagoons. The paired-count was a joint effort with Kelly's Slough NWR, and continued communication regarding migratory birds and management of the sewage lagoons and Base property is planned.

This section will also describe significant natural resource management issues especially those that have the potential to impose constraints or conflicts with the military mission, regulatory requirements and conflicts with other Base groups. For example, GFAFB must comply with federal laws like the Endangered Species Act and the Migratory Bird Treaty Act, but is also required to carry out the military mission and protect the lives of its personnel and property (BASH conflict).

Table 5.3.1-2 shows a variety of birds, many of which are nongame species, associated with wetland, grassland, and woodland riparian habitats. Grassland birds have undergone severe declines in abundance over the last several decades, primarily because of native prairie habitat loss. Less than 1% of native prairie remains in North America. GFAFB has over 2,000 acres of grassland, where several breeding grassland bird species are documented. The acreage is dotted with small potholes, providing denser coverage for those species requiring it. These wetlands provide needed shelter and a vital food source to these birds.

Before settlement of the prairie grasslands, fire and the earth-disturbing activities of animals like bison and badgers combined with the physical constraints of topography and soil type combined to form and maintain the mosaics of habitats that make up the grassland ecosystem. Therefore, healthy grassland is made up of a number of different habitats including different types of wetlands, woodlands and streams. It is noteworthy



KEY MAP

N

- Roads
- Tree Farm
- Buildings/Structures
- Installation Boundary
- Tree Arboretum
- Haylease
- Floodplain
- Turtle River
- Wetlands
- Lagoons
- Natural Area
- Training
- Trees/Wooded/Shelterbelts

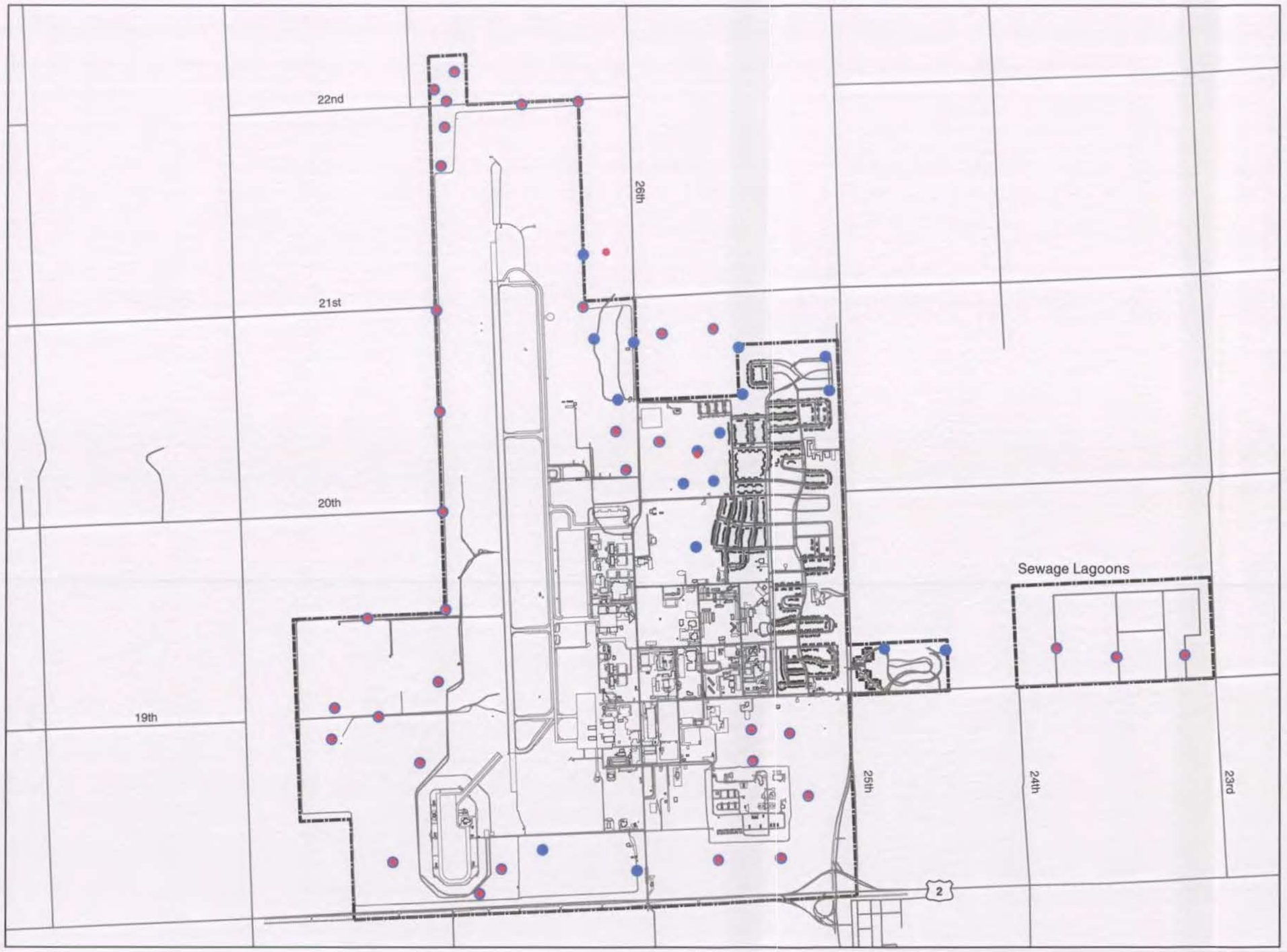
0 1,000 2,000 3,000 Feet

FIGURE 5.3.2-1
NATURAL RESOURCES

2004 INRMP
GRAND FORKS AFB, ND

DATE: SEPTEMBER 2004

REV. No.: DECEMBER 2005 -- KR | DRAWN BY: MS







N

Bird Survey Points (2001,2004)
Bird Survey Points 2005
Roads
Buildings/Structures
Installation Boundary

0 1,000 2,000 3,000 Feet

FIGURE 5.3.2-2
BIRD SURVEY POINTS

2004 INRMP
GRAND FORKS AFB, ND

DATE: SEPTEMBER 2004

REV. No.: DECMEMBER 2005 -- KR | DRAWN BY: MS

that like the activities of animals, fire did not burn an area uniformly; some areas never burn and some areas only burn once in a while. The fact that grasslands are composed of several different types of habitats is important to natural resource management in creating or maintaining the greatest diversity of plant communities to promote the highest wildlife diversity. Preferences of grassland birds range from areas that are dry and nearly devoid of vegetation to those that are extremely lush like tallgrass prairie or the lush marsh habitat that the Nelson's sharp-tailed sparrow requires for breeding. Managing areas away from the airfield to ensure a mosaic of habitat will benefit grassland birds, butterflies, mammals, amphibians, reptiles and other animals found in a grassland ecosystem. Protecting marshes and prairie potholes from physical damage and pollution will also benefit aquatic and terrestrial invertebrates, which form the basis for the food chain for these ecosystems.

GFAFB shall design and implement a prescribed burning plan to simulate presettlement conditions to create a variety of habitat mosaics. The resultant of a varied structure and texture to the grassland will maintain and conserve current populations of grassland species identified at GFAFB. Therefore a prescribed fire management plan is currently being written in house, and a project is programmed to burn unimproved grassland acreage in FY07. Prescribed burning shall improve habitat for many of the grassland and wetland dependent species. Interseeding in areas around the MSA, west of the lagoons, and west of the airfield security fence shall also improve habitat conditions for these grassland birds and compliment the prescribed burning program.

General management recommendations for conservation of these grassland species include: avoidance of habitat fragmentation, minimization of linear edge effects, control for woody vegetation, implement prescribed burning prior to ground-nesting activities (March/April), keep grassland size tracts at least 125-250 acres in size, control for noxious/invasive weeds, and do not mow grasslands prior to July 15 where applicable.

The sewage lagoon east of the base is important habitat for waterfowl, swallows, and black terns. Another species that likes aquatic habitats, the bald eagle has also been documented at the sewage lagoon. PIF High Priority species like the marsh wren and Wilson's phalarope also inhabit the sewage lagoon. It is recommended that the sewage lagoons continue to be monitored for rare bird species using the area, and that the adjacent grasslands be included in the fire management plan. GFAFB has programmed bird monitoring and survey projects for the lagoons and all other unimproved areas of the base through FY11. The grassland to the west of the lagoons is an alkali mud flat that should be considered as an area to restore to an alkali prairie for habitat improvement.

Preserving and enhancing the native grassland systems and the prairie pothole system will benefit not only grassland bird species, but other grassland dependent animals on GFAFB to include amphibians, reptiles, butterflies, and mammals. The reptiles and amphibians located at GFAFB are dependent on the health and vitality of the prairie pothole system. GFAFB shall conserve and maintain current populations for these species by protecting wetlands and using proper permitting procedures. There are many butterflies dependent on native prairie ecosystems, and the Base has documented several species occurring here. A butterfly garden shall be constructed in the Prairie View Nature Preserve, to improve habitat by using host plants and nectar plants, provide an educational platform for base residents to learn about natural resources, and shall assist in maintaining current populations and species of butterflies.

Wildlife management of the Turtle River riparian area should include a deer hunting program (see next section), continued species and population monitoring of this sensitive area, and habitat improvement (see

section 5.3.6). The area has been identified as a natural community by the state Natural Heritage Inventory program, and provides habitat to high species diversity of migratory and breeding birds. Pileated woodpeckers are believed to be nesting in the woodland.

### 5.3.3 Hunting Program

There is a bow-hunting program at GFAFB, and 19 permits were issued in 2003, 11 in 2004, and 7 in 2005. One buck was taken in 2004, and one in 2005 from the designated hunting area. White-tail deer frequent unimproved areas of the Base such as the grasslands and shelterbelts of the MSA, the western grassland of the airfield, and the turtle river riparian area. The turtle river area is the only section open to bow-hunting. Base instruction regulates hunting in this area GFAFBI 32-4004.

Hunting, fishing, trapping and dispersed outdoor recreation programs are appropriate when they are consistent with INRMP goals for natural resources management. Fish and game harvests must comply with all national and state laws and regulations, and will be consistent with Department of Defense principles for ecosystem management and biodiversity conservation. The designated installation natural resources program manager is responsible for direction and oversight of the bow hunting programs and fee collection for hunting permits. GFAFB may utilize the voluntary assistance of others to help manage hunting and fishing programs, to include the Air Force Services Agency or Rod and Gun Clubs, but organizations outside the installation chain of command shall not direct policy on hunting, fishing, trapping and outdoor recreation. Program support provided by the Air Force Services Agency may be reimbursed from user fees. In addition, GFAFB needs to coordinate with NDGFD and the USFWS on its hunting program.

Administrative and management costs associated with hunting, fishing, trapping and the management of outdoor recreation access must be fully reimbursed by user fees collected by the installation and deposited into the AF account for fish and wildlife management (57 5095). Use DoD Form 1131, Cash Collection Voucher to record fee collections and submit collections to the appropriate accounting and finance office. If the Air Force Service Agency or other organization assists the natural resources management program office with the collection of user fees, any administrative fees charged must be accounted for separately from fees collected into the 57 5095 appropriation. In such case, the permit issued must identify the portion of the fee payment that represents the seller's administrative charge. Upon termination of a fee collection program for hunting, fishing, trapping, or outdoor recreation, installations must notify the MAJCOM and the collection account will be closed.

The deer archery season may be authorized annually and will coincide with the state of North Dakota deer archery season in accordance with state law. The specific dates of the deer hunt within the confines of GFAFB will be established, and notice provided through the base newspaper, electronic bulletin board and e-mail, approximately one month prior to the opening of the season. No trespassing signs are posted in the area and only active duty military and dependents, retired military and dependents, and DoD civilians are eligible to apply for permits to hunt in this area. However, because of the small size of this area, opportunities for hunting constrained by the number of deer stands available, are somewhat limited.

The Natural Resources Program Manager will issue permits and collect fees. Permits are issued on a lottery basis and a fee of $10 is required at the time the permit is issued. Hunters must possess the following: a North Dakota hunting license with valid bow hunting license, and a GFAFB hunting permit. The location of the hunt will be on the unimproved area of the northwest corner of GFAFB (Figure 5.3.3-1) located outside the perimeter fence (CE Park or the Turtle River area). Hunting will not be allowed within 200 feet of any

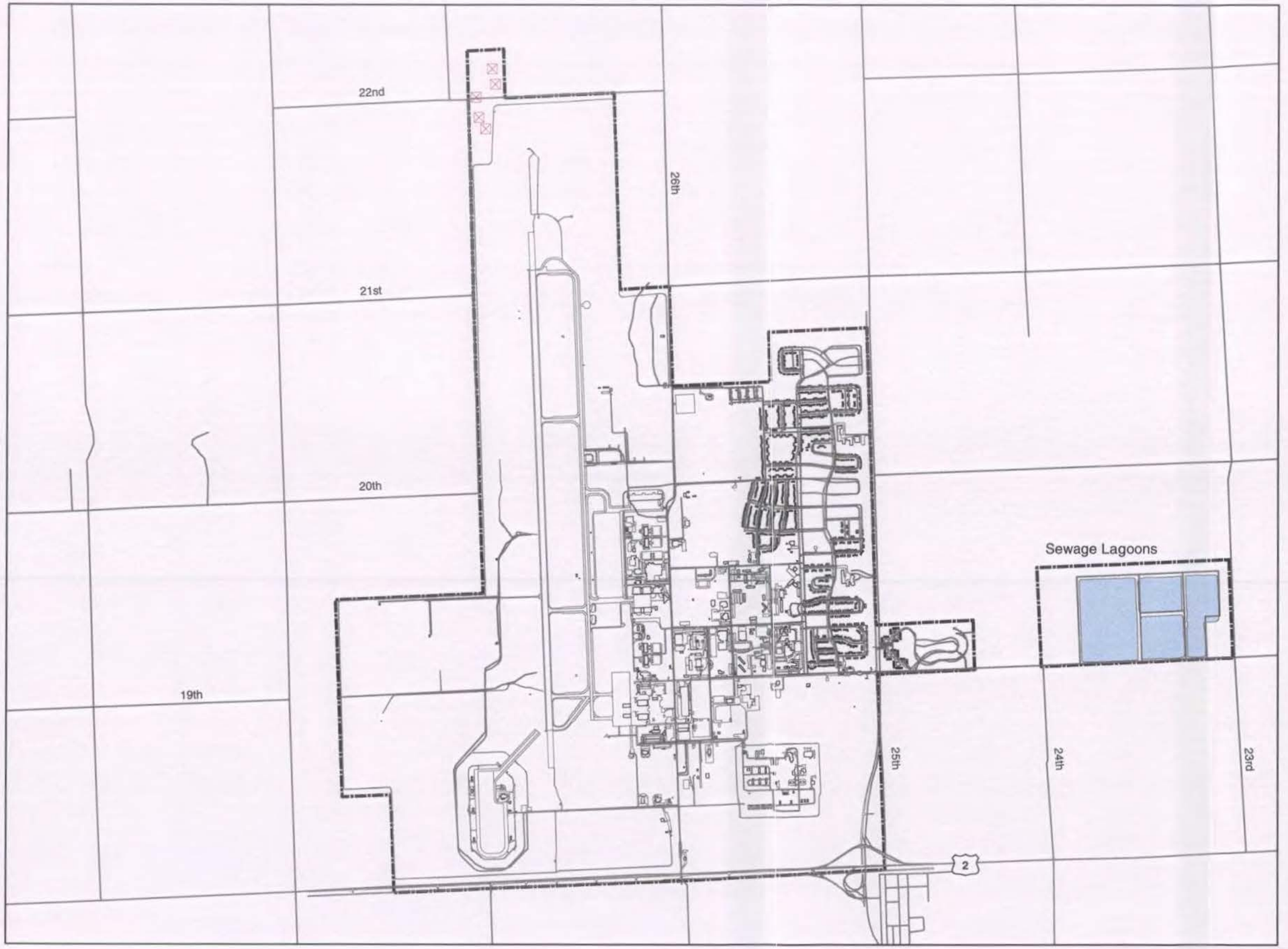



FIGURE 5.3.3-1
HUNTING STANDS

2004 INRMP
GRAND FORKS AFB, ND

DATE: SEPTEMBER 2004

REV. No.:

DRAWN BY: MS

building or dwelling in the hunting area. Hunting will cease when training or other activities are occurring. Hunters will be provided maps of the area and signs will be posted to inform others that hunting is going on. All deer taken or injured will be reported to the natural resource program manager. All North Dakota deer registration and reporting procedures are and will remain the responsibility of the individual hunter. Under certain circumstances, mission or Force Protection requirements will supersede hunter's rights. In addition, areas designated by the base commander as being off limits to recreational hunting, fishing, trapping, and dispersed outdoor recreation will apply to all persons at any given time. These are areas where mission security and safety concerns will not allow such use.

To assist with enforcement of wildlife and hunting regulations GFAFB utilizes where feasible, federal and state conservation officers for the purpose of enforcing fish and wildlife laws. In addition, GFAFB may designate fish and wildlife law enforcement authority to military or civilian personnel who have either been certified in fish and wildlife law enforcement through training at the Federal Law Enforcement Training Center or by commission as a fish and wildlife conservation officer in the state where the installation is located. Law enforcement personnel who do not possess either federal or state fish and wildlife enforcement certification can be used to supplement fish and wildlife law enforcement under the direction of certified personnel.

GFAFB is concerned about controlling beavers on the installation. To trap beavers in the state of North Dakota a furbearer's license and certificate are required. The license is available at most sporting goods stores and can also be purchased on the NDGFD website. The cost for the license is $7.00, and the certificate can be purchased for an additional $1.

### 5.3.4 Wildlife Control

According to the Wildlife Damage Control Act of 1931 (amended in 1987 and 1991), the Secretary of the U.S. Department of Agriculture (USDA) is authorized to conduct investigations and tests to determine the best methods of eradication, suppression, or bringing under control mountain lions, wolves, coyotes, bobcats, prairie dogs, gophers, ground squirrels, jack rabbits, and other animals injurious to agriculture, horticulture, forestry, animal husbandry, wild game animals, fur-bearing animals and birds. Another reason for the control is to protect domestic animals through the suppression of wildlife diseases like rabies. Under the Act, the Secretary may cooperate with states, individuals, agencies and organizations. There is no inventory of controlled wildlife at GFAFB other than a depredation list. In general, GFAFB does not kill nuisance animals on the airfield, but has an agreement with the USDA to perform this task. A big game permit from the state is required for this activity. Pest management at GFAFB has the authority to kill non-game animals such as rabbits, skunks, mice, possums and ground squirrels because these animals are not regulated by the state. Local game wardens may on occasion be called upon to control nuisance wildlife.

The Secretary is also authorized, except for urban rodent control, to control nuisance mammals, birds, and those mammal and bird species that are reservoirs for zoonotic diseases. Agreements may be entered into with states, local jurisdictions, individuals, and organizations for this purpose.

Species that present a potential hazard to aircraft operations are deer that periodically gain access to the airfield. The tree cover available on base and relatively easy entry to the Base has encouraged deer populations in the region. Deer appear to gain



***White-tailed Jackrabbit***

entry to the airfield beneath perimeter fencing in areas near vehicle gates where erosion has washed away soil or when gates may have been left open. When deer are observed on the airfield, personnel drive them off on foot and in all-terrain vehicles (ATVs). Most of the time, they are driven out of a gate at the northwest end of the airfield near the Turtle River usually twice a year or as needed.



***Evidence of Beaver Activity***

Occasionally, white-tailed jackrabbits are a problem at GFAFB. Jackrabbits injure or destroy tree saplings during the winter by consuming the bark of young trees. Young trees are protected by tree trunk guards that extend several feet above ground level to protect them during time of deep winter snow cover.

Beavers present a problem on the base by occasionally building dams in a drainage ditch west of the airfield. These dams restrict the flow of water through the ditch, and consequently, airmen with trapper licenses have to trap the beavers. Dams are removed by in-house labor. Grounds maintenance and perimeter security personnel continue to monitor the situation, and beavers have been trapped and removed as recently as the fall of 2002. Standing water created by beavers could become a BASH problem. Appendix B provides information on managing beavers with construction of a "beaver pipe" and how to trap the beavers. In addition to this information, Biological Survey Product #4, conducted by the North Dakota Parks and Recreation Department (the North Dakota Natural Heritage Inventory, page 89), provides information on beaver management and monitoring.

**Issue** - Richardson's ground squirrels create a nuisance by burrowing under buildings, burrowing around plantings and damaging improved turf areas. Squirrels are managed by pest control personnel to reduce populations using smoke canisters and Rodex 4000 applicator.

Richardson's ground squirrels were observed in very high numbers on the Base July 2003. This indicates a lack of natural predators of the squirrel such as the extirpated black-footed ferret. Prairie grassland predators such as the badger, the ferruginous and other hawks, coyotes, bobcats, and swift foxes formerly kept the numbers of this burrowing rodent in check. Prairie rattlesnakes and bull snakes also prey upon ground squirrels. Existing natural predators on base shall be left in tact where they do not conflict with human use of the base. Some coyote, badger, and fox have been noted on base in the western portions of the base and at the lagoons. These areas have been identified as potential hay lease areas and candidates for restoration to native vegetation. These land management strategies are compatible with fostering most natural predator populations. Continued removal by pest management will continue in the manicured areas of the base to remove large groupings of these squirrels where damage to property may occur.

**Badger**

**Issue** – Some base residents view badgers as pests. Complaints have been received from Prairie View Nature Preserve and elsewhere.



***Badger***

Badgers are medium sized members of the weasel, or mustelid, family. Their powerful bodies are well adapted to digging and moving through tunnels in search of burrowing, or fossorial, prey

including ground squirrels, prairie dogs and pocket gophers. Like the ferruginous hawk, the badger is a valuable component of a functioning tallgrass prairie ecosystem. Base residents should be made aware of the fact that the badger is a natural part of the prairie ecosystem and is very important in the control of small mammal populations including Richardson's ground squirrels, other rodents and rabbits.

### Cliff Swallows

**Issue** –Cliff swallows are considered a pest at GFAFB and repellents have been used to prevent them from nesting in hangers and other buildings.



***Cliff Swallow***

Cliff swallows, like other swallows including the purple martin, are agile and graceful aerial predators of insects. While the larger martin takes larger insect prey including dragonflies, swallows take smaller prey including large numbers of mosquitoes. They congregate in large colonies composed of gourd-shaped mud nests and have adapted to attaching their mud nests to human dwellings. On Base these nests are removed by authorized personnel only in the BASH-zone where appropriate permits are held from the USFWS. This activity shall continue to protect the mission of GFAFB as part of the BASH plan (Appendix J). Active nests elsewhere on Base containing eggs or nestlings may not be removed by any individual, and is prohibited by the Migratory Bird Treaty Act. Swallows are prolific in the area, and shall be tolerated as they assist in mosquito control, and are a protected migratory bird. Migratory birds are protected through International Treaties and the Migratory Bird Treaty Act. Federal regulations (50 CFR) and Executive Order 13186 provide the framework for regulation of migratory bird take and possession. Federal permits are required to take, possess, transport, and dispose of migratory birds, bird parts, feathers, nests, or eggs. When necessary, application for permits shall be made to the USFWS Migratory Bird Permit Office in Denver, CO.

### Beavers

**Issue** – Beavers have been causing flooding by clogging the drainage ditch west of the airfield. Dams require regular removal by in-house labor. Airmen with trapper's licenses trap beavers on nearby off-installation property. Grounds maintenance and perimeter security personnel need to continue to monitor this situation and clean out the drainage ditch when necessary. Suggestions for alleviating beaver damage are provided in the following paragraphs.

When beaver fur was in style, extensive trapping and hunting substantially reduced beaver numbers across the United States and Canada. Today the resilient beaver has returned and is plentiful again throughout much of its range. In general, the beaver's return has been beneficial to wildlife. For example, additional wetland habitat created by the beaver has aided in the recovery of the wood duck and many other species, which use the beaver's ponds as habitat. Beaver ponds are excellent areas to view wildlife. Unfortunately, the beaver's return has created problems with landowners, including the Air Force, due to economic damage from flooding of low lying areas and the destruction of trees and crops associated with the beaver's damming and diversion of streams and other bodies of water. The following paragraphs provide some management suggestions for the beaver taken from the Alberta (Canada) Department of Agriculture, Food, and Rural development (AgDex 681-1).

Tree protection

Beavers can be fenced out of a treed area or individual trees can be wrapped with galvanized metal or chicken wire to a height of at least 1 meter (m). A galvanized metal fence at least 1 m (3 ft) high and 0.5 m (18 in) below ground can protect valuable broad-leaved trees; however, this protection method can be expensive.

Repellents

Thiram, the only repellent known to reduce beaver damage, is applied directly to trees and shrubs. However, it will usually work only where beaver have alternate sources of food, i.e. other trees they can cut for food. No license or permit is required to purchase or use this product.

Water level control without beaver removal – "Beaver Drain Pipes"

Where flooding is the major problem, the use of a "beaver drain pipe" is the best solution. Make a "drain pipe" or water level stabilization device by fitting two plastic sewer pipes together and perforating one of them. The diameter of the pipes can be 4, 6, 8 or 10 in., depending on volume of water in the stream.

Dig a hole through the beaver dam in line with the original stream channel. Set three-quarters of the pipe at almost any level in the dam, and extend the perforated end out into the pond. A weight should be placed on the end of the pipe. Allow about one quarter of the pipe to extend on the downstream side of the dam. Beaver pipes work best where the flooded area is more than one acre and the minimum water depth at the pond is 0.5 m (18 in.) or deeper. Be sure to add a 30 cm (12 in.) elbow or turndown to the end of the pipe to discourage plugging of the upstream end of the pipe.

In the case of a plugged culvert, the dam should be removed and a heavy wire mesh fence (No. 6 concrete reinforcing wire) should be installed around the mouth of the culvert and secured with steel posts. When the beaver build a dam on the fence, a "beaver pipe" can be placed through the fence to keep the water at a desired level.

A single "beaver pipe" can handle the normal runoff from a 2,000-acre drainage area; some installations use up to three pipes. It is not feasible to manage streams with flows from drainage areas exceeding 10 to 11 square km with beaver pipes.

A pipe installation usually provides a long-term water level control at a nuisance site. However, it can also provide control until beaver are removed from the site through a regular fur-trapping season. If all else fails, #330 Conibear brand traps are considered the best types of traps to use for lethal beaver control because they kill instantly. However, many states require that these traps must be set in or under water to prevent other non-target species from being killed.

The benefits of a pipe installation include elimination or reduction of beaver damage as well as the conservation of a beaver colony and a steady supply of stock water. In problem areas where emigrating beaver continually re-occupy the site, trapping would be necessary on a yearly basis. If trapping is required in five or more years out of fifteen, a pipe installation is a more effective and less costly method of controlling the problem.

Three important requirements need to be considered when using beaver pipes are water depth and area must be adequate to install the pipes properly; normal flow of the stream during the control period must not exceed the flow capacity of the pipe; and you must be willing to accept short periods of high water levels.

Beaver guards

A wire mesh cylinder of 10 x 10 cm (4 inches x 4 inches) welded wire mesh (0.4 gauge or 0.25 inch diameter) will protect culverts from beaver. The diameter of the cylinder should be the same as the culvert, and the cylinder may be in a horizontal or vertical position.

The length of the cylinder may vary, but as a general rule, the length should be twice the diameter of the beaver guard. Secure the cylinder with heavy metal stakes and fasten it to the culvert. To prevent standing water problems caused by beaver activity, funds should be budgeted for this beaver control project to address flooding caused by beaver on GFAFB. For details on construction of the "beaver pipe," please see http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex3469. See Appendix B for more information on beaver control.

### Rabbits

**Issue -** Rabbits cause significant damage to landscape plants.

Environmental pest control manages rabbit populations by shooting. As stated earlier, natural predators of rabbits including badgers, foxes and hawks should tolerated and appreciated on Base for keeping pest species in check.

## 5.3.5 Feral Animals

The GFAFB Veterinarian office was contacted for information on diseases that might be transmitted by wildlife or domestic animals. There has been no incidence of Lyme Disease, rabies or equine encephalitis (horses are vaccinated yearly) on the Base. There is no feral animal inventory for GFAFB.

### Rabies and West Nile Virus

However, there have been 23 skunks that have tested positive for rabies in the Grand Forks and western Minnesota area. Wildlife species that are the most susceptible to rabies are raccoons, skunks, bats, coyotes and foxes. Fortunately these are common species of wildlife that are not threatened or endangered and they are not likely to pass this disease to threatened or endangered species of wildlife because there are none in the GFAFB area. It is unknown whether this disease existed in the U.S. prior to European settlement. During the 1800s in Europe, rabies was very common among dogs and many human deaths occurred. It is thought that the rabies virus was introduced when Europeans brought over their dogs and introduced the red fox to the U.S. for British-style foxhunts. With vaccinations of pets, incidence of rabies in domestic animals has been replaced with an increase of rabies in wildlife species. Base personnel are required to vaccinate their pets so rabies should not affect pet dogs and cats at GFAFB.

There has been one report of a bird that tested positive for West Nile Virus. This disease will present the most serious threat to wildlife management as almost any species of bird, including declining grassland and other rare bird species, can contract the disease. West Nile Virus is especially lethal to members of the crow family, including blue jays, crows, and ravens. Horses also are susceptible. West Nile Virus is fatal to birds, horses, and people - especially those over 50 years of age.

### Cats and Dogs

Cat and dog scanning chip implants are mandatory at GFAFB. Cats destroy millions of native songbirds and other types of birds every year. And dogs running in packs can be dangerous to people attempting to utilize natural areas.



***Common Yellowthroat***

Extensive studies of domestic cats show approximately 60 to 70 percent of cat prey are small mammals, 20 to 30 percent are birds, and the remaining percent is a combination of amphibians, reptiles, and insects. The number and type of animals killed by cats varies, depending on the individual cat, time of year, and availability of prey. Birds compose over 50 percent of cats' prey on seabird islands. Rural cats take more prey than suburban or urban cats. Birds that nest or feed on the ground are the most susceptible to cat predation (taken from the American Bird Conservancy's "Cats Indoors" website: http://www.abcbirds.org/cats/). Sensitive and rare grassland birds found at GFAFB nest directly on the ground becoming an easy target for domestic cats. Therefore, feral cat control is especially critical to the survival of the resident grassland bird assemblage. In addition, cats commonly kill spectacular neotropical migrants, such as this Common Yellowthroat shown at the right. GFAFB shall control free roaming and feral cats on the installation through pest management personnel by removal to shelters and/or replacement to Base owners. These efforts will protect birds and other beneficial native small wildlife.

Loose and/or wild dogs are also actively managed at the Base. Dogs are hunted down and captured with a "catch pole," which is a long pole with a loop, which is placed around the animal's neck. Dogs are then transported to the animal shelter, or returned to their owner.

### 5.3.6 Wildlife Habitat Improvement

**Issue – T**here is bank slumping and erosion in the Turtle River because of recent flooding, and a lack of streamside vegetation.

Best management practices for stream or riparian areas such as the Turtle River primarily revolve around reducing and controlling erosion and maintaining native vegetation along the stream's banks. This is accomplished by protecting and where needed, replacing native vegetation in bare areas; controlling storm water run off into the stream; improving timber and agricultural practices to reduce erosion and run off, if applicable; and excluding cattle and vehicles of any kind from entering the water. According to NDGFD, healthy waterways should include the following:

- At least 25 percent of the channel should be braided (i.e. not channelized, etc.)
- Channel dynamics that allow water to spread laterally rather than vertically through the channel (no artificial bank stabilization with riprap, concrete, tires etc.)
- Maintenance of natural hydrologic cycles (i.e. flooding and seasonality of flow)
- Protection of riparian woodlands, vegetated buffers, associated wetlands and other water bodies
- Minimization of pollution entering riparian areas due to poor human land management practices

Native tree species such as willow (*Salix* species) and cottonwood (*Populus deltoides*) should be planted near the Turtle River. Bur oaks (*Quercus macrocarpa*) should be planted on the first terrace above the stream. Until established, these trees should be watered, protected with collars that prevent gnawing by herbivorous mammals and staked to hold them upright. In addition for at least three years, they will need monitoring, mulching, and depending on rainfall, watering on a regular basis.

To improve the area for wildlife, small berry producing tree or shrub species such as juneberry (*Amelanchier* species), chokecherry (*Prunus virginiana*), service berry (*Amelanchier* species), and buffaloberry (*Shepherdia argentia*) should be planted near the stream. These plants generally form the understory layer for the taller tree species listed above. However since they produce fruit for birds they may occur anywhere frequented by birds including fence lines. They are also used in landscaping because of their attractive blooms, leaves and fruit. Service berry also has beautiful fall foliage.



***Service Berry***

Birds and all kinds of wildlife from foxes to bears to moose and elk enjoy the berries of these small shrub or tree species. In addition, grouse eat the buds and twigs during the winter when few other foods are available to them. These species are well adapted to the Grand Forks area and were suggested by the NDSU Extension Service.

For additional species, contact the NDGFD or the NDSU Extension Service for native species adapted to growing at the water's edge. Possible woody candidates are speckled alder (*Alnus incana*), red-osier dogwood, and willow (*Salix* species). Potential perennial herbaceous species are marsh marigold (*Caltha palustris L.*), cinquefoil or silverweed (*Potentilla anserina*), cinquefoil or strawberry weed (*Cinquefoil norvegica L.*), and marsh vetchling (*Lathyrus palustris L.*). These species are well adapted to live along the banks of a stream. More plant species can be found in GFAFB's *Architectural and Landscape Compatibility Guide*. GFAFB has programmed a riparian stabilization project for the area, and expects funds in FY06 and FY07 to implement these ideas.



***Chokecherry***

**Issue** - Plant species at Prairie View Nature Preserve are still in the process of establishing themselves and people do not appreciate the area because they do not understand that it is still "under construction."

Prairie View Nature Preserve has two management zones semi-improved and minimal disturbance area. These areas have the same goals: eliminating noxious and invasive weeds, increasing biodiversity, tree maintenance (if applicable), managing turf (if applicable), and summer dormancy (to reduce browning of turf).

In the preserve, mowing will be employed to reduce plant pest species; and limited burning will be employed every two to three years to increase biodiversity. More specific management will be undertaken depending on the management zone and the individual characteristics (microhabitat) of the site. For example, the arboretum will receive spot burns to protect the trees; bare areas will have their soil broken up and be hand seeded with the appropriate grass or forb seed, and the minimal disturbance native grass areas will be hayed and have litter or thatch removal every three to five years. In addition, native tall grasses will never be cut shorter than four inches. Tree care includes watering, mulching, pruning, staking and training to a single leader, and installation of tree guards.

**Issue** – Houses for blue birds, purple martins and bats have been installed on the base. Local Boy Scouts have volunteered to maintain these houses in the spring, but this has not taken place.

GFAFB shall coordinate better with the local clubs to generate interest. The boy scouts have helped during Earth Day events, and shall evaluate the interest in making this activity part of "Earth Week". National Public Lands Day could also be another avenue to generate club interest to assist with upkeep of bird houses. More houses should be installed in Prairie View Nature Preserve to provide blue bird habitat, and generate more interest in the area.

### 5.3.7 Watchable Wildlife

The paragraphs below provide suggested approaches for a watchable wildlife program. The Turtle River, Prairie View Nature Preserve, wetlands, Multi-use Trails and the sewage lagoon are possible candidates for watchable wildlife sites. Educational brochures should be developed before program is implemented, particularly in regard to taking children to a watchable wildlife site. An inventory of watchable wildlife could be developed from biological surveys that have been and are being conducted. It is important to stress that animals should be viewed without interrupting their normal activities. Much of this information was taken from: http://www.ca.blm.gov/caso/wf-ultimate.html. The following guidelines should be followed when observing animals:

- Wear natural colors and unscented lotions.
- Remove glasses that glint.
- Walk softly, and move slowly and smoothly so that there is less chance of stressing the animals.
- Never approach animals directly; approach in a roundabout way.
- Make yourself as small and unassuming as possible.
- Hide your figure behind boulders, vegetation, or your car; try not to cast a shadow.
- Keep your distance - stay on established trails, and maintain a distance that is comfortable for wildlife.
- Watch where animals are most likely to be present: drinking sites, trail intersections, perches, ledges and overlooks to open areas. Wildlife often gathers at "edges" between habitat types, for instance, a deer herd may graze at the edge of a meadow near a wooded area that offers cover.
- Bring the right tools, i.e., binoculars, spotting scope or camera zoom lens (400 mm lens).
- Use materials such as field guides and checklists to identify animal species, and to learn where you are most likely to see these animals.
- Watch at dawn and dusk, when most wildlife species are active enough to view.
- Be patient - do not expect to see everything right away.

- Give nests a wide berth - you could frighten the parents away and leave eggs or young animals exposed to predators.
- Avert your gaze, as animals may interpret a direct stare as a threat.

Many wildlife-watching lists emphasize birds, for good reason. There is often more information about birds than other type of wildlife at any given site, because birdwatchers (or "birders") continually record their sightings. Birds are often easier to spot, as they roost in trees or brush and take to the air. And most can be seen during the day, unlike many animals that only emerge at dawn, dusk, or during the night. You may not always see the other wildlife, but you will almost always see birds. So, you may want to come prepared with bird watching tools: a field guide to help you identify them; binoculars, spotting scope or long-lens camera to get a better view; and possibly a checklist to record those you do see.

Encourage visitors to look for signs of animals not always seen by day. Signs can include tracks, scat, burrows, mounds, and beaver dams. A field guide can help you learn what to look for, and where. For more information on watchable wildlife programs consult: Wildlife Viewing Guide of North Dakota Paperback: 96 pages; Publisher: Falcon Publishing Company; 1st edition (May 1992) ISBN: 1560441208.

Bird nest box areas offer another possible location for watching wildlife as long as visitors are unobtrusive. There are 12 purple martin houses located in the military housing area. There are about 20 bluebird houses around the Multi-use trail near the horse stables and pastures. In addition, there are about six bat houses: one near the southside of the riding arena, one at the redwood water tower (may not still be there), one on the north side of the FamCamp by the north perimeter fence, two in the wooded area south of the Trail Park, and one near the 7th Avenue water tower. Except when maintaining bluebird houses after the nesting season is over, bird houses should not be touched because human scent attracts opportunistic wildlife like raccoons and also feral cats.

Prairie View Nature Preserve and the Arboretum are good spots for watchable wildlife as well. Butterflies and birds are easy to see here in the spring and summer months. Visitors might enjoy the challenge of identifying birds and insects including butterflies. Installation of a butterfly garden (Section 5.3.1) shall enhance watchable wildlife programs as well.



***Protective Tree Skirts***

## 5.4 Grounds Maintenance

Contractors perform most grounds maintenance at GFAFB including fertilizer and herbicide application. This is done for all improved grounds (including herbiciding 66 acres of fairways on the golf course). Approved fertilizers/herbicides are applied in accordance with the manufacturer's instructions. The appropriate type and amount of herbicide and fertilizer applied are documented in the contractor's Quality Assurance Plan. Contractors coordinate with 319 CES Entomology Shop to ensure compliance with pesticide/herbicide reporting procedures. Tree, shrub and lawn trimmings generated during grounds maintenance activities are collected by the city of Grand Forks where they are shredded and composted.

### 5.4.1 Tree Maintenance

The grounds maintenance program is administered by 319 CES/CEO QAE (Civil Engineering Quality Assurance Evaluation Office). This office oversees the grounds maintenance contractor and their workers. The five-year contract is usually about $600,000 per year and is currently in its 4th year. One requirement of the contract is a one-year survival warranty for all tree planting. A Grounds Maintenance Plan was prepared in March 2001 and provides recommendations to reduce grounds maintenance costs by transferring some areas from 'improved' (vegetation 2-4" in height) to 'semi-improved' (vegetation 7-14" height) grounds categories. Tree removal and trimming is performed in the 1.) airfield clear zone to ensure clear zone requirements are met 2.) along the perimeter security fence to maintain visibility, and 3.) shelterbelts and elsewhere as needed to remove diseased or invasive trees.

Landscape trees are staked, given a layer of shredded mulch and many are fitted with "collars" to protect them from severe weather and rodents, rabbits and other species that would eat the bark of young trees. Trees are being used for an oil reclamation project near the construction of new Aircraft Maintenance Unit building; cottonwoods were planted in an effort to clean soils. In addition, cottonwoods were installed as a visual screen for new propane tank area.



***A Newly Planted Landscape***

**Issue** - Because of Dutch Elm disease, many American elm trees need to be removed annually. Grounds maintenance personnel regularly mark affected trees for removal. Funding to remove diseased trees is the responsibility of Grounds Maintenance. Additional Dutch Elm disease mortality is expected in the future. Arbortech injections (systemic fungicides) have been used for disease control in local communities. A fungus, *Ophiostoma ulmi* (syn. *Ceratocystis ulmi*), transmitted by both native and European species of elm bark beetle spread Dutch elm disease. It is also spread by natural root grafting, in which the roots of adjacent trees come into contact with one another potentially spreading the disease from one infected tree to another. Piles of elm firewood containing the beetle larvae can also spread the disease to nearby trees.

Ideally, effective Dutch elm disease control programs should be undertaken on a base or community-wide basis, involving: (1) community-wide sanitation programs designed to reduce the level of elm bark beetles; and (2) prevention of the spread of the disease through natural root grafts from infected trees to adjacent healthy trees.

There is no way to eliminate Dutch elm disease once it begins; control programs emphasize management of the disease so that losses are spread out over a long period, therefore minimizing the spread of the disease (NDSU, NDSU Extension Service). Trees infected by the native bark beetle (more important in the spread of the disease in North Dakota) will be infected within the lower first four feet of the trunk. This area of the tree trunk can be treated with Dursban. Funding for the removal of diseased trees comes from Grounds Maintenance. Appendix A provides additional information on Dutch elm disease. Proper sanitation, as referred to above involves prompt disposal or burning of old elm firewood or diseased trees, which is a haven for bark beetle larvae. The following website also provides more detailed information on control of Dutch elm disease: http://www.ext.nodak.edu/extpubs/plantsci/trees/pp324w.htm.

One of the goals of the GFAFB community planning office is to strive for more tree species diversity on the Base as directed by AFI 32-7064. To promote natural resource awareness and increase biodiversity, Base personnel and the local community have planted many trees including native species and their cultivars. In 2001, the Boy Scouts and the CE (in-house) planted over 3000 tree saplings/seedlings east of Eielson and south of Steen streets. Tree species planted include 200 green ash, 200 hackberry (*Celtis occidentalis*), 200 bur oak (*Quercus macrocarpa*), 200 quaking aspen, and 300 Souixland poplar. Also in the fall of 2001, an additional 2,000 green ash trees were planted. In 2003, 100 bur oaks, 100 common hackberry, 200 North American plum, 200 quaking aspen, and 400 redosier dogwoods were planted. These trees are later available for transplanting to areas where they are needed. Although these trees were provided free of charge from the National Tree Trust, maintenance has been a problem. Smaller trees and shrubs include crabapple (*Malus* species), Redosier dogwood (*Cornus serica*), and Canada red chokecherry (*Prunus virginiana 'schubert'*). Plaques identifying tree species are planned for placement in the arboretum in Prairie View Nature Preserve. As described above, trees will be mulched out to a safe distance from the trunk to protect them from lawnmowers and weed eaters; and they will be fitted with collars to protect them from chewing animals.

A tree-planting project for bioremediation purposes was established near a fuel storage area on Base. Trees numbering approximately 433 poplar (Siouxland, prairie sky, and imperial) and Russian olive trees were planted. Contamination includes chlorinated solvents and fuel from a jet engine test cell (Building 539) that was used from the late 1950s through 1992. The building was removed in 1996. A petroleum odor was detected in the soils, and samples were found to contain trichloroethylene (TCE) and petroleum hydrocarbons (diesel and gasoline range organics). Six monitoring wells were installed in September 2001 and soil samples collected. Phytoremediation will be used to clean up the site (Area of Concern 539). The tree species were selected because they are capable of drawing relatively large quantities of water from shallow groundwater and associated capillary fringe. The site was also seeded with salt-tolerant, fast-growing, high-water-use grasses including tall fescue, western wheatgrass, sainfoin (*Onobrychis vicifolia*), and hycrested wheatgrass. The project was funded through Environmental Compliance at an estimated cost of $363,000. Since they are a noxious and invasive species, Russian olive trees should be removed from this area and disposed of according to AF and local requirements regarding the disposal of hazardous waste. This species should not be used for projects in the future.

The condition of the shelterbelts is seen as a concern. Many shelterbelts contain trees that are reaching physiological maturity. There is an interest in examining the concept of strategic placement of shelterbelts for energy conservation, snow management, and wildlife habitats.

**Issue -** Shelterbelts located parallel to east installation fence (from main gate to prairie view project – known as the B3 belt) requires attention.

Older American elms (second row from fence) are showing signs of senescence (aged-induced decline) and are currently over-topping and suppressing the growth of younger green ash and American elm planted in the first row nearest the fence. It is recommended that the second row be removed. Three-year old hackberry trees (about 2" caliper) that were planted in the fourth shelterbelt row about 3 years ago are exhibiting die-back (dead branches). Die-back appears to be drought-induced.

Replant with other types of native trees that are not susceptible to Dutch elm disease and are more suited to the area like bur oak. See section 5.3.6 for other tree species. At the present time there is no urban tree inventory for GFAFB. A tree inventory and an urban forestry plan are projects that would benefit GFAFB.

Coordination and open lines of communication between the Community Planner, Grounds Maintenance QAE, Airfield Manager and the Environmental Flight are necessary to ensure success of natural resource projects and the health of the ecosystem at GFAFB. All groups should have the opportunity to review each other's program plans to ensure continuity and prevent redundancies in projects and goals.

### 5.4.2 Mowing Maintenance

For mowing and other grounds maintenance activities, at GFAFB, 927.3 acres are classified as improved, 971.9 are classified as semi-improved, and 1574.7 are classified as unimproved. In addition, there are 61.1 of watered acres, 93.4 acres covered by a landfill cap and 6.3 acres of multi-use trail.

Contractors maintain turf at GFAFB. Grass height is maintained on improved grounds between 2 to 4 inches, and on semi-improved grounds and the airfield between 7 to 14 inches in height. Grounds maintenance is performed in accordance with current standards of Professional Grounds Management Society (PGMS), National Arborist Association, American Society of Landscape Architects, and the local county extension office.

Public law 93-629 mandates control of noxious weeds. Contractors are obliged to limit possible seed transport from infested areas to non-infested areas by avoiding activities in or adjacent to heavy infestations or removing seed sources and propagules from site prior to conducting activities. They are also required to wash or otherwise remove all vegetation and soil from equipment before transporting to a new site. If fill material is required, weed free sources should be used.

## 5.5 Agricultural Outleasing Management

The real estate office administers the agricultural outleasing program, and the USACOE, Omaha District, manages the agricultural lease administration for GFAFB. In recent years the amount of agricultural land available for lease has decreased considerably from over 2000 acres to less than 1000 acres. Tenants are not interested in leasing these lands due to their degraded condition. However, some of these areas are in the process of being restored to naturalized or native grasses. After 2004, GFAFB would like to start haying historic hay leases west and north of the airfield and an area in the western portion of the sewage lagoon. No leases will be active in 2004 due to noxious weed problem. The Natural Resource Conservation Service can assist GFAFB through its Legacy Resource Management Program in promoting, managing, and conserving its biological, geophysical, and historical resources.



***Old Agricultural Outlease Area***

### 5.5.1 Real Property Management

**Issue** – As stated above, hay leases have become less attractive due to the condition of the available lands, as a result parcel sizes have diminished. Also, leases taken out of hay production in the airfield area have become infested with tall weeds and woody species and are now a potential BASH problem.

Tree encroachment and weeds are cited as causes for degradation of hay leases. Some trees have been cut down for airfield clearance, but potential lessees are concerned about the remaining stumps. As a result of this and other similar problems, only one lease of two potential leases is active. As an example, a parcel of 322 acres had no interested bidders due to its poor condition; 1,088 acres of previously leased land had diminished to 497 acres of leased land useful for agriculture. The construction of a new grenade range also contributed to the diminished desire for these lands. Environmental Flight is not actively involved in agricultural outlease administration. The U.S. Army Corps of Engineers has authority over the leasing of these agricultural lands. Refer to Appendix H, Hay Lease for GFAFB, for details on terms of the lease, recommended adjustments, monitoring requirements, and checklist.

Several solutions exist to improve and expand the agricultural lease program. One possible method is to offer rental abatements that would allow lessees to deduct investments in improving the land from rental fees. Concern was expressed for effects of hay leases on ground-nesting birds. The timing of the hay cut should be made a condition of lease. In addition to harvesting hay at the appropriate time, prompt removal of bales should be another stipulation of the lease. Regularly scheduled oversight of the leased areas should be conducted to ensure lessees are fulfilling all requirements of the lease.

In addition, the process of restoring degraded hay lease areas around the airfield to native grasses and forbs has already been initiated. Some tree cutting, grading and removal of large rocks, stumps, and former building foundations have already been accomplished. Follow-up treatments including prescribed burns and selective herbicide treatments area are planned to remove encroaching invasive vegetation. Taken together these activities will improve the condition of lease areas and make them more attractive to lessees. In addition, plan future annual haying in August in airfield leases to reduce the BASH hazard.

In 2003, as part of airfield hay lease management, the Red River Regional Council from Grafton, North Dakota conducted a survey on behalf of the AF, *Recommendations for the Agricultural Hay Lease Rehabilitation at Grand Forks Air Force Base, North Dakota* to assess the possibility of restoring agricultural hay leases at GFAFB. Hay lease management units are referenced in Figure 5.5.1-1. Areas around the airfield at GFAFB have historically been hayed. However, in the last several years, the condition of the leases has degraded to the point that they are no longer desirable for haying. The goal of the rehabilitation plan was to initiate the process of restoring the hay lease lands to a hayable condition. The survey showed that most of the hay lands were encroached by trees, contained obstructions, and were infested by two noxious weed species. Intensive weed control should be conducted on all parcels and should include chemical and biological control measures as well as the use of prescribed fire at the appropriate time to avoid bird-nesting season. Properly planned burning can reduce weeds and introduced cool season grass, sapling trees and shrubs, existing grass fuels, and promote growth of native grass and other prairie species. Continued management of noxious and invasive plant species will be necessary to maintain the health and ability to hay the grasslands. As part of this initial project, one of the management units, judged to be in the best condition, had tree and other obstructions removed to get it ready for haying. Subsequent projects also removed trees form the area.

### 5.5.2 Tallgrass Prairie

The following paragraphs provide suggestions on establishing or re-creating a tallgrass prairie. However, each site is different with regard to soil, topography, and water regime so ultimately decisions will depend on a keen understanding of the site and close monitoring.

Cut and immediately apply herbicide (Roundup) to Russian olive stumps. Roundup is preferred because it breaks down quickly, however it is nonselective, so care must be exercised so that non-targeted species are not affected. Apply Roundup to monotypic stands of Kentucky bluegrass and smooth brome when plants are actively growing.

After invasive species are under control later in the project, divide pasture into management units. Do not burn all units in one year. Leaving areas unburned will create a mosaic of habitats and will allow recruitment of soil invertebrates from unburned areas.




*Native Grass Planting Equipment*

If weather permits, burn in April. Late April is better for control of brome and Kentucky bluegrass (Kurtz, 2001).

Burns should occur every two to three years, however if bird breeding season is already underway, do not burn or mow until before the end of July (Marty Egelend, NDGFD, personal communication, July 30 2003).



*Field Roller*

Late fall planting of seeds for native prairie species is best (late October through mid November), seeds do best under a cold wet stratification regime. Seed approximately 10-15 lbs grass and forb mix per acre.

Plant seed using equipment as shown above or something similar in design. Older Truax drills work very well for clean seed, but not for mixtures containing leaves, stems and other debris. The newer Truax drills work well with seed containing nothing over one inch in size. Dry fertilizer spreaders perform well, but someone needs to stand in the back of the spreader to make sure the mix comes out evenly.



*Harrow Rake*

Harrow lightly and roll; this will level the soil and help reduce erosion during heavy rain.

For ground nesting bird conservation, no mowing should occur between late April and mid August (or at a minimum of July 15). A close scrutiny of the hay lease area will indicate when ground nesters are finished usually between mid July and mid August. Flying birds seen carrying food are a good indication that nesting is not over.

Mowing or haying is vital to suppress tall weed species that shade out native grass and forbs. Ideally yellow and white clover should be mowed in the bloom stage.

After the nesting season, mow to a height of three to four inches at three week intervals depending on rainfall. Note: no fertilizer should be applied; this stimulates weed growth.

Second season mowing helps suppress brome species. Late fall application of herbicide for invasive species is preferred. A combination of cuts, burns and selected herbicide application is ideal.

On going and regular monitoring of areas in the process of being restored is required. All scheduled management activities are subject to adjustments (i.e. adaptive management). Monitoring for invasives like Russian olives, leafy spurge, Canadian thistle, purple loosestrife, Korean bush clover, cut-leaved teasel and garlic mustard is critical. If these are detected, institute immediate control measures. Control will depend on the level of infestation. If solid stands of invasive species are present, broadcast herbicide application is probably the best treatment. If invasive species are mixed evenly with natives, then mowing is suggested, preferably during the bloom stage of the weeds unless it is during bird nesting season.

For wetland grasslands, Rodeo is the herbicide of choice. For these sensitive areas, it is particularly important to not allow herbicide to drip from the leaves.

**Issue** – Native tallgrass prairie will attract nearby grassland birds, perhaps some that are endangered or threatened. Routine bird inventories should be conducted in spring to determine whether endangered species are present, and bird behavior should be observed for a few days before haying or a burn to ensure that the birds' nesting season is over.

**Issue** – Restoring areas to a near natural prairie condition is a process that will take two to three years before any resemblance to "text book" tallgrass prairie is obtained. An important part of this effort will be vigilance in eliminating invasive species from the hay lease areas. Patience and time are essential to success.

**Issue** – Hay Lease lessees will have to coordinate with the Base for airfield access and will have to be monitored to ensure they are complying with lease requirements (i.e. timing of haying, and perhaps control of invasive species).

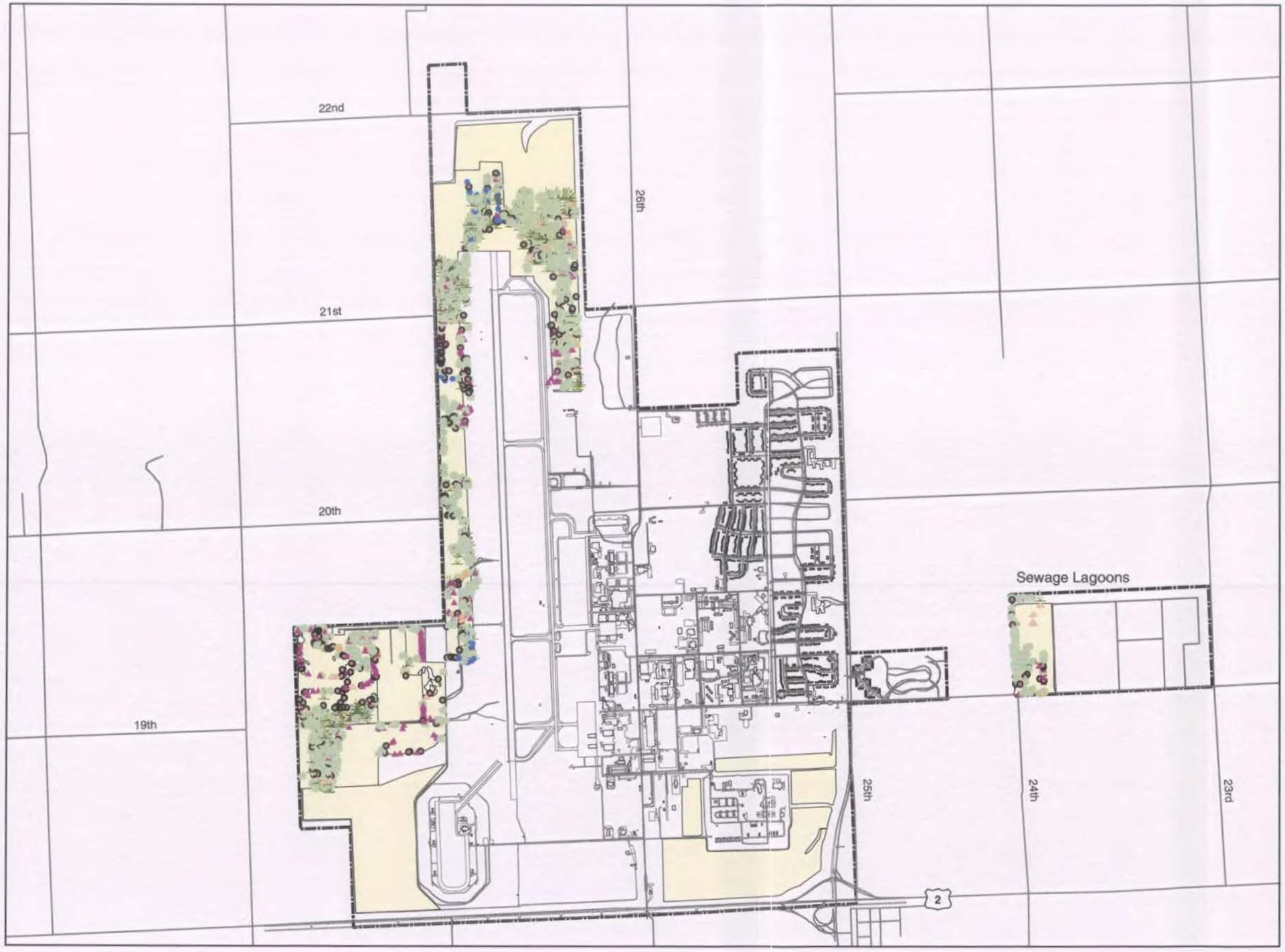
**Issue** – Permits to burn will have to be obtained from the state, which may take time and this time will have to factored into the planning process.

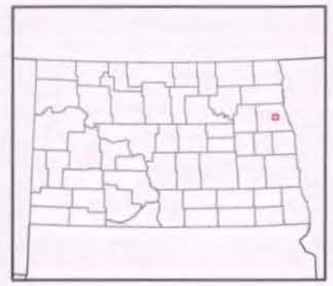
**Issue** – Eradication of invasive plants will be expensive and on going.

### 5.5.3 Airfield Obstruction Removal

**Issue** - Volunteer tree regeneration (cottonwood, willow, Russian olive etc.) is prevalent throughout the airfield. Trees in this area are a violation of airfield approach lighting visibility criteria. Periodic tree removals have been performed on an as-needed basis. Several small stands of trees were cut down in 2001 because they were: 1) a violation of airfield primary surface or transitional surface criteria or 2) an attractant to deer as cover. Several poplar trees have been removed from golf course due to violations of approach-departure 50:1 glide slope. More trees will need to be removed in the near future. Cottonwood seedlings and stump sprouts (from previously cut problem trees) can grow up to 3 feet per year initially.

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KEY MAP

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- Ant Mound
- Gopher Mounds
- Rock Pile
- Shrub
- Sign
- Stump
- Tree
- Utilities
- Miscellaneous
- Roads
- Buildings/Structures
- Installation Boundary
- Proposed Hay Lease Area

0 1,000 2,000 3,000 Feet

FIGURE 5.5.1-1
HAY LEASE MANAGEMENT UNITS

2004 INRMP
GRAND FORKS AFB, ND

DATE: SEPTEMBER 2004

REV. No.: DECEMBER 2005 -- KR | DRAWN BY: MS

Airfield tree management has been described as a 'band-aid' approach, where individual problem trees are removed as needed. Funding and labor resources limit airfield tree management. The planned restoration, monitoring and treatment of degraded hay lease tracks, and possible expansion of lease areas where practicable, should provide the means to manage airfield vegetation. Lease requirements should include the timely mowing and removal of hay bales as well as invasive weed control.

To protect Air Force personnel and property, all obstructions must be removed from airfield safety zones to prevent collisions of aircraft with trees, buildings or other man-made structures. In November of 2003, 316 stumps and 368 trees were removed. In December of that same year, 202 stumps and 352 trees were removed. And in January of 2004, 200 stumps and 445 trees were removed. And finally in February of 2004, 485 trees were removed. In all, 718 stumps and 1,650 trees were removed from airfield safety zones.

## 5.6 Outdoor Recreation

Outdoor recreation facilities include stables, skeet range, gardens, snowmobile trail, playgrounds, pavilions, picnicking, ice skating rink, multi-use trail, bicycle motocross (BMX), track, paintball, all terrain vehicle (ATV) riding, remote-controlled plane club, family camping (FamCamp), golf course, athletic courts, and sports fields. Management plans for the golf course and horse stables and pasture are not available at this time. According to the manager of the golf course, there is no management plan. The nine-hole golf course is about 100 acres and is open from April to October. It is continuously maintained and treated with Air Force approved-chemicals. A management plan for the golf course should be developed. The management plan for the horses and their pastures is currently being prepared.

Gardening opportunities are available for base residents. About five acres are sectioned off into 50 20 by 40-foot plots which can be rented. In the spring they are tilled and weather permitting, they are tilled in the fall as well. The Sportsman's Club offers skeet and archery. They shoot every Saturday from 10:00 am to 3:00 pm. Membership costs $20 for a single membership or $30 for a family membership. In addition, there is family camping consisting of 21 full hook-ups, and amenities such as mini laundromat, showers, handicapped accessible bathrooms and cable. Pavilions are also available for all sorts of gatherings. There are snowmobile routes on the eastern half of the base that connect to the housing area and lead to snow mobile trails off base. A private club on base maintains the approximately six-mile long snowmobile trail, most of which is off base. The multi-use trail is approximately nine miles long and covers roughly the same area as does the snowmobile route. The multi-use trail is asphalt covered. In addition, the multi-use trail goes by the bluebird boxes and through the Prairie View Nature Preserve. It is used for a variety of exercise and nature-related walks and activities. The gravel-covered BMX area lies north of the north pasture and is adjacent to both the multi-use trail and the snowmobile trail. Bike riders can ride all over this area and do their jumps. Grounds maintenance takes care of the multi-use trail, the remote controlled plane flying area and the BMX area. Maintenance includes mowing, trimming and spraying for weeds. Skating is also available. Ice skating, depending on the weather is available from December to March. Skates can be rented for $2 a day. Roller-skating occurs in an indoor facility and is available for military and their families on Fridays, Saturdays and Sundays. In addition, there are about 1.4 miles of ATV trails in the southern and eastern parts of the base. Both paintball and ATV areas are under development and at the present time the ATV area is only used for training, but a private club is interested in using it as well. The remote-control plane area has a small structure associated with it. Grounds Maintenance mows the area to keep it open.

Outdoor recreational activities with the potential to have an impact on the environmental, particularly ATV riding and paintball, should have management plans developed and should be coordinated with the

Environmental Flight's INRMP. Ideally all recreational activities should develop management plans to facilitate proper stewardship of natural areas on the base.

### Executive Orders 11644 and 11989 and AFI 32-7064 and Off Road Vehicles

Certain EOs and AFIs provide guidance on outdoor recreation activities that have the potential to affect the environment. Current language in AFI 32-7064 Chapter 10.6, on Off-Road Vehicles (ORV) requires agencies to restrict and close areas that become damaged from ORV use. "Allow use of off-road vehicles only after thoroughly analyzing the resources of the base. Especially evaluate the impact on erodible soils and wildlife." Specific language of the AFI is provided below:

- 10.6.1 Restrict use of off-road vehicles, including dirt bikes and all terrain vehicles, to areas that can sustain their use without damage to natural or cultural resources. Make sure all off-road vehicles are licensed and insured.
- 10.6.2 Close areas damaged from uncontrolled off-road vehicle use from further use. Undertake rehabilitation projects to restore the damage."

Executive Orders 11644 and 11989 (an amendment to Executive Order 11644) provide additional guidance and were established to provide "procedures that will ensure that the use of off-road vehicles on public lands will be controlled and directed so as to protect the resources of those lands, to promote the safety of all users of those lands, and to minimize conflicts among the various uses of those lands.

Executive Orders 11644 requirements include:

- Sec. 3. Instructs agencies to minimize soil, watershed, and vegetation damage, minimize harassment of wildlife and habitat disruption, minimize conflicts between recreation uses or neighboring public lands, and ensure adequate opportunity for public participation.
- Sec 5, Instructs respective agencies to ensure all trails are properly marked, with information available describing the conditions on vehicle use in the area.
- Sec 8, Details that the respective agency is responsible to monitor the effects and review the impacts of the ORV use. The respective agency "shall from time to time amend or rescind designations of areas or other actions taken pursuant to this order as necessary to further the policy of this order".
- Sec 9, Instructs the respective agency to close the ORV area if considerable adverse effects have taken place, and reopen the ORV area only if the "adverse effects have been eliminated and that measures have been implemented to prevent future recurrence".

The Base shall regulate off-road vehicle use to designated areas, patrolling the perimeter on the road, and responding to emergencies as necessary. No joy-riding or training in undesignated areas is allowed to comply with the EO 11644 and 11989 and AFI 32-7064.

GFAFB would like to expand recreational opportunities for Base personnel. The National Park Service can aid GFAFB in the development of an outdoor recreation plan. Outdoor activities at GFAFB include horse riding and golf, as previously mentioned, but there is also skeet, gardens, snowmobiling, playgrounds, picnicking, multi-use trail, bicycle motocross track, paintball, all-terrain vehicle riding, remote controlled plane club, family camping, athletic courts and sports field.

The current outdoor recreation areas are shown in Figure 5.6-1. Future individual projects are described below.

**Issue -** Some Base personnel would like additional recreational opportunities such as paintball, ATV riding, an additional 9 holes of golf, or camping. Some of these activities do not currently have a designated recreation area and are currently taking place unsanctioned in CE Park (Turtle River area).

### Golf Course Expansion

If golf course expansion occurs in the current location, there is a potential for an increased concern under BASH. Canada geese often like to frequent short-manicured grass (like a golf course), and this would be very attractive for thise species.

### ATV Area

GFAFB is planning a dual-use Off Road Vehicle (ORV) facility in the former Dakota MFH area. The site has been zoned for training and the first priority of the facility is to serve as an area for security forces mission training, and the second is for recreational ORV riding. Houses have been removed from the area but roads and foundations still exist. Roads would be removed along with any existing concrete foundations. New construction would be required to make this a "closed loop" trail. Some low spots would require small amounts of fill and an effort would be made to retain as many existing trees as possible. The course would be used for ATV training by the Security Forces and as the designated ORV riding area for base personnel and residents. Security Forces has designed the new trail. Only ATVs and Motocross motorcycles would be used on the trail. No other vehicles would be allowed on the trail unless they are performing track maintenance. The track would be approximately ten to fifteen feet wide. Length is dependent on the area dedicated to this function. Other future plans include the creation of a motorcycle club and children's track. ORVs would be transported via trailer to and from the site and would only be ridden in the confines of the designated area. Plans for the existing ATV training area include building a new wing headquarters, making the proposed site in the previous Dakota MFH area more feasible. The previous ATV training area would be restored to native vegetation and all wetlands damaged by previous construction would be restored. Previous surveys did not indicate the presence of wetlands in the previous Dakota MFH area. This proposed area would provide a safe means of training on land that is groomed and taken care thereby decreasing the chance for injuries.

Due to the nature of ATV recreation and its affect on the area, it would probably be a good idea to collect a modest user fee to help pay for repairing potential damage to trails. As an example, the U.S. Forest Service has ATV fee stations and collects $5 for vehicles and $2.50 for mountain bikes, motorcycles and all-terrain vehicles for a two-day pass. In addition, they charge $15 for an annual pass for vehicles and $7.50 for mountain bikes, motorcycles and ATVs.

**Issue -** Unsanctioned paintball is occurring at CE Park (Turtle River area).

### Paintball Area

Paintball should not be allowed here because it is in conflict with sanctioned deer hunting. In general, natural areas like the Turtle River corridor should be protected from heavy use like ATV riding and paintball that has the potential to degrade the site. Areas near the flight line or sensitive natural areas like the Turtle River or

wetlands are not appropriate for these types of activity. In addition, ATVs should not be allowed in wetlands or places where ground-nesting birds are breeding between May and August, inclusive.

In response to this demand, Grand Forks AFB would also like to construct a miscellaneous services recreation area in the former Dakota MFH Area. A contractor would be responsible for the preparation of the field including barricade construction and weed removal. The area would be fitted with signs stating that entry or trespassing on this property has to be authorized through outdoor recreation or security forces. The field would be fitted with movable objects and walls that could be set up and taken down easily. A fence may be included as part of the project. Funding limitation may require the fence be constructed after operation of the facility has generated the required funds. In addition, Security Forces would construct a building for their military working dog training. This location would keep the military working dogs away from MFH and the general base population preventing anyone from getting in the way of the dogs. Security Forces would also practice combat movements in the area. No paintball would occur at these times.

**Issue –** People dump trash including cans, bottles, cardboard, and old appliances at the Turtle River Area. This area has also been used for unauthorized paintball and loitering.

This area should either be fenced or monitored very closely to prevent people from littering or using it without permission. This is a valuable oasis of water and cover in a sea of agriculture and development.

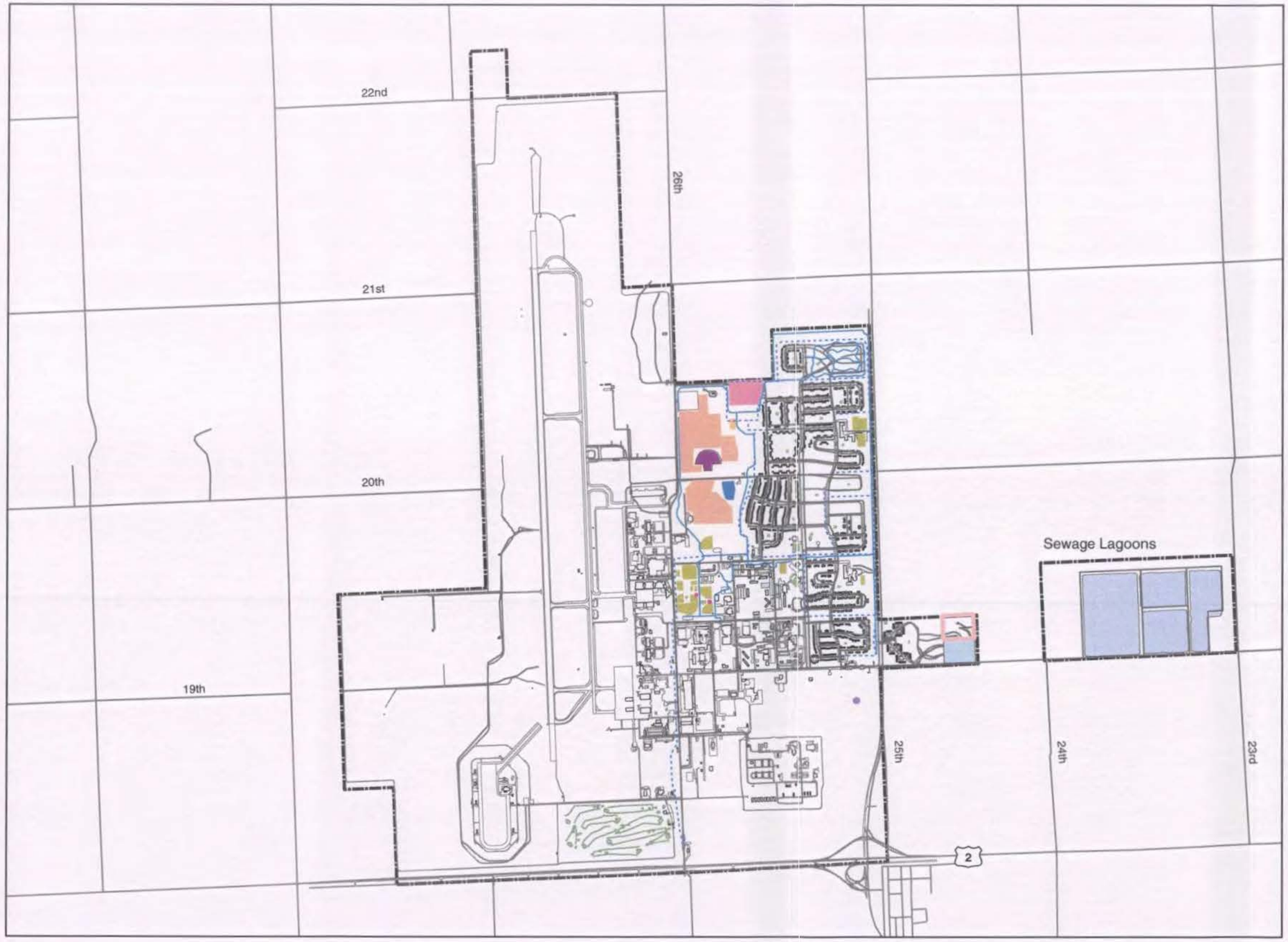
Issue - There is demand for an extended snowmobile trail.

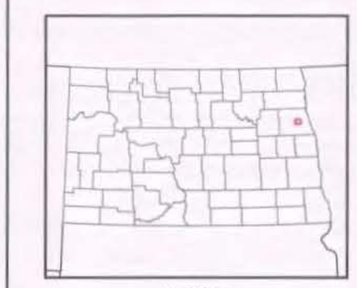
**Snowmobile Area**

Grand Forks AFB would like to reroute the base's snowmobile trail to allow base residents to ride their snowmobiles on and off base. Snowmobiles would only be driven on the designated trail. Trails would only be used to gain access to off base trails and then to return to the rider's residence. The club requests a waiver of liability insurance because each member is required to have liability insurance on their snowmobile as per North Dakota law. The Freedom Riders operate under a "Permission to Organize" dated 5 August 98 and signed by the Mission Support Group commander. The club established the trails on base that same year. The trails open on 1 December or when there is a minimum of 4 inches of snow, whichever is later. The Mission Support Group Commander is briefed annually on the club and makes the decision to open the trails. Signs are placed along the trail annually but no other maintenance is conducted. Occasionally, a limb may be removed, but since all trails are established as multi-use trails, there are no other maintenance requirements. Stop signs are placed at road crossings and occasional orange triangular trailblazers arrows are placed where necessary. The trail is approximately eight to twelve feet wide and nine to ten miles long. The base requires annual safety and trail usage training by all members of the Freedom Riders using the trail. Safety training certificates are issued immediately after receiving the training.

**Issue -** Expand the current multi-use trail system and connect the trail to the Turtle River State Park for horseback, hiking, and mountain bike use.

Outdoor Recreation and Services personnel expressed the desire for outdoor recreation development on the west side of the airfield. Locating a campground there is a possibility unless it violates airfield safety requirements or security. These activities may be feasible for the unused area around the airfield as well as connecting with off-base recreational areas. Outdoor recreation programs can be expanded to generate monies that can be used for enhancement of other natural resources.




N

- Roads
- Buildings/Structures
- Installation Boundary
- Remote-control Hobby Plane Flying Club
- ATV
- Golf Course
- Snowmobile Route
- Horse Stables/Pasture
- Skeet Range
- Multi-Use Trail
- Paintball
- Playgrounds
- Picnic Areas
- Athletic Fields
- Athletic Courts
- Gardens
- BMX Track
- Family Camping

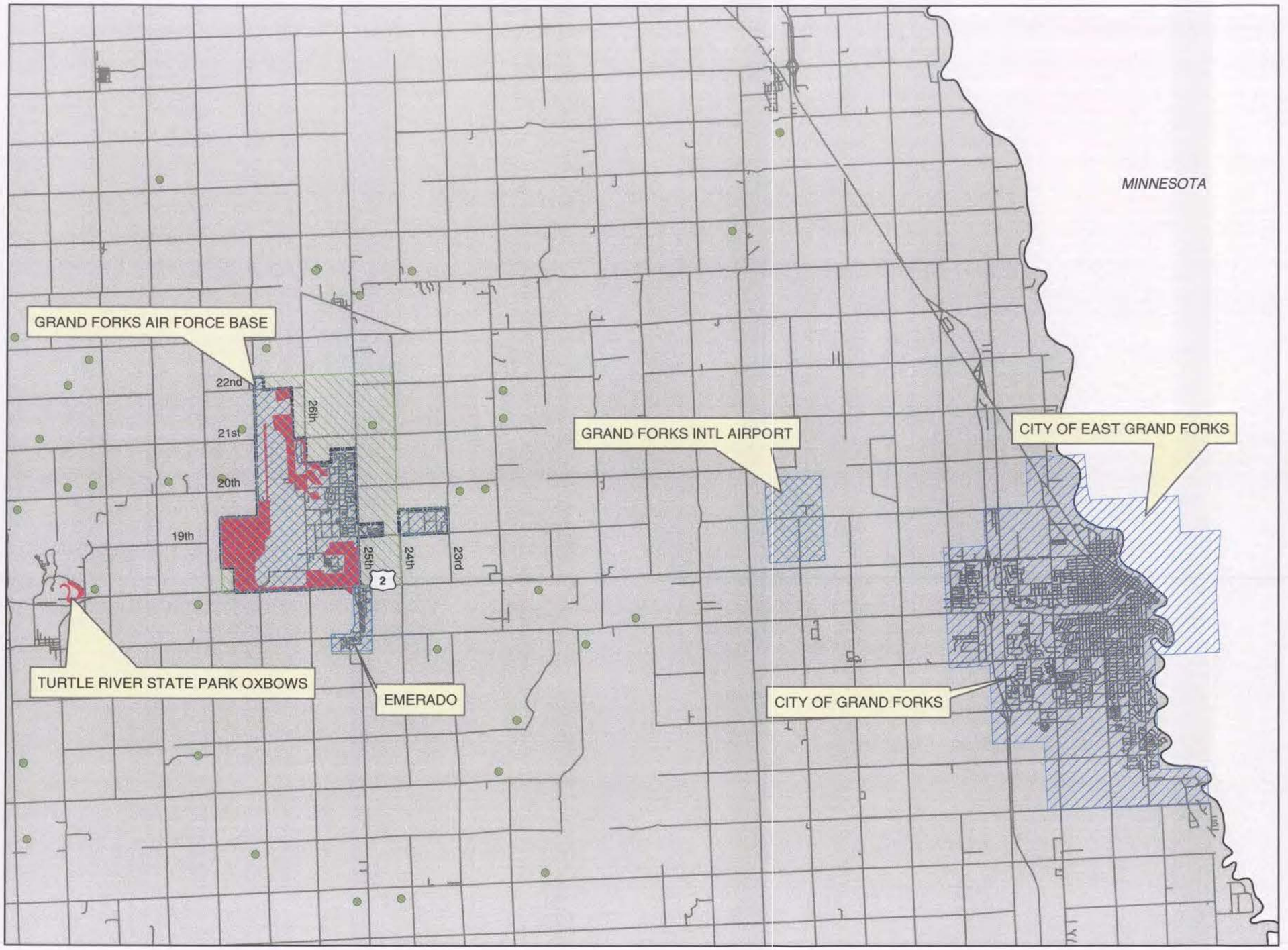
0 1,000 2,000 3,000 Feet

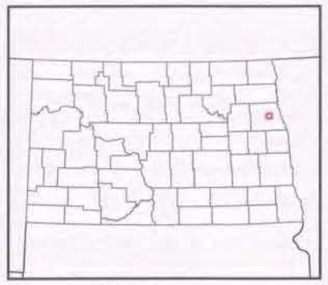
FIGURE 5.6-1
OUTDOOR RECREATION AREAS

2004 INRMP
GRAND FORKS AFB, ND

DATE: SEPTEMBER 2004

REV. No.: DECEMBER 2005 -- KR | DRAWN BY: MS




N

Bee Yard Locations
Larvacide 2005
Adulticide June 2005
Adulticide August 2005
Roads
Installation Boundary
Grand Forks County ND

0 0.9 1.8 2.7 Miles

FIGURE 5.7.1-1C
LARVACIDE/ADULTICIDE APPLICATION
2005 AREAS

2004 INRMP
GRAND FORKS AFB, ND

DATE: SEPTEMBER 2004

REV. No.: DECEMBER 2005-KR | DRAWN BY: MS

**Issue** - The Saddle Club is concerned about the degraded pasture conditions caused by encroachment of weeds and woody plants, particularly Russian olive trees.

There are 22 horses at the stable that are individually owned by 12 families. At the present time, horses are utilizing both north and south pastures. Both pastures combined total about 65 acres. The 45-acre north pasture has been divided into two sections and during the summer, horses are rotated between the two sections. During the winter, horses utilize the south pasture. However, the south pasture is degraded due to the presence of noxious and invasive weeds and needs weed removal and grass installed. Plans are in place to eliminate weeds and restore both pastures to native grasses including big blue stem.

**Issue** – Ample bird watching opportunities offer the chance to view rare and valuable grassland and other bird species on the Base. This activity should receive more attention and be promoted on GFAFB. Viewing areas could be constructed as part of nature trails. Kellys Slough NWR is a very important local ecological resource that potentially could be connected to GFAFB by riparian corridor enhancement (i.e. native species plantings. Outdoor Recreation should work with Environmental Management to promote bird watching onbase. A bird list can be developed by using the list provided in the "*Spring Migration and Summer Breeding Bird Survey*" conducted in November 2001.

The Environmental Flight expressed a desire to create a Watchable Wildlife Area or expand on other existing educational opportunities. Such opportunities could include experimenting and expanding use of native grasses in turf areas. GFAFB should develop a nature study program to educate people on and off the base about local natural resources. This could be tied in with watchable wildlife viewing areas, expansion of existing trails, Prairie View Nature Preserve and bird watching. Outdoor Recreation and the Environmental Management Flight should also coordinate efforts on developing a Watchable Wildlife Program.

## 5.7 Integrated Pest Management

**Issue** - Base residents are unable to use existing trails effectively because of mosquitoes and other biting arthropod pests. See above paragraph on maintenance of Prairie View Nature Preserve and cliff swallow section under wildlife management.

*Aedes dorsalis, Aedes vexans,* and *Culex tarsalis* mosquitoes are extremely abundant and annoying in the Grand Forks area during the summer. *Ae. dorsalis* breed continuously during the summer in fresh and brackish water marshes such as Kellys Slough. *Ae. vexans* are floodwater mosquitoes associated with floodplains such as the Turtle River and also with grassy drainage ditches such as those draining surface water from throughout GFAFB. *Ae. dorsalis* and *Ae. vexans* feed on a variety of mammals including man, and both of these species may migrate 20 to 30 miles from breeding sites. With the combination of heat, lights, and elevated carbon dioxide concentrations associated with combustion engines and aircraft operations, places such as GFAFB and the city of Grand Forks become highly attractive areas for mosquitoes moving across open country.

In addition, *Cx. tarsalis* mosquitoes feed primarily on birds and are a vector of western equine encephalitis virus. West Nile Virus (WNV), also carried primarily by Culex species, can cause encephalitis that can be transmitted to people. The disease can cause death, but normally people over 50 years of age and those with compromised immune systems are most vulnerable.

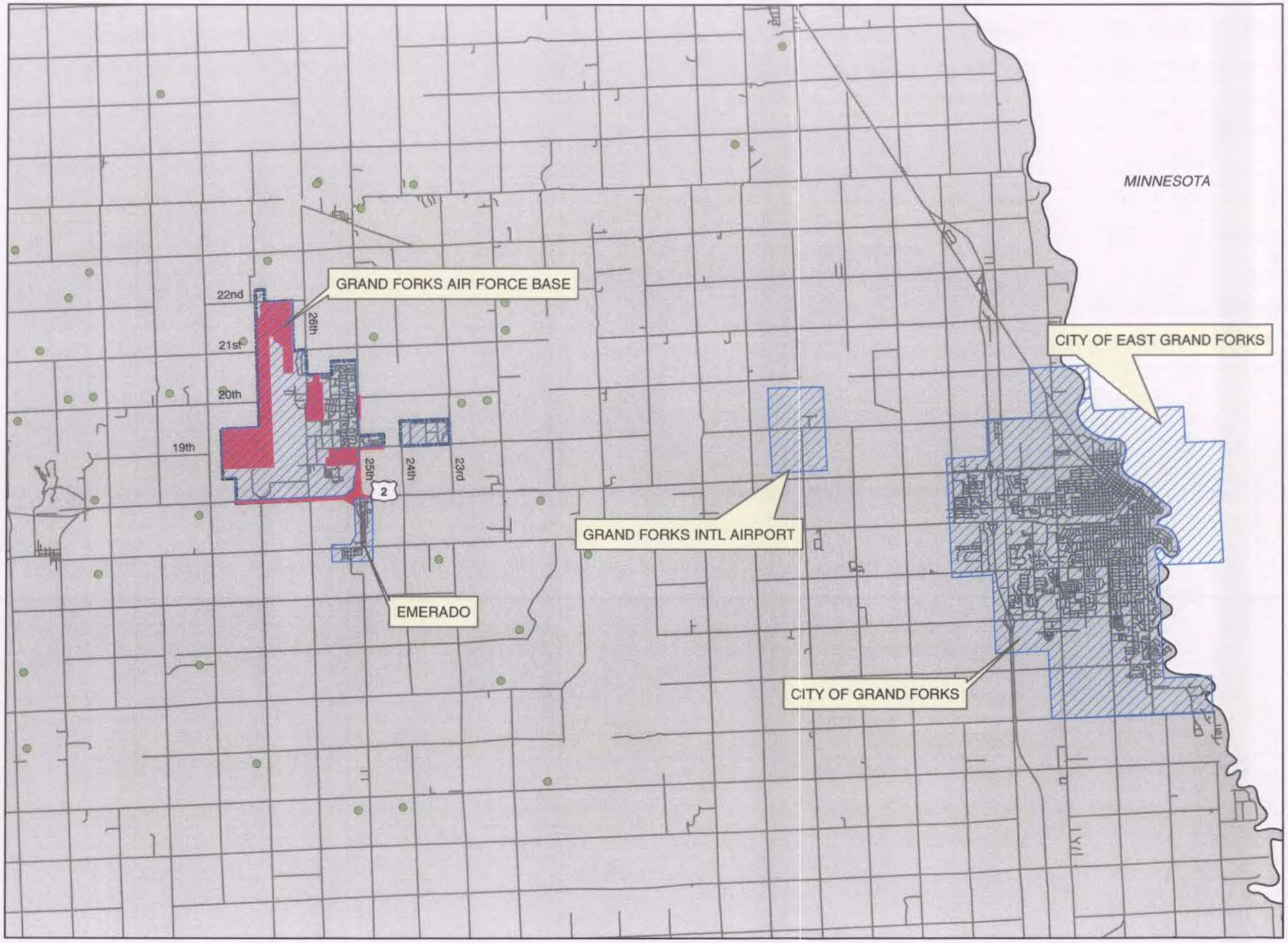



FIGURE 5.7.1-1B
LARVACIDE/ADULTICIDE APPLICATION
2004 AREAS

2004 INRMP
GRAND FORKS AFB, ND

DATE: SEPTEMBER 2004

REV. No.: DECEMBER 2005-KR | DRAWN BY: MS

During 2003, the state of North Dakota conducted extensive testing for West Nile Virus on humans, horses, birds and mosquitoes. In Grand Forks County, two humans, ten birds and the mosquito species, *Culex tasalis* all tested positive for WNV.

### 5.7.1 Aerial Spray for Mosquitoes

Aerial sprays of adulticide to control mosquito populations take place at GFAFB and townships within a five-mile radius including the cities of Grand Forks, East Grand Forks, Emerado and Thompson, and the townships of Mekinock, Blooming, Chester, Oakville, Rye, Lakeville, Larimore and Gilby (Figure 5.7.1-1). Based on results from the March 2003 "*Environmental Assessment for Aerial Application of Pesticide for Mosquito Control, Grand Forks Air Force Base, North Dakota and Vicinity*," aerial spraying for mosquitoes was expanded to Grand Forks County and East Grand Forks, Minnesota. Kellys Slough NWR is excluded. The application of microbial and chemical insecticides by aerial dispersal has proven to be an effective means to reduce mosquito populations of certain species. The primary species to be controlled are *Aedes vexans, Aedes doralis, Culiseta inornata,* and *Culex tarsalis*. The Youngstown Air Reserve Station performs the application. In addition, larvicide sprays are also applied to a smaller area.

Houseflies (Musca domestica) are another summertime insect pest, especially around food preparation and serving areas. Other pest species include horseflies (Tabanidae) and ticks, bark beetles on certain tree species and white grubs.

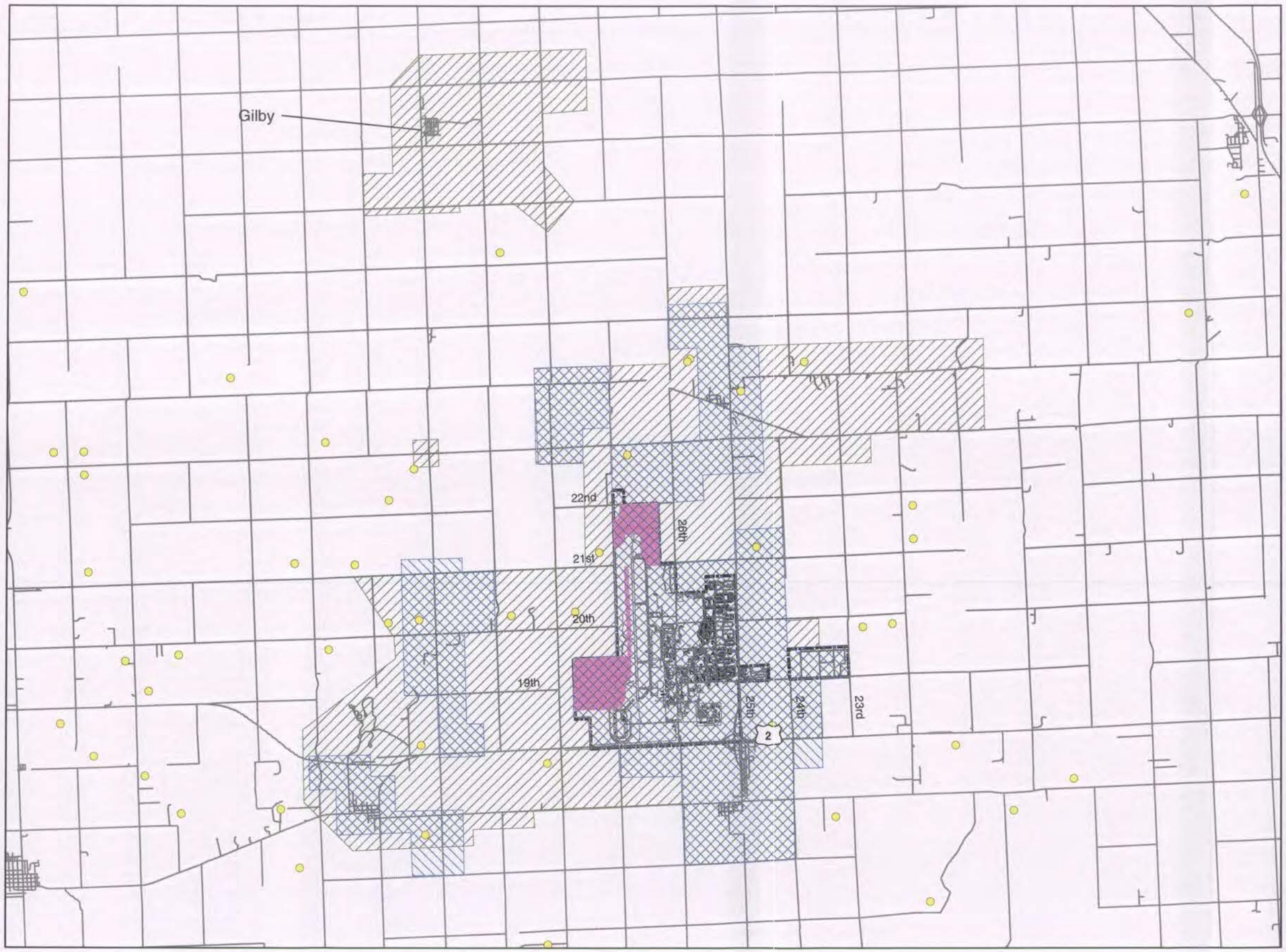
**Issue -** Effectiveness of aerial spray may need to be objectively monitored.

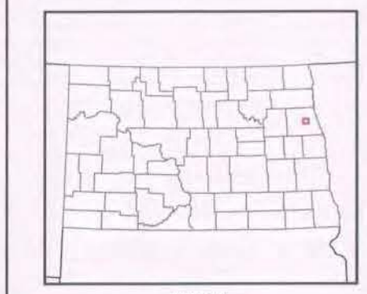
Aerial spraying for mosquitoes is a successful program that began in 2001. Environmental Flight contacts landowners in the project area to identify any concerns or special needs. Neighboring landowners have provided financial support to extend spraying (a five-mile buffer) to adjacent properties. Aerial spray for mosquitoes includes both larvicides (*Bacillus thuringiensis var. israelensis*) and adulticides (Naled).

### 5.7.2 Invasive/Noxious Weeds

**Issue -** Noxious and invasive species, such as leafy spurge and Russian olive, are encroaching into open areas throughout the base. Figure 5.7.2-1 shows the locations of noxious weed species on GFAFB. Table 5.7.2-1 provides a summary of the extent of these weeds at GFAFB.

The noxious/invasive weed survey and control plan conducted in 2004 identified 6 noxious plants (absinth wormwood, Candada thistle, field bindweed, leafy spurge, musk thistle, and spotted knapweed), and 3 invasive plants (bull thistle, perennial sowthistle, and wavyleaf thistle). Areas of previous disturbance were identified as the most prolific areas growing noxious weeds. The Base plan recommends 1) initiation of an immediate and aggressive control plan for the most heavily infested areas (see figure ), and 2) establish a monitoring program to evaluate success of control efforts and to monitor the Base for new infestations and their potential sources. The Base has a control plan in place, and has programmed annually for noxious weed eradication projects. In FY05 the base restored 20 acres of prairie land by revegetation of the area to native warm season grasses. An unselective herbicide was used to kill all vegetation, disk the area level to allow haying operations to continue, and reseed with appropriate native vegetation. Similar projects to this have been programmed through FY08. In addition, an airfield obstruction removal project conducted by Base Development has restored approximately 515 acres inside the airfield security fence through complete revegetation by using an unselective herbicide, disking, and planting operation. The area fields were seeded



KEY MAP

N

- Bee Yard Locations
- Adulticide August 2002
- Adulticide June 2002
- Larvacide 2002
- Roads
- Buildings/Structures
- Installation Boundary

0 0.7 1.4 2.1 Miles

FIGURE 5.7.1-1A
LARVACIDE/ADULTICIDE APPLICATION
2002 AREAS

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to slender wheat grass and smooth brome. GFAFB is committed to control noxious weeds through restoration projects, herbicide applications, and mowing. A prescribed fire management plan shall also assist controlling these noxious/invasive species as well.

In the past at GFAFB Russian olives were used for: 1) windward side tree plantings for low-maintenance shelterbelts, and 2) bio-remediation on Installation Restoration Program (IRP) sites (tap groundwater and slow plume spread).

Russian olive (*Elaeagnus angustifolia*) ranges in size from a small tree to a shrub and is a noxious and invasive species. These trees have been widely used for farmstead and field windbreaks. Unfortunately, birds spread the seed prolifically and it is known to invade a wide variety of sites with different soil and moisture regimes. It is particularly well equipped to overrun riparian sites and totally displace native species. These trees are listed as a noxious weed in North Dakota. Russian olive trees are often infected by branch and steam cankers (*Tubercularia canker*).

The use of Russian olive at GFAFB should be eliminated due to their massive seed production and ability to rapidly overrun an area to the detriment of native species. Native fast growing species should be substituted for the above-mentioned purposes. To manage Russian olives, regular burns and/or mowing should be employed to eliminate very young trees as they sprout. Older Russian olive trees that have escaped captivity should be cut and herbicide applied to the freshly cut stumps to avoid the vigorous resprouting from the base that will occur after the cut or a dormant season burn. For these established trees, a glyphosate (Roundup) herbicide is recommended. Foliar application is effective in controlling this species, but individual "hack and squirt" application is best. Since glyphosate is a nonselective herbicide, it will affect all green vegetation with which it comes into contact. Care should be taken to avoid spraying or allowing excess herbicide to drip upon native plant species. Glyphosate herbicides are recommended because they are biodegradable. To be safe and effective, herbicide use requires knowledge of the chemicals and their appropriate concentrations as well as understanding of the method and timing of their application. Burning large trees to reduce above ground biomass and then foliar, or preferably hack and squirt, application is very effective. Control sites will need to be monitored and treated for at least two to three more years. State agricultural extension agents or natural resource specialists can be consulted for more information on control of Russian olive. This plant has proven that it can out compete valuable native vegetation, reducing biodiversity, and habitat for wildlife. It also has a very high rate of evapotranspiration, which robs native plant and animal species of valuable water resources. In addition, it can alter hydrologic cycles and invade cropland as well. For more information on this noxious and invasive species, please see these two websites: http://tncweeds.ucdavis.edu/esadocs/documnts/elaeang.html and http://24.43.24.85/nbs/ipcan/factoliv.html. All appropriate Air Force guidance for the use of herbicides will be followed. Table 5.7.2-1 summarizes the relative abundance and distribution of noxious weeds at GFAFB. Noxious and invasive weeds are a tremendous problem at GFAFB and a separate EA is needed for the level of effort and herbicide required to accomplish the task. An EA was completed in FY05 addressing natural resource actions regarding noxious weed control.

### 5.7.3 Animal Pest Control

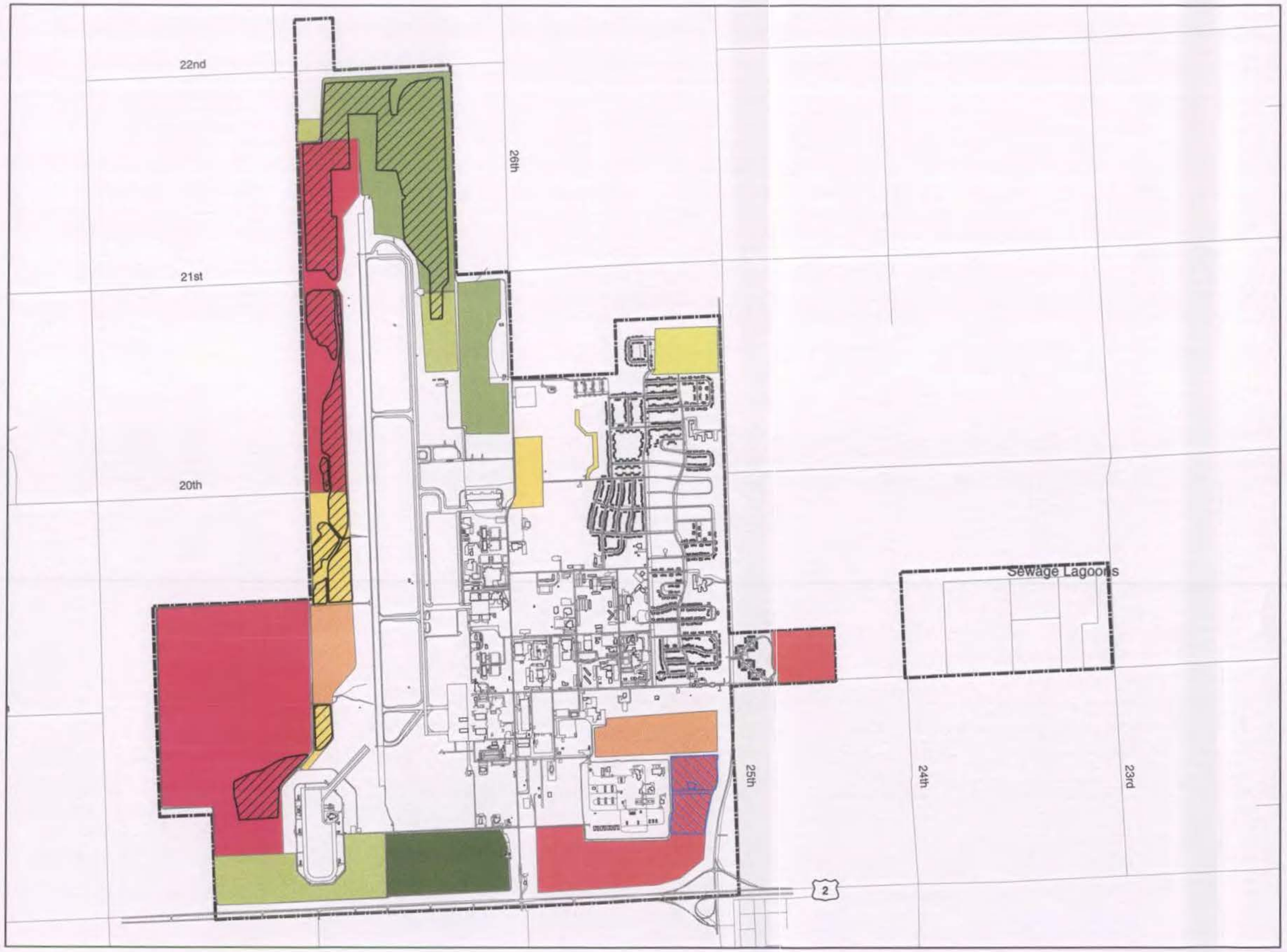
At GFAFB, Pest Management is in charge of controlling certain wild animals if necessary. Although they have the authority to kill any animal that is causing a hazard near the runway, they usually have other agencies do it for them. Under the authority of the Wildlife Damage Control Act, the USDA, Wildlife Services, has the authority to control mountain lions, wolves, coyotes, bobcats, prairie dogs, gophers, ground squirrels,

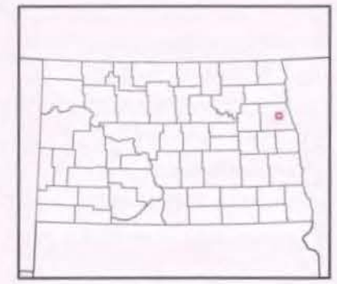
## Table 5.7.2-1 Noxious Weeds at GFAFB

*Indicates species included in the survey, but not listed by North Dakota as a noxious weed. Acreage infested is total infested acres across all areas surveyed (total = 1706 acres surveyed, rounded to the nearest acre. TR = Turtle River, LFC= landfill Caps, PVP = Prairie View Nature Preserve, HP = Horse Pastures, HIT Hiking Trail, GOLF = Golf Course, REC = Recreation Management Unit, NA = Not Applicable.

1 = Infrequent, 2 = Occasional, 3 = Moderately, 4 = Abundant, 5 = very abundant
Note: Acreage and level of infestation not calculated for species in the roughs of the Golf Course.

| | MANAGEMENT UNITS | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hay Lease | | | | | | | | | | TR | LFC | PVP | HP | HIT | GOLF | REC | | |
| Common Name | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 14 | 16 | 17 | 12 | 10 | 13 | 11 | 15 | 9 | No. Areas Infested | No. Acres Infested |
| | 110 ac | 15 ac | 55 ac | 64 ac | 221 ac | 276 ac | 38 ac | 478 ac | 69 ac | 167 ac | 7 ac | 86 ac | 42 ac | 28 ac | 5 ac | NA ac | 45 ac | | |
| Canada Thistle | 4 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | X | 5 | 17 | 1706 |
| Perennial Sowthistle | 3 | 3 | 4 | 3 | 3 | 2 | 3 | 4 | 3 | 4 | 3 | 2 | 3 | 4 | 3 | X | | 17 | 1630 |
| Leafy Spurge | 4 | 5 | 5 | 5 | 5 | 4 | 3 | 2 | 4 | 4 | 3 | 2 | 3 | 4 | 3 | | | 15 | 1112 |
| Absinth wormwood | | 1 | 1 | 1 | 2 | | | 2 | 2 | 2 | | | 2 | 2 | 2 | | 3 | 9 | 1055 |
| Musk Thistle | | | | | 2 | | | 1 | 2 | 2 | | | | | | | | 6 | 838 |
| Field Bindweed | | | | | | | | 2 | | | | 2 | | | | | | 2 | 488 |
| Spotted Knapweed | | | | | | | | | | | | | | | | | 2 | 1 | 45 |
| *Bull Thistle | | | | | | | | | | | | | | | | | 1 | 1 | 1 |
| *Wavyleaf Thistle | | | | | | | | 1 | | | | | | | | | | 1 | 1 |
| No. Noxious weeds/area | 3 | 4 | 4 | 4 | 5 | 3 | 3 | 7 | 5 | 5 | 3 | 4 | 4 | 4 | 4 | 2 | 5 | | |
| Sum of Infestation Levels | 11 | 14 | 15 | 14 | 17 | 10 | 11 | 17 | 15 | 16 | 11 | 10 | 13 | 14 | 14 | NA | 16 | | |




N

**Levels of Infestation**

- 0
- 10
- 11
- 13
- 14
- 15
- 16
- 17
- Roads
- Buildings/Structures
- Installation Boundary
- Airfield Obst/Hay Lease Res 2005
- Noxious Weed Removal 2005

0 1,000 2,000 3,000 Feet

FIGURE 5.7.2-1
NOXIOUS WEED LOCATIONS

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and jackrabbits. In the past, Wildlife Services has dispatched deer that have gotten inside the fence around the airfield. For some game species, the state game warden may assist with problem animals. Pest Management will occasionally kill raccoons, opossums, bats, wild or feral cats, badgers, ground squirrels and jackrabbits in addition to common rats and mice. In addition, Security Police assist state game wardens during certain situations with wild animals. Security Police will also assist in the capture of feral dogs.

## 5.8 BASH

**Issue** - During floods (1997 and 2001), overflow from the Turtle River, northwest of airfield, backed up water in drainage ditches and northwest clear zone area. Pools create BASH hazard. BASH hazards are shown in Figure 5.8-1. The BASH plan is found in Appendix J.

If the standing water was caused by beaver activity, refer to section 5.3.4 for instruction on how to construct a beaver pipe. Alternatively, plan for annual beaver trapping. If not, additional drainage capacity may be required in this area.

**Issue** - Deer are thought to be entering the base on the western side through fence breaches. Small stands of trees located southwest of the airfield provide cover for the deer.

Contractors may be leaving the gates open, however this problem has diminished since September 11, 2001. The Flight Safety conducts periodic deer drives using ATVs in which the deer are driven from tree cover in the southwest area out through the gate where the property boundary turns west. Two ATV deer drives were performed in 2002: the one that was conducted in June pushed out 7 deer, and an additional drive was conducted in the fall. In addition, particularly troublesome deer are shot if they cannot be driven from the airfield.

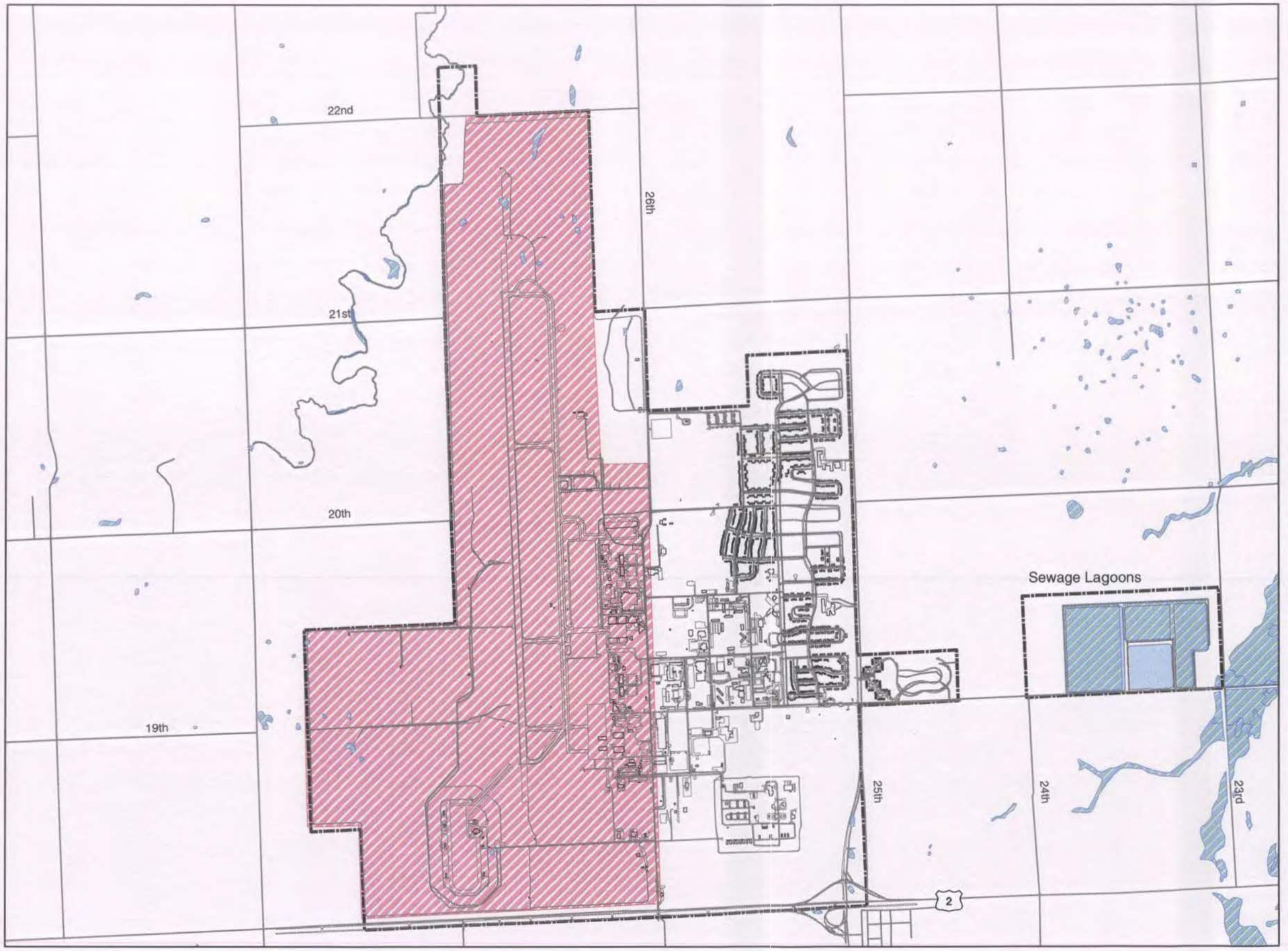
Annual bow hunting or obtaining a state depredation permit for deer may be a solution for deer control. The 319 CES/CEV now manages deer hunts at CE Park (Turtle River area) and bow hunters are chosen on a lottery basis. Bow Hunting Program instruction is found in Appendix H.

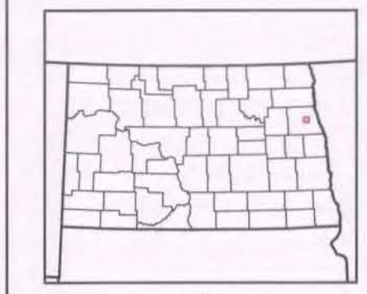
**Issue** - Tree cover and an abundance of weeds including white and yellow clover around the airfield attract deer. Alfalfa previously planted in these areas attracts deer as well.

Periodic deer drives and bow hunting has mitigated the problem; however, diminishing the habitat, by reducing amount of cover by alfalfa and clover while maintaining clear areas along the fence perimeter would provide a more permanent solution. As stated earlier, bow hunting for deer should be conducted on a regular basis until deer numbers decrease to an acceptable level. Bow hunting instructions are found in Appendix H. The Base should consider banning the use of alfalfa as a crop in the hay leases around the airfield.

To reduce the number of BASH incidents, the Air Force Safety Automated System (SAS) database is used to manage BASH data. Several nearby water bodies were noted as waterfowl attractants. Resident Canada geese inhabit the sewage lagoons, with an estimated population of 100-200 and growing (Lt Col Carey, former Chief of Safety and MSgt Chicosky, Flight Safety Superintendent, pers. comm.). Stratacon ponds are a privately owned gravel pit with two pools located northeast of the runway. In addition, uncontrolled growth of vegetation within the drainage canal between the west perimeter fence and roadway creates habitat deemed as an attractant to wildlife, especially waterfowl. Flight Safety personnel shoot bird scare rounds

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KEY MAP

N

Roads
Buildings/Structures
Installation Boundary
BASH Depredation Area
NWI Wetlands
Turtle River
Lagoons

0 1,000 2,000 3,000 Feet

FIGURE 5.8-1
BASH

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with 12-gauge shotgun and occasionally kill birds in the vicinity of the airfield. In addition, airfield personnel use up to 20 propane cannons for bird harassment, which are set up and used during migration periods.

**Issue** - Cliff swallows have created problems in the past by nesting in hangars. This problem has been solved by the application of Bird-X repellent once a year. Nesting populations have been waning since the application of this new repellent.

Whereas it is necessary to discourage swallows from nesting in airfield areas, they should be allowed to nest in other areas because they consume tremendous quantities of mosquitoes. Mosquitoes are a serious problem on GFAFB and swallows are a natural control. Untidy situations created by swallow nesting can easily be cleaned up and the nesting season only lasts a couple of months. The insect control they provide is worth the mess they make for a couple of months and some structure with roof overhangs away from the airfield should be set aside for their use during the breeding season.

The NDGFD issued a Depredation Permit to take cliff and barn swallows, gulls, ducks and geese to reduce hazards to aircraft. Appendix D contains state and federal Depredation Permits.

## 5.9 Natural Resource Education and Awareness

Program elements of the Natural Resource Education and Awareness program are Earth Day/Arbor Day programs, the Tree Arboretum, Prairie View Nature Preserve, and the Wildlife Museum (Environmental Education Center). GFAFB uses these program elements to promote environmental education and natural resource awareness for the base residents and community.

### 5.9.1 Arboretum

The Earth Week committee established an arboretum within the core of the Prairie View restoration project. The Arboretum is located within the Prairie View Nature Preserve area at the northeast corner of GFAFB. It has approximately 37 species, many of them native, including American linden, common hackberry, green ash, eastern cottonwood, box elder, and river birch. It has great potential as a "living classroom" to teach children and others about the ecological and aesthetic value of trees in an urban setting. This site serves as a setting for the celebration of Arbor Day.

This area will require different management than the surrounding Prairie View Nature Preserve as it contains tree species that are not fire tolerant. See section 5.3.6 for appropriate native species. Figure 5.9.1-1 shows tree species within the arboretum.

### 5.9.2 Wildlife Museum

GFAFB would like to create a wildlife museum and educational center and use a mounted bear as the centerpiece of the display. While the mounted bear currently resides at the Base library, Natural Resources would like to set up a special place for their museum located at the Educational Center, Building 252. A large poster depicting the life history of bears has been created for this display. The display is intended for educational use to teach children about the diversity of wildlife of the GFAFB area. Over time this museum can be expanded and include other information about wildlife and native plants of the area. Potential items to include for hands-on learning could be feathers, skulls, turtle shells, mussel shells, pelts, unusual seedpods or other mounted wildlife.

### 5.9.3 Prairie View Nature Preserve



*Prairie Coneflower at Prairie View Nature Preserve*

**Issue** - Prairie View Nature Preserve has received complaints with regard to maintenance, visibility and pest control. In addition, tree species planted in Prairie View area are not burn resistant. Consequently in the event of a prescribed burn, the trees must be protected. Close proximity of this area to housing is also a cause of concern.

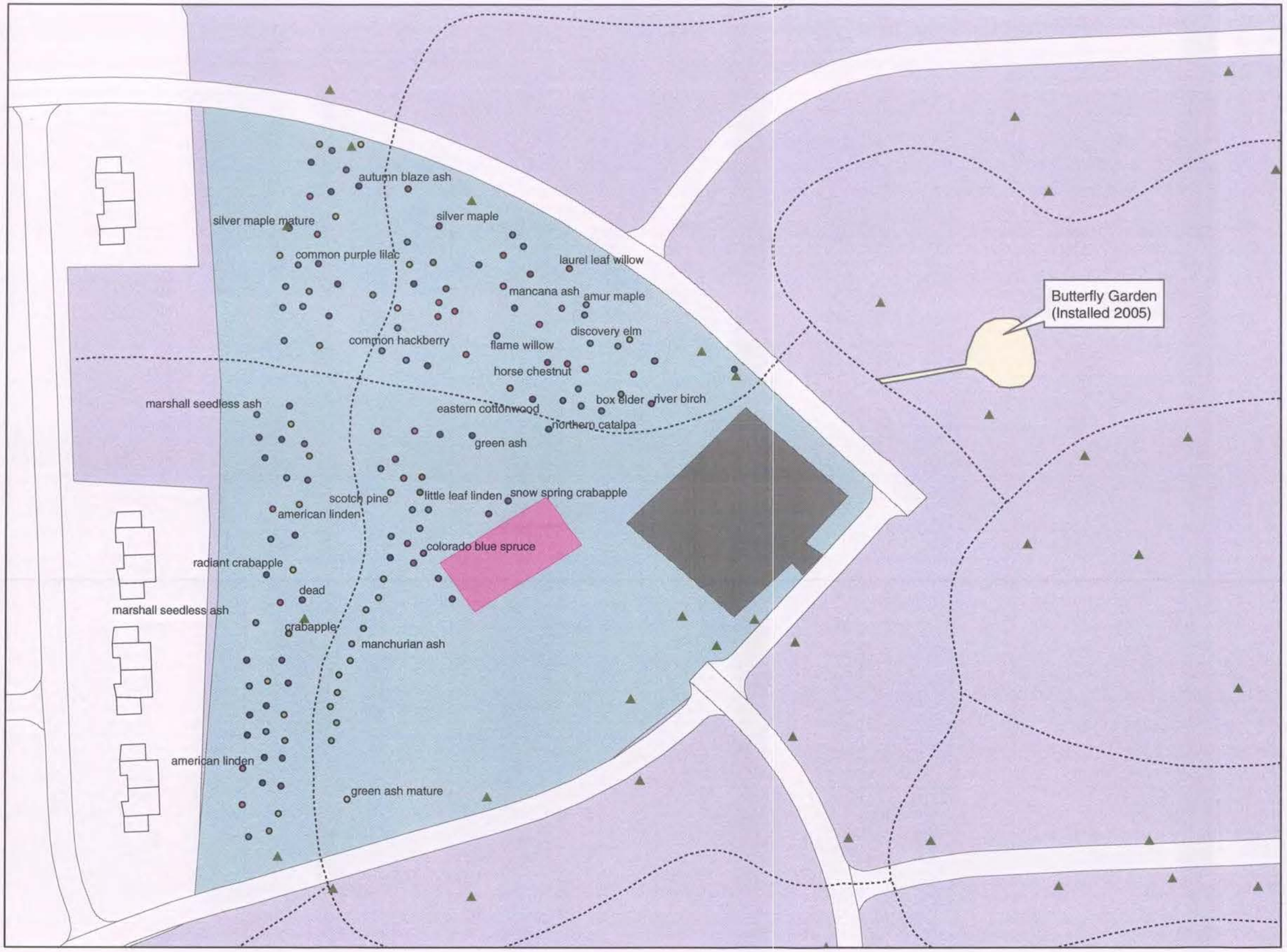
Prairie View Nature Preserve was designed for the Base community to experience on a small scale the native grassland vegetation that covered this region prior to European settlement. In addition, the creation of this area is in agreement with the goals of the DoD's ecosystem management, AFI 32-7064 objectives, and other guidance that restores native vegetation to the area. Base personnel should be informed of the Air Force's commitment to ensuring biodiversity on its property and of the Nature Preserve's ecological value and educational potential. Prairie View Nature Preserve should be understood in terms of its long-term potential to be a living classroom for students of all ages. Complete development of this area will take years and will require maintenance including mowing, watering, thatch removal, spot burning, and weeding. For example, taller, faster growing weed species are shading out the young grass plants and will need selective removal and/or mowing. Funds have been programmed to ensure this area gets the maintenance it requires.

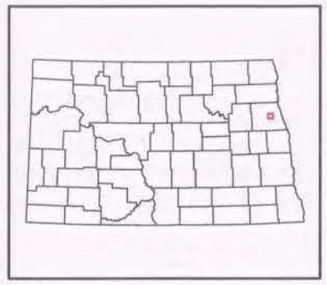


*Purple Prairie Clover at Prairie View Nature Preserve*

Prairie View Nature Preserve would be an excellent location for the placement of a butterfly garden, and bird houses. Educational signs depicting local indigenous butterflies, birds and other wildlife could be located near the butterfly garden.

The Prairie View Nature Preserve Restoration Project began in 1998 and has generated various comments from ground maintenance and safety personnel. The project was completed in October 2001 with a cost of $389,500. Its goal was to restore the 43-acre site in the northeastern corner of the Installation to a more natural condition by planting native vegetation in the area. In addition, it also educates visitors and creates a place for recreation. Grasses planted include blue grama and



KEY MAP

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- Buildings/Structures
- Installation Boundary
- Tree Arboretum
- Roads
- Playground
- Prairie View Nature Preserve
- Aggregate Trail
- Gravel Parking Lot
- Mature Trees

**Tree Species**

- american linden
- amur cork tree
- amur maple
- autumn blaze ash
- autumn gold ginkgo
- box elder
- colorado blue spruce
- commn purple lilac
- common hackberry
- common purple lilac
- crab apple mature old kind
- crabapple
- cutleaf weeping birch
- dakota centennial ash
- dead
- discovery elm
- eastern cottonwood
- fallgold ash
- flame willow
- green ash
- green ash mature
- horse chestnut
- laurel leaf willow
- little leaf linden
- mancana ash
- manchurian ash
- marshall seedless ash
- northern catalpa
- northern treasure ash
- radiant crabapple
- redbud crabapple
- river birch
- scotch pine
- silver maple
- silver maple mature
- snow spring crabapple
- thornless cockspur

0 30 60 90 Feet

FIGURE 5.9.1-1
ARBORETUM TREE SPECIES

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buffalo grass, western and slender wheatgrass, Canada/Beardless wildrye, switchgrass and a wildflower mix. Later, the Service Contract Support (319 CES/CEOES) established annual Arbor Day tree plantings in the arboretum.

### 5.9.4 Environmental Education and Awareness Celebrations

Other environmental educational opportunities at GFAFB are the celebration of Earth Week and Arbor Day. A Prairie Day celebration could be developed to coincide with this event as well. These are big events for school children at Air Force bases across the U.S., and GFAFB is no exception. Celebration of Earth Week includes luncheon with guest speaker and information booths, children's environmental learning fair, environmental scavenger hunt, tree planting ceremony, and library story time. Volunteer groups provide additional activities. Environmental education videos are also shown on the local Air Force Channel.

## 5.10 Identification, Classification, and Mapping of Natural Resource Units

### Land Use Categories

AFI 32-7064 specifies three categories of natural resource management units. Below this level are more specific types of properties: grounds categories, land use categories, and land management units.

Grounds categories follow the traditional divisions of improved, semi-improved, and unimproved land. These types of categories are defined by the intensity of grounds maintenance required for their upkeep. Improved lands are those that require the most maintenance (mowing, fertilization, application of pesticides, etc.) followed by semi-improved and unimproved which do not require the same commitment of time, and labor for their upkeep. Land use categories are subunits of each grounds category. Land uses categories are defined by their economic and social uses rather than the amount of labor involved in their maintenance. Land management units are a further division of the grounds and land use categories. For natural resource management purposes, land management units are the operable units for managing the natural resources of an installation. They are the smallest identifiable units used in developing natural resource management goals.

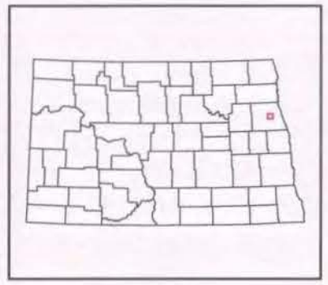
Land Management units at Grand Forks are: airfield, administrative, agricultural outlease, industrial (air operations support), community, golf course, athletic field, military family housing, industrial/administrative, munitions storage, sewage lagoons, medical, prime outdoor recreation area, outdoor recreation area, explosive ordnance disposal (closed IRP site), open space (parking, above ground storage tanks (ASTs), miscellaneous industrial activities, and landfill. Table 5.10-1 on the following pages presents a summary of land management units and recommended management at GFAFB.

### Geographic Information Systems (GIS)

**Issue** - Land Classification of installation lands needs to be updated, mapped and monitored to insure appropriate and regular grounds maintenance are provided by contractors or other responsible parties. For example, Prairie View Nature Preserve and the areas around the airfield need regular maintenance. An updated Land Classification Map would facilitate the care of these and other areas. GFAFB should establish and maintain a natural resources management database and track progress toward goals. Consult with MAJCOM for information on the appropriate format and software to be used. Maps should be prepared on a scale that is practical for the size of the installation and should be reviewed annually. Geographic information

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KEY MAP

N

Roads

Buildings/Structures

Installation Boundary

| LMUs ID | | | |
|---|---|---|---|
| AD-1 | FH-6 | IN-1 | OR-7 |
| AD-2 | IN-10 | IN-11 | OS-1 |
| AO-1 | IN-2 | IN-3 | OS-2 |
| AO-10 | IN-4 | IN-5 | OS-3 |
| AO-4 | IN-6 | IN-7 | OS-4 |
| AO-5 | IN-8 | IN-9 | OS-5 |
| AO-6 | CM-1 | CM-2 | OS-6 |
| AO-7 | FH-1 | FH-2 | OS-7 |
| AO-8 | FH-3 | FH-4 | OS-8 |
| AO-9 | FH-5 | MD-1 | UH-1 |
| OR-1 | OR-2 | OR-3 | UN-1 |
| OR-4 | OR-5 | OR-6 | UN-2 |
| UN-3 | UN-4 | UN-5 | UN-6 |
| UN-7 | UN-8 | UN-9 | |

0 1,000 2,000 3,000 Feet

FIGURE 5.10-1
LAND MANAGEMENT UNITS

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system (GIS) maps should be compatible with base comprehensive planning maps. Share GIS and other information on species and habitat with state Natural Heritage database and the local Nature Conservancy. Cooperative agreements are the means to facilitate this exchange. Ensure that at least three or four people are annually trained in the use of GIS receivers and field computers.

To facilitate natural resources management, GFAFB is currently collecting and updating GIS data for its many resources, including improved, semi-improved, and unimproved lands, wetlands and all surface waters, aerial spray areas for mosquitoes, land use, outdoor recreation including multi-use trail, ATV, paintball, picnicking, playgrounds, horse stables, cultural resources, hay leases, location of monitoring wells, natural resource management areas, bird survey points, soil, proposed burn units, AICUZ, training area, BASH, noxious weeds, vegetative cover, tree farms, and location of deer stands and hunting area. A summer intern from one of the local universities could assist in gathering GPS data and developing layers.

A good choice for GPS equipment is the Trimble GeoExplorer or Ag GPS™ 132, which are high-performance GPS receivers that use either free public or subscription-based private differential correction services to calculate sub-meter positions in real-time. Natural resource managers can use these devices to tag soil type, noxious weed infestation, or habitat information with precise, sub-meter location data. Mapping this data highlights problem areas and helps managers concentrate their efforts to save time and money. To process data, a field computer, or tablet PC, such as the Hammerhead Xtreme Ruggedized Tablet (XRT) or the Toshiba Protege 3505, is also recommended for the field computing needs of natural resource managers.

Base general plan maps should use the same data source as the INRMP map documents to ensure continuity and data integration between the two different CE flights. In addition, GFAFB map data should be standardized with GeoBase requirements and integrated into INRMP maps. All GIS work uses the coordinate system North Dakota State Plane Coordinate System (North). The vertical datum is North American Vertical Datum 1988 (NAVD 88) and the horizontal datum is North American Datum 1983 (NAD 83).

Table 5.10-1 Land Management Units on GFAFB

| LMU_ID | LANDUSE | PLANNED | PROJECT |
|---|---|---|---|
| AD-1 | Administrative | Administrative Area | Maintain current condition. Focus on incorporating landscape plan and urban forestry concepts into this area. |
| AD-2 | Administrative | South Gate | Maintain current condition. Focus on incorporating landscape plan and urban forestry concepts into this area. |
| AO-1 | Airfield Operations | Airfield Operations | Maintain in current condition. |
| AO-10 | Airfield Operations | Airfield Operations | Non-pavement areas, remove noxious/invasive weeds. Remove tree obstructions. Regrade rough areas, and reseed with appropriate grass mix for BASH. |
| AO-4 | Airfield Operations | Hay Lease, brome grass mix | Remove invasive/noxious weeds, manage for hay lease, manage for suitable forage and bash appropriate land cover, managed as a burn unit, regrade rough areas., regrade rough areas |

Table 5.10-1 Land Management Units on GFAFB

| LMU_ID | LANDUSE | PLANNED | PROJECT |
|---|---|---|---|
| AO-5 | Airfield Operations | Hay Lease, brome grass mix | Remove invasive/noxious weeds, manage for hay lease, manage for suitable forage and bash appropriate land cover, managed as a burn unit, regrade rough areas |
| AO-6 | Airfield Operations | Hay Lease, brome grass mix | Remove invasive/noxious weeds, manage for hay lease, manage for suitable forage and bash appropriate land cover, managed as a burn unit, regrade rough areas |
| AO-7 | Airfield Operations | Hay Lease, brome grass mix | Remove invasive/noxious weeds, manage for hay lease, manage for suitable forage and bash appropriate land cover, managed as a burn unit, regrade rough areas |
| AO-8 | Airfield Operations | Hay Lease, brome grass mix | Remove invasive/noxious weeds, manage for hay lease, manage for suitable forage and bash appropriate land cover, managed as a burn unit, regrade rough areas |
| AO-9 | Airfield Operations | Hay Lease, brome grass mix | Remove invasive/noxious weeds, manage for hay lease, manage for suitable forage and bash appropriate land cover, managed as a burn unit |
| CM-1 | Community | Community | Maintain current condition. Focus on incorporating landscape plan and urban forestry concepts into this area. |
| CM-2 | Community | Boy Scouts | Maintain current condition. Focus on incorporating landscape plan and urban forestry concepts into this area. |
| FH-1 | Family Housing | School | Maintain current condition. Location for additional shelterbelt installation (along B3). |
| FH-2 | Family Housing | School | Maintain current condition. Location for additional shelterbelt installation (along B3). |
| FH-3 | Family Housing | Family Housing | Maintain current condition. Focus on incorporating landscape plan and urban forestry concepts into this area. |
| FH-4 | Family Housing | Arboretum | maintain arboretum, plant trees, install sign, install tree plaques, remove noxious/invasive plants |
| FH-5 | Family Housing | Shelterbelt | Maintain shelterbelt, plant new trees, and remove diseased trees. |
| FH-6 | Family Housing | Native Prairie Restoration | Remove noxious/invasive weeds, develop nature trail, develop butterfly garden, restore native prairie, manage for grassland birds, burn every 3-5 years or as needed, intersede, water |
| IN-1 | Industrial | Munitions Storage | Maintain in current condition. |
| IN-10 | Industrial | Fire training pit | Maintain in current condition. |
| IN-11 | Industrial | Industrial | Maintain current condition. Focus on incorporating landscape plan and urban forestry concepts into this area. |
| IN-2 | Industrial | Tree Farm | Continue adding to tree farm from National Tree Trust. Transplant trees as needed on throughout base. |
| IN-3 | Industrial | Training - Mixed Grassland Area | Remove noxious/invasive plant species - manage for mixed-grassland |

| Table 5.10-1 Land Management Units on GFAFB | | | |
|---|---|---|---|
| LMU_ID | LANDUSE | PLANNED | PROJECT |
| IN-4 | Industrial | Training - proposed off-road vehicle area | Remove noxious/invasive plants - maintain grassland - mitigate off-road vehicle impacts |
| IN-5 | Industrial | Training - Mixed Grassland | Remove invasive/noxious weeds, maintain grassland for airfield and training purposes |
| IN-6 | Industrial | Storage Area | Maintain current condition. |
| IN-7 | Industrial | Mass/Mobility Parking Lot | Remove invasive/noxious weeds. |
| IN-8 | Industrial | New Fire Station | Maintain current condition. Focus on incorporating landscape plan and urban forestry concepts into this area. |
| IN-9 | Industrial | Industrial Operations | Maintain current condition. Focus on incorporating landscape plan and urban forestry concepts into this area. |
| MD-1 | Medical | Medical | Maintain current condition. Focus on incorporating landscape plan and urban forestry concepts into this area. |
| OR-1 | Outdoor Recreation | River bottom woodland and naturalized grasslands | Plant hardwoods, stabilize banks, install additional pine shelterbelts, restore adjacent uplands to native prairie, incorporate multi-use trail, bow-hunting to manage deer pop., general floodplain mgmt |
| OR-2 | Outdoor Recreation | naturalized grassland | Remove invasive/noxious weeds, restore native prairie, manage for bi |
| OR-3 | Outdoor Recreation | Golf Course bluegrass, bentgrass, rye, fescue | Manage shelterbelts and individual tree species with urban forestry and tree inventory, evaluate possible use of buffalograss, treated wastewater for irrigation, native vegetation, blue-bird trail |
| OR-4 | Outdoor Recreation | RV Storage Area | Maintain current condition. |
| OR-5 | Outdoor Recreation | Family Camping | Plant shelterbelts for protection, wildlife, and aesthetics. Improve landscape features and facilities. Evaluate south-end for naturalized prairie |
| OR-6 | Outdoor Recreation | horse pasture and stables, gardens, skeet, misc | Improve and install shelterbelts, develop butterfly garden, develop nature study along multi-use trail |
| OR-7 | Outdoor Recreation | Paintball Field | Remove invasive/noxious weeds, Focus on urban forestry and landscaping to add playing interest and wildlife habitat to area. |
| OS-4 | Open Space | Hay Lease | Remove invasive/noxious weeds, manage for hay lease, restore naturalized grassland suitable for forage |
| OS-9 | Open Space | Naturalized Grassland | Serves as a landfill cap. Reduce erosion problems. Maintain as naturalized grassland. |
| OS-6 | Open Space and Airfield Operations | Hay Lease, brome grass mix | Remove invasive/noxious weeds, manage for hay lease, restore naturalized grassland suitable for forage |
| OS-7 | Open Space | Hay Lease, brome grass mix | Remove invasive/noxious weeds, manage for hay lease, restore naturalized grassland suitable for forage, burn unit, install hawk platforms, potential area to incorporate into multi-use trail, regrade |
| OS-8 | Open Space and Airfield Operations | Land Treatment Facility | Remediate petroleum contaminated soils |

| Table 5.10-1 Land Management Units on GFAFB | | | |
|---|---|---|---|
| LMU_ID | LANDUSE | PLANNED | PROJECT |
| OS-2 | Open Space | Hay Lease | Remove invasive/noxious weeds, manage for hay lease, restore naturalized grassland suitable for forage, managed as a burn unit, regrade rough areas. |
| OS-3 | Open Space | Hay Lease | Remove invasive/noxious weeds, manage for hay lease, restore naturalized grassland suitable for forage, managed as a burn unit, regrade rough areas |
| OS-5 | Airfield Operations | Hay Lease, brome grass mixture | Remove invasive/noxious weeds, manage for hay lease, manage for suitable forage and bash appropriate land cover, managed as a burn unit, regrade rough areas |
| UH-1 | Unaccompanied Housing | Barracks | Maintain current condition. Focus on incorporating landscape plan and urban forestry concepts into this area. |
| UN-1 | Unknown and Industrial | Tree Farm | Continue adding to tree farm from National Tree Trust. Transplant trees as needed on throughout base. |
| UN-5 | Unknown | Lagoons | Maintain in current condition. |
| UN-6 | Unknown | Hay Lease or Tree Farm | Manage for hay lease or tree farm area. |
| UN-7 | Unknown | Naturalized grassland and wetland area | Manage for grassland habitat and wetlands. Improve wetland and quality of grassland for wildlife. |
| UN-8 | Open Space | Plane Displays | Maintain current condition. Focus on incorporating landscape plan and urban forestry concepts into this area. |
| UN-9 | Unknown | Open Space | Maintain shelterbelt by installing and thinning dying/diseased trees for wildlife, energy, and aesthetics. |
| UN-2 | Unknown | Tree Farm | Continue adding to tree farm from National Tree Trust. Transplant trees as needed on throughout base. |
| UN-3 | Unknown Unknown | Naturalized Grassland | Remove noxious/invasive plants - manage for native prairie and grassland birds |
| UN-4 | Unknown | Hay Lease, Mixed-grass prairie, Old EOD area | Remove invasive/noxious weeds, manage for hay lease, restore naturalized grassland suitable for forage |
| UN-10 | Unknown | Naturalized Grassland | Maintain as fire training area. |

### Natural Resource Inventories

Previous natural resource surveys and inventories conducted at GFAFB are:

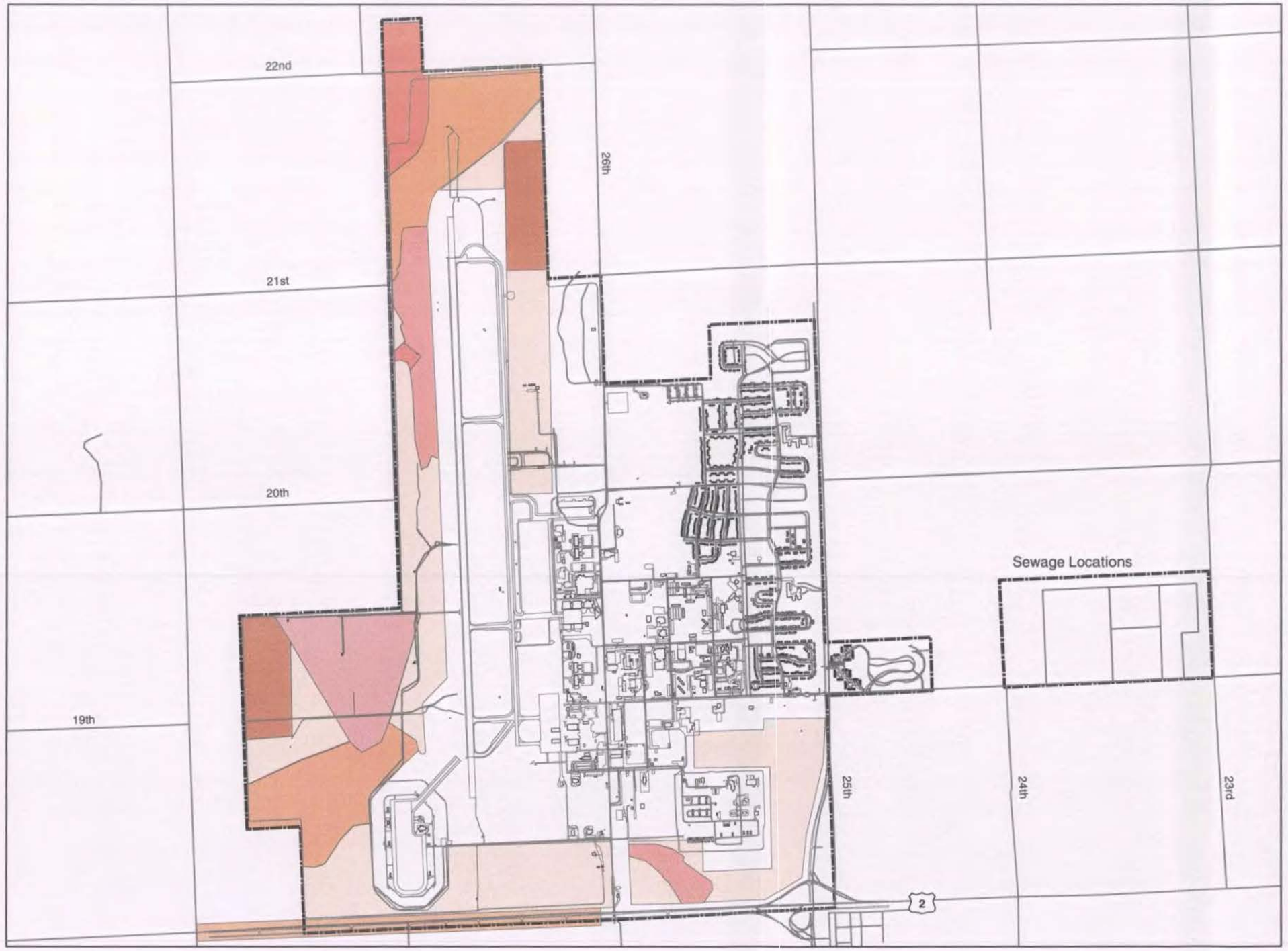
- Grand Forks Air Force Base Biological Survey (August 1993)
- Final Wetland Identification and Delineation Report (February 2000)
- Spring Migration and Summer Breeding Bird Surveys on Grand Forks Air Force base, ND (November 2001)
- Noxious Weed and Invasive Plant Survey and Control Plan (November 2003)
- Recommendations for the Agricultural Hay Lease Rehabilitation at the Grand Forks Air Force Base (November 2003)

## 5.11 Cultural Resources

"*Grand Forks Air Force Base Cultural Resource Survey Class III Intensive Archaeological Survey*" was performed in September 1996. The east terrace of the Turtle River has a potential for undiscovered archaeological sites. GFAFB will consult with the State Historical Society of North Dakota (SHSND) concerning the necessity for any additional studies in archeologically sensitive areas prior to any proposed undertaking in the area. In addition, the east terrace is vulnerable to erosion and roughly one foot of the southernmost archeologically sensitive portion of the river bluff was lost to erosion after the flood of 2000. Strategies to prevent damage to this area include establishing and maintaining native vegetative cover, especially in the paleosol (an ancient soil formed in the geological past). The National Park Service and National Clearinghouse for Archeological Site Stabilization offer specific guidance on site stabilization. By revegetating vulnerable areas and preserving existing native plants, both natural and cultural resources will benefit.

In January 2004, another report, "*Final Integrated Cultural Resource Management Plan, Grand Forks Air Force Base*" was conducted. According to this report, artifacts have been recovered from the hay lease area. Restoration and ultimately use of the hay lease areas has the potential to uncover previously unknown cultural resources. The hay leases contain areas of high, medium and low probability of discovering archeological remains (Figure 5.11-1). The types most likely to be found are historic remains from old farmsteads but Native American artifacts either in the paleosols near the Turtle River or around the edges of the former Lake Agassiz (beach ridges) may also be present.

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KEY MAP

N

Roads
Buildings/Structures
Installation Boundary
High Probability
Historic Bridge Inventory Survey
Kinney Survey
Low Probability (10% sample)
Low Probability (distance from water)
Medium Probability (beach ridge)
Medium Probability (near water)

0 1,000 2,000 3,000 Feet

FIGURE 5.11-1
CULTURAL RESOURCES

2004 INRMP
GRAND FORKS AFB, ND

DATE: SEPTEMBER 2004

REV. No.:

DRAWN BY: MS

# 6.0 MANAGEMENT GOALS AND OBJECTIVES

Management goals and objectives are policy statements that provide overall program direction and specific management instruction for the natural resources compliance programs at GFAFB. Goals are intended to direct resource management programs for the next five years, 2004-2008. Objectives are more specific than goals, and are directives to help achieve the larger goals. Further, projects detail the steps needed to achieve the objective, which lead to achieving the particular goal.

These goals address the need to better manage natural resources at GFAFB. Natural resources are those areas associated with water and land not part of the built environment and include wildlife, plants, wetlands, trees, outdoor recreation areas, and other unimproved and landscaped areas. GFAFB natural areas are subject to substantial human activity. At an installation such as GFAFB, the ecosystem is comprised primarily of terrestrial plants, animals, agricultural land, wetlands, and some forestland. Lowland prairies and marshes are found within the nearby Kelly Slough NWR.

## 6.1 Goals and Objectives

Nine goals have been identified to guide natural resource planning and management at GFAFB. Objectives and projects are also identified to address these goals.

**Goal 1.1 – Water Resources: Incorporate the concept of ecosystem management concepts into the management of wetlands and surface water at GFAFB.**

**Objective 1.1.1:** Enhance and restore wetlands and other water bodies under the jurisdiction of GFAFB.

**Project 1.1.1.1:** Update base-wide wetland delineation and continue jurisdictional wetland delineation for all wetlands at GFAFB.

**Project 1.1.1.2:** Monitor the water quality of the base wetlands to create a baseline. Parameters should include dissolved oxygen content, turbidity ph, and the presence or absence of benthic invertebrates.

**Project 1.1.1.3:** Produce wetland signage and brochures for protection and education purposes. Develop two brochures, one outlining the ecological benefits provided by wetlands and the other describing penalties for dumping in wetlands.

**Goal 2.1 - Wildlife: Incorporate the concept of ecosystem management into the GFAFB natural resources program and emphasize increasing species diversity in degraded habitats.**

**Objective 2.1.1:** Provide management activities to enhance wildlife habitat.

**Project 2.1.1.1:** Maintain the Prairie View Nature Preserve enhancing habitat for grassland birds and butterflies by instituting a management plan for prescribed burns, watering, mowing, tree maintenance, noxious weed removal, and interseeding grasses and wildflowers as

necessary. Burns will occur every 3 yrs, with watering, mowing, tree maintenance, herbiciding, interseeding every year as needed.

**Project 2.1.1.2:** Plant appropriate native riparian vegetation along the Turtle River to stabilize the riverbank and enhance wildlife habitat.

**Project 2.1.1.3:** Allow minimal predator removals from base unless human conflicts arise.

**Project 2.1.1.4**: Develop a variety of grassland habitat mosaics across the unimproved areas by developing and implementing a prescribed burn plan to improve grassland bird habitat by favoring warm season grasses, improving wetland conditions, and reducing noxious/invasive weeds.

**Project 2.1.1.5:** To the extent possible, interseed unimproved areas with native warm season grasses to improve grassland habitats for wildlife.

**Project 2.1.1.6:** Create a butterfly garden in Prairie View Nature Preserve.

**Project 2.1.1.7:** Install and maintain bluebird, cliff swallow, and bat houses where appropriate. Maintain existing houses.

**Objective 2.1.2:** Monitor as needed for threatened, endangered, and sensitive species.

**Project 2.1.2.1:** Conduct biosurveys at regular intervals to monitor for the presence of rare, threatened or endangered species, including grassland birds; and to determine the status of invasive plant species (increasing or decreasing).

**Project 2.1.2.2:** Conduct local bird surveys to monitor the presence of black terns and bald eagles utilizing the sewage lagoons. Also collect data to create baseline for water quality at the lagoons.

**Goal 2.2 - Wildlife:** Identify new sources of funding and volunteer support for Natural Resource Management Programs.

**Objective 2.2.1:** Solicit and utilize volunteers from local groups including Audubon, the Native Plant Society, Boy Scouts, Nature Conservancy, University, schools, and others to maintain or install bluebird, purple martin, and bat houses.

**Project 2.2.1.1:** Plan a Prairie View Nature Preserve Maintenance Day; invite groups listed above to plant trees, water, or weed area by hand (see Goal 8 section).

**Objective 2.2.2:** Continue to coordinate with the USFWS and the University of North Dakota (UND) on the impact of base operations on Kellys Slough and UND lands surrounding GFAFB. Consider the possibility of enhancing with native plants, the area between the base and Kellys Slough NWR and/or enhancement of the Turtle River riparian corridor.

**Project 2.2.2.1:** Pursue possible sources of funding from outside private organizations and agencies such as Ducks Unlimited or The Conservation Fund. If threatened or endangered species habitat is present on Base, it is possible to apply for grants through Section 6 of the Endangered Species Act to offset the costs of preserving that habitat.

**Project 2.2.2.2:** Obtain a license and certificate to control beavers in the section of the Turtle River adjacent to the base prior to any attempts to reintroduce native trees and shrubs for bank stabilization or general riparian corridor and woodland habitat restoration.

**Goal 3.1 – Grounds Maintenance: Improve grounds maintenance effectiveness.**

**Objective 3.1.1:** Manage the "urban forest" to maximize the aesthetic appeal while minimizing maintenance costs and nuisances.

**Project 3.1.1.1:** Develop and implement a shelterbelt plan for use as "living fences" using native trees and shrubs (i.e. cottonwoods, poplars, bur oak, and red-osier dogwood) to serve as snow maintenance structures, improve energy conservation, and create wildlife habitat.

**Project 3.1.1.2:** Stimulate recently planted trees by removing diseased trees and others that are shading out more recently planted trees, such as the B3 shelterbelt issues, and rejuvenate aging shelterbelts on base by planting new trees as needed.

**Project 3.1.1.3:** Create a real-time tree inventory to aid in urban forestry management with details on tree species and health, infrastructure conflicts, hazard tree identification, planting guidelines and maintenance.

**Project 3.1.1.4:** Develop and continue tree seedling farm. Continue to receive trees from National Tree Trust to replace dead individuals.

**Objective 3.1.2:** Reduce grounds and golf course maintenance costs.

**Project 3.1.2.1:** Convert as much land as possible from improved to semi-improved or unimproved through planting of low-maintenance ground covers and low and slow growing trees on the golf course.

**Project 3.1.2.2:** Implement a pilot program at a new development site to determine the feasibility of using a mix of buffalo grass ("Bowie") and northern blue gramma ("Bad River") for improved and semi-improved lawn and golf course areas to reduce irrigation needs. Contact Seed Stock Farms at http://www.stockseed.com for more information. Buffalo grass is on the northern edge of its range in the Grand Forks area and may experience some winterkill. It should do well on southern facing slopes and can be re-seeded if necessary.

**Project 3.1.2.3:** Explore the feasibility of using treated wastewater effluent for golf course irrigation and implement a test program to see if this program would be successful at GFAFB.

**Goal 4.1 – Agricultural Outlease: Improve the quality of hay lease areas at GFAFB.**

**Objective 4.1.1:** Make hay lease areas more attractive to potential lessees.

**Project 4.1.1.1:** To the extent possible, grade, treat with herbicide, and seed hay lease areas using native warm season grasses to receive higher rents and curtail degradation of these areas. Avoid the breeding bird season.

**Project 4.1.1.2:** Develop and implement a prescribed burn plan for the hay lease areas to foster maintenance of the area to include improvement of grass quality, reduce noxious weeds, and facilitate excavation of gopher mounds to curtail degradation of the lease area (see project 2.1.1.4).

**Objective 4.1.2:** Reform the written agricultural lease to include land restoration measures and ensure that the lessee is in compliance with the terms of the lease.

**Project 4.1.2.1:** Institute temporary rent abatements for lessees that agree to clear, maintain, and improve agricultural lease lands. Also include noxious weed control as part of lease requirements.

**Project 4.1.2.2:** Institute discretionary/contingent leases for greater than standard lease periods (i.e. five years with first rights to renew/refuse) for lessees that perform according to the lease terms (i.e. are good stewards of the land).

**Project 4.1.2.3:** Regularly monitor the hay lease areas to ensure timely haying and prompt hay bale removal, plus retrieve records and perform visual inspection of the lessee applying herbicide to eliminate invasive weed species.

**Goal 5.1 – Outdoor Recreation: Enhance outdoor recreational opportunities at GFAFB.**

**Objective 5.1.1:** Develop pest management strategies to enhance enjoyment of outdoor pursuits on GFAFB.

**Project 5.1.1.1:** Conduct a comprehensive on-base mosquito breeding site survey and treat active sites with a season-long larvicide such as Bactimos or other biological larvicide.

**Project 5.1.1.2:** Evaluate weekly treatment of vegetation in the Turtle River area adjacent to GFAFB with a low-toxicity residual insecticide to reduce mosquito annoyance in this area and make this area more viable as an outdoor recreational site. Alternatively, allow cliff swallows to nest somewhere in the area or install bat houses.

**Objective 5.1.2:** Continue the development of a multipurpose base trail loop that would join restored natural areas, remnant natural areas such as along Turtle River, developed areas (such as the golf course), and housing.

**Project 5.1.2.1:** Investigate the use of agricultural outleased moneys to develop and enhance equipment access routes to outleased lands that could double as part of the multipurpose base trail loop.

**Objective 5.1.3:** Further develop fee-generating outdoor recreational opportunities on base, trapping of fur-bearers, nature study, picnicking and fishing in the Turtle River area.

**Project 5.1.3.1:** Provide a leaflet to base personnel describing possible volunteer opportunities on base related to non-consumptive outdoor recreational opportunities and natural resources. Encourage initiatives such as winter-feeding of resident songbirds, establishment of perennial plants within the garden plot areas that are attractive to butterflies, and maintenance of bluebird trails.

**Project 5.1.3.2:** Investigate the idea of allowing fishing and picnicking at the Turtle River. Use information from other installation fishing programs as guidance.

**Project 5.1.3.3:** Monitor off-road vehicle areas monthly, or as needed, to determine if usage levels are appropriate for the site.

**Project 5.1.3.4:** Evaluate the possibility of generating and using fees from off road vehicles use to mitigate any adverse impacts from this activity.

**Goal 6.1 – Integrated Pest Management: Reduce levels of pest species, at GFAFB.**

**Objective 6.1.1:** Focus mosquito control efforts to reduce wasted time and money.

**Project 6.1.1.1:** Coordinate with pest management on the need and the timing of mosquito control, particularly in regards to natural resources, such as the Turtle River and wetland areas.

**Goal 6.2 – Eliminate noxious/invasive species from GFAFB with the understanding that it may take years to accomplish.**

**Objective 6.2.1:** Use a combination of stressors to reduce/eliminate noxious/invasive weeds.

**Project 6.2.1.1:** Develop and implement a noxious weed control plan to eradicate noxious/invasive weeds, especially targeting leafy spurge, Canada thistle, and Russian Olive. Use a combination of stressors including herbicide application and timely controlled-burns on all areas of the base as required.

**Project 6.2.1.2:** Experiment with the use of leafy spurge beetles as a biological control for leafy spurge.

**Goal 7.1 – BASH: Manage airfield habitats to meet airfield safety regulations.**

**Objective 7.1.1:** Reduce BASH and other wildlife/aircraft strike hazards by making the airfield area as unattractive to wildlife as possible.

**Project 7.1.1.1:** Coordinate with agriculture lessees, grounds maintenance, airfield and safety personnel to reduce BASH. Remove white and yellow clover and replace with approved airfield seed mix (see project 4.1.1.1).

**Project 7.1.1.2:** Program improvements for airfield drainage to reduce areas of standing water until improvements are complete. Regularly monitor the ditch draining west from the airfield for beaver activity. Program funds to install "beaver pipe."

**Project 7.1.1.3:** Coordinate weekly during migratory season with USFWS personnel on the status and the movements of waterfowl populations in Kellys Slough.

**Objective 7.1.2:** Continue bow-hunting and monitor the deer population to determine the effectiveness of an on-base bow-hunting season in reducing the frequency of airfield deer problems. Make base personnel and public aware of the recreational opportunity.

**Project 7.1.2.1:** Conduct deer survey twice a year to monitor deer number and facilitate management

**Goal 8.1 – Natural Resource Education: Promote natural resource education and awareness.**

**Objective 8.1.1:** Create opportunities for interpretive environmental education on the base installation, including displays, signs, materials, and educational programs.

**Project 8.1.1.1:** Plan observance of Earth Day, National Public Lands Day or Arbor Day Celebrations around Prairie View Nature Preserve. Purchase prizes for children.

**Project 8.1.1.2:** Plan a Prairie View Nature Preserve clean up day, would coincide with project above. Utilize in-house or hire local tree expert to demonstrate proper pruning techniques for Arboretum trees.

**Project 8.1.1.3:** Plan for the observance of a North Dakota Prairie Day with a visit to Prairie View Nature Preserve to observe native grassland species.

**Project 8.1.1.4:** Plan a Backyard Wildlife Education Day to promote bird feeding, watering and the planting of seed or berry producing native plant species. Also inform residents on the importance of providing water to birds, as long as it is a location that affords a clear view of free-ranging cats or other predators. Consider giving away a few native plant seedlings.

**Project 8.1.1.5:** Develop curriculum for natural resource educational courses. Incorporate visits to wildlife museum and mounted bear exhibits into the curriculum.

**Project 8.1.1.6:** Create a design for the Tree Arboretum located in Prairie View Nature Preserve and continue to add vegetation and signage to the area.

**Objective 8.1.2:** Continue to increase public information and outreach efforts as the primary means of reducing human-wildlife conflicts and of maintaining wildlife populations in as natural and dynamic a state as possible.

**Project 8.1.2.1:** Create a volunteer brochure to solicit help for GFAFB Natural Resources clean-up projects (in house).

**Project 8.1.2.2:** Research private funding opportunities for GFAFB natural resource clean-up projects (in house).

**Project 8.1.2.3:** Increase environmental awareness among base and local community-sponsored volunteer organizations about opportunities to learn about and participate in on-base natural resources activities.

**Objective 8.1.3:** Feature flora and fauna species native to the base in various programs, and promote native species management and biodiversity.

**Project 8.1.3.1:** Create signs to identify tree, grass, butterfly garden and trail, and wild flower species at the Arboretum / Prairie View Nature Preserve area.

**Project 8.1.3.2:** Create wildlife brochures for badgers and swallows to educate residents and base personnel on the value of these species.

**Project 8.1.3.3:** Develop watchable wildlife brochures and determine what areas are appropriate for wildlife viewing.

**Project 8.1.3.4:** Build Watchable Wildlife observation decks

**Goal 9.1 – Identification, Classification and Mapping of Natural Resource Units: Enhance and update GIS/GeoBase data and provide state-of-the-art training for GFAFB personnel.**

**Objective 9.1.1:** Ensure that all current and new information relative to natural resources is incorporated into the Geographic Information System (GIS). Conduct natural resource surveys as needed to update land classification maps (including wetlands) for GFAFB to aid natural resource and grounds maintenance programs.

**Project 9.1.1.1:** Integrate current Computer Aided Drafting and Design (CADD) files, as built drawings, and other databases into GIS.

**Project 9.1.1.2:** Develop management plan to create new environmental constraint maps (wetlands, forestry, floodplain, cultural resources, etc.) and other currently non-existent database layers. Surveys required for data collection. Utilize interns.

**Project 9.1.1.3:** Develop management plan for verifying existing database layers, and update and improve existing database layers where necessary (to be incorporated with above projects).

**Project 9.1.1.4:** Hold yearly training sessions for GIS and GeoBase personnel.

**Project 9.1.1.5:** Purchase updated equipment and software for the existing natural resources GIS program.

**Project 9.1.1.6:** Acquire the services of a GIS intern through cooperative agreements or other means with local area universities to help update the natural resources GIS data.

## 6.2 Summary of Goals and Objectives

Costs and time frames are subject to change as funding becomes available.

Table 6.2-1 below presents an estimated cost and timeline for each project.

**Table 6.2-1 Project Cost and Implementation Schedule**

| Project Number | Project Title | Cost | Fiscal Year |
|---|---|---|---|
| 1.1.1.1 | Update wetland delineation | $50 K | 2004 |
| 1.1.1.2 | Monitor water quality of wetlands | $15 K | 2005 |
| 1.1.1.3 | Produce wetland signage and brochures. Develop two brochures, one outlining the ecological benefits provided by wetlands and the other describing penalties for dumping in wetlands. | $0.5 K | 2004 |
| 2.1.1.1 | Maintain the Prairie View Nature Preserve enhancing habitat for grassland birds and butterflies by instituting a management plan for prescribed burns, watering, mowing, tree maintenance, noxious weed removal, and interseeding grasses and wildflowers as necessary. Burns will occur every 3 yrs, with watering, mowing, tree maintenance, herbiciding, and interseeding as needed every year. | 5K; 2K per year | 2004, 2007; all INRMP years |
| 2.1.1.2 | Plant appropriate native riparian vegetation along the Turtle River to stabilize the riverbank and enhance wildlife habitat. | $15K | 2006 |
| 2.1.1.3 | Allow minimal predator removals from base unless human conflicts arise. | $0K | All INRMP years |
| 2.1.1.4 | Develop a variety of grassland habitat mosaics across unimproved areas by developing and implementing a prescribed burn plan to improve grassland bird habitat by favoring warm season grasses, improving wetland conditions, and reducing noxious/invasive weeds. | $15K | All INRMP years |
| 2.1.1.5 | To the extent possible, interseed unimproved areas with native warm season grasses to improve grassland habitats for wildlife. | 2.5K | ALL INRMP YEARS |
| 2.1.1.6 | Create a butterfly garden in Prairie View Nature Preserve. | $2K | 2005 |

| Project Number | Project Title | Cost | Fiscal Year |
|---|---|---|---|
| 2.1.1.7 | Install and maintain bluebird, cliff swallow, and bat houses where appropriate. | $1K | 2006 |
| 2.1.2.1 | Conduct biosurveys at regular intervals to monitor for the presence of rare, threatened or endangered species, including grassland birds, and to determine the status of invasive species (increasing or decreasing). | $20K | 2008 |
| 2.1.2.2 | Conduct local bird surveys to monitor the presence of black terns and bald eagles utilizing the sewage lagoons. Also collect data to create baseline for water quality at the lagoons. | 1K | ALL INRMP YEARS |
| 2.2.1.1 | Plan and conduct a Prairie View Nature Preserve Maintenance Day (see Goal 8 section) | $1 K | 2004 |
| 2.2.2.1 | Pursue possible sources of funding through private groups (see goal 8 section) | $0 | All INRMP years |
| 2.2.2.2 | Obtain a license and a certificate to trap beavers in Turtle River area | $0 K | All INRMP years |
| 3.1.1.1 | Develop and implement a shelterbelt plan for use as "living fences" using native trees and shrubs (i.e. cottonwoods, poplars, bur oak, and red-osier dogwood) to serve as snow maintenance structures, improve energy conservation, and create wildlife habitat. | 5K | 2005 |
| 3.1.1.2 | Stimulate recently planted trees by removing diseased trees and others that are shading out more recently planted trees, such as the B3 shelterbelt issues, and rejuvenate aging shelterbelts on base by planting new trees as needed. | $15K | All INRMP years |
| 3.1.1.3 | Create a real-time tree inventory to aid in urban forestry management with details on tree species and health, infrastructure conflicts, hazard tree identification, planting guidelines and maintenance. | $35K | 2005 |
| 3.1.1.4 | Develop and continue tree seedling farm. Continue to receive trees from National Tree Trust to replace dead individuals. | $0 | All INRMP years |
| 3.1.2.1: | Convert as much land as possible from improved to semi-improved or unimproved through planting of low-maintenance ground covers and low and slow growing trees on the golf course. | $0 | All INRMP years |

| Project Number | Project Title | Cost | Fiscal Year |
|---|---|---|---|
| 3.1.2.2 | Implement a pilot program at a new development site to determine the feasibility of using a mix of buffalo grass ("Bowie") and northern blue gramma ("Bad River") for improved and semi-improved lawn and golf course areas to reduce irrigation needs. Contact Seed Stock Farms at http://www.stockseed.com for more information. Buffalo grass is on the northern edge of its range in the Grand Forks area and may experience some winterkill. It should do well on southern facing slopes and can be re-seeded if necessary. | $1.5K | 2004 |
| 3.1.2.3 | Explore the feasibility of using treated wastewater effluent for golf course irrigation and implement a test program to see if this program would be successful at GFAFB. | TBD | 2006 |
| 4.1.1.1 | To the extent possible, grade, treat with herbicide, and seed hay lease areas using native warm season grasses to receive higher rents and curtail degradation of these areas. Avoid the breeding bird season. | $100K | 2005 |
| 4.1.1.2 | Develop and implement a prescribed burn plan for the hay lease areas to foster maintenance of the area to include improvement of grass quality, reduce noxious weeds, and facilitate excavation of gopher mounds to curtail degradation of the lease area. (see project 2.1.1.4) | $15K | All INRMP YEARS |
| 4.1.2.1 | Institute temporary rent abatements for lessees that agree to clear, maintain, and improve agricultural lease lands. Also include noxious weed control as part of lease requirements. | $0 | 2005 |
| 4.1.2.2 | Institute discretionary/contingent leases for greater than standard lease periods (i.e. five years with first rights to renew/refuse) for lessees that perform according to the lease terms (i.e. are good stewards of the land). | $0 | 2005 |
| 4.1.2.3 | Regularly monitor the hay lease areas to ensure timely haying and prompt hay bale removal, plus retrieve records and perform visual inspection of the lessee applying herbicide to eliminate invasive weed species. | $0 | 2005 |
| 5.1.1.1 | Conduct a comprehensive on-base mosquito breeding site survey and treat active sites with a season-long larvicide such as Bactimos or other biological larvicide. | $2K | 2004 |

| Project Number | Project Title | Cost | Fiscal Year |
|---|---|---|---|
| 5.1.1.2 | Evaluate weekly treatment of vegetation in the Turtle River area adjacent to GFAFB with a low-toxicity residual insecticide to reduce mosquito annoyance in this area and make this area more viable as an outdoor recreational site. Alternatively, allow cliff swallows to nest somewhere in the area or install bat houses. | $TBD | 2004 |
| 5.1.2.1 | Investigate use of agricultural outleased money to develop and enhance equipment routes to outleased lands that could double as part of the multi-trail base loop trail | $ 0 | 2004 |
| 5.1.3.1 | Provide a leaflet to base personnel describing possible volunteer opportunities on base related to non-consumptive outdoor recreational opportunities and natural resources. Encourage initiatives such as winter-feeding of resident songbirds, establishment of perennial plants within the garden plot areas that are attractive to butterflies, and maintenance of bluebird trails. | $ 0.5 K | 2004 |
| 5.1.3.2 | Investigate the idea of allowing fishing and picnicking at the Turtle River. Use information from other installation fishing programs as guidance. | $ 0 | 2004 |
| 5.1.3.3 | Monitor off-road vehicle areas monthly, or as needed, to determine if usage levels are appropriate for the site. | $0 | All INRMP years |
| 5.1.3.4 | Evaluate the possibility of generating and using fees from off road vehicle use to mitigate any adverse impacts from this activity. | $0 | All INRMP years |
| 6.1.1.1 | Coordinate with pest management on the need and the timing of mosquito control, particularly in regards to natural resources, such as the Turtle River and wetland areas. | $ 0 | 2004 |
| 6.2.1.1 | Develop and implement a noxious weed control plan to eradicate noxious/invasive weeds, especially targeting leafy spurge, Canada thistle, and Russian Olive. Use a combination of stressors including herbicide application and timely controlled burns on all areas of the base as required. | $20 K year | All INRMP years |
| 6.2.1.2 | Experiment with the use of leafy spurge beetles as a biological control on the weed leafy spurge. | $5 K year | All INRMP years, |
| 7.1.1.1 | Coordinate with agricultural lessees, grounds maintenance, and airfield and safety personnel to reduce BASH. Remove white and yellow clover and replace with approved airfield grass mix (See project 4.1.1.1). | $ 0 | 2005 |
| 7.1.1.2 | Install beaver pipe; monitor drainage. | $ 1K | 2004 |
| 7.1.1.3 | Coordinate with USFWS weekly during migration. | $ 0 | All INRMP years |
| 7.1.2.1 | Perform deer surveys twice yearly (in-house). | $ 0 | All INRMP years |

| Project Number | Project Title | Cost | Fiscal Year |
|---|---|---|---|
| 8.1.1.1 | Plan observance of Earth Day, Arbor Day and other related celebrations; purchase prizes for children | $ 1K Per Event | All INRMP years |
| 8.1.1.2 | Plan Prairie View Nature Preserve clean-up day (would coincide with project above); utilize in-house or hire local tree expert to demonstrate proper pruning techniques | $ 1K | All INRMP years |
| 8.1.1.3 | Plan observance of a North Dakota Prairie Day with a visit to Prairie View Nature Preserve | $ 0 | All INRMP years |
| 8.1.1.4 | Plan a Backyard Wildlife Education Day to promote bird feeding, providing water, and planting fruit producing native plants for wildlife; consider giving away a few native plant seedlings. | $ 0.5 | All INRMP years |
| 8.1.1.5 | Develop curriculum for natural resource education courses (in-house); visits to wildlife museum | $ 0 | All INRMP years |
| 8.1.1.6 | Create a design for the Tree Arboretum located in Prairie View Nature Preserve and continue to add vegetation and signage to the area. | 1K | All INRMP Years |
| 8.1.2.1 | Create a volunteer brochure to solicit help for GFAFB natural resource clean-up projects (in-house) | $ 0 | All INRMP years |
| 8.1.2.2 | Research private funding opportunities for GFAFB natural resource clean-up projects (in-house) | $ 0 | All INRMP years |
| 8.1.2.3 | Increase environmental awareness among Base and the local community by advertising natural resource events by Base e-mail, flyers, newspaper ads, etc. | $ 0.5 K | All INRMP years |
| 8.1.3.1 | Create signs to identify tree, grass butterfly garden and trail and wildflower species at the Prairie View Nature Preserve and Arboretum areas | $ 1.5 | 2005-6 |
| 8.1.3.2 | Create wildlife brochures for cliff swallows and badgers to educate residents and Base personnel about these animals. | $ 0.5 | 2005 |
| 8.1.3.3 | Develop Watchable Wildlife brochures (in-house). | $ 0 | 2005 |
| 8.1.3.4 | Build Watchable Wildlife observation deck.s | $ 2 K | 2006 |
| 9.1.1.1 | Integrate current CADD files, as-built drawing and other databases into GIS (in-house). | $ 0 | 2004 |
| 9.1.1.2 | Conduct surveys and develop a management plan to create new environmental constraint map (layers); utilize interns | $ 0 | 2004 |
| 9.1.1.3 | Develop a management plan for verifying existing database layers, updating layers; to be incorporated with above projects. | $ 0 | 2004 |
| 9.1.1.4 | Hold yearly training sessions for GIS and GeoBase personnel | $0 | All INRMP years |
| 9.1.1.5 | Purchase updated GIS equipment and software | $ TBD | TBD |
| 9.1.1.6 | Contact local universities for the services of a GIS intern | $7 K | 2005-6 |

# 7.0 IMPLEMENTATION AND WORK PLAN FOR GOALS AND OBJECTIVES

## 7.1 Implementation Plan

This Implementation Plan addresses requirements that would implement those goals and objectives addressed in Chapter 6. As annual updates to the INRMP are developed, those projects that have gone unfunded would be identified and reason(s) provided for why they were not funded. Reallocation of funds or the development of additional funding requests would be necessary to accomplish the objectives.

This Implementation Plan will also be used as a work plan, to be used independent of this INRMP by the natural resources manager and other planners to obtain funding, prepare scopes of work, and to develop mitigation and monitoring plans for all projects. This chapter identifies the goals and quantifiable objectives, funding source and their level, priority and cost, performance requirements to accomplish the goal, a fiscal year timeline for scheduling purposes, and the office of responsibility to make it happen.

An Excel spreadsheet has been developed, as shown in Table 7.1-1 to be used by the natural resources manager to request funding by compliance class levels 1-3.

Even the best INRMP will not accomplish its goals and objectives without a useful Implementation Plan, which provides a method for tracking progress and funding. This Implementation Plan is a "living document" not rigidly set, which may be adjusted and updated over time. A commitment to implementing the plan has been made by the base and every effort will be made to fund the proposed project.

## 7.2 INRMP Summary Progress

The last INRMP management plan spanned the years 1997-2001, and had 11 goals. Many of these goals are systemic and carry through to the 2004-2008 INRMP. Selected specific accomplishments of that plan include the following: 1) Native prairie restoration of 40 acres creating the, "Prairie View Nature Preserve"; 2) Plant native grasses on the closed land-fill cap; 3) Installation of purple martin and bat houses; 4) Ensure Natural Resources Manager review of all EIAP documents; 5) Incorporate the INRMP into the General Plan; 6) Wetland jurisdictional delineation of specific base areas; 7) Developed Earth Day program into an Annual environmental awareness and educational event; 8) Maintained current BASH permits for taking of swallows as necessary; 9) Installed native grass plot on Golf Course; 10) Expanded multi-use trail to connect family camping and Prairie View Nature Preserve; and 11) Conducted a biological survey update.

GFAFB has made good progress on implementing the previous INRMP, and intends to continue in this direction. Natural resource management shall continue to progress at GFAFB with this plan (2004-2008) by supporting ecosystem management and multiple human uses that directly support the Mission of the 319th ARW.

Table 7.1-1: Project Funding and Work Plan for GFAFB.

| FY04 | DESCRIPTION | CLASS | AMOUNT | PRIORITY | FUNDED | STATUS |
|---|---|---|---|---|---|---|
| JFSD539910A4 | Wetland Base Wide Survey -- Goal 1.1/Objective 1.1.1/Project 1.1.1.1 | O&M | $50,000.00 | 1 | Y | Complete |
| JFSD533863A4 | Noxious Weed Eradication -- Goal 6.2/Objective 6.2.1.1/Project 6.2.1.1 | O&M | $20,000.00 | 2 | N | Not Funded/AMC did not support |
| JFSDOS5322A4 | MGT Habitat, Shelterbelt, Windbreak -- Goal 3.1/Objective 3.1.1/Project 3.1.1.2 | O&S | $5,500.00 | | Y | Complete |
| JFSDOS5324A4 | MGT Habitat, Eielson Windbreak -- Goal 3.1/Objective 3.1.1/Project 3.1.1.2 | O&S | $5,000.00 | | Y | Complete |
| JFSDOS5325A4 | MGT Habitat, Family Camp Windbreak -- Goal 3.1/Objective 3.1.1/Project 3.1.1.2 | O&S | $5,000.00 | | Y | Complete |
| JFSDOS5330A4 | TDY, CN Office | O&S | $2,000.00 | | Y | Complete |
| JFSDOS5340A4 | Supplies, CN Office | O&S | $1,000.00 | | Y | Complete |
| JFSDOS5360A4 | Public Awareness, Natural -- Goal 8.1 | O&S | $2,000.00 | | Y | Complete |
| JFSDOS530004 | Natural Resources Conf | O&S | $1,700.00 | | N | Not Funded/AMC did not support |
| JFSDOS5320A4 | TDY, Other | O&S | $10,000.00 | | N | Not Funded/AMC did not support |
| JFSDOS5300A4 | Training , CN Office | O&S | $2,000.00 | | N | Not Funded/AMC did not support |
| JFSDOS5310A4 | Training Others | O&S | $10,000.00 | | N | Not Funded/AMC did not support |
| JFSDOS5365 | Equipment Maint, CN Support -- Goal 3.1/Objective 3.1.1/Project 3.1.1.4 | O&S | $3,000.00 | | N | Not Funded/AMC did not support |
| **FY04 FUNDS TOTAL** | | | **$117,200.00** | | | |
| **FY04 ADDITIONAL PLAN COMMENTS** | Seed Horse Pasture to Native Grasses -- Goal 2.1/Objective 2.1.1/Project 2.1.1.5 | O&S | $1,700.00 | | Y | Complete - was noted as a positive finding during ECAMP 2005 |
| | Guest speaker from ND Forest Service for Earth Day -- Goal 8.1/Objective 8.1.1/Project 8.1.1.1 | Coordinate | $0.00 | | | Complete |
| | Kid's Environmental Learning Fair, Earth Day, 4-H, Soil Water Conservation District, GF Greenway, Dakota Science Center -- Goal 8.1/Objective | Coordinate | $0.00 | | | Complete |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 8.1.1/Project 8.1.1.1 | | | | | |
| | Completed Updated Biological Inventory/Survey FY03 project -- Goal 2.1/Objective 2.1.2/Project 2.1.2.1 | O&M | $17,000.00 | | Y | Complete |
| | Completed Noxious Weed Inventory/Control Plan FY03 project -- Goal 6.2/Objective 6.2.1.1/Project 6.2.1.1 | O&M | $10,000.00 | | Y | Complete |
| | Coordinated with Turtle River State Park and USFWS on updated biological surveys | Coordinate | $0.00 | | | Complete |
| | Conduct BASH bird survey (Safety money) -- -- Goal 2.1/Objective 2.1.2/Project 2.1.2.2 | Coordinate | $0.00 | | | Complete |
| | Coordinate with Airfield Obstruction Removal project on revegetating airfield grounds to remove obstructions and combat noxious weeds -- Goal 7.1/Objective 7.1.1/Project 7.1.1.1 | Coordinate | | | | In-Progress |
| | Implemented Bow-hunting program for the 2nd year -- Goal 7.1/Objective 7.1.2 | Coordinate | | | | Complete |
| | Create interpretive storyboard for the Black Bear taxidermy mount in the library -- Goal 8.1/Objective 8.1.1/Project 8.1.1.5 | In-House | | | | Complete |
| | Install Prairie View Nature Preserve sign -- Goal 8.1/Objective 8.1.3/Project 8.1.3.1 | O&S | $4,500.00 | | | Complete |
| JFSD539910A4 | Wetlands survey was delivered in GIS format compatible with GeoBase program -- Goal 9.1/Objective 9.1.1/Project 9.1.1.2, Project 9.1.1.3 | | | | | Complete |
| | Prairie View Nature Preserve Prescribed-burn/Interseed with wildflowers -- Goal 2.1/Objective 2.1.1/Project 2.1.1.1 | Housing | $7,000.00 | | | Complete |
| | Assisted development of Base Green Plan to include several natural resource | Coordinate | $2,200,000.00 | | | Complete/Won AMC Design |

| | | | | | | |
|---|---|---|---|---|---|---|
| | projects | | | | | Award |
| | | | | | | |
| **FY05** | **DESCRIPTION** | **CLASS** | **AMOUNT** | **PRIORITY** | **FUNDED** | |
| JFSD534048 | Jurisdictional Wetland Survey of Fire Station -- Goal 1.1/Objective 1.1.1/Project 1.1.1.1 | O&M | $15,000.00 | 1 | Y | In Progress |
| JFSD533863A5 | Noxious Weed Eradication -- Goal 6.2/Objective 6.2.1.1/Project 6.2.1.1 | O&M | $20,000.00 | 2 | Y | In Progress |
| JFSD530867A5 | Native Prairie Restoration -- Goal 2.1/Objective 2.1.1/Project 2.1.1.5 | O&M | $20,000.00 | 3 | N | Not Funded/AMC did not support |
| JFSD536677 | Urban Tree Inventory Grand Forks AFB -- Goal 3.1/Objective 3.1.1/Project 3.1.1.3, Project 3.1.1.1 | O&M | $25,000.00 | 4 | Y | In Progress |
| JFSD530705A5 | Migratory Birds Management -- Goal 2.1/Objective 2.1.1/Project 2.1.2.2 | O&M | $7,000.00 | 5 | Y | In Progress |
| JFSDOS5322A5 | MGT Habitat, Shelterbelt, Windbreak -- Goal 3.1/Objective 3.1.1/Project 3.1.1.2 | O&S | $5,500.00 | | Y | Complete |
| JFSDOS5324A5 | MGT Habitat, Eielson Windbreak -- Goal 3.1/Objective 3.1.1/Project 3.1.1.2 | O&S | $5,000.00 | | Y | Complete |
| JFSDOS5325A5 | MGT Habitat, Family Camp Windbreak -- Goal 3.1/Objective 3.1.1/Project 3.1.1.2 | O&S | $5,000.00 | | Y | Complete |
| JFSDOS5330A5 | TDY, CN Office | O&S | $2,000.00 | | Y | Complete |
| JFSDOS5340A5 | Supplies, CN Office | O&S | $1,000.00 | | Y | Complete |
| JFSDOS5360A5 | Public Awareness, Natural -- Goal 8.1 | O&S | $2,000.00 | | Y | Complete |
| JFSDOS530005 | Natural Resources Conf | O&S | $1,700.00 | | N | Not Funded/AMC did not support |
| JFSDOS5320A5 | TDY, Other | O&S | $10,000.00 | | N | Not Funded/AMC did not support |
| JFSDOS5300A5 | Training , CN Office | O&S | $2,000.00 | | N | Not Funded/AMC did not support |
| JFSDOS5310A5 | Training Others | O&S | $10,000.00 | | N | Not Funded/AMC did not support |
| JFSDOS5360A5 | Equipment Maint, CN Support -- Goal 3.1/Objective 3.1.1/Project 3.1.1.4 | O&S | $3,000.00 | | N | Not Funded/AMC did not support |
| **FY05 FUNDS TOTAL** | | | **$134,200.00** | | | |
| **FY05 ADDITIONAL PLAN** | National Public Lands Day Butterfly Garden -- Goa1 2.1/Objective 2.1.1/Project 2.1.1.6 | Legacy | $6,000.00 | | Y | Complete |

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|---|---|---|---|---|---|---|
| **COMMENTS** | Red River Zoo, Earth Day Presentation at School and CAC -- Goal 8.1/Objective 8.1.1/Project 8.1.1.1 | O&S | $500.00 | | Y | Complete |
| | Installed 10 blue bird nest boxes (purchased equip/water shop installed) -- Goal 2.1/Objective 2.1.1/Project 2.1.1.7 | O&S | $110.00 | | Y | Complete |
| | Cub scouts cleaned out purple marten and blue bird houses for Earth Week -- Goal 2.2/Objective 2.2.1 | Coordination | $0.00 | | | Complete |
| | Guest Audobon Speaker for Earth Day -- Goal 2.2/Objective 2.2.1 | Coordination | $0.00 | | | Complete |
| | Cooperated w/USFWS for paired waterfowl count on lagoons -- Goal 2.2/Objective 2.2.2 | In House | $0.00 | | | Complete |
| | Coordinate with Airfield Obstruction Removal project on revegetating airfield grounds to remove obstructions and combat noxious weeds -- Goal 7.1/Objective 7.1.1/Project 7.1.1.1 | Coordinate | | | | In Progress |
| | Implemented Bow-hunting program for the 2nd year -- Goal 7.1/Objective 7.1.2 | | | | | In Progress |
| JFSD534048 | Wetlands survey was delivered in GIS format compatible with GeoBase program -- Goal 9.1/Objective 9.1.1/Project 9.1.1.2, Project 9.1.1.3 | | | | | In Progress |
| | Updated landcover for vegetation GeoBase layer -- Goal 9.1/Objective 9.1.1/Project 9.1.1.1, Project 9.1.1.2, Project 9.1.1.3 | In House | | | | Complete |
| | Tree removal/replacement in B3 shelterbelt and throughout Base Housing -- Goal 3.1/Objective 3.1.1/Project 3.1.1.2 | Coordinate w/grounds maint/ landscape IDIQ | | | | In Progress |
| | | | | | | |
| **FY06** | **DESCRIPTION** | **CLASS** | **AMOUNT** | **PRIORITY** | **FUNDED** | |
| JFSD533863A6 | Noxious Weed Eradication -- Goal 6.2/Objective 6.2.1.1/Project 6.2.1.1 | O&M | $20,000.00 | 1 | Y | |
| JFSD534101 | Jurisdictional Wetland Surveys of O&M project areas -- Goal 1.1/Objective 1.1.1/Project 1.1.1.1 | O&M | $35,000.00 | 2 | Y | |

| | | | | | | |
|---|---|---|---|---|---|---|
| JFSD536677A6 | Urban Tree Inventory -- Goal 3.1/Objective 3.1.1/Project 3.1.1.3, Project 3.1.1.1 | O&M | $25,000.00 | 3 | Y | |
| JFSD536050 | Riparian Riverbank Stabilization -- Goal 2.1/Objective 2.1.1/Project 2.1.1.2 | O&M | $30,000.00 | 4 | Y | |
| JFSD581305 | Interpretive Signs Prairie View -- Goal 8.1/Objective 8.1.3/Project 8.1.3.1 | O&M | $20,000.00 | 5 | N | |
| JFSD539222 | Prairie View Butterfly Garden (Deleted because accomplished w/Legacy in FY05) | | $0.00 | | N | |
| JFSD539333 | Landscape Multi-Use Recreation Area -- related to Goal 5.1/Objective 5.1.3/Project 5.1.3.3, 5.1.3.4 | O&M | $20,000.00 | 6 | N | |
| JFSD539267 | Shelterbelt Rejuvenation Base Areas -- Goal 3.1/Objective 3.1.1/Project 3.1.1.2 | O&M | $50,000.00 | 7 | Y | |
| JFSD530867A5 | Native Prairie Restoration -- Goal 2.1/Objective 2.1.1/Project 2.1.1.5 | O&M | $20,000.00 | 8 | N | |
| JFSD532111 | Living Snow Fences Base Areas -- Goal 3.1/Objective 3.1.1/Project 3.1.1.1 | O&M | $50,000.00 | 9 | N | |
| JFSD539663 | Habitat Assessment, Quantification, and Mapping -- related to Goal 9.1/Objective 9.1.1/Project 9.1.1.2, 9.1.1.3, 9.1.1.4 | O&M | $30,000.00 | 10 | N | |
| JFSDOS5308A | Native Prairie Restoration -- Goal 2.1/Objective 2.1.1/Project 2.1.1.5 | O&S | $15,000.00 | | N | |
| JFSDOS5322A6 | MGT Habitat, Shelterbelt, Windbreak -- Goal 3.1/Objective 3.1.1/Project 3.1.1.2 | O&S | $5,500.00 | | Y | |
| JFSDOS5324A6 | MGT Habitat, Eielson Windbreak -- Goal 3.1/Objective 3.1.1/Project 3.1.1.2 | O&S | $5,000.00 | | Y | |
| JFSDOS5325A6 | MGT Habitat, Family Camp Windbreak -- Goal 3.1/Objective 3.1.1/Project 3.1.1.2 | O&S | $5,000.00 | | Y | |
| JFSDOS5360A6 | Public Awareness, Natural -- Goal 8 | O&S | $2,000.00 | | Y | |
| JFSDOS5360A6 | Equipment Maint, CN Support -- Goal 3.1/Objective 3.1.1/Project 3.1.1.4 | O&S | $3,000.00 | | N | |
| JFSDOS530005 | Natural Resources Conf | O&S | $1,700.00 | | N | |
| JFSDOS5300A | Training , CN Office | O&S | $2,000.00 | | Y | |
| **FY06 FUNDS TOTAL** | | | **$339,200.00** | | | |
| | | | | | | |
| **FY07** | **DESCRIPTION** | **CLASS** | **AMOUNT** | **PRIORITY** | **FUNDED** | |

| | | | | | | |
|---|---|---|---|---|---|---|
| JFSD534593 | Prescribed Burn of Unimproved Grassland Areas, Phase I -- Goal 2.1/Objective 2.1.1/Project 2.1.1.4,4.1.1.2 | O&M | $20,000.00 | 1 | | |
| JFSD534428 | Wetland Monitoring and Baseline Establishment -- Goal 1.1/Objective 1.1.1/Project 1.1.1.2 | O&M | $25,000.00 | 2 | | |
| JFSD533863A7 | Noxious Weed Eradication -- Goal 6.2/Objective 6.2.1.1/Project 6.2.1.1 | O&M | $20,000.00 | 3 | | |
| JFSD530705A7 | Migratory Birds Management -- Goal 2.1/Objective 2.1.1/Project 2.1.2.2 | O&M | $7,000.00 | 4 | | |
| JFSD532111P2 | Living Snow Fences Base Areas -- Goal 3.1/Objective 3.1.1/Project 3.1.1.1 | O&M | $50,000.00 | 5 | | |
| JFSD536051 | Riparian Riverbank Stabilization Phase II -- Goal 2.1/Objective 2.1.1/Project 2.1.1.2 | O&M | $30,000.00 | 6 | | |
| JFSD539267P2 | Shelterbelt Rejuvenation Base Areas -- Goal 3.1/Objective 3.1.1/Project 3.1.1.2 | O&M | $50,000.00 | 7 | | |
| JFSDOS5308A | Native Prairie Restoration -- Goal 2.1/Objective 2.1.1/Project 2.1.1.5 | O&S | $15,000.00 | | | |
| JFSDOSXXXX | Noxious Weed Control -- Goal 6.2/Objective 6.2.1.1/Project 6.2.1.1 | O&S | $15,000.00 | | | |
| JFSDOS5322A7 | MGT Habitat, Shelterbelt, Windbreak -- Goal 3.1/Objective 3.1.1/Project 3.1.1.2 | O&S | $5,500.00 | | | |
| JFSDOS5324A7 | MGT Habitat, Eielson Windbreak -- Goal 3.1/Objective 3.1.1/Project 3.1.1.2 | O&S | $7,500.00 | | | |
| JFSDOS5325A7 | MGT Habitat, Family Camp Windbreak -- Goal 3.1/Objective 3.1.1/Project 3.1.1.2 | O&S | $7,000.00 | | | |
| JFSDOS5360A7 | Public Awareness, Natural -- Goal 8 | O&S | $2,000.00 | | | |
| JFSDOS5360A7 | Equipment Maint, CN Support -- Goal 3.1/Objective 3.1.1/Project 3.1.1.4 | O&S | $3,000.00 | | | |
| JFSDOS5330A | TDY, CN Office | O&S | $2,000.00 | | | |
| JFSDOS5340A | Supplies, CN Office | O&S | $1,000.00 | | | |
| JFSDOS5366A | Natural Resources Conf | O&S | $1,700.00 | | | |
| JFSDOS5300A7 | Training , CN Office | O&S | $2,000.00 | | | |
| **FY07 FUNDS TOTAL** | | | **$263,700.00** | | | |
| | | | | | | |
| **FY08** | **DESCRIPTION** | **CLASS** | **AMOUNT** | **PRIORITY** | **FUNDED** | |

| | | | | | | |
|---|---|---|---|---|---|---|
| JFSD538603A8 | Update Biological Survey -- Goal 2.1/Objective 2.1.2/Project 2.1.2.1 | O&M | $25,000.00 | 1 | | |
| JFSD533863A8 | Noxious Weed Eradication -- Goal 6.2/Objective 6.2.1.1/Project 6.2.1.1 | O&M | $20,000.00 | 2 | | |
| JFSD53XXXX | Prescribed Burn of Unimproved Grassland Areas, Phase II -- Goal 2.1/Objective 2.1.1/Project 2.1.1.4,4.1.1.2 | O&M | $20,000.00 | 3 | | |
| JFSD531108 | Mosquito Breeding Survey and Management Plan -- Goal 5.1/Objective 5.1.1/Project 5.1.1.1 | O&M | $30,000.00 | 4 | | |
| JFSD532111P3 | Living Snow Fences Base Areas -- Goal 3.1/Objective 3.1.1/Project 3.1.1.1 | O&M | $50,000.00 | 5 | | |
| JFSD539267P3 | Shelterbelt Rejuvenation Base Areas -- Goal 3.1/Objective 3.1.1/Project 3.1.1.2 | O&M | $50,000.00 | 6 | | |
| JFSDOSXXXX | Noxious Weed Control -- Goal 6.2/Objective 6.2.1.1/Project 6.2.1.1 | O&S | $15,000.00 | | | |
| JFSDOS5308A | Native Prairie Restoration -- Goal 2.1/Objective 2.1.1/Project 2.1.1.5 | O&S | $15,000.00 | | | |
| JFSDOS5322A8 | MGT Habitat, Shelterbelt, Windbreak -- Goal 3.1/Objective 3.1.1/Project 3.1.1.2 | O&S | $5,500.00 | | | |
| JFSDOS5324A8 | MGT Habitat, Eielson Windbreak -- Goal 3.1/Objective 3.1.1/Project 3.1.1.2 | O&S | $7,500.00 | | | |
| JFSDOS5325A8 | MGT Habitat, Family Camp Windbreak -- Goal 3.1/Objective 3.1.1/Project 3.1.1.2 | O&S | $7,000.00 | | | |
| JFSDOS5360A8 | Public Awareness, Natural -- Goal 8 | O&S | $2,000.00 | | | |
| JFSDOS5365A8 | Equipment Maint, CN Support -- Goal 3.1/Objective 3.1.1/Project 3.1.1.4 | O&S | $3,000.00 | | | |
| JFSDOS5366A | Natural Resources Conf | O&S | $1,700.00 | | | |
| JFSDOS5340A | Supplies, CN Office | O&S | $1,000.00 | | | |
| JFSDOS5330A | TDY, CN Office | O&S | $2,000.00 | | | |
| JFSDOS5300A8 | Training , CN Office | O&S | $2,000.00 | | | |
| **FY08 FUNDS TOTAL** | | | **$256,700.00** | | | |

# 8.0 ENVIRONMENTAL ASSESSMENT

## 8.1 Environmental Impact Analysis Process

The 319 CES/CEV Environmental Management Flight office is responsible for implementing the environmental impact analysis process (EIAP) at GFAFB in accordance with the National Environmental Policy Act (NEPA) (42 USC 4321, et seq.), the Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations [CFR] 1500-1508) implementing the NEPA, and AFI 32-7061, The Environmental Impact Analysis. The EIAP ensures that potential environmental concerns are considered as early as possible in the Air Force planning process. It also serves to integrate all environmental concerns, including natural resources issues, into the decision making process. The EIAP procedures have statutory public involvement requirements that are determined by the nature of the action and are based on the amount of potential impact. All new projects that have the potential to affect natural resources must be supported by a work request during the project-planning phase.

Air Force approved projects must be covered by one of the following documents:

- Air Force Form 813, Request for EIAP. The size of the project and the amount of disturbance determine the required level of documentation. Projects may not proceed without reviewed and signed documentation. Project planning emphasizes maximum reuse of facilities and siting within previously disturbed areas to minimize loss of natural resources. Projects found to have no significant impacts may routinely proceed as exempt or as a categorical exemption (CATEX) without further processing.

- Categorical Exclusion (CATEX): The environmental review for a CATEX frequently generates project restrictions that ensure no significant impacts to natural or cultural resources. These restrictions must be followed before the project may proceed. An environmental checklist is provided to the proponents with the project restrictions.

- Environmental Assessment (EA): Projects that are found to potentially have a significant impact to resources are handled through the NEPA process and would require a detailed environmental assessment. Consultation with the U.S. Fish and Wildlife Service, and coordination with other federal and state offices, including appropriate public involvement, are required for these projects before they may be approved and initiated.

To comply with NEPA and the Sikes Act Improvement Amendment (SAIA), this EA has been prepared to evaluate the potential impacts of the implementation of this INRMP. The SAIA requires NEPA compliance and also requires that the public be given an opportunity to review and comment on the entire INRMP.

## 8.2 Purpose and Need

The purpose and need of this chapter is to address potential impacts from the implementation of the goals and objectives identified in detail in the INRMP. Although the impacts are discussed in general for this INRMP, the EIAP would be applied to each specific project when they are funded for implementation.

This INRMP will serve as the primary management tool for natural resource areas managed by the Air Force on GFAFB properties. This INRMP allows for coordinated management of different resources in a

manner consistent with the principle of multiple use. Integration of resource management requires that the interrelationships among different resources, as well as the military mission of GFAFB, be fully understood so that potential conflicts can be identified in advance and avoided or minimized, wherever possible.

## 8.3 Public and Agency Involvement

This INRMP/EA included public, federal and state agency involvement in order to ensure coordinated management of the resources identified in the INRMP. The public and agency involvement process included:

- A Notice of Availability (NOA) for a 30-day review period of the Draft INRMP was advertised in the local newspaper and held in the Grand Forks Library for review by the general public.

- Review by cooperating agencies – the U.S. Fish and Wildlife Service (USFWS) and the North Dakota Game and Fish Department were provided copies for their 30-day review period.

## 8.4 Interagency and Intergovernmental Coordination for Environmental Planning

Both NEPA and the CEQ regulations require intergovernmental notifications prior to making any detailed statement of environmental impacts. Through the process of Interagency and Intergovernmental Coordination for Environmental Planning (IICEP), the U.S. Air Force must notify concerned Federal, state, and local agencies and allow them sufficient time to evaluate potential environmental impacts of a proposed action. Comments from these agencies are subsequently incorporated into the Air Force EIAP.

## 8.5 Relevant Regulatory Legislation

The listing below of relevant environmental/natural resource legislation, EOs, and AFIs either directly or indirectly affect the implementation of the INRMP. This list is not intended to be all-inclusive.

### Environmental Laws, Executive Orders, and Air Force Instruction

Rivers and Harbors Act of 1899
Antiquities Act of 1906
Migratory Bird Treaty Act of 1918
Migratory Bird Conservation Act of 1929
Historic Sites Act of 1935
Water Conservation and Utilization Act of 1939 1940
Bald Eagle Protection Act of 1940
Flood Control Act of 1944
Federal Water Pollution Control Act of 1948 (Clean Water Act)
Federal Insecticide, Fungicide, and Rodenticide Act of 1947 (FIFRA)
Water Rights of 1952
Watershed Protection and Flood Prevention Act of 1954 (McCarran Amendment)
Fish and Wildlife Act of 1956 Waterfowl Depredations Prevention Act of 1956
Fish and Wildlife Coordination Act of 1958
Archeological and Historic Preservation Act of 1960 and 1974
Cooperative Research and Training Units Act of 1960
Refuge Recreation Act of 1962
Anadromous Fish Conservation Act of 1965
Federal Water Project Recreation Act of 1965

Land and Water Conservation Fund Act of 1965 (LWCFA)
Water Resources Planning Act of 1965
National Historic Preservation Act of 1966
Clean Air Act and Amendments of 1970
Estuary Protection Act of 1970
Noise Pollution and Abatement Act of 1970
Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970
Water Bank Act of 1970
Noise Control Act of 1972
Endangered Species Act of 1973
Archeological Recovery Act of 1974 (Moss-Bennett)
Federal Aid and Wildlife Restoration Act of 1974
Federal Noxious Weed Act of 1974
Safe Drinking Water Act of 1974
Federal Land Policy and Management Act of 1976
Resource Conservation and Recovery Act of 1976 (RCRA)
American Indian Religious Freedom Act of 1978
Forest and Rangeland Renewable Resources Act of 1978
Quiet Communities Act of 1978
Urban Park and Recreation Recovery Act of 1978
Archaeological Resources Protection Act of 1979
Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA or Superfund)
Paperwork Reduction Act of 1980
Farmland Protection Policy Act of 1980 and 1995
Federal Managers' Financial Integrity Act of 1982 (FMFIA)
Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA)
Emergency Wetlands Resources Act of 1986
Superfund Amendments and Reauthorization Acts of 1986 (SARA)
Toxic Substances Control Act of 1986 (TSCA)
Water Resources Development Act of 1986 1990
Budget Enforcement Act of 1990 (BEA) (and other budget laws)
Native American Graves Protection and Repatriation Act of 1990 (NAGPRA)
Pollution Prevention Act of 1990
Energy Policy Act (EPACT) of 1992
Federal Facilities Compliance Act of 1992
Wild Bird Conservation Act of 1992
Government Performance and Results Act of 1993
Omnibus Parks and Public Land Management Act of 1996
Sikes Act (P.L. 105-85), 19972000
Sikes Act Improvement Amendment (P.L. 206-580), 2000

**Executive Orders**

Protection and Enhancement of Environmental Quality, Executive Order 11514 of 1977
Floodplain Management, Executive Order 11988 of 1977
Protection of Wetlands, Executive Order 11990 of 1977
Federal Compliance With Pollution Control Standards, Executive Order 12088 of 1978
Federal Compliance With Right-to-Know Laws and Pollution Prevention, Executive Order 12856
Regulatory Planning and Review, Executive Order 12866
Federal Acquisition, Recycling, and Waste Prevention, Executive Order 12873 of 1993
Enhancing Intergovernmental Partnership, Executive Order 12875, 1993
Environmental Justice, Executive Order 12898, 1994

**U.S. Air Force Instructions and Directives**

AFI 32-7001, Environmental Budgeting, 9 May 1994

AFI 32-7002, Environmental Information Management System, 31 May 1994
AFI 32-7061, The Environmental Impact Analysis Process, 24 January 1995
AFI 32-7064, Integrated Natural Resources Management, November 2002 (under revision from 1994 version)
AFPD 32-70, Environmental Quality, 20 July 1994

## 8.6 Description of the Proposed Action and No-Action Alternative

### Proposed Action

The Air Force proposes to implement the INRMP for lands managed by GFAFB. Implementation of the INRMP would be accomplished through the execution of the projects within the objectives listed in Chapter 6, the Implementation Plan. This EA evaluates the INRMP goals and objectives. However, at the time of individual project funding, the proposed project may require the preparation of a site-specific EA or it may qualify for a CATEX.

### No Action Alternative

The No Action Alternative is not implementing the INRMP. The No-Action Alternative is included in this EA to meet the procedural requirements of NEPA. No Action would be inconsistent with Congressional directives, as well as with the Air Force's expressed intent to work cooperatively with other agencies and organizations in the areas under Air Force management. The No Action Alternative would not allow projects to comply with Air Force and federal laws and regulations and would not allow for preservation and enhancement of natural resources at GFAFB.

## 8.7 Mission Activities and Potential Effects

The following sections summarize current and future mission impacts on the environment for GFAFB. In cases such as Environmental Restoration Program sites (ERP), impacts to the natural environment and to human health have been thoroughly documented in separate studies (ERP under CERCLA). In other cases, such as the biological impacts, the conclusions are based on visual observations and the results of past studies. Detailed impact studies have not been performed, and monitoring may be needed to determine the significance of these impacts. The existing conditions of natural resources are described fully in Chapters 3, 4 and 5 (General Physical Environment, General Biotic Environment and Natural Resource Program Management, respectively).

### Current Impacts

The complex community and operations that support the military mission at GFAFB require air and water discharges, some hazardous materials management, and a wide range of land uses in a rural setting. The base works with state and federal authorities to implement up-to-date environmental permit requirements and to minimize potential environmental effects of base operations. This section summarizes the status of permits that deal with potential impacts to water, land, and air resources, and describes how activities at the base can affect biological systems.

### Impacts to Natural Areas at GFAFB

The Turtle River area or CE Park is sometimes used for legitimate military training and readiness, but is also used for non-sanctioned activities like paintball and ATV riding. Military training that has the potential to degrade the site should not take place at this area, and non-sanctioned activities should be banned from the area because they are in conflict with AFI goals for promoting biodiversity.

### Hazardous Waste and Materials

Hazardous materials (Hazmat) used on GFAFB include petroleum fuels, flammable solvents, paints, corrosives, pesticides, cleaners, and a number of other materials. Hazardous materials are managed through the base Hazmart program. Hazardous wastes generated at GFAFB are mainly associated with painting and de-painting aircraft and include used paint, thinners, surface cleaners and abrasive media. Large quantities of de-icing materials are also used at GFAFB. GFAFB is classified as a small quantity hazardous waste generator (greater than 100 kg but less than 1,000 kg per month). GFAFB does not maintain a permitted hazardous waste storage facility. All wastes are stored in containers and may be accumulated for up to 180 days at the central accumulation site located at Base Supply, Building 408. The Hazardous Waste Management Plan (Plan 7042) assigns organizational responsibilities for the handling of hazardous waste. Satellite hazardous waste accumulation points are located in or near facilities where the wastes are generated. Wastes are transported from the satellite generation points to the central accumulation site periodically as specified in the Hazardous Waste Management Plan. A permitted DRMO contractor periodically collects the wastes from the central accumulation site for transportation to a permitted treatment/disposal facility (Base General Plan 2001).

Emergency response equipment is maintained in accessible areas throughout GFAFB. Spill response kits and fire extinguishers are available at all satellite accumulation points as well as the hazardous waste accumulation site. GFAFB Fire Department maintains fire response, discharge control, and containment equipment in Buildings 523 and 530.

### Environmental Restoration Program (ERP)

GFAFB administers an ERP under CERCLA guidance. The ERP was initiated in 1984 when a Phase I records search identified three potential hazardous substance sites. Three additional sites were added to the list in 1991, and another site was added in 1995. There are currently seven ERP sites at GFAFB, including the Fire Training Area/Old Sanitary Landfill Area; New Sanitary Landfill Area; Building 306; Explosive Ordnance Detonation Area; Refueling Ramps and Pads; Base Tanks Area; and POL Off-loading Area. GFAFB is not on the National Priorities List of Superfund Sites.

In 1993, the North Dakota Department of Health added 48 new suspected areas of concern to the base ERP. All areas, including the seven existing ERP sites, were grouped together and reclassified as 20 solid waste management units (SWMUs). All SWMUs are subject to RCRA Corrective Action and are regulated by the base's RCRA Part B Permit. ERP sites are regulated by CERCLA. Figure 8.7-1 shows ERP sites at GFAFB.

A tree-planting project for bioremediation purposes was established near an fuel storage area on base. Contamination includes chlorinated solvents and fuel from spills that occurred from the late 1950s through 1992. Since a petroleum odor was detected in the soils after the building was removed, and samples were found to contain TCE and petroleum hydrocarbons (diesel and gasoline range organics), six monitoring wells were installed in September 2001 and soil samples collected. To assist in cleaning up the site, four hundred and thirty-three poplar (Siouxland, prairie sky, and imperial) and Russian olive trees were planted. The tree species were selected because they are capable of drawing relatively large quantities of water from shallow groundwater and associated capillary fringe. For the same reasons, the site was also seeded with salt-tolerant, fast-growing, high-water-use grasses including tall fescue, western wheatgrass, sainfoin, and hycrested wheatgrass.

### Underground Storage Tanks (USTs)

POLs are stored in forty-three USTs at GFAFB. Twenty-three USTs are regulated and store the following materials: three gasoline tanks, eleven diesel fuel tanks, three JP-8 tanks, and six waste oil tanks from oil water separators. Fourteen USTs are deferred from regulations and store JP-8 for the hydrant fuel system. Eight of the hydrant USTs have a capacity of 50,000 gallons each. Six USTs are exempt from regulation and store heating oil or provide emergency spill containment for JP-8 or hydraulic oil.

### Above Ground Storage Tanks (ASTs)

JP-8, gasoline, diesel fuel, and used oil are stored in fifty-one ASTs at GFAFB. JP-8 is stored in four ASTs with a combined capacity of 3,150,000 gallons. Diesel fuel for motor vehicle use is stored in three ASTs with a combined capacity of 50,000 gallons. The remaining forty-four ASTs store diesel fuel, used oil, and heating oil in smaller capacity tanks throughout the base.

Runway de-icing products are also stored in tanks. Potassium acetate is stored in two 5,000-gallon ASTs and propylene glycol is stored in a 20,000-gallon AST and a 25,000-gallon AST.

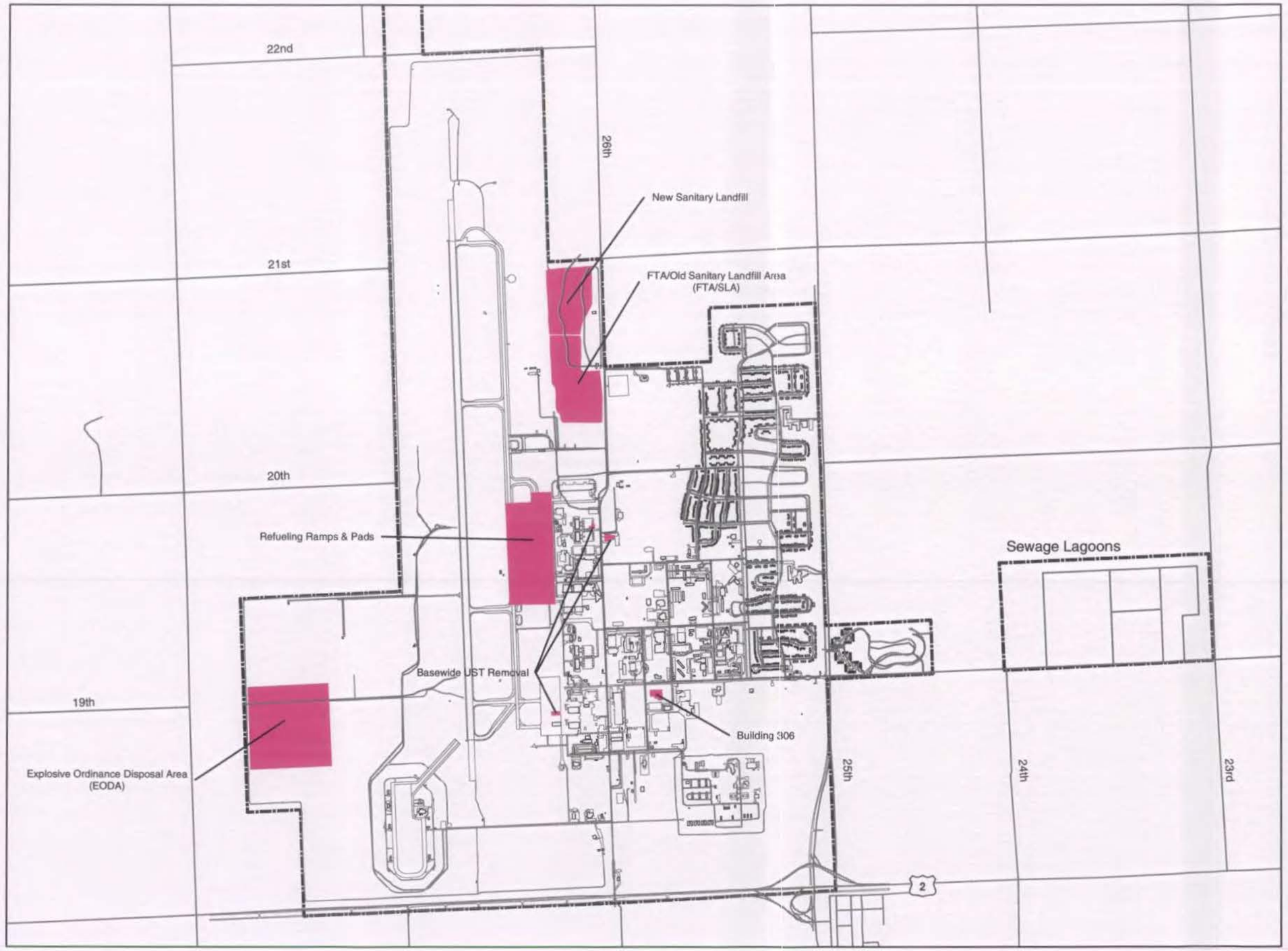
The main natural resource concern from storage tanks is the potential for a release that would impact ground water and surface water (Turtle River and Kellys Slough NWR as well as other numerous small wetlands in the area).

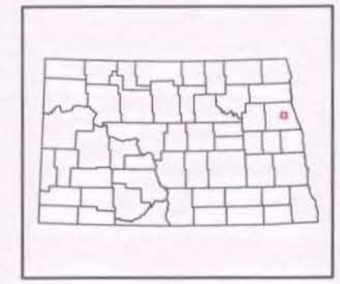
### Air Quality

GFAFB is located in Environmental Protection Agency, Region VIII Air Quality Control Region. Within this region, air quality is generally considered good, as Grand Forks is located in an attainment area. The base currently possesses both the T5-F78004 (permit to operate) issued by the North Dakota Department of Health (NDDH), and the Clean Air Act (CAA) Title V air emissions permit.

The most significant sources of criteria pollutants at GFAFB are related to natural gas combustion associated with the heating of base facilities. Internal combustion engine emissions, coating operations, fire fighter training, hazardous material handling, and fuel transfers are other significant sources. Other stationary air emission sources include solvent use, and fuel tank purging.

The maximum actual single hazardous air pollutant emitted is methyl ethyl ketone, associated with aircraft and vehicle maintenance and repair. Secondary hazardous air pollutants sources include fuel storage and dispensing (Base General Plan 2001).




Roads
Buildings/Structures
Installation Boundary
SWMU Locations

0 1,000 2,000 3,000 Feet

FIGURE 8.7-1
ERP & SWMU SITES

2004 INRMP
GRAND FORKS AFB, ND

DATE: SEPTEMBER 2004

REV. No.:

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The base does not conduct regular outdoor burning of vegetative wastes. However, future management of grassland areas will be done using open burning that will encourage naturalized and native tallgrass prairie development. These burns will be subject to air quality regulations and permitting will be required.

**Wastewater**

GFAFB discharges its domestic and industrial wastewater to a lagoon located east of the main base. The lagoon is subdivided into four separate treatment cells. These cells consist of one primary treatment cell, two secondary treatment cells, and one tertiary treatment cell. The primary treatment cell is approximately 80 acres in size and has a holding capacity of 100 million gallons. The two secondary treatment cells are 23 and 36 acres in size and hold up to 30 and 50 million gallons, respectively. The tertiary treatment cell is approximately 41 acres and can retain up to 70 million gallons.

Wastewater effluent at GFAFB is discharged under North Dakota Permit ND0020621. Three lift stations are also regulated under this permit. Wastewater at GFAFB is periodically discharged from the stabilization lagoon (tertiary or south secondary cells) to Kellys Slough NWR. Typically, lagoon discharges last approximately one week and may occur from mid-April through October.

Industrial wastewater at the base comprises less than ten percent of the total flow to the treatment lagoon. Industrial wastewater originates from boiler blowdown, aircraft and vehicle maintenance facilities and sewage from septic tanks. The lagoon expansion project (Project No. JFSD 938004) was completed in 1996. The project increased lagoon capacity by increasing lagoon dike height.



**Wastewater lagoons at GFAFB**

In the past, storm water entering the sewage lagoons has resulted in the discharge of untreated or partially treated wastewater into Kellys Slough NWR. However, these problems have been rectified. An infiltration study and repair project was conducted in 1998 and 1999. Total suspended solids and ammonia levels are also seasonally high in the lagoons during spring. It is likely that the levels are high due to the fact that the lagoons are covered with ice for five months and the levels would be high until aerobic activity starts taking place in late spring. The western portion of Kellys Slough NWR, that receives both treated wastewater and storm water discharges from GFAFB, is characterized as having dense stands of cattails (*Typha)* and duckweed (*Lemna*). This may be due to both the lower salinities and higher nutrient levels found in these discharges relative to the more naturally saline waters in the rest of the Kellys Slough NWR.

**Storm Water**

Storm water runoff leaves the installation at four locations related to identifiable drainage outfalls. These outfalls have been approved by the North Dakota Department of Health, and additional information on them is provided in Section 4.5.4 of this plan. Under NPDES permit NDR02-0314; Bioenvironmental Engineering monitors storm water exiting west to Turtle Creek and east to Kellys Slough NWR monthly during de-icing season. The base NPDES permit does not contain specific contaminant limits for discharge to the WMA and Turtle Creek. An infiltration study was conducted to evaluate inflow and lift station design capacity.

## Noise

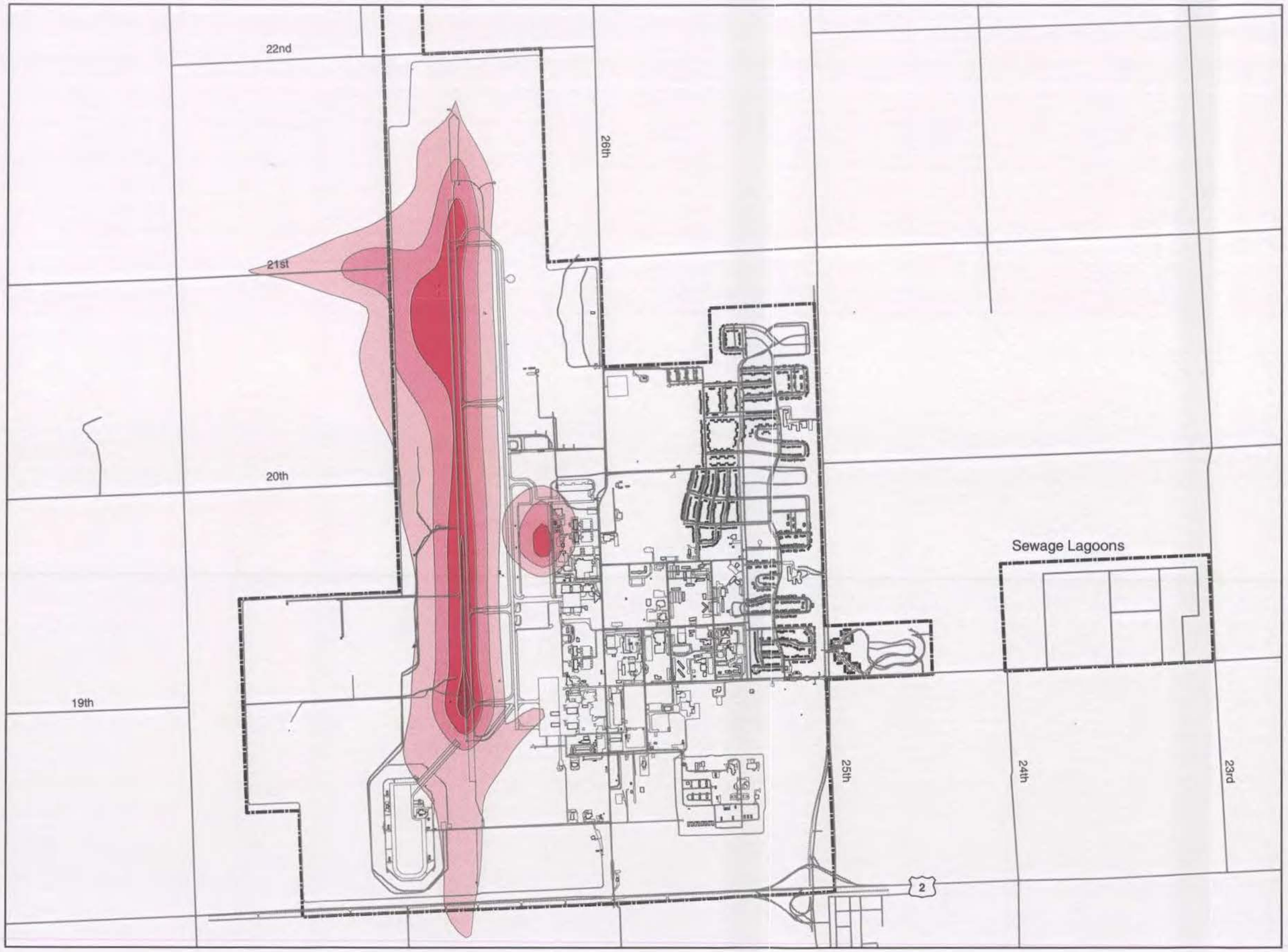
The DoD uses the Air Installation Compatible Use Zones (AICUZ) program to protect aircraft operational capabilities at its installations and to assist local government officials in protecting and promoting the public health, safety and quality of life. The guidelines recommend land uses which are compatible with airfield operations yet allow the maximum beneficial use possible of adjacent properties.

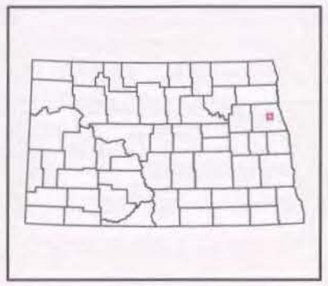
The first constraint involves areas, which the Federal Aviation Administration (FAA) and DoD have identified for height limitations. Air Force height obstruction (airfield/airspace clear zone) criteria are based on those contained in Federal Aviation Regulation Part 77. The second constraint involves Clear Zones and Accident Potential Zones based on statistical analyses of past aircraft accidents.

Figure 8.7-2 shows safety zones and airfield waivers on GFAFB and its vicinity. These areas include noise contours and accident potential zones identified by the AICUZ program, and explosive safety quantity distance (QD) zones. In addition to the noise contours developed as part of the AICUZ program, DoD has identified areas immediately beyond the end of runways and along approach and departure paths that have significant potential for aircraft accidents. Each active runway has associated with it a Clear Zone and Accident Potential Zones (APZ) I and II. The geometry of these zones is based on analyses of DoD aircraft accident history.

To assess the impact of military aircraft operations at an installation, DoD produces mapped contours to describe the noise environment. Air Force installation and surrounding community planners can then determine their exposure relative to existing land use and develop future plans compatible with aircraft operations at the installation.

The Base Operations office (319 OSS/OSAA) is the point of contact for flight information and local operating procedures and noise-sensitive areas are identified to aircrews. GFAFB does not operate any special-use airspace or supersonic areas. Pilots receive training in the Military Training Route (MTR) program on minimum altitude procedures and noise problems with an MTR. The tactical visual flight rules (VFR) training program provides information on avoidance of noise-sensitive areas. There have been no problems reported concerning noise disturbance of wildlife within the GFAFB vicinity. Noise complaints should be directed to Public Affairs (319 ARW/PA).



KEY MAP

N

**DB Mean**

- 65
- 70
- 75
- 80
- Roads
- Buildings/Structures
- Installation Boundary

0 1,000 2,000 3,000 Feet

FIGURE 8.7-2
AICUZ

2004 INRMP
GRAND FORKS AFB, ND

DATE: SEPTEMBER 2004

| REV. No.: | DRAWN BY: MS |
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| | |

**Pesticide Management**

Pesticides are handled at various facilities including Environmental Controls and Golf Course Maintenance. Other organizations assist in the management of pesticides and monitoring of personnel working with pesticides. Primary uses are for weed control associated with paved surfaces and mosquito control. Herbicides are used to maintain areas adjacent to roadways. The GFAFB fire department provides emergency response in the event of a spill, fire, or similar incident.

The annual amount of chemicals used on base decreased 47 percent from 1993 to 1996 (from 1,475 lbs. to 700 lbs). In fiscal year 1999, the ground contractor used 728 pounds, 80 pounds by the golf course, and 158 pounds by entomology. Herbicides make up 89 percent of the total poundage, and much of the herbicide treatment area involves the airfield. Pesticide use must be reduced by 50 percent. Reducing herbicide use helps reduce the storm water non-point source pollution potential, and thereby may be beneficial to water quality in the Turtle River that receives the bulk of the runoff from the airfield. Insecticides make up the remaining 11 percent of pesticides used on GFAFB. Control of mosquitoes is undertaken between June and September as discussed in section 5.7.1, Aerial Spray for Mosquitoes.

Noxious and invasive weed species are a big problem at many AF installations and GFAFB is no exception. The leafy spurge beetle was provided by the Grand Forks County Weed Board to be used as a biological control for leafy spurge, one of the noxious weeds at GFAFB. It takes the beetle approximately five years after introduction into an area to develop population levels high enough to effect control. Beetles have been introduced in the naturalized grassland area near the base stable. Leafy spurge has also been managed using herbicides. Herbicides provided by the county board, has also been used in the control of Russian thistle, another noxious weed species at GFAFB. For more information on the extent of noxious weeds, see section 5.7.2 in Chapter 5.

Hydraulic sprayers and ultra low-volume sprayers are used for insecticide application. String trimmers are used in drainage ditch areas to reduce the amount of herbicide. Electric-powered carts are used for herbicide application on and adjacent to paved surfaces. Environmental Controls and golf course personnel minimize pesticide disposal by either using already mixed material at an application site or by using leftover mixed material as starting diluent for subsequent operations involving the same active ingredient.

**Solid Waste Management**

Hardfill, construction debris, and inert waste generated by GFAFB are hauled off base for disposal. The base does have a permitted inert waste landfill, but the landfill has never been used and is still inactive. The landfill is permitted by the North Dakota Department of Health as an "Inert Solid Waste Landfill" and assigned permit number IT-183. All on-base household garbage and solid waste is collected by a contractor and transported to the Grand Forks County Landfill. In addition, GFAFB has a family housing recycling program handled by a contractor providing curbside pickup. Recyclables are taken to the city of Grand Forks for processing. Other items such as filters, batteries, and items not collected by the contractor can be taken to the city's recycling center.

GFAFB has implemented policies and programs for the recovery and reclamation of various industrial waste streams including: waste oil and contaminated fuels; lead-acid and dry cell batteries; solvents used in parts washers; tires; metals; and aluminum. Recovery and reclamation activities at GFAFB have

removed over 120,000 tons of construction/demolition debris for reuse and recycling in CY 2000 alone. The Solid Waste Management Plan was revised in March 2002.

### Cultural Resource Limitations on Natural Resource Management

Cultural resources, although limited in quantity, have a small potential to affect natural resource management at GFAFB. These include Native American artifacts that might occur around the Turtle River (paleosols) and along old Lake Agassiz beach ridges in some portions of the hay lease areas. Historical items from former homesteads in the area might also occur in some of the hay lease areas. All protocol regarding inadvertent unearthing of cultural resources will be adhered to and all appropriate persons informed. As stated previously, ensuring that soils are protected with native vegetation in the Turtle River area will help protect any Native American artifacts that may be present.

## 8.8 Future Mission Impacts

The 321st Missile Group was inactivated in 1997 following a 1995 Base Realignment and Closure (BRAC) Commission decision to realign the ICBMs from the 321st Missile Group missile complex to Malmstrom AFB, Montana. The last 321st Missile Group launch facility was demolished under the Strategic Arms Reduction Treaty (START) in August 2001. A launch facility, N-33, and a Missile Alert Facility, O-0, are being turned over to the North Dakota State Historical Preservation Office for static display.

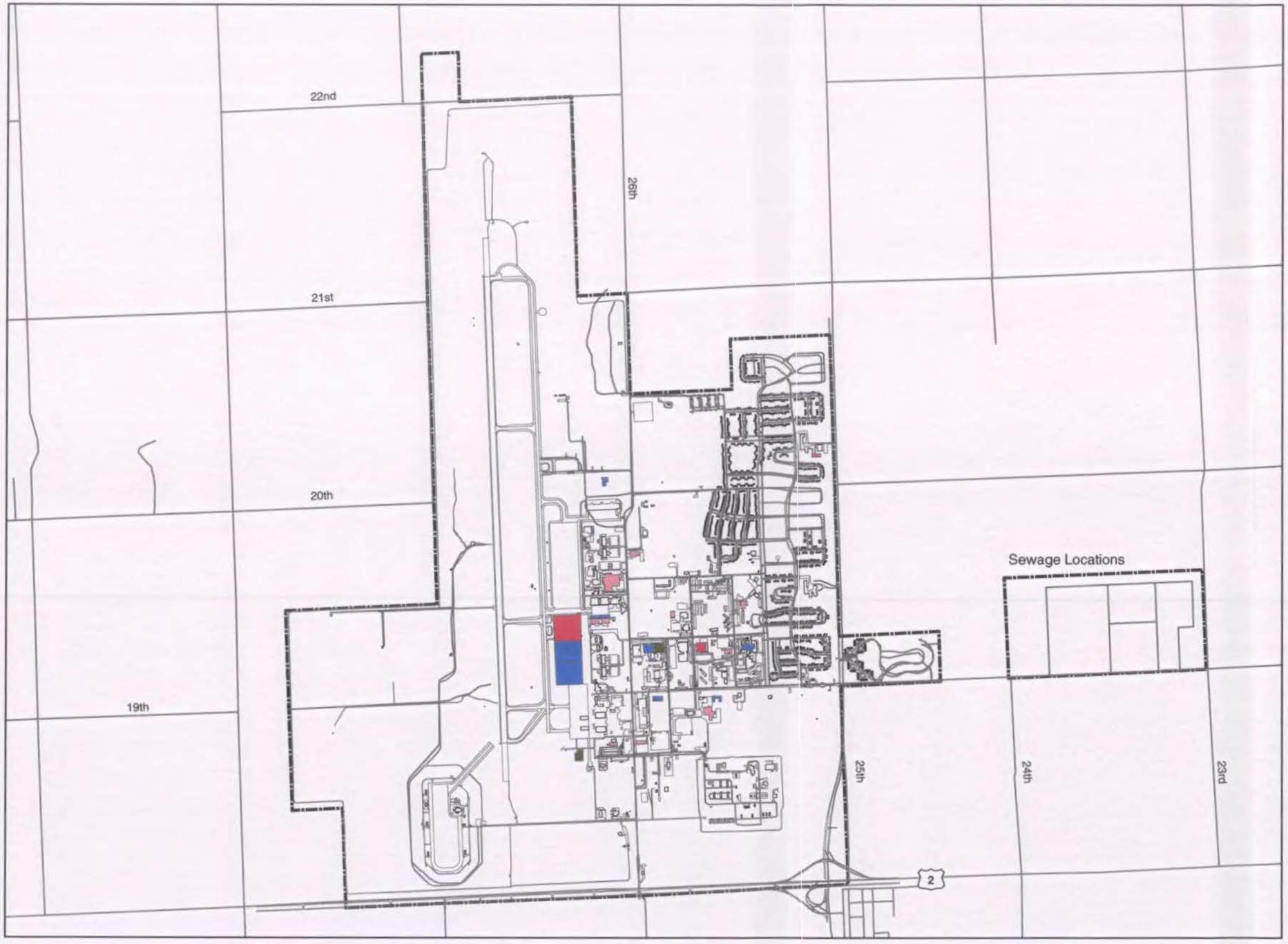
Future capital improvements on GFAFB will be modest. Most projects in the base Capital Improvements Plan should have little direct impact on natural resources assets. Figure 8.8-1 shows Capital Improvements scheduled for 2004-2008.

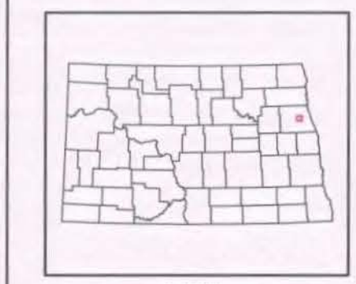
Potential future mission impacts at GFAFB are replacing the KC-135 with Boeing 767 aircraft. According to globalsecurity.org website, the current DoD tanker fleet averages over 40 years in age, and yet it is the backbone of US ability to project force. The Boeing 767 has been proposed by Boeing as a replacement for the aging KC-135 family of aircraft. In terms of offload performance, the proposed Boeing KC-767 modestly outperforms the standard KC-135R.

The KC-767 can offload 20 percent more fuel than the KC-135E and unlike the E-model, can itself be refueled in flight. It will also have the capability to refuel Air Force, Navy, Marine and allied aircraft on every mission. At maximum takeoff weight, the KC-767A requires 4,000 feet less runway than the KC-135E. Besides its role as a tanker, the KC-767A will be configured as a convertible freighter and can carry 200 passengers or 19 pallets of cargo.

## 8.9 Natural Resources Constraints to Mission Planning

GFAFB is fortunate to lack many of the constraints to mission planning present at many bases. Critical habitat for threatened and endangered species is not present at GFAFB. However, invasive and noxious tree species are a serious problem and without constant diligence, encroachment will continue. Invasive and noxious species are a serious problem for at least two reasons: if lighting visibility is obstructed on the airfield and if goals for promoting biodiversity, as mandated in the AFIs, are not met. Several tree species are also affected by disease, which requires treatment or tree removal and can negatively affect tree cover. In addition, wetlands, floodplains and other surface waters near the airfield are mission constraints and may



KEY MAP

N

**5 Year Project**
- MILCON
- O&M
- SQ

**10 Year Project**
- MILCON
- O&M

**15 Year Project**
- MILCON
- O&M

Roads

Buildings/Structures

Installation Boundary

0 1,000 2,000 3,000 Feet

FIGURE 8.8-1
CAPITAL IMPROVEMENTS

2004 INRMP
GRAND FORKS AFB, ND

DATE: SEPTEMBER 2004

REV. No.:

DRAWN BY: MS

provide habitat for waterfowl resulting in a BASH problem. Building and earth-disturbing activities will be constrained in this area as well.

## 8.10 Summary of Cumulative Effects

### Cumulative Impacts

Cumulative impacts result when the effects of an action are added to or interact with other actions in a particular place and within a particular time. This interaction and any resulting environmental degradation should be the focus of cumulative impact analysis. While impacts can be differentiated by direct, indirect, and cumulative, the concept of cumulative impacts takes into account all disturbances since cumulative impacts result in the compounding of the effects of all actions over time. Thus the cumulative impacts of an action can be viewed as the total effects on a resource, ecosystem, or human community of that action and all other activities affecting that resource no matter what entity (federal, non-federal, or private) is taking the actions (CEQ, 1987). The level of analysis and scope should be commensurate with the potential impacts, resources affected, project scale, and other factors.

Because the implementation of the INRMP would generally benefit the GFAFB installation's ecosystem in a positive manner, and probably boost morale, total effects on all resources are considered positive through the passing of time. Natural resource projects are restorative or educational in nature and will not involve major construction or earth-disturbing activities. Overall, implementation of the INRMP would result in minor, temporary impacts to the following resources:

- **Geology and Soils**: Implementation of the INRMP would not contribute to cumulative impacts on the geology or soils of GFAFB. Any excavation or minor construction activities for the purpose of preservation, enhancement or restoration would entail little excavation and the potential for soil erosion would be localized and properly mitigated.

- **Water Resources**: Implementation of the INRMP would not contribute to the cumulative impact on the surface water and groundwater of GFAFB. With BMPS in place and restoration activities conducted in accordance with applicable guidance, no discharges to surface or groundwater are anticipated as a result of any of the preservation, enhancement or restoration activities.

- **Cultural Resources**: Implementation of the INRMP would not contribute to cumulative impacts on cultural resources at GFAFB. Aside from several Cold War Era buildings and structures, other areas where cultural resources might occur are in the Turtle River, and hay lease areas around the airfield. Types of resources that are most likely to be encountered are historic remain from former homesteads, but Native Americans remains may be encountered near the Turtle River or on the former shoreline of ancient glacial Lake Agassiz. If cultural remains are encountered during such activities as planting native species in selected areas or building observation decks, all activity in the area will cease and the GFAFB natural and cultural resource manager and the appropriate state historic agency will be notified.

- **Air Quality**: Additional air emissions or changes to air quality as a result of implementation of the INRMP would be minor or negligible and temporary as a result of any preservation, enhancement or restoration project.

- **Noise**: As a result of any preservation, enhancement or restoration project, noise levels may increase during the activity, but the noise would be temporary and negligible and cumulative impacts would not occur.

- **Socioeconomic**: Environmental effects on the economy and community from implementation of the INRMP would be minimal and positive. There would be some short-term benefits from jobs created by the preservation, enhancement and restoration projects. However, due to the temporary nature of the activities, no long-term impacts would be anticipated. In addition, restoration and enhancement of GFAFB natural areas should boost morale. There would be no cumulative impact or change to regional income, housing markets, or the demand for community services.

- **Environmental Justice**: There would be no cumulative effects on environmental justice as a result of implementing the INRMP. No procedural, geographical, or social inequities are anticipated.

- **Visual Aesthetics**: There would be positive cumulative effects to visual aesthetics as a result of the implementation of the INRMP due to the preservation, enhancement and restoration activities at GFAFB.

- **Land Use**: The implementation of the INRMP would result in minimal and positive changes in land use and therefore there would be no cumulative impacts.

- **Biological Resources**: The implementation of the INRMP would positively benefit the ecosystem at GFAFB in a cumulative sense. Fish and wildlife, vegetation, and wetlands would benefit from proper management through time, with proper monitoring.

- **Invasive plants**: The extermination or reduction of noxious and invasive species would be affected in a cumulative sense if properly managed as addressed in the INRMP. The population of these species would be reduced over time, thus, benefiting the growth and success of desirable native species and resulting in increased biodiversity on GFAFB.

## 8.11 Summary of Preliminary Environmental Assessment of INRMP Projects

Nine goals have been identified to guide natural resource planning and management at GFAFB. Objectives and their associated projects are described below that address these goals. Table 8.11-1 provides a cursory review of these INRMP projects and the anticipated impacts to environmental resources on GFAFB.

## Table 8.11-1 Summary of Preliminary Environmental Assessment of INRMP Projects

### Goal 1.1 – Water Resources: Incorporate the concept of ecosystem management concepts into the management of wetlands and surface water at GFAFB.

**Objective 1.1.1**: Enhance and restore wetlands and other water bodies under the jurisdiction of GFAFB.

| INRMP Project | Anticipated Impact(s) | Is Separate EIAP Documentation Needed? |
|---|---|---|
| **Project 1.1.1.1:** Update base-wide wetland delineation and continue jurisdictional wetland delineation for all wetlands at GFAFB. | Beneficial, would provide a tool to manage and protect wetlands and identify constraints to development and operations. | No. |
| **Project 1.1.1.2:** Monitor the water quality of the base wetlands to create a baseline. Water quality will be protected in accordance with all state and federal standards. | Beneficial, would provide a tool to manage wetland and identify constraints to development and operations. | No. |
| **Project 1.1.1.3:** Produce wetland signage and two brochures one outlining the ecological benefits of wetlands and another describing penalties for dumping. | Beneficial, would provide wetland identification and protection. | No. |

### Goal 2.1 – Wildlife: Incorporate the concept of ecosystem management into the GFAFB natural resources program and emphasize increasing species diversity in degraded habitats.

**Objective 2.1.1**: Provide management activities to enhance wildlife habitat.

| INRMP Project | Anticipated Impact(s) | Is Separate EIAP Documentation Needed? |
|---|---|---|
| **Project 2.1.1.1:** Maintain the Prairie View Nature Preserve enhancing habitat for grassland birds and butterflies by instituting a management plan for prescribed burns, watering, mowing, tree maintenance, noxious weed removal, and interseeding grasses and wildflowers as necessary. Burns will occur every 3 years, with watering, mowing, tree maintenance, herbiciding, interseeding every year as needed. | Beneficial with proper implementation. Would be in compliance with AFIs. | No, would be implemented along with existing herbaceous control programs. |
| **Project 2.1.1.2:** Plant appropriate native riparian vegetation along the Turtle River to stabilize the riverbank and enhance wildlife habitat. | Beneficial with proper implementation. Would be in compliance with AFIs. | No, would be implemented along with existing herbaceous control programs. |

| INRMP Project | Anticipated Impact(s) | Is Separate EIAP Documentation Needed? |
|---|---|---|
| **Project 2.1.1.3:** Build two nesting platforms for hawks. | Beneficial, would aid in control of rodent and other small mammal populations that could be detrimental to human health; also would aid in control of smaller bird species and potential reduction of BASH. | No. |
| **Project 2.1.1.4:** Develop a variety of grassland habitat mosaics across unimproved areas by developing and implementing a prescribed burn plan to improve grassland bird habitat by favoring warm season grasses, improving wetland conditions, and reducing noxious/invasive weeds. | Beneficial with proper implementation. Would be in compliance with AFIs. | No. |
| **Project 2.1.1.5:** To the extent possible, interseed unimproved areas with native warm season grasses to improve grassland habitats for wildlife. | Beneficial with proper implementation. Would be in compliance with AFIs. | No. |
| **Project 2.1.1.6:** Create a butterfly garden in Prairie View Nature Preserve. | Beneficial with proper implementation. Would be in compliance with AFIs. | No. |
| **Project 2.1.1.7:** Install and maintain bluebird, cliff swallow, and bat houses where appropriate. Maintain existing houses. | Beneficial with proper implementation. Would be in compliance with AFIs. | No. |

**Objective 2.1.2:** Monitor as needed for threatened, endangered, and sensitive species.

| INRMP Project | Anticipated Impact(s) | Is Separate EIAP Documentation Needed? |
|---|---|---|
| **Project 2.1.2.1:** Conduct biological surveys at regular intervals to monitor for the presence of rare, threatened or endangered species, including grassland birds; and to determine the status of invasive plant species (increasing or decreasing). | Beneficial, would provide data for better management of wildlife resources and control of undesirable invasive plant species. | No. |
| **Project 2.1.2.2:** Conduct local bird surveys to monitor the presence of black terns and bald eagles utilizing the sewage lagoons. Also collect data to create baseline for water quality at the lagoons. | Beneficial, would provide data for better management of wildlife resources and control of undesirable invasive plant species. | No. |

**Goal 2.2 – Wildlife: Identify new sources of funding and volunteer support for Natural Resource Management Programs.**

**Objective 2.2.1**: Solicit and utilize volunteers from local groups including Audubon, the Native Plant Society, Boy Scouts, Nature Conservancy, University, schools, and others to maintain or install bluebird, purple martin, and bat houses.

| INRMP Project | Anticipated Impact(s) | Is Separate EIAP Documentation Needed? |
|---|---|---|
| **Project 2.2.1.1:** Plan a Prairie View Park Maintenance Day; invite groups listed above to plant trees, water, or weed area by hand (see Goal 8 section). | Beneficial, this action would enhance management resources by providing educational opportunities and manual labor for natural resource improvements. | No. |

**Objective 2.2.2**: Coordinate more closely with the USFWS and the University of North Dakota (UND) on the impact of base operations on Kellys Slough and UND lands surrounding GFAFB. Consider the possibility of enhancing with native plants, the area between the base and Kellys Slough NWR and/or enhancement of the Turtle River riparian corridor.

| INRMP Project | Anticipated Impact(s) | Is Separate EIAP Documentation Needed? |
|---|---|---|
| **Project 2.2.2.1:** Pursue possible sources of funding from outside private organizations and agencies such as Ducks Unlimited or The Conservation Fund. | Beneficial. | No, administrative action only. |
| **Project 2.2.2.2:** Obtain a license and a certificate to control beavers in the section of the Turtle River adjacent to the base prior to any attempts to reintroduce native trees and shrubs. | Beneficial. | Coordination with state and local wildlife management entities would be desirable to ensure their cooperation and concurrence in the control of beaver populations. |

## Goal 3.1 – Grounds Maintenance: Improve grounds maintenance effectiveness.

**Objective 3.1.1**: Manage the "urban forest" to maximize the aesthetic appeal while minimizing maintenance costs and nuisances.

| INRMP Project | Anticipated Impact(s) | Is Separate EIAP Documentation Needed? |
|---|---|---|
| **Project 3.1.1.1:** Develop and implement a shelterbelt plan using "living fences" of native cottonwoods, poplars, bur oak, and red-osier dogwood to serve as snow maintenance structures, aid in energy conservation, and also provide wildlife habitat. | Beneficial with proper implementation. | No. Monitoring and additional assessment may be necessary to evaluate potential structural hazards from overhanging tree branches. |
| **Project 3.1.1.2:** Stimulate recently planted trees by removing diseased trees and others that are shading out more recently planted trees, such as the B3 shelterbelt issues, and rejuvenate aging shelterbelts on base by planting new trees as needed. | Beneficial with proper implementation. | No. Monitoring and additional assessment may be necessary to evaluate potential structural hazards from overhanging tree branches. |
| **Project 3.1.1.3:** Create a real-time tree inventory to aid in urban forestry management with details on tree species and health, infrastructure conflicts, hazard tree identification, planting guidelines and maintenance. | Beneficial, will assist in urban tree management. | No. |
| **Project 3.1.1.4:** Develop and continue tree seedling farm. Continue to receive trees from National Tree Trust to replace dead individuals. | Beneficial, will potentially lower costs of tree replacement with proper protection and management. | No. |

**Objective 3.1.2**: Reduce grounds and golf course maintenance costs.

| INRMP Project | Anticipated Impact(s) | Is Separate EIAP Documentation Needed? |
|---|---|---|
| **Project 3.1.2.1:** Convert as much land as possible from improved to semi-improved or unimproved through planting of low-maintenance ground covers and low and slow growing trees on the golf course. | Beneficial with proper implementation. | Removal of "improvements" should be evaluated for potential impacts to drainage and vehicular accessibility. |

| INRMP Project | Anticipated Impact(s) | Is Separate EIAP Documentation Needed? |
|---|---|---|
| **Project 3.1.2.2:** Implement a pilot program at a new development site to determine the feasibility of using a mix of buffalo grass ("Bowie") and northern blue gramma ("Bad River") for improved and semi-improved lawn and golf course areas to reduce irrigation needs. | Beneficial. | No. |
| **Project 3.1.2.3:** Explore the feasibility of using treated wastewater effluent for golf course irrigation and implement a test program to see if this program would be successful at GFAFB. | Beneficial if implemented properly and assurance is made that the wastewater treatment system produces water of sufficient quality. | Evaluation of wastewater treatment and the quality of the effluent would be necessary to determine potential risk of dispersal of pathogens. Continuous monitoring of effluent may be needed. |

## Goal 4.1 – Agricultural Outlease: Improve the quality of hay lease areas at GFAFB.

**Objective 4.1.1:** Make hay lease areas more attractive to potential lessees.

| INRMP Project | Anticipated Impact(s) | Is Separate EIAP Documentation Needed? |
|---|---|---|
| **Project 4.1.1.1:** To the extent possible, grade, treat with herbicide, and seed hay lease areas using native warm season grasses to receive higher rents and curtail degradation of these areas. Avoid the breeding bird season. | Mostly beneficial with proper implementation. Would reduce forage for wildlife and reduce BASH potential. | No, would be implemented along with existing herbaceous control programs. |
| **Project 4.1.1.2:** Develop and implement a prescribed burn plan for the hay lease areas to foster maintenance of the area to include improvement of grass quality, reduce noxious weeds, and facilitate excavation of gopher mounds to curtail degradation of the lease area (see project 2.1.1.4). | Mostly beneficial with proper implementation. Would reduce forage for wildlife and reduce BASH potential. | No, would be implemented along with existing herbaceous control programs. |

**Objective 4.1.2:** Reform the written agricultural lease to include land restoration measures and ensure that the lessee is in compliance with the terms of the lease.

| INRMP Project | Anticipated Impact(s) | Is Separate EIAP Documentation Needed? |
|---|---|---|
| **Project 4.1.2.1:** Institute temporary rent abatements for lessees that agree to clear, maintain, and improve agricultural lease lands. Also include noxious weed control as part of lease requirements. | Mostly beneficial with proper implementation. | No, would be implemented along with existing herbaceous control programs and should be properly supervised to ensure compliance with GFAFB and INRMP policies. |

| INRMP Project | Anticipated Impact(s) | Is Separate EIAP Documentation Needed? |
|---|---|---|
| **Project 4.1.2.2:** Institute discretionary/contingent leases for greater than standard lease periods (i.e. five years with first rights to renew/refuse) for lessees that perform according to the lease terms (i.e. are good stewards of the land). | Mostly beneficial with proper implementation. | No, would be supplemental to existing programs and should be properly supervised to ensure compliance with GFAFB and INRMP policies. |
| **Project 4.1.2.3:** Regularly monitor the hay lease areas to ensure timely haying and prompt hay bale removal, plus retrieve records and perform visual inspection of the lessee applying herbicide to eliminate invasive weed species. | Mostly beneficial with proper implementation. Timely removal of hay will reduce BASH. Elimination of noxious weeds is in compliance with AFIs and EOs. | No, would be supplemental to existing programs and should be properly supervised to ensure compliance with GFAFB and INRMP policies. |

## Goal 5.1 – Outdoor Recreation: Enhance outdoor recreational opportunities at GFAFB.

**Objective 5.1.1**: Develop pest management strategies to enhance enjoyment of outdoor pursuits on GFAFB.

| INRMP Project | Anticipated Impact(s) | Is Separate EIAP Documentation Needed? |
|---|---|---|
| **Project 5.1.1.1:** Conduct a comprehensive on-base mosquito breeding site survey and treat active sites with a season-long larvicide such as Bactimos or other biological larvicide. | Mostly beneficial with proper implementation. | No, would be supplemental to existing pest management programs and should be properly supervised to ensure compliance with GFAFB and INRMP policies. |
| **Project 5.1.1.2:** Evaluate weekly treatment of vegetation in the Turtle River area adjacent to GFAFB with a low-toxicity residual insecticide to reduce mosquito annoyance in this area and make this area more viable as an outdoor recreational site. Alternatively, allow cliff swallows to nest somewhere in the area. | Mostly beneficial with proper implementation. | No, would be supplemental to existing pest management programs and should be properly supervised to ensure compliance with GFAFB and INRMP policies. Coordination with state and local wildlife management entities would be desirable to ensure their cooperation and concurrence. |

**Objective 5.1.2**: Continue the development of a multipurpose base trail loop that would join restored natural areas, remnant natural areas such as along Turtle River, developed areas (such as the golf course), and housing.

| INRMP Project | Anticipated Impact(s) | Is Separate EIAP Documentation Needed? |
|---|---|---|
| **Project 5.1.2.1:** Investigate the use of agricultural outleased moneys to develop and enhance equipment access routes to outleased lands that could double as part of the multipurpose base trail loop. | Mostly beneficial with proper implementation. | No, would be supplemental to existing programs and should be properly supervised to ensure compliance with GFAFB and INRMP policies, particularly with regard to security and access concerns. |

**Objective 5.1.3**: Further develop fee-generating outdoor recreational opportunities on base, trapping of fur-bearers, nature study, picnicking and fishing in the Turtle River area.

| INRMP Project | Anticipated Impact(s) | Is Separate EIAP Documentation Needed? |
|---|---|---|
| **Project 5.1.3.1:** Provide a leaflet to base personnel describing possible volunteer opportunities on base related to non-consumptive outdoor recreational opportunities and natural resources. Encourage initiatives such as winter-feeding of resident songbirds, establishment of perennial plants within the garden plot areas that are attractive to butterflies, and maintenance of bluebird trails. | Beneficial with proper implementation. | No, would be supplemental to existing programs and should be properly supervised to ensure compliance with GFAFB and INRMP policies. Coordination with state and local wildlife management entities would be desirable to ensure their cooperation and concurrence. |
| **Project 5.1.3.2:** Investigate the idea of allowing fishing and picnicking at the Turtle River. Use information from other installation fishing programs as guidance. | Beneficial with proper implementation. | No, would be supplemental to existing programs and should be properly supervised to ensure compliance with GFAFB and INRMP policies. Coordination with state and local wildlife management entities would be desirable to ensure their cooperation and concurrence. |

| INRMP Project | Anticipated Impact(s) | Is Separate EIAP Documentation Needed? |
|---|---|---|
| **Project 5.1.3.3:** Monitor off-road vehicle areas monthly, or as needed, to determine if usage levels are appropriate for the site. | Beneficial. Off-road vehicle use provides recreational benefits but is potentially detrimental to natural resources by accelerating erosion, disturbing wildlife, etc. if not implemented properly. | No, if implemented and monitored in accordance with EO 11644 and coordinated with appropriate state and local natural resources management entities. |
| **Project 5.1.3.4:** Evaluate the possibility of generating and using fees from off road vehicles use to mitigate any adverse impacts from this activity. | Beneficial. | No. |

## Goal 6.1 – Integrated Pest Management: Reduce levels of pest species, such as mosquitoes, at GFAFB.

**Objective 6.1.1**: Focus mosquito control efforts to reduce wasted time and money.

| INRMP Project | Anticipated Impact(s) | Is Separate EIAP Documentation Needed? |
|---|---|---|
| **Project 6.1.1.1:** Coordinate with pest management on the need and the timing of mosquito control, particularly in regards to natural resources, such as the Turtle River and wetland areas. | Beneficial with proper implementation. | No, would be supplemental to existing pest management programs. Coordination with state and local wildlife management entities would be desirable to ensure their cooperation and concurrence. |

**Goal 6.2 – Eliminate noxious/invasive species from GFAFB with the understanding that it may take years to accomplish.**

**Objective 6.2.1:** Use a combination of stressors to reduce/eliminate noxious/invasive weeds.

| INRMP Project | Anticipated Impact(s) | Is Separate EIAP Documentation Needed? |
|---|---|---|
| **Project 6.2.1.1:** Develop and implement a noxious weed control plan to eradicate noxious/invasive weeds, especially targeting leafy spurge, Canada thistle, and Russian Olive. Use a combination of stressors including herbicide application and timely controlled-burns on all areas of the base as required. | Beneficial. Elimination of noxious weeds is in compliance with AFIs and EOs. | Possibly, depending on the extent of treatment. For guidance check other AF Base's EAs for Noxious and Invasive weed control. |
| **Project 6.2.1.2:** Experiment with the use of leafy spurge beetles as a biological control for leafy spurge. | Beneficial. Elimination of noxious weeds is in compliance with AFIs and EOs. | No. |

**Goal 7.1 – BASH: Manage airfield habitats to meet airfield safety regulations.**

**Objective 7.1.1:** Reduce BASH and other wildlife/aircraft strike hazards by making the airfield area as unattractive to wildlife as possible. Replace alfalfa, white and yellow clover with native grass or forb species.

| | | |
|---|---|---|
| **Project 7.1.1.1:** Coordinate with agriculture lessees, grounds maintenance, airfield and safety personnel to reduce BASH. Remove white and yellow clover and replace with approved airfield seed mix (see project 4.1.1.1). | Mostly beneficial with proper implementation. Would reduce forage for wildlife and reduce BASH potential. | No, would be implemented along with existing herbaceous control programs. |
| **Project 7.1.1.2:** Install beaver pipe monitor install "beaver pipe." | Beneficial. | No. Coordination with state wildlife agencies to ensure their concurrence in the control of beaver populations. |
| **Project 7.1.1.3:** Coordinate weekly during migratory season with USFWS personnel on the status and the movements of waterfowl populations in Kellys Slough. | Beneficial. | No. Coordination with state and local wildlife management entities would be desirable to ensure their cooperation and concurrence. |

**Objective 7.1.2:** Continue bowhunting and monitor the deer population to determine the effectiveness of an on-base bowhunting season in reducing the frequency of airfield deer problems. Make base personnel and public aware of the recreational opportunity.

| INRMP Project | Anticipated Impact(s) | Is Separate EIAP Documentation Needed? |
|---|---|---|
| **Project 7.1.2.1:** Conduct deer survey twice a year to monitor deer numbers and facilitate management. | Beneficial. | No. |

## Goal 8.1 – Natural Resource Education: Promote natural resource education and awareness.

**Objective 8.1.1:** Create opportunities for interpretive environmental education on the base installation, including displays, signs, materials, and educational programs.

| INRMP Project | Anticipated Impact(s) | Is Separate EIAP Documentation Needed? |
|---|---|---|
| **Project 8.1.1.1:** Plan observance of Earth Day, National Public Lands Day or Arbor Day Celebrations around Prairie View Nature Preserve. Purchase prizes for children. | Beneficial. | No. Coordination with Base personnel, cities of Grand Forks and communities in adjoining areas, and state and local natural resources management entities would be desirable to encourage their participation. |
| **Project 8.1.1.2:** Plan a Prairie View Park clean up day (would coincide with project above). Utilize in-house or hire local tree expert to demonstrate proper pruning techniques for Arboretum trees. | Beneficial. | No. Coordination with Base personnel, cities of Grand Forks and communities in adjoining areas, and state and local natural resources management entities would be desirable to encourage their participation. |
| **Project 8.1.1.3:** Plan for the observance of a North Dakota Prairie Day with a visit to Prairie View Park to observe native grassland species. | Beneficial. | No. Coordination with Base personnel, cities of Grand Forks and communities in adjoining areas, and state and local natural resources management entities would be desirable to encourage their participation. |

| INRMP Project | Anticipated Impact(s) | Is Separate EIAP Documentation Needed? |
|---|---|---|
| **Project 8.1.1.4:** Plan a Backyard Wildlife Education Day to promote bird feeding, watering and the planting of seed or berry producing native plant species. Consider giving away a few native plant seedlings. | Beneficial. | No. Coordination with Base personnel, and if desired, the City of Grand Forks and communities in adjoining areas with state and local natural resources management entities would be desirable to encourage their participation. |
| **Project 8.1.1.5:** Develop curriculum for Natural resource educational courses. Incorporate visits to wildlife museum. | Beneficial. | No. Coordination with state and local natural resources management entities would be desirable to ensure their cooperation and concurrence. |
| **Project 8.1.1.6:** Create a design for the Tree Arboretum located in Prairie View Nature Preserve and continue to add vegetation and signage to the area. | Beneficial. | No. |

**Objective 8.1.2**: Continue to increase public information and outreach efforts as the primary means of reducing human-wildlife conflicts and of maintaining wildlife populations in as natural and dynamic a state as possible.

| INRMP Project | Anticipated Impact(s) | Is Separate EIAP Documentation Needed? |
|---|---|---|
| **Project 8.1.2.1:** Create a volunteer brochure to solicit help for GFAFB Natural Resource clean-up projects (in-house). | Beneficial. | No. Coordination with state and local natural resources management entities would be desirable to ensure their cooperation and concurrence. |
| **Project 8.1.2.2:** Research private funding opportunities for GFAFB natural resource clean-up projects (in-house). | Beneficial. | No, administrative action. |
| **Project 8.1.2.3:** Increase environmental awareness among base and local community by advertising natural resource events by Base e-mail, flyers and newspaper ads. | Beneficial. | No. Coordination with state and local natural resources management entities would be desirable to ensure their cooperation and concurrence. |

**Objective 8.1.3**: Feature flora and fauna species native to the base in various programs, and promote native species management and biodiversity.

| INRMP Project | Anticipated Impact(s) | Is Separate EIAP Documentation Needed? |
|---|---|---|
| **Project 8.1.3.1:** Create signs to identify tree, grass, butterfly garden and trail, and wild flower species at the Arboretum / Prairie View Park area. | Beneficial. | No. Coordination with state and local natural resources management entities would be desirable to ensure their cooperation and concurrence. |
| **Project 8.1.3.2:** Create wildlife brochures for badgers and swallows to educate residents and base personnel on the value of these species. | Beneficial. | No. Coordination with state and local natural resources management entities would be desirable to ensure their cooperation and concurrence. |
| **Project 8.1.3.3:** Develop watchable wildlife brochures and determine what areas are appropriate for wildlife viewing. | Beneficial. | No. Coordination with state and local natural resources management entities would be desirable to ensure their cooperation and concurrence. |
| **Project 8.1.3.4:** Build Watchable Wildlife observation decks. Use BMPs. | Beneficial. | No. |

**Goal 9.1 – Identification, Classification and Mapping of Natural Resource Units: Enhance and update GIS/GeoBase data and provide state-of-the-art training for GFAFB personnel.**

**Objective 9.1.1**: Ensure that all current and new information relative to natural resources is incorporated into the Geographic Information System (GIS). Conduct natural resource surveys as needed to update land classification maps (including wetlands) for GFAFB to aid natural resource and grounds maintenance programs.

| INRMP Project | Anticipated Impact(s) | Is Separate EIAP Documentation Needed? |
|---|---|---|
| **Project 9.1.1.1:** Integrate current Computer Aided Drafting and Design (CADD) files, as built drawings, and other databases into GIS. | Beneficial. | No, administrative action. |
| **Project 9.1.1.2:** Conduct surveys and develop management plan to create new environmental constraint maps (layers.). Utilize intern. | Beneficial. | No, administrative action. |
| **Project 9.1.1.3:** Develop management plan for verifying existing database layers, and update layers where necessary (to be incorporated with above project). | Beneficial. | No, administrative action. |

| INRMP Project | Anticipated Impact(s) | Is Separate EIAP Documentation Needed? |
|---|---|---|
| **Project 9.1.1.4:** Hold yearly training sessions for GIS and GeoBase personnel. | Beneficial. | No, administrative action. |
| **Project 9.1.1.5:** Purchase updated equipment and software. | Beneficial. | No, administrative action. |
| **Project 9.1.1.6:** Contact local universities to acquire the services of a GIS intern. | Beneficial. | No, administrative action. |

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# APPENDIX A
# North Dakota State University
# Extension Service
# Dutch Elm Disease Information

North Dakota State University
**NDSU Extension Service**

Dutch Elm Disease
**PP-324** (Revised)
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Introduction
Symptoms
Elm Bark Beetles – Carriers of the Fungus
Bark Beetles and Dutch Elm Disease
Control Measures
Chemical Treatment
Precautions in Handling Pesticides
Sampling Procedures
Alternative to Planting Elms
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## Introduction

Dutch elm disease was first found in the United States in Ohio in 1930. It has now spread throughout North America and has destroyed over half the elm trees in the northern United Sates. The disease has been reported in all states except the desert Southwest.

Dutch Elm Disease (DED) was first found in North Dakota in 1969 in Mandan. It was discovered in eastern North Dakota in 1973. By 1987 it had become established throughout eastern and central North Dakota and reported from all counties except those in the extreme northwestern part of the state.

Dutch elm disease is caused by the fungus *Ophiostoma ulmi (syn. Ceratocystis ulmi)* which is transmitted by two species of bark beetles or by root grafting. The American elm, *Ulmus americana*, is the most seriously affected of all elms. The Siberian elm, *Ulmus pumila*, (colloquially called "Chinese elm" in North Dakota) is tolerant but not immune to the disease.

### Symptoms

The observable symptoms and the progression of the disease differ among trees which are inoculated through beetle feeding and those which are infected through root grafts. Trees infected by beetles first show wilting, curling and yellowing of leaves on one or more branches in the upper portion of the tree. Large trees may survive and show progressively more symptoms for one or more years. Trees infected through root grafts wilt and die rapidly; this frequently occurs in the spring soon after the trees have leafed out and progresses from the base of the tree upward.

The symptom pattern is different for infections resulting from feeding by the native elm bark beetle and the smaller European elm bark beetle. This is related to the preferred feeding habits of the two

species. The smaller European elm bark beetle feeds in small twigs, usually high in the crown, while the native elm bark beetle bores under the bark of branches 2-4 inches in diameter to feed. Inoculations from the smaller European elm bark beetle result first in yellowing and wilting of small branches, high in the crown. As the infection progresses downward, more and larger branches are affected. A complete sequence of foliar symptoms occurs; yellowing, then wilting branches can be seen in succession. When infections of this type occur, streaking will be found in the wood of small branches and even twigs. Recommendations for therapeutic pruning or therapeutic chemical treatment of infected elms assume infection from smaller European elm bark beetle feeding is being treated.

When inoculation has been done by the native elm bark beetle, a different pattern of symptoms appears and there are important differences in the feasibility of control measures. Because the native elm bark beetle feeds in bark of branches 2-4 inches in diameter, DED infections start as much as 10-20 feet farther down into the crown than with smaller European elm bark beetle infections. From this infection site, the fungus moves down the branch and, to a lesser extent, upward. The first symptom usually seen is wilting and browning of an entire branch or segment of the crown. There may or may not be yellowing of leaves preceding this wilt. Such early symptoms may closely resemble those resulting from a broken branch. While streaking is present in the larger branch where inoculation took place, many of the smaller wilted branches (1-2 inch diameter) and twigs may not show streaking in the wood. This absence of streaking in branches of the size normally submitted for laboratory diagnosis has caused some confusion in the past, as these non-streaked branch samples will not yield the DED fungus when tested.

In addition, because of their position, the infections arising from native elm bark beetle inoculations have a head start in spreading through the tree. Frequently, by the time first symptoms are noted, the fungus has already reached scaffold branches or the main trunk of the tree; this renders therapeutic pruning impossible and chemical therapy unlikely to succeed. Most of the beetle-involved DED infections in North Dakota cities have been the native elm bark beetle type. For this reason, use of therapeutic treatments for infected trees often is not effective and is not recommended.

Trees infected with Dutch elm disease usually develop brown streaks in the sapwood of wilting branches. Cross sections of infected branches will show brown streaks in the outer wood in spring; in summer they will show a single ring of brown dots in the wood. Trees infected through root grafts or lower trunk infection do not show these symptoms in the branches but will show streaking in wood of the trunk if a chip or wedge is removed.

Once the fungus is established within a tree, it spreads rapidly via the water-conducting vessels. The tree forms gums within these vessels in response to the presence of the fungus, causing the tree to wilt and eventually die.

Since the causal fungus fruits in or under the bark, the only positive method of diagnosing Dutch elm disease is laboratory isolation of the fungus from living infected branches.

**Elm Bark Beetles – Carriers of the Fungus**

Two kinds of bark beetles attack elm trees, the smaller European elm bark beetle *(Scolytus multistriatus)* and the native elm bark beetle *(Hylurgopinus rufipes)*. They are important elm pests because they carry the Dutch elm disease fungus as they move from infected breeding sites to feed on healthy elm trees. The European species is the more important carrier where it occurs, but while both species are present in North Dakota, the native elm bark beetle is much more common and important in the spread of DED.

SMALLER EUROPEAN ELM BARK BEETLES pass the winter as larvae in the bark. When warm weather comes in the spring, larvae complete their growth and transform to pupae and later to

adult beetles. The adults begin emerging about the middle of May through holes that they make in the bark (Figure 4). They continue to emerge during the warm months. The adults feed in the crotches of living elm twigs and, if carrying the Dutch elm disease fungus, may introduce it into healthy elm trees. Later they bore through the bark of dead or dying elm trees or recently cut elm logs. They form galleries in the inner bark, grooving the surface of the wood parallel with the grain.

The female places her eggs in niches along the sides of the gallery. Larvae that hatch from these eggs feed in the inner bark and the surface of the wood and construct mines that extend at an angle from the egg gallery (Figure 5a). When full-grown, larvae build cells in the bark and there transform to pupae.

The cold North Dakota winters kill off most of the smaller European elm bark beetles. Those that survive do so only in protected spots, **especially home firewood piles**. It is for this reason that elimination of elm firewood is such an important factor in DED control.

NATIVE ELM BARK BEETLES pass the winter either as larvae in elm bark or as adults. Most of the adults overwinter in tunnels they have made in the thick bark at the base of healthy elm trees. They begin to appear in May and make their egg galleries in the same kind of elm material as do the smaller European elm bark beetles. However, these galleries extend across the grain of the wood (Figure 5b) instead of parallel with it and can be distinguished from the egg galleries of the smaller European elm bark beetles. An egg gallery of the native elm bark beetle usually consists of two branches diverging from the point where the parent beetle penetrated the bark.

The native elm bark beetle feeds in bark of small to medium-sized branches – often those 2-4 inches in diameter. They bore into the bark and tunnel along the bark-wood interface, scoring the wood as they feed. If a beetle is carrying spores of the DED fungus, it will be introduced into the wood of the branch and a DED infection may be the result.

In arid, windy sites the beetles may prefer to feed on branches of smaller, understory trees rather than the larger, more exposed elms. When this happens, such smaller trees may become infected while larger, overstory trees are not. This pattern has been observed repeatedly in the woody draws and sloughs along the Missouri River Valley.

**Bark Beetles and Dutch Elm Disease**

Unless elm bark beetles are associated with Dutch elm disease, there is usually little need for control measures as the beetles' feeding and boring activity does not harm trees that are in a vigorous condition. Once DED becomes established in a location, better control of bark beetles is an integral part of a DED management program.

Spores of the Dutch elm disease fungus are carried on the bodies of these beetles and deposited in egg galleries and tree wounds. European elm bark beetles transmit the fungus by feeding on small twigs. Native elm bark beetles introduce the Dutch elm disease fungus when making feeding tunnels in the bark. After feeding, bark beetles seek breeding sites under the bark of dead or dying elm trees or recently cut logs. The DED fungus develops in the galleries formed by the bark beetles. There it produces spores which are picked up by the young beetles when they emerge. Most emerging beetles feed on healthy elms within 1,000-1,500 feet of where they hatched. However, beetles may rise to altitudes of several hundred feet and be carried by air currents for many miles.

## Control Measures

Effective disease control programs should be considered on a community-wide basis. Dutch elm disease control involves two different but related programs: (1) community-wide sanitation programs designed to reduce the level of elm bark beetles (principal carriers of the Dutch elm disease fungus); and (2) prevention of the spread of the disease through natural root grafts from infected trees to adjacent healthy trees.

There is no way to eliminate Dutch elm disease once it begins; control programs have as their object the management of the disease so that losses are spread out over a long period, minimizing the impact of the disease.

### Insecticides

As mentioned before, the adult native elm bark beetles bore into the thick bark of large trees in the fall to overwinter. Because most of the elm bark beetles which survive the winter in our climate do so only near the base (lower 4 feet) of large trees, it has been possible to treat such trees with insecticide to reduce beetle populations. Such treatments are feasible both for communities and for individual homeowners, although individual action is of limited value. Some cities, such as Winnipeg, have included Dursban® insecticide spray of tree bases as part of their regular DED control program. It is especially useful for treatment of problem areas, such as areas near river corridors where bark beetle populations are high and disease-carrying beetles emigrate in the fall from infected native stands to residential areas.

The insecticide Dursban® (2E and 4E) is registered for control of overwintering native elm bark beetles. Dursban® 4E should be used at the rate of 0.5% active ingredient, which is 1 1/3 fl. oz. (2 2/3 tablespoons) per gallon of water. Dursban® 2E is to be used at the rate of 2 2/3 fl. oz. (5 1/3 tablespoons) per gallon of water. The bottom 9 feet of the trunk should be sprayed to wet the trunk thoroughly but do not spray to runoff. Special care should be taken to clear away grass and weeds from the base of the trunk to get good coverage of the root flare. Sprays can be applied from spring to early fall and are most effective if applied by the end of August. An early spring (late March – early April) treatment may offer some additional protection. Dursban® is a restricted use pesticide and is to be applied by certified pesticide applicators only.

### Sanitation

A year-round community sanitation program is the key to slowing the spread of the disease. Since elm bark beetles breed in dead elm wood with intact bark and in weak or dying elm trees, the first steps toward control of the beetle involve the destruction of all dead or dying elm wood present in the community. This includes Siberian elm as well as American elm.

Any dead, dying, or weak elm trees or elm wood with bark firmly attached can serve as a breeding site for beetles. This includes limbs hanging on trees that may have been damaged by storms (hail, wind, etc.) the previous season, trees that are very old or weakened by pests, and fresh elm firewood. Branches less than 4 inches in diameter are generally not a threat because the beetles do not survive in

them even if colonized. Firewood is an exception, however, because firewood piles are often in protected locations and partially covered with snow.

The chance of root graft spread of Dutch elm disease to adjacent trees increases in direct proportion to the length of time an infected tree stands before removal. Immediate removal (within two weeks) of newly infected trees will substantially reduce the number of trees infected by root grafts. Immediate removal should be a routine procedure where it can be accomplished.

Sanitation alone will not stop the spread of the disease, but it will tend to stabilize its spread and prevent epidemic outbreaks. The true value of a good sanitation program is that it allows time for a replacement program so that a community doesn't lose all of its trees at once. Replanting new trees of other species can then proceed on a gradual basis.

The value of a good sanitation program is often underestimated because some people believe that, "The elms will die anyway." Although this may be true, the rate of dying can be dramatically affected. The experience in Illinois is an example. When DED was first found in 1950, certain communities established excellent sanitation programs. Some communities that maintained these programs still had 75 percent of their elms 25 years later. In contrast, communities with no sanitation programs had lost all of their elms.

The value of boulevard elms is great and maintaining them should be a high priority because of their beauty as well as for three economic reasons. First, property values are enhanced by shade trees, and their loss results in lowered property values. Second, trees provide shade and evaporative cooling which reduces cooling costs in summer. Third, even the bare branches of trees in winter effectively reduce winter wind velocity and so reduce winter heating costs.

**Firewood Control**

In cities with municipal forestry programs where standing dead trees and fallen logs are routinely removed, elm firewood with intact bark may play a major role in overwintering survival of elm bark beetles. Because the interior of a firewood pile offers a protected environment, beetle survival may be higher than in standing trees or fallen logs. It appears likely that elm firewood piles are the only important survival site for the smaller European elm bark beetle in North Dakota cities.

Effective reduction of elm firewood cannot be achieved by ordinance alone – it requires the cooperation of an informed public. A few elm logs secreted away by one homeowner who does not understand the importance of the problem can undo all attempts at thorough sanitation and watchful disease surveillance for an area of several city blocks.

In firewood-poor areas like most of North Dakota, high heat value elm wood is a resource which many feel should not be wasted. The desire to use wood from dead and dying elm trees is a legitimate one and must be weighed against the need to control Dutch elm disease – also a legitimate concern. Some communities

have obtained de-barking equipment which permits both of these goals to be achieved.

**Failure to effectively control presence of bark-on elm firewood will doom any municipal control program, regardless of how well its other aspects are carried out.** No American city has ever been able to control DED if it was unable or unwilling to control elm firewood. If a community is not prepared to enforce tough firewood control as part of its tree ordinance, then the other parts of a DED control program are of questionable value.

Information on identification of elm wood is provided in the circular **"Identifying Elm Firewood"** (Minnesota Tree Line No. 25) available from county offices of the NDSU Extension Service or from the NDSU Ag Communication Distribution Center.

**Root Graft Transmission Spread through natural root grafts has accounted for a majority of new cases of Dutch elm disease each year in some Midwestern cities.**

Elm trees which are growing close together (within 50 feet) over a period of years form root grafts. If one of the trees becomes diseased, the DED fungus will be transmitted along an entire street by moving directly through the root system into adjoining healthy trees. In other words, disease in just one tree in the row could cause infection and death of the remaining trees. Immediate removal of infected trees (see sanitation) reduces the chance of root graft spread by getting rid of the infected tree before the Dutch elm disease fungus reaches the roots.

The only way to prevent transmission through the roots is to create a barrier between diseased and healthy trees by severing or killing those roots between the trees. This can be done without harm to the healthy trees either by mechanical trenching or through the use of chemical barriers, which have been found to be quite effective in some situations.

Mechanical trenching for disruption of root grafts has the advantage of being quick and effective if the machinery is available and no pipes, underground cables or pavements are encountered. Two types of equipment are commonly used for me chanical root disruption – ditch diggers or trenchers and the vibrating plow. The trench should be as narrow as practical and can be refilled immediately. Many cities and towns own or have access to small self-powered trenchers (such as "Ditch Witch") which will cut a trench 24-30 inches deep. Homeowners using such equipment (often from rental stores) should exercise **EXTREME CARE** not to contact buried power cables or gas lines. Severe injury or death could result

To be entirely certain of disruption, a trench depth of 48 inches is needed, but most roots are much nearer the soil surface and trenching to a depth of 24-30 inches is often adequate. The deeper trenching may require specialized equipment. A 30-inch trench cut immediately is probably better than a 48-inch trench delayed for days or weeks while waiting for the special machine.

A fumigant, sodium N-methydithiocarbamate (SMDC) sold under the trade names of Vapam and VPM, has been found effective as a chemical barrier. The chemical fumigant is dangerous and should be applied only by trained applicators. Homeowners should consult their city forester or a reputable, trained arborist.

**Chemical Treatment**

Systemic fungicides (Arbotect) can be injected into the trunk or root-collar of the affected tree. Follow label directions. These fungicides should be used only by trained arborists; in many cities arborists must be licensed by the city forester to permit this work. A special circular, **How to Inject Elms With Systemic Fungicides** (Minnesota AG-FO-0781), is available at county offices of the NDSU Extension Service or from the Ag Communication Distribution Center at NDSU.

Because slogans such as "Save the Elms" have wide popular appeal, chemical tree treatment is sometimes offered by untrained or unscrupulous individuals in competition with reputable trained arborists. Check out the individual offering treatment with your local Chamber of Commerce, Better Business Bureau or local forester before agreeing to any treatments; obtain a written description of all work to be done and get any guarantees in writing.

Do not use systemic fungicides with highly alkaline water. If the level of calcium is very high, or if the hardness is over 10 grains per gallon, the fungicide may form a precipitate rendering it ineffective and possibly damaging the tree. Much of the water in North Dakota exceeds this level of hardness. If the local water is too alkaline, use distilled water, deionized water, or bottled spring water.

**Therapy of Infected Elms**

Many municipal tree ordinances require removal of Dutch elm disease-infected elms regardless of therapeutic treatment; check your local tree ordinance before arranging therapeutic treatment. "Curing" Dutch elm disease is a popular slogan in advertisements, but a true cure can be obtained only in a small proportion of cases under very specific conditions. Even when these specific conditions are met, a substantial proportion (20-30 percent) of infected elms fail to recover and are eventually lost.

Therapeutic tree injection is generally only effective where less than 5 percent of the crown of the tree shows symptoms. The symptomatic part of the tree should be pruned out promptly as it will not recover. Ideally, the infected branch should be removed 10 feet below where streaking of the wood ceases.

Most DED infections in North Dakota arise from inoculations by the native elm bark beetle. For that reason, most DED infected trees will already show more than 5 percent crown involvement by the time first symptoms become evident. At that time, in many such trees, the fungus will have already invaded the main branches or trunk – as evidenced by streaking in the wood. For these reasons therapeutic treatment will be expected to fail in many cases and cannot be recommended in North Dakota.

Therapeutic treatment of trees infected through root grafts has never been successful and cannot be recommended under any circumstances. Community-wide chemical therapy should **never** be attempted. Such a program cannot be justified either economically or biologically. A few communities have tried this

approach and all have failed to arrest the disease and have seriously compromised their overall DED control program in the process.

**Protective Treatment of Healthy Elms**

Preventive injection with currently registered fungicides will require retreatment every one to three years to maintain the protective effect. Trunk or root collar injections injure the tree and the cumulative effect of repeated injections may damage the tree directly or lead to severe wetwood or other infection.

Homeowners wishing to use preventive fungicide injection should contact a reputable, trained arborist or their city forester or state district forester for information. The current recommendations for treatment methods and chemicals are contained in a special circular, **How to Inject Elms With Systemic Fungicides** (Minnesota AG-FO-0781), available at county offices of the NDSU Extension Service and from the NDSU Ag Communication Distribution Center.

The most effective chemical currently available is Arbotect. It has undergone extensive testing. Used at the high rate (12 fl. oz. per 5-inch trunk diameter) it gives three seasons of protection. Other products appear on the market from time to time. Most have received less rigorous testing; none has been shown to be as effective as Arbotect at the high rate (three-season protection).

By 1987 it was apparent that preventive treatment with Arbotect at the high rate ("Minnesota 3X" rate, or 12 fl. oz. per 5-inch trunk diameter) every third year was effective in reducing risk of DED infection and caused no long-term damage to most American elm trees, providing label and application procedures are carefully followed (See the circular **How to Inject Elms With Systemic Fungicides**).

**Precautions in Handling Pesticides**

Handle pesticides and solvents carefully. Pesticides are poisons. Follow directions on labels exactly and take all precautions listed. The solvents are flammable and their fumes may be toxic. Keep them away from fire. Do not inhale the fumes or spray. If you spill any of the chemical on the skin, immediately wash with soap and water.

Do not let the spray get into bird baths or fish pools. Do not let it form puddles beneath the trees or along street curbs where birds may come to drink. Keep children and animals away when spraying. Do not contaminate streams or ponds. Keep stored chemicals out of reach of children, animals, or birds.

**Sampling Procedures**

An accurate and efficient laboratory diagnosis of trees suspected to have Dutch elm disease is important. Several diseases affecting trees in North Dakota cause symptoms similar to those caused by Dutch elm disease. Among the more serious are Verticillium wilt, Dothiorella wilt, and wetwood.

**Wetwood**

Wetwood disease is caused by a bacterium which lives in the heart of the tree. Its growth results in pressure (up to 40 pounds per square inch) buildup inside the tree. This internal pressure causes oozing of sap from wounds and branch stubs. This sap is quickly colonized by yeasts and molds as it runs down the side of the tree, giving rise to the name "slime flux." In dry seasons this flux may appear as a

whitish stain. Wetwood infection is found in nearly every elm. When it is severe branches may wilt and die and young trees may be killed. These symptoms resemble those of Dutch elm disease. A laboratory test is required to confirm the presence of Dutch elm disease.

### Sampling

The wilting of one or more branches of a tree is generally an indication of disease. For sampling, six diseased but alive twigs, about 6 to 8 inches long and 1 inch in diameter should be cut and identified with the tree (Figure 7). The presence of the DED fungus can be determined only by a plant pathologist using laboratory techniques. Submit twig samples to the North Dakota State University Plant Diagnostic Laboratory through your county agent, state forester, or city forester. Place samples in a clean plastic bag and label them clearly. See the section on symptoms. If no streaking is found, sample larger and not smaller branches.

In cases where the entire tree has wilted or is nearly dead, it is possible to take samples from the main trunk. These can be chain saw wedges or ax chips. If ax chips are taken, be sure that the chips include wood, not just bark. Make sure that the wood shows dark discolored streaks in it.

### Alternative to Planting Elms

The value of Dutch elm disease resistance in American elm is of special importance. At present all species of elm hardy in North Dakota are more or less susceptible to Dutch elm disease. Several Dutch elm disease-tolerant American elms and hybrid elms have been found and may be available in the nursery trade. These include Delaware #2, Jacan, L'Assumption, Sapporo Autumn Gold, American Liberty, and Urban. Their winter hardiness has not been determined in North Dakota. Siberian elms are not immune to Dutch elm disease but they generally show less severe symptoms and are not quickly killed. They do become infected and can act as a source of Dutch elm disease infection for neighboring American elms – they can act as the "Typhoid Mary" of Dutch elm disease.

It is best to plant a mixture of other trees with American elm, preferably mixing species within blocks or plantings.

You can plant the following tree species instead of elm or in mixed plantings with elm: green ash, common hackberry, basswood, soft or silver maple, bur oak, Russian olive, black walnut or flowering crabs. Distinctions and limitations of these trees are offered in Extension Bulletin No. 13, **Trees and Shrubs for North Dakota**.

### Individual Citizen Responsibility

1. **See that your elm trees are kept in good, healthy condition by pruning, fertilization and deep watering during periods of drought.**
2. **Control other pests that may weaken your trees.**
3. **Support community interest in a Dutch elm disease control program.**

Remember, your trees are an important community asset. Trees, like anything else, need periodic maintenance in order to keep them performing well. What would your community be without them?

Guidelines for community tree management, model tree ordinances, and data on costs and benefits of Dutch elm disease control for community programs are available from North Dakota State University.

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**PP-324** (Revised), Reviewed July 96

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**This publication will be made available in alternative formats for people with disabilities upon request 701/231-7881.**

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North Dakota State University
**NDSU Extension Service**

# APPENDIX B
# Control of Beaver Damage

## Control of Beaver Damage

Source: www.agric.gov.ab.ca/agdex/600/681

This publication is meant to help people cope with beaver problems and to present techniques that will minimize the negative aspects of beaver-caused damage.

Biology

The beaver is a semi-aquatic mammal and the largest native North American rodent. Mature males weigh 40 to 60 lb., but can weigh over 100 lbs. Only one litter of four to six kits is produced each year from April to June, following a 100 to 105 day gestation. At two years of age, beaver leave the home colony to search for winter quarters, which may take them up to 10 km away.

The life span of beaver is 5 to 10 years, with some living up to 20 years. Because of their size, behavior and habitat, beaver have few enemies. Mortality is highest during the first year; coyotes, wolves, bears and other large carnivores are the main predators.

Apart from occasional sickness, trapping is the only major cause of death. Research shows that beaver can maintain or increase their numbers with an annual trapping rate of 30 to 40 per cent. It is no surprise then, that beaver numbers never seem to decline significantly in problem areas where removal is the major method of control.

Beaver ponds play a valuable and significant role in the formation of Alberta's plant and animal communities. Their dams create ponds that contribute to the stabilization of water tables and help reduce rapid rain runoff. Dams also help reduce soil erosion and improve soil quality, since runoff deposits in quiet pools near beaver dams. As a result, beaver habitat is often rich in plant and animal life, making beaver ponds excellent sites for observing nature.

Beaver ponds also provide recreation such as fishing and hunting, and have great aesthetic value. Furthermore, beaver ponds create habitat for other fur bearing animals with good harvest value.

Harvesting of beaver is a major source of income to Alberta's fur trade industry and annually represents about 30 per cent of gross fur sale revenues ($3.6 million in 1987).

Giardiasis (inaccurately called "beaver fever") is a disease caused by a microscopic parasite found in the excrement of infected birds and mammals, including beaver. Beaver often get the blame for the spread of the disease because they are the most obvious carrier in water contaminated with the parasite.

Damage

In Alberta, beaver problems occur wherever there are trees and water. Most conflicts with beaver, however, occur in the aspen parkland region, which covers more than half the province's farm land. In these areas, beaver cause problems by flooding cultivated land, hay fields, pasture land, roadways and often detour or restrict water flow in streamways.

Damage in urban areas is generally minor. However, beaver problems can be severe where beaver girdle or cut down valuable ornamental trees and shrubs or undermine yards, walks and roadways with their burrowing.

## Beaver Damage Control

Before beginning any beaver control action, assess the beaver problem fairly and objectively. Are beaver really causing damage or creating hardship requiring control action? The very presence of beaver is often seen as a problem when, in fact, the beaver are causing no harm. You should also determine the type of damage or problem the animals are causing, then match the most appropriate and cost effective controls to the situation.

Once you have decided to control beaver damage, you have three control options:

- Prevention - treat the area to prevent or reduce the damage
- Live trap and relocate the problem beaver
- Destroy the problem beaver and remove the dam

Since live trapping and relocating beaver are often cost prohibitive, their use is limited and often not practical. Also, research has shown that these methods of control are of questionable value because translocated beaver either return to the problem area or seldom survive relocation. However, in urban areas where lethal trapping may be illegal or unsafe, live capture and translocating may be the only alternative.

## Prevention

### Tree protection

Beavers can be fenced out of a treed area or individual trees can be wrapped with galvanized metal or chicken wire to a height of at least 1 m. Valuable broad-leaved trees can be protected by a galvanized metal fence at least 1 m (3 ft) high and 0.5 m (18 in) below ground; however, this protection method can be expensive.

### Repellents

Thiram, the only repellent known to reduce beaver damage, is applied directly to trees and shrubs. However, it will usually work only where beaver have alternate sources of food, i.e. other trees they can cut for food. No license or permit is required to purchase or use this product.

### Water level control without beaver removal

Where flooding is the major problem, the use of a "beaver drain pipe" is the best solution. Make a "drain pipe" or water level stabilization device by fitting two plastic sewer pipes together and perforating one of them. The diameter of the pipes can be 4, 6, 8 or 10 in., depending on volume of water in the stream.

Dig a hole through the beaver dam in line with the original stream channel. Set three-quarters of the pipe at almost any level in the dam, extending the perforated end out into the pond (Figure 1). A weight should be

placed on the end of the pipe. Allow about one quarter of the pipe to extend on the downstream side of the dam. Beaver pipes work best where the flooded area is more than one acre and the minimum water depth at the pond is 0.5 m (18 in.) or deeper. Be sure to add a 30 cm (12 in.) elbow or turndown to the end of the pipe to discourage plugging of the upstream end of the pipe.

In the case of a plugged culvert, the dam should be removed and a heavy wire mesh fence (No. 6 concrete reinforcing wire) should be installed around the mouth of the culvert and secured with steel posts. When the beaver build a dam on the fence, a "beaver pipe" can be placed through the fence to keep the water at a desired level (see Figure 2).

A single "beaver pipe" can handle the normal runoff from a 2,000-acre drainage area; some installations use up to three pipes. It is not feasible to manage streams with flows from drainage areas exceeding 10 to 11 square km with beaver pipes.

A pipe installation usually provides a long-term water level control at a nuisance site. However, it can also provide control until beaver are removed from the site through a regular fur trapping season.

The benefits of a pipe installation include elimination or reduction of beaver damage as well as the conservation of a beaver colony and a steady supply of stock water. In problem areas where emigrating beaver continually re-occupy the site, trapping would be necessary on a yearly basis. If trapping is required five or more years out of fifteen, a pipe installation is a more effective and less costly method of controlling the problem.

Three important requirements need to be considered using beaver pipes:

- Water depth and area must be adequate to install pipes properly.
- The normal flow of the stream during the control period must not exceed the flow capacity of the pipe.
- You must accept short periods of high water levels.

Beaver guards

A wire mesh cylinder of 10 x 10 cm (4 in. x 4 in.) welded wire mesh (0.4 gauge or 0.25 in. diameter) will protect culverts from beaver. The diameter of the cylinder should be the same as the culvert, and the cylinder may be in a horizontal or vertical position (Figure 3).

The length of the cylinder may vary, but as a general rule, the length should be twice the diameter. Secure the cylinder with heavy metal stakes and fasten it to the culvert.

Shooting and trapping

Landowners may shoot and trap beaver without a license, year-round, on their own land. On private land, hunters may trap or shoot beaver, year-round, with written landowner permission.

Shooting - Shooting beaver can be an effective control technique. At dawn and dusk, keep hidden and patiently stalk or wait for beaver near their dams. Because beaver spend most of their time in water, the

only target they offer is a partially submerged head. Skilled marksmanship is needed to shoot beaver. Practice shooting small targets the size of an oil can at distances of 50 to 100 yards.

Trapping - In agricultural areas, beaver damage usually occurs when fur values are low and beaver numbers high. The solution is a combination of preventive control and timely beaver harvest. To achieve this end, beaver numbers need to be regularly and continually monitored to observe population shifts and to avert potential problems. Contact your agricultural service board or Fish and Wildlife officer for the name of a local trapper if you do not want to remove the beaver yourself.

You can resolve many beaver problems by trapping. The type of trap and set used depends on the type of problem, location and time of year. Beaver are generally easy to trap; however, they can quickly become "trap-wise" from poorly placed traps or inferior equipment.

Equipment

The most effective trap for beaver is the body-grip trap called a "conibear." The proper size of conibear trap for beaver is 280 through 330.

Set and handle conibear traps with great care. To set them, you will need a safety clamp and a seven-foot nylon rope to ensure your own safety (Figure 4). You should also always carry a hacksaw blade with you. A hacksaw blade is your back-up safety if you get caught in a trap and cannot escape. Most professional trappers sew a hacksaw blade into their trapping coat, so they will always have a saw with them.

Conibear traps are equipped with safety catches on each spring, but the safety clamp should always be used when setting and placing them.

The springs of the conibear trap can also be set with the nylon rope by typing the rope to one spring coil and running it through both coils two or three times. This method will allow you to easily pull the spring coils together and secure them with the safety catches.

Canal set

One of the easiest and most successful conibear trap sets is the canal set. Place a heavy pole through each spring coil of the trap. Use baling wire to attach this pole to two anchor stakes, and drive the anchor stakes into the canal banks. When set, the pole should touch the water surface to cause the beaver to dive under it into the trap (Figure 5).

If the canal is wider than 16 to 18 in., place a short pole on either side of the trap to encourage the beaver to enter the trap. Note: Bend the trigger wires to the sides, as shown in Figure 5, so the approaching beaver does not sense the trap.

Bank den set

Place the trap at the bank den entrance and put a stake through each spring coil. Drive the two stakes into the mud to secure this underwater set (Figure 6). The bank den set may also be used at the entrance to the beaver lodge.

Dam set

Locate the travel path on top of the dam and set a conibear trap as shown in Figure 7. The trap may be camouflaged with grass, twigs or leaves to break the trap outline. Scent lure may be placed on the trail about two feet from the trap.

Water edge set

Another set for unwary beaver is to secure a conibear trap in the water about 12 to 18 in. from bait or lure placed at the water's edge. The trap should never be more than half submerged in the water. Use grass or leafy branches to camouflage the trap outline. Do not place camouflage material within the trap's jaws (Figure 8).

Explosives

Federal law restricts the use of explosives to only authorized people who are specially trained and certified. Alberta Agriculture, Food and Rural Development does not recommend explosives for beaver control for landowners. For more information, contact your local municipal office.

Information prepared by John Bourne, Alberta Agriculture. Revised March 2001 Agdex 681-1

For more information about the content of this document, contact John Bourne.
This document is maintained by Ada Serafinchon. Published: May 18, 2001.

Figure 1. Drain Pipe

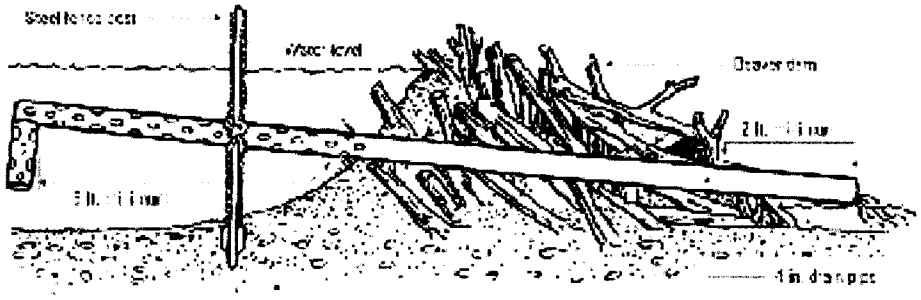
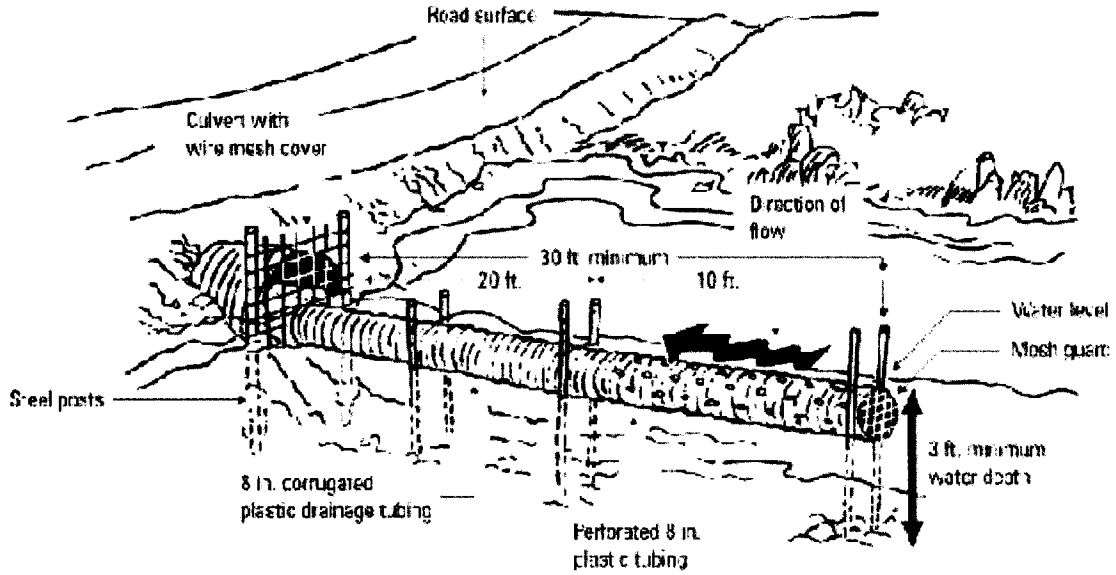
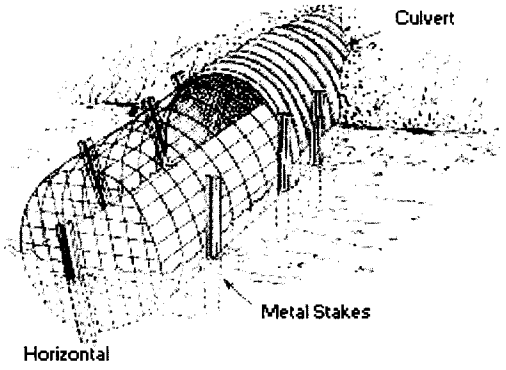


Figure 2. Beaver Pipe



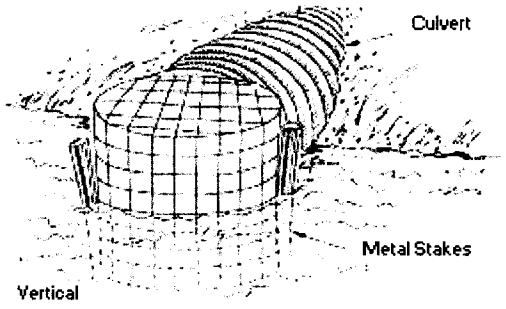




Figure 3. Beaver Guards (above)

Figure 4 Conibear Trap and Setting Equipment

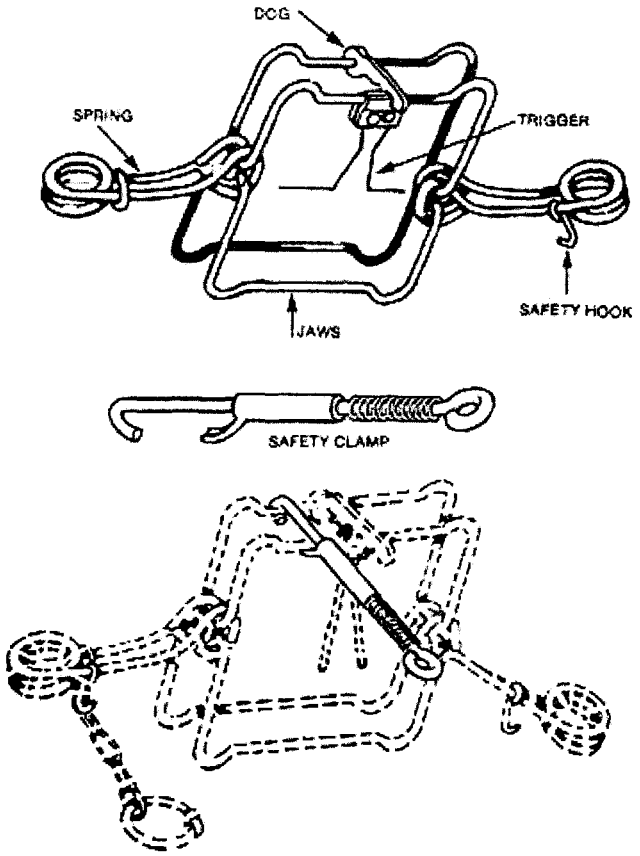
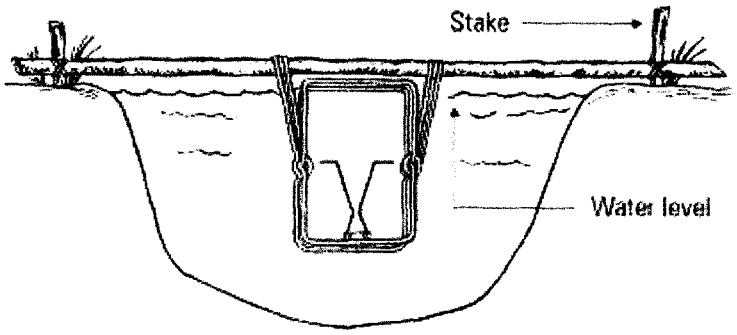



Figure 5 Canal Set



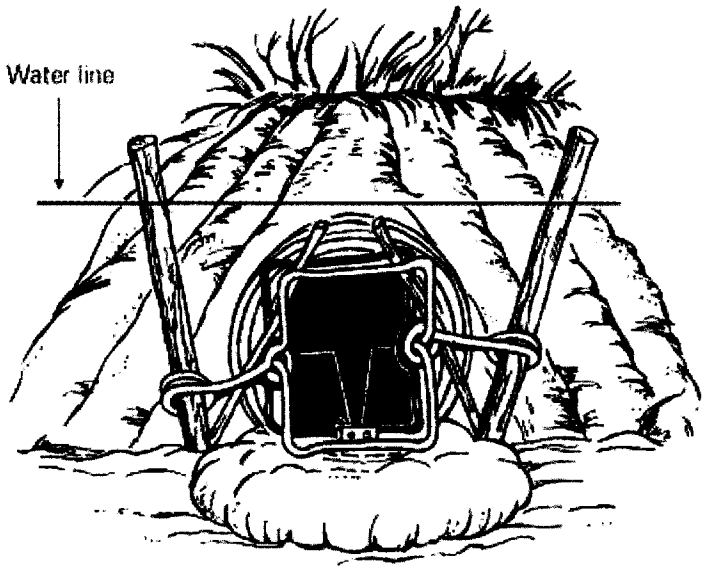



Figure 6. Bank Den set

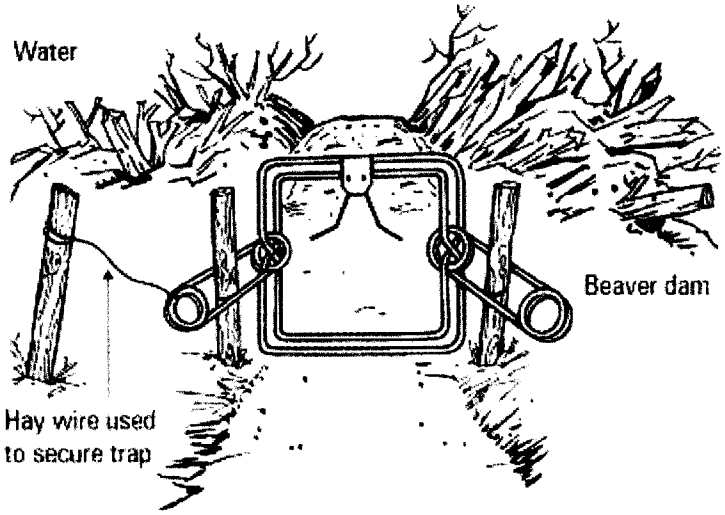



Figure 7. Conibear Set at Dam

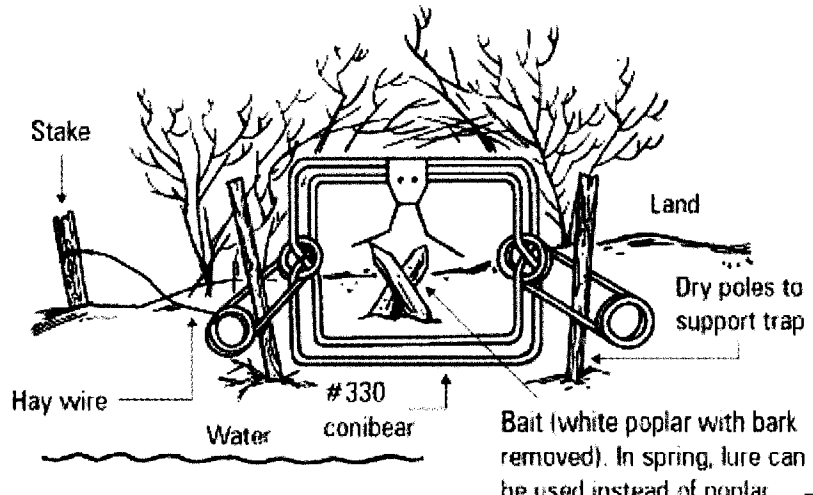



Figure 8. Conibear set at Water's edge

# APPENDIX C
# INTERAGENCY AND INTERGOVERNMENTAL COORDINATION FOR ENVIRONMENTAL PLANNING (IICEP) CORRESPONDENCE

# DEPARTMENT OF THE AIR FORCE

HEADQUARTERS 319TH AIR REFUELING WING (AMC)
GRAND FORKS AIR FORCE BASE, NORTH DAKOTA

17 March 2006

MEMORANDUM FOR 319 ARW/CC

FROM: 319 ARW/JA

SUBJECT: Legal Review – Update for Integrated Natural Resources Management Plan

1. ISSUE: Proposed annual update 2004-2008 for Integrated Natural Resources Management Plan (INRMP) is legally sufficient. Recommend 319 ARW/CC approval.

2. LAW/AFI: Section 101(b)(2) of the Sikes Act [16 U.S.C. 670a(b)(2)] states that each INRMP "must be reviewed as to operation and effect by the parties thereto on a regular basis, but not less often than every 5 years."

3. DISUCSSION: Although the Sikes Act specifies only that a formal review must be completed no less often than every 5 years, DoD policy requires installations to review INRMPs annually in cooperation with the other parties to the INRMP. Annual reviews facilitate "adaptive management" by providing an opportunity for the parties to review the goals and objectives of the plan, as well as establish a realistic schedule for undertaking proposed actions.

4. RECOMMENDATION/CONCLUSION: The INRMP I reviewed is legally sufficient. Recommend 319 ARW/CC sign the proposed document.

MARK W. HANSON, GS-12, DAF
Chief, General Law

## STAFF SUMMARY SHEET

| | TO | ACTION | SIGNATURE (Surname), GRADE AND DATE | | TO | ACTION | SIGNATURE (Surname), GRADE AND DATE |
|---|---|---|---|---|---|---|---|
| 1 | 319 MSG/CCE | Coord | | 6 | 319 ARW/CC | Sign | 3/21/06 |
| 2 | 319 MSG/CD | Coord | | 7 | | | |
| 3 | 319 MSG/CC | Coord | | 8 | | | |
| 4 | 319 ARW/JA | Coord | | 9 | | | |
| 5 | 319 ARW/CV | Coord | | 10 | | | |

| SURNAME OF ACTION OFFICER AND GRADE | SYMBOL | PHONE | TYPIST'S INITIALS | SUSPENSE DATE |
|---|---|---|---|---|
| Rundquist, GS-11 | 319 CES/CEVC | 7-4774 | kr | |

| SUBJECT | DATE |
|---|---|
| GFAFB Integrated Natural Resources Mangement Plan (INRMP) | 20060214 |

SUMMARY

1. An annual update for the Integrated Natural Resources Management Plan (INRMP) has been completed. The current plan covers the management years 2004-2008. The document has been coordinated and has received approval by signature from the ND Game and Fish and US Fish & Wildlife Service (Denver Office, Sikes Act Coordinator) (Tab 1).

2. The executive summary section of the INRMP (ES-1 through ES-3) provides a brief discussion of the goals and objectives outlined in the document. An annual update was required because the US Fish and Wildlife Service provided significant comments received in 2005. Therefore, edits were made to chapters 5 and 7 to address USFWS concerns for mutual agreement (Tab 2).

3. AFI 32-7064 and the amended Sikes Act of 1997 mandate that military installations must prepare and implement an INRMP that ıll be mutually agreed upon by US Fish and Wildlife Service, ND Game and Fish Department, and the military.

4. RECOMMENDATION: 319 ARW/CC sign/approve the INRMP approval page at tab 1.

JOHN P. DEWINE, Lt. Col
Base Civil Engineer

2 Tabs
1. INRMP Approval Pages
2. INRMP

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Mountain-Prairie Region

IN REPLY REFER TO:

MAILING ADDRESS:
Post Office Box 25486
Denver Federal Center
Denver, Colorado 80225-0486

STREET LOCATION:
134 Union Blvd.
Lakewood, Colorado 80228

FWS/R6/FR
INRMP

February 10, 2006

William J. Bender
Colonel, U.S. Air Force
c/o 319 CES/CD
525 Tuskegee Airmen Blvd
Grand Forks AFB ND 58205-6434

Dear Colonel Bender:

We are happy to forward you the signature page for Grand Forks AFB ND Integrated Natural Resources Management Plan. The Fish and Wildlife Service Regional Director's signature indicates our agreement that your INRMP meets the intent, standards, and requirements of the Sikes Act (16 U.S.C. 670a et seq.) as amended.

If there are any questions, please contact Morgan McCosh Elmer, Regional Sikes Act Coordinator, at 303-236-4512

Sincerely

M. McCosh Elmer

Assistant Regional Director, Fisheries

Enclosure

DEPARTMENT OF THE AIR FORCE
319TH CIVIL ENGINEER SQUADRON
GRAND FORKS AIR FORCE BASE, NORTH DAKOTA

DEC 0 8 2005

MEMORANDUM FOR US Fish and Wildlife Services
Attention: Morgan Elmer, Sikes Act Coordinator
PO Box 25486
Denver Federal Center
Denver, CO 80225-0486

FROM: 319 CES/CD
525 Tuskegee Airmen Blvd
Grand Forks AFB ND 58205-6434

SUBJECT: Integrated Natural Resource Management Plan Update

1. Grand Forks AFB has completed an annual update to the, "Integrated Natural Resources Management Plan (INRMP), Grand Forks AFB, 2004-2008" document. The comments received from your office in March 2005 were reviewed and incorporated as appropriate by the Sikes Act. Most modifications were completed in chapters 5 and 7 for your review based on comments received. A copy of all interagency correspondence is included for informational background in appendix C of the INRMP. Please sign the enclosed approval page 3 of 3, and return to the following address: 319 CES/CEVC, 525 Tuskegee Airmen Blvd, Grand Forks AFB ND, 58205-6434.

2. Keep the enclosed courtesy copy of the INRMP for your records.

3. Any questions may be directed to Ms Kristen Rundquist, Natural Resources Program Manager, (701) 747-4774.

MARY C. GILTNER
Deputy Base Civil Engineer

Attachments:
Approval Page and Final Integrated Natural Resources Management Plan

DEPARTMENT OF THE AIR FORCE
319TH CIVIL ENGINEER SQUADRON
GRAND FORKS AIR FORCE BASE, NORTH DAKOTA

DEC 0 8 2005

MEMORANDUM FOR NORTH DAKOTA GAME AND FISH DEPARTMENT
Attention: Mr. Dean Hildebrand, Commissioner
100 North Bismarck Expressway
Bismarck ND 58501

FROM: 319 CES/CD
525 Tuskegee Airmen Blvd
Grand Forks AFB ND 58205-6434

SUBJECT: Integrated Natural Resource Management Plan Update

1. Grand Forks AFB has completed an annual update to the, "Integrated Natural Resources Management Plan (INRMP), Grand Forks AFB, 2004-2008" document. Comments were received from the Denver USFWS office in March 2005. GFAFB reviewed and incorporated those comments as appropriate to comply with the Sikes Act. Most modifications were completed in chapters 5 and 7 for your review. A copy of all interagency correspondence is included for informational background in appendix C of the INRMP. Please sign the enclosed approval page 2 of 3, and return to the following address: 319 CES/CEVC, 525 Tuskegee Airmen Blvd, Grand Forks AFB ND, 58205-6434.

2. Keep the enclosed courtesy copy for your records.

3. Any questions may be directed to Ms Kristen Rundquist, Natural Resources Program Manager, (701) 747-4774.

MARY C. GILTNER
Deputy Base Civil Engineer

Attachments:
Approval Page and Final Integrated Natural Resources Management Plan

DEPARTMENT OF THE AIR FORCE
319TH CIVIL ENGINEER SQUADRON
GRAND FORKS AIR FORCE BASE, NORTH DAKOTA

DEC 2 2 2004

MEMORANDUM FOR US FISH AND WILDLIFE SERVICE
Mike Stempel, Assistant Regional Director of Fisheries
PO Box 25486, DFC
Denver, CO 80225

FROM: 319 CES/CD
525 Tuskegee Airmen Blvd
Grand Forks AFB ND 58205-6434

SUBJECT: INRMP Approval

1. Grand Forks AFB is required to maintain an Integrated Natural Resources Management Plan (INRMP) in accordance with the Sikes Act. The Sikes Act also requires documented coordination with State and Federal Wildlife agencies. To comply with these requirements, Grand Forks AFB sent the INRMP to the Bismarck USFWS Office for review in July 2004, and subsequently received a letter dated, Aug 20, 2004, requesting additions to the document and concurring comments regarding no significant impact associated with implementing the plan (see enclosures). The final document was edited to include these comments. Signature approval was obtained from the Bismarck USFWS office on Nov 10, 2004. On Dec 16, 2004, Grand Forks Air Force Base received a phone call from the Bismarck USFWS Office indicating that an official at the Denver location is required to approve the plan.

2. Therefore, to ensure compliance with the Sikes Act, please review the enclosed CD containing the entire document. If no comments, please sign the attached original-final approval page, and return to 319 CES/CEVC, 525 Tuskegee Airmen Blvd, Grand Forks AFB ND, 58205-6434. If there are comments, please fax them to 701-747-6155, and revisions will be incorporated and returned to you expediently.

3. Any questions may be directed to Ms Kristen Rundquist, Natural Resources Program Manager, (701) 747-4774. A courtesty copy has been sent to Mr. Jeffrey Towner, Field Supervisor of Ecological Services, US Fish and Wildlife Services, 3425 Miriam Avenue, Bismarck, ND 58501-7926.

MARY C. GILTNER,
Deputy Base Civil Engineer

Attachments:
INRMP, Original Approval Page, and USFWS Correspondence

United States Department of the Interior
FISH AND WILDLIFE SERVICE

[redacted]

**MEMORANDUM**

**DATE:** March 1, 2005

**TO:** Morgan Elmer, Sikes Act Coordinator

MAILING ADDRESS:
Post Office Box 25486
Denver Federal Center
Denver, Colorado 80225-0486

**FROM:** John Cornely, Chief - Division of Migratory Bird Conservation

**SUBJECT:** Grand Forks AFB INRMP

The Migratory Bird Program has reviewed the subject document with regard to impacts on migratory birds. We appreciate the opportunity for input, and hope that our comments can be incorporated into the INRMP.

**General comments:**

We view a plan to be a document that provides strategic guidance for activities that are linked to specific goals and objectives. However, we found very little in terms of specific objectives in the migratory bird components of this plan. Despite language in Chapter 7 (Section 7.1: 'This chapter identifies the goals and quantifiable objectives, ...'), we could not find such objectives in the chapter. Most goals and objectives were stated in terms of habitat manipulations (e.g., planting trees, seeding with natives), with no specific linkage as to how those activities would affect the demographics of (unspecified) bird objectives. Further, much of the text has language such as 'GFAFB *should* ensure,' 'water quality in wetlands *could be* protected,' 'at GFAFB *it is very important* to control free roaming and feral cats,' and 'GFAFB *should consider*' (all italics added). To us, these statement appear to recognize problems, but no specific activities are provided to address the concerns (i.e., there is no 'GFAFB *will* enforce this regulation by...,' 'GFAFB *will* protect water quality by...,'). We don't mean to imply that GFAFB will not address these problems. However, we believe a plan should provide explicit activities to address specific issues. Objectives such as 'increasing biodiversity' and 'improving water quality' are vague and not useful in terms of measuring progress toward them, unless the terms are explicitly defined in

quantifiable terms (e.g., increase biodiversity by 3 bird species by providing breeding habitat in area *x*).

Also, because this is a revised INRMP (the previous plan was finalized in 2001), we would like to have seen a section on progress made toward objectives specified in the earlier plan. Such information would allow GFAFB and reviewers of the current INRMP to assess what management actions had desired effects and which were ineffective, and how much progress had been made, which would allow all parties to better plan strategies for this revision of the plan.

Overall, we found the document very weak in its migratory bird components. No explicit objectives for improved or maintained migratory bird abundances were specified, precluding us from being able to assess the efficacy of proposed habitat-management activities. Because GFAFB is situated within the prairie grassland region, and because grassland birds have undergone severe declines in abundance over the last several decades, we would have liked to see more specific plans to benefit these species. The document listed endangered species of birds, but summarily dismissed the need for activities on their behalf:

*'Due to the lack of habitat for sensitive species at GFAFB, GFAFB has little concern or expenditure required for threatened and endangered species...'*

First, we note that Table 5.3.1-1 incorrectly lists the Peregrine Falcon as endangered. The species was de-listed in 1999, and this fact was brought to GFAFB's attention in previous reviews (Region 6's review of the 2001 INRMP for GFAFB; in a letter from the ES Field Supervisor in North Dakota, dated 20 August, 2004). Nonetheless, the species remained in the table as of this draft of the INRMP, for which the FONSI and Approval Page for the revised INRMP was signed on 20 December, 2004 by the base Commander.

While the statement above regarding threatened and endangered species may be true and justified, the document does not mention the Service's Birds of Conservation Concern list of 2002 (BCC 2002), produced as a requirement of the Fish and Wildlife Conservation Act (as amended). The purpose of the list is to identify migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act. Thus, the list provides entities an opportunity to be pro-active in their management strategies, and avoid potential impacts to activities that could result once a species is listed. GFAFB falls within Bird Conservation Region 11, which has 29 species listed in BCC 2002. Eight of these species are listed in Table 4.5.2-1 as inhabiting the Grand Forks area. Further, the document does not mention birds listed in North Dakota's Species of Conservation Priority, 14 of which are listed in Table 4.5.2-1. We encourage GFAFB to work with the Service and North Dakota as we collaborate on the state's comprehensive wildlife management plan to address concerns for these species.

The INRMP does not mention the authority of the Service to regulate take of migratory birds. We are concerned by the statement (page 5-22) that '[cliff swallow] nests are often removed by people who don't like the "mess" created by birds during

the nesting season...' During the breeding season, nests of all migratory birds are protected by the Migratory Bird Treaty Act, and cannot be removed without a permit issued by the Service. We note that GFAFB has a permit to remove swallow nests, but the removal must be conducted by authorized personnel. However, when these nests are inactive (i.e., no eggs or nestlings in the nest), they can be removed and destroyed (but not possessed) by anyone. Further, the text also states (page 5-53) that 'The NDGFD issued a depredation permit to take cliff and barn swallows, gulls, ducks and geese to reduce hazards to aircraft.' Although a state permit may also be required, the primary permitting authority is the Service. Without a permit by the Service, these activities may not be conducted (with the exception of Canada geese, for which the Service has provided North Dakota a statewide permit for removing a certain number of this species). The following text should be included or referenced in several sections (4.5.4 Bird Aircraft Strike Hazard (BASH); 5.3.4 Wildlife Control; 5.8 BASH) of this INRMP:

"Migratory birds are protected through International Treaties and the Migratory Bird Treaty Act. Federal regulations (50 CFR) and Executive Order 13186 provide the framework for regulation of migratory bird take and possession. Federal permits are required to take, possess, transport, and dispose of migratory birds, bird parts, feathers, nests, or eggs. When necessary, application for permits will be made to the U.S. Fish and Wildlife Service Migratory Bird Permit Office in Denver, Colorado."

We also note some concern about the potential for contaminants in storm water runoff (pages 5.2 - 5.6). The text states "Storm water discharging to surface waters via the Northwest, West, South, and North Ditches have the potential to contain significant *materials*" (italics added). These materials could include: propylene glycol; jet, diesel, motor vehicle fuels; oils and lubricants; used oils; and hazardous chemicals. Further, "Discharges [of stormwater] to the east of the base... flow into Kelly's Slough..." The text states that GFAFB is required to monitor its storm water discharge, but no information is provided as to what levels of *materials* currently exist, nor are specific mitigative measures provided if unacceptable levels are present. Also, water from the wastewater treatment plant is discharged to Kelly's Slough 4 times per year, but the plan provides no information as to the quality of the discharged water. Perhaps the Refuge Manager has information regarding the wastewater issue that they could provide. These issues have the potential to degrade habitats for migratory birds, especially waterbirds, and we encourage GFAFB to identify any problems if they exist and initiate corrective actions. (Also, we note that the Service's review of the 2001 INRMP stated "GFAFB also appears to be attempting to coordinate with Kelly's Slough WMA on migratory bird, hazardous leakage, and base water runoff issues." In the current INRMP (page 6-2, Objective 2.2.2), text states "Coordinate more closely with the USFWS and the University of North Dakota (UND) on the impact of base operations on Kellys Slough and UND lands surrounding GFAFB." Thus, we wonder if plans to better coordinate were carried out previous to this revision.)

Finally, regarding the use of Adaptive Management in the plan, we offer the following.

For adaptive management to be efficient, the plan needs to:

1. Identify explicit, quantifiable objectives related to the goals of management.
2. Identify alternative management activities that managers believe would achieve the objective(s). Ideally, the different activities would differ in the degree (e.g., speed) at which the objective would be achieved.
3. Predict how the system would respond to the activity (e.g., models).
4. Implement a management activity (or several at different sites, if the opportunity exists).
5. Monitor the results. The monitoring program must provide information relevant to the explicit objective(s).
6. Assess the efficacy of the treatment(s) relative to predictions of how the system would change.
7. Incorporate the feedback from 5 into planning and/or implementation.

Although the term adaptive management is invoked in this INRMP, we do not see how it will be used to address goals and objectives of management. That is, we can see no specific application of adaptive management in the plan.

**Specific comments:**

Page 5-9: "The crane and the falcon may stop to feed or rest at GFAFB, but the crane breeds only at the Aransas National Wildlife Refuge..." The whooping crane does not breed at Aransas, but rather winters there. These cranes are from the Wood Buffalo National Park flock, and breed in Canada.

Page 5-10: "...GFAFB must comply with federal laws like the Endangered Species Act or the Migratory Bird Treaty Act..." 'Or' should be replaced with 'and' to indicate needed compliance with both (and others).

Page 5-22: The plan states that hawks should be encouraged to nest at GFAFB to help control ground squirrels (we note that the plan says they should not be encouraged to nest and feed around the runway). However, a current depredation permit for GFAFB allows the take of up to 15 Swainson's hawks and 15 red-tailed hawks, indicating a problem with BASH. Therefore, we don't see the logic in management activities that encourage more hawks to occupy the area, because we cannot control how much of the airspace they will use. A more practical approach may be to encourage more terrestrial predators, such as coyotes, bobcats, and foxes, provided increased numbers of

these animals don't result in other conflicts.

Page 5-33: We believe the recommendations regarding timing of controlled burns and mowing are appropriate and will benefit ground-nesting birds.

Page 5-39: Although this INRMP does not have a specific recommendation regarding expansion of the golf course from 9 to 18 holes, we note that there is an interest in doing so. We would caution that additional, manicured short-grass areas are very attractive to Canada geese, and expansion of the golf course could result in a significant increase in BASH concerns, especially given the location of the current golf course at the south end of the airfield.

Pages 6-1 to 6-7: Most of the objectives related to wildlife and habitats are not quantifiable, so the potential for measuring progress toward them is limited.

DEPARTMENT OF THE AIR FORCE
319TH CIVIL ENGINEER SQUADRON
GRAND FORKS AIR FORCE BASE, NORTH DAKOTA

OCT 0 6 2004

MEMORANDUM FOR US Fish and Wildlife Services
Attention: Mr. Jeffrey Towner, Field Supervisor of Ecological Services
3425 Miriam Avenue
Bismarck, ND 58501-7926

FROM: 319 CES/CD
525 Tuskegee Airmen Blvd
Grand Forks AFB ND 58205-6434

SUBJECT: Integrated Natural Resource Management Plan

1. Grand Forks AFB has finalized the Integrated Natural Resources Management Plan, and has incorporated your comments from the correspondence dated August 20, 2004 as required by the Sikes Act. Please sign the enclosed approval page to be included in the document, and return to the following address: 319 CES/CEVC, 525 Tuskegee Airmen Blvd, Grand Forks AFB ND, 58205-6434, no later than Oct 15.

2. Keep the enclosed courtesy copy for your records. A copy of the approval page and signed environmental assessment will be sent to you upon completion.

3. Any questions may be directed to Ms Kristen Rundquist, Natural Resources Program Manager, (701) 747-4774.

MARY C. GILTNER,
Deputy Base Civil Engineer

Attachments:
Approval Page and Final Integrated Natural Resources Management Plan

# United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
3425 Miriam Avenue
Bismarck, North Dakota 58501

AUG 2 0 2004

Mr. Wayne A. Koop, R.E.M.
Environmental Management Flight Chief
Department of the Air Force
319th Civil Engineer Squadron
Grand Forks Air Force Base, ND 58205-6434

Re: Final Draft - Integrated Natural Resources Management Plan, Grand Forks Air Force Base, North Dakota

Dear Mr. Koop:

In response to your July 1, 2004, letter, the Fish and Wildlife Service (Service) has reviewed the referenced project and offers the following comments.

We concur with your determination of no adverse affect to federally listed species. No critical habitat has been designated on Grand Forks Air Force Base. I am providing updated lists (state and county) of federally endangered, threatened, and candidate species and designated critical habitat in North Dakota for incorporation in the Final Integrated Natural Resources Management Plan (INRMP). Please note that on August 18, 2004, the Service announced removal of the black-tailed prairie dog (*Cynomys ludovicianus)* from the list of candidate species. We made this determination because recent distribution, abundance, and trend data indicate threats to the species previously identified are not as serious as earlier believed. More information on the black-tailed prairie dog determination can be found at: http://www.fws.gov/. Additionally, in 1999, all recovery goals for the peregrine falcon (*Falco peregrinus*) were achieved and the Service removed the species from the list of federally endangered and threatened species.

Overall, impacts to fish and wildlife resources as a result of implementing the INRMP have been adequately addressed in the Final Draft INRMP. We agree with the conclusion that environmental effects associated with implementing the INRMP are not significant.

Thank you for the opportunity to provide comments. If further information is required, please contact Karen Kreil of my staff at 701-355-8506.

Sincerely,

Jeffrey K. Towner
Field Supervisor
North Dakota Field Office

Enclosures

cc/enc: ARD-ES, Denver (60120)
(Attn: C. Davis)
ARD-Fisheries, Denver (60120)
(Attn: M. McCosh Elmer)
Director, ND Game & Fish Dept., Bismarck
(Attn: M. McKenna)

FEDERAL THREATENED, ENDANGERED, AND CANDIDATE SPECIES
AND DESIGNATED CRITICAL HABITAT FOUND IN
NORTH DAKOTA
August 13, 2004

## ENDANGERED SPECIES

### Birds

Interior least tern (Sterna antillarum): Nests along midstream sandbars of the Missouri and Yellowstone Rivers.

Whooping crane (Grus Americana): Migrates through west and central counties during spring and fall. Prefers to roost on wetlands and stockdams with good visibility. Young adult summered in North Dakota in 1989, 1990, and 1993. Total population 140-150 birds.

### Fish

Pallid sturgeon (Scaphirhynchus albus): Known only from the Missouri and Yellowstone Rivers. No reproduction has been documented in 15 years.

### Mammals

Black-footed ferret (Mustela nigripes): Exclusively associated with prairie dog towns. No records of occurrence in recent years, although there is potential for reintroduction in the future.

## THREATENED SPECIES

### Birds

Bald eagle (Haliaeetus leucocephalus): Migrates spring and fall statewide but primarily along the major river courses. It concentrates along the Missouri River during winter and is known to nest in the floodplain forest.

Piping plover (Charadrius melodus): Nests on midstream sandbars of the Missouri and Yellowstone Rivers and along shorelines of saline wetlands. More nest in North Dakota than any other state.

### Mammals

Gray wolf (Canis lupus): Occasional visitor in North Dakota. Most frequently observed in the Turtle Mountains area.

Plants

W. prairie-fringed orchid (Platanthera praeclara): Locally common in moist swales on Sheyenne National Grasslands. Largest known U.S. population is on the Sheyenne.

## CANDIDATE SPECIES

Invertebrates

Dakota skipper (Hesperia dacotae): Found in native prairie containing a high diversity of wildflowers and grasses. Habitat includes two prairie types: 1) low (wet) prairie dominated by bluestem grasses, wood lily, harebell, and smooth camas; 2) upland (dry) prairie on ridges and hillsides dominated by bluestem grasses, needlegrass, pale purple and upright coneflowers and blanketflower.

## DESIGNATED CRITICAL HABITAT

Birds

Piping Plover - Alkali Lakes and Wetlands - Critical habitat includes: (1) shallow, seasonally to permanently flooded, mixosaline to hypersaline wetlands with sandy to gravelly, sparsely vegetated beaches, salt-encrusted mud flats, and/or gravelly salt flats; (2) springs and fens along edges of alkali lakes and wetlands; and (3) adjacent uplands 200 feet (61 meters) above the high water mark of the alkali lake or wetland.

Piping Plover - Missouri River - Critical habitat includes sparsely vegetated channel sandbars, sand and gravel beaches on islands, temporary pools on sandbars and islands, and the interface with the river.

Piping Plover - Lake Sakakawea and Oahe - Critical habitat includes sparsely vegetated shoreline beaches, peninsulas, islands composed of sand, gravel, or shale, and their interface with the water bodies.

## County Occurrence of Endangered, Threatened and Candidate Species and Designated Critical Habitat in North Dakota

August 2004

| Species | Adams | Barnes | Benson | Billings | Bottineau | Bowman | Burke | Burleigh | Cass | Cavalier | Dickey | Divide | Dunn | Eddy | Emmons | Foster | Go. Valley | Gr. Forks | Grant | Griggs | Hettinger | Kidder | Lamoure | Logan | McHenry | McIntosh | McKenzie |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Interior Least Tern - E | | | | | | | | X | | | | | X | | X | | | | | | | | | | | | X |
| Whooping Crane - E | X | X | X | X | X | X | X | X | | X | X | X | X | X | X | X | X | | X | X | X | X | X | X | X | X | X |
| Black-footed Ferret - E | X | | | X | | X | | | | | | | X | | | | X | | X | | X | | | | | | X |
| Pallid Sturgeon - E | | | | | | | | X | | | | | X | | X | | | | | | | | | | | | X |
| Bald Eagle - T | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Gray Wolf - T | | | | | X | | X | | | X | X | X | X | | | | | X | | | | | | | | X | X |
| Piping Plover - T | | | X | | | | X | X | | | | X | X | X | X | X | | | | | | X | | X | X | X | X |
| Western Prairie Fringed Orchid - T | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dakota Skipper - C | | | | | | | X | | | | | | | X | | | | | | | | | | | X | | X |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Designated Critical Habitat | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Piping Plover | | | X | | | | X | X | | | | X | X | X | X | | | | | | | X | | X | X | X | X |

E - Endangered T - Threatened C - Candidate

## County Occurrence of Endangered, Threatened and Candidate Species and Designated Critical Habitat in North Dakota

August 2004

| Species | McLean | Mercer | Morton | Mountrail | Nelson | Oliver | Pembina | Pierce | Ramsey | Ransom | Renville | Richland | Rolette | Sargent | Sheridan | Sioux | Slope | Stark | Steele | Stutsman | Towner | Traill | Walsh | Ward | Wells | Williams |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Interior Least Tern - E | X | X | X | X | | X | | | | | | | | | | X | | | | | | | | | | X |
| Whooping Crane - E | X | X | X | X | | X | | X | | | X | | X | | X | X | X | X | | X | X | | | X | X | X |
| Black-footed Ferret - E | | X | X | | | X | | | | | | | | | | X | X | X | | | | | | | | |
| Pallid Sturgeon - E | X | X | X | X | | X | | | | | | | | | | X | | | | | | | | | | X |
| Bald Eagle - T | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Gray Wolf - T | | | | X | | | X | | | | X | | X | | | | | | | | X | | X | X | | X |
| Piping Plover - T | X | X | X | X | | X | | X | | | X | | | | X | X | | | | X | | | | X | X | X |
| W. P. Fringed Orchid - T | | | | | | | | | | X | | X | | | | | | | | | | | | | | |
| Dakota Skipper - C | | | | | | | | | | X | | X | X | X | | | | | | X | | | | X | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Designated Critical Habitat** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Piping Plover | X | X | X | X | | X | | X | | | X | | | | X | X | | | | X | | | | X | | X |

E - Endangered T - Threatened C - Candidate

# United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
3425 Miriam Avenue
Bismarck, North Dakota 58501

NOV 10 2004

Ms. Mary C. Giltner
Deputy Base Civil Engineer
Department of the Air Force
319th CES/CEVC
525 Tuskegee Airmen Blvd.
Grand Forks Air Force Base, ND 58205-6434

Re: Integrated Natural Resource Management Plan

Dear Ms. Giltner:

I have signed and enclosed the approval page for the referenced document, as requested. If you have any additional requirements or questions, please contact Karen Kreil of my staff at 701-355-8506.

Sincerely,

Jeffrey K. Towner

Jeffrey K. Towner
Field Supervisor
North Dakota Field Office

Enclosure

cc: ARD-ES, Denver, CO (60120)
(Attn: B. Dach)
ARD-FR, Denver, CO (60140)
(Attn: M. McCosh Elmer)

# *2004-2008 UPDATE FOR*
# INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN
# GRAND FORKS AIR FORCE BASE, NORTH DAKOTA

## APPROVAL PAGE

"Consistent with the use of military installations to ensure the preparedness of the Armed Forces, the Secretaries of the military departments shall carry out the program required by this subsection to provide for —

- The conservation and rehabilitation of natural resources on military installations;
- The sustainable multipurpose use of the resources, which shall include hunting, fishing, trapping, and nonconsumptive uses; and
- Subject to safety requirements and military security, public access to military installations to facilitate the use"

Sikes Act (16 USC 670a)

This Updated Integrated Natural Resources Management Plan meets the requirements of the Sikes Act (16 U.S.C. 670 *et seq.*) as amended and the Air Force Instruction 32-7064.

MARK F. RAMSAY, Colonel, USAF
Commander, 319 Air Refueling Wing
Grand Forks Air Force Base, North Dakota

Date

Mr. Dean Hildebrand, Commissioner
North Dakota Game and Fish Department
100 North Bismarck Expressway
Bismarck, North Dakota 58501

Jeffrey K. Towner 11/10/04

Mr. Jeffery Towner
Field Supervisor of Ecological Services
U.S. Fish & Wildlife Service
3345 Miriam Avenue
Bismarck, North Dakota 58501

DEPARTMENT OF THE AIR FORCE
319TH CIVIL ENGINEER SQUADRON
GRAND FORKS AIR FORCE BASE, NORTH DAKOTA

0 1 JUL 2004

MEMORANDUM FOR NORTH DAKOTA GAME AND FISH DEPARTMENT
Attention: Mr. Dean Hildebrand, Commissioner
100 North Bismarck Expressway
Bismarck ND 58501

FROM: 319 CES/CEV
525 Tuskegee Airmen Blvd
Grand Forks AFB ND 58205-6434

SUBJECT: Integrated Natural Resource Management Plan

1. Grand Forks AFB is required to maintain an Integrated Natural Resources Management Plan (INRMP) in accordance with the Sikes Act. The Sikes Act also requires documented coordination with State and Federal Wildlife agencies. The current INRMP was prepared in 1997, but has now been rewritten. In December 2002 the ND Game and Fish Department reviewed the first INRMP draft for GFAFB. Extensive revision of this document has occurred since that time, and a 2004 final-draft has been completed.

2. To ensure compliance with the Sikes Act, please review the attached document, and forward any comments to 319 CES/CEVC, 525 Tuskegee Airmen Blvd, Grand Forks AFB ND, 58205-6434, no later than 21 Jul 04. Comments will be incorporated into the INRMP.

3. Any questions may be directed to Ms Kristen Rundquist, Natural Resources Program Manager, (701) 747-4774.

WAYNE A. KOOP, R.E.M.
Environmental Management Flight Chief

Attachment:
Integrated Natural Resources Management Plan

North Dakota Game & Fish Dept.
100 N. Bismarck Expressway
Bismarck, ND 58501-5095

We have reviewed the project and foresee no identifiable conflict with wildlife or wildlife habitat based on the information provided.

(for) Michael G. McKenna
Chief, Conservation & Communication Division
Date: 7/21/04

DEPARTMENT OF THE AIR FORCE
319TH CIVIL ENGINEER SQUADRON
GRAND FORKS AIR FORCE BASE, NORTH DAKOTA

22 SEP 2004

MEMORANDUM FOR NORTH DAKOTA GAME AND FISH DEPARTMENT
Attention: Mr. Dean Hildebrand, Commissioner
100 North Bismarck Expressway
Bismarck ND 58501

FROM: 319 CES/CD
525 Tuskegee Airmen Blvd
Grand Forks AFB ND 58205-6434

SUBJECT: Integrated Natural Resource Management Plan

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2. Keep the enclosed courtesy copy for your records. A copy of the approval page and signed environmental assessment will be sent to you upon completion.

3. Any questions may be directed to Ms Kristen Rundquist, Natural Resources Program Manager, (701) 747-4774.

MARY C. GILTNER,
Deputy Base Civil Engineer

Attachments:
Approval Page and Final Integrated Natural Resources Management Plan

# 2004-2008 UPDATE FOR
# INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN
# GRAND FORKS AIR FORCE BASE, NORTH DAKOTA

## APPROVAL PAGE

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- The conservation and rehabilitation of natural resources on military installations;
- The sustainable multipurpose use of the resources, which shall include hunting, fishing, trapping, and nonconsumptive uses; and
- Subject to safety requirements and military security, public access to military installations to facilitate the use"

Sikes Act (16 USC 670a)

This Updated Integrated Natural Resources Management Plan meets the requirements of the Sikes Act (16 U.S.C. 670 *et seq.*) as amended and the Air Force Instruction 32-7064.

_____

MARK F. RAMSAY, Colonel, USAF
Commander, 319 Air Refueling Wing
Grand Forks Air Force Base, North Dakota

_____

Date

_____

Mr. Dean Hildebrand, Commissioner
North Dakota Game and Fish Department
100 North Bismarck Expressway
Bismarck, North Dakota 58501

_____

Mr. Jeffery Towner
Field Supervisor of Ecological Services
U.S. Fish & Wildlife Service
3345 Miriam Avenue
Bismarck, North Dakota 58501

DEPARTMENT OF THE AIR FORCE
319TH CIVIL ENGINEER SQUADRON
GRAND FORKS AIR FORCE BASE, NORTH DAKOTA

27 AUG 2004

Dr Terry Dwelle, State Health Officer
North Dakota Department of Health
600 East Boulevard Avenue, Dept 301
Bismarck ND 58505-0200

RE: Environmental Assessment for Grand Forks Air Force Base, North Dakota.

Dear Dr. Dwelle:

The U.S. Air Force is preparing an environmental assessment (EA) on the Final Draft of the Integrated Natural Resources Management Plan (INRMP). Attached is a CD containing a copy of the EA included in Chapter 8. Please review the document and identify any additional resources within your agency's responsibility that may be impacted by the action. Comments should be sent within 15 days of receipt of this letter to:

Mrs. Diane Strom, 319 CES/CEVA
525 Tuskegee Airmen Blvd.
Grand Forks AFB, ND 58205-6434

Your assistance in providing information is greatly appreciated. If you have any questions, please call Mrs. Strom at 701-747-6394.

Sincerely,

WAYNE A. KOOP
Environmental Management Flight Chief

Attachment:
Environmental Assessment

# NORTH DAKOTA DEPARTMENT OF HEALTH
## Environmental Health Section

**Location:**
1200 Missouri Avenue
Bismarck, ND 58504-5264

**Fax #:**
701-328-5200

**Mailing Address:**
P.O. Box 5520
Bismarck, ND 58506-5520


September 1, 2004

Mrs. Diane Strom
319 CES/CEVA
525 Tuskegee Airmen Blvd.
Grand Forks AFB, ND 58205-6434

Re: Environmental Assessment on Final Draft pf
Integrated Natural Resources Management Plan
Grand Forks Air Force Base, Grand Forks County

Dear Ms. Strom:

This department has reviewed the information concerning the above-referenced project submitted under date of July 27, 2004, with respect to possible environmental impacts.

This department believes that environmental impacts from the proposed construction will be minor and can be controlled by proper construction methods. With respect to construction, we have the following comments:

1. Care is to be taken during construction activity near any water of the state to minimize adverse effects on a water body. This includes minimal disturbance of stream beds and banks to prevent excess siltation, and the replacement and revegetation of any disturbed area as soon as possible after work has been completed. Caution must also be taken to prevent spills of oil and grease that may reach the receiving water from equipment maintenance, and/or the handling of fuels on the site. Guidelines for minimizing degradation to waterways during construction are attached.

2. Projects disturbing one or more acres are required to have a permit to discharge storm water runoff until the site is stabilized by the reestablisment of vegetation or other permanent cover. Further information on the storm water permit may be obtained from the Department's website or by calling the Division of Water Quality (701-328-5210). Also, cities may impose additional requirements and/or specific best management practices for construction affecting their storm drainage system. Check with the local officials to be sure any local storm water management considerations are addressed.

The department owns no land in or adjacent to the proposed improvements, nor does it have any projects scheduled in the area. In addition, we believe the proposed activities are consistent with the State Implementation Plan for the Control of Air Pollution for the State of North Dakota.



Rec 7 Sep 04

These comments are based on the information provided about the project in the above-referenced submittal. The U.S. Army Corps of Engineers may require a water quality certification from this department for the project if the project is subject to their Section 404 permitting process. Any additional information which may be required by the U.S. Army Corps of Engineers under the process will be considered by this department in our determination regarding the issuance of such a certification.

If you have any questions regarding our comments, please feel free to contact this office.

Sincerely,

L. David Glatt, Chief
Environmental Health Section

LDG:cc
Attach.

NORTH DAKOTA DEPARTMENT OF HEALTH
Environmental Health Section

*Location:*
1200 Missouri Avenue
Bismarck, ND 58504-5264

*Fax #:*
701-328-5200

*Mailing Address:*
P.O. Box 5520
Bismarck, ND 58506-5520

December 2000

## Construction and Environmental Disturbance Requirements

These represent the minimum requirements of the North Dakota Department of Health. They ensure that minimal environmental degradation occurs as a result of construction or related work which has the potential to affect the waters of the State of North Dakota. All projects will be designed and implemented to restrict the losses or disturbances of soil, vegetative cover, and pollutants (chemical or biological) from a site.

### Soils

Prevent the erosion of exposed soil surfaces and trapping sediments being transported. Examples include, but are not restricted to, sediment dams or berms, diversion dikes, hay bales as erosion checks, riprap, mesh or burlap blankets to hold soil during construction, and immediately establishing vegetative cover on disturbed areas after construction is completed. Fragile and sensitive areas such as wetlands, riparian zones, delicate flora, or land resources will be protected against compaction, vegetation loss, and unnecessary damage.

### Surface Waters

All construction which directly or indirectly impacts aquatic systems will be managed to minimize impacts. All attempts will be made to prevent the contamination of water at construction sites from fuel spillage, lubricants, and chemicals, by following safe storage and handling procedures. Stream bank and stream bed disturbances will be controlled to minimize and/or prevent silt movement, nutrient upsurges, plant dislocation, and any physical, chemical, or biological disruption. The use of pesticides or herbicides in or near these systems is forbidden without approval from this Department.

### Fill Material

Any fill material placed below the high water mark must be free of top soils, decomposable materials, and persistent synthetic organic compounds (in toxic concentrations). This includes, but is not limited to, asphalt, tires, treated lumber, and construction debris. The Department may require testing of fill materials. All temporary fills must be removed. Debris and solid wastes will be removed from the site and the impacted areas restored as nearly as possible to the original condition.

DEPARTMENT OF THE AIR FORCE
319TH CIVIL ENGINEER SQUADRON
GRAND FORKS AIR FORCE BASE, NORTH DAKOTA

Mr Merlen E. Paaverud
State Historic Preservation Officer
State Historical Society of North Dakota
North Dakota Heritage Center
612 East Boulevard Avenue
Bismarck ND 58505-0830

RE: Environmental Assessment for Grand Forks Air Force Base, North Dakota.

Dear Mr. Paaverud:

The U.S. Air Force is preparing an environmental assessment (EA) on the Final Draft of the Integrated Natural Resources Management Plan (INRMP). Attached is a CD containing a copy of the EA included in Chapter 8. Please review the document and identify any additional resources within your agency's responsibility that may be impacted by the action. Comments should be sent within 15 days of receipt of this letter to:

Mrs. Diane Strom, 319 CES/CEVA
525 Tuskegee Airmen Blvd.
Grand Forks AFB, ND 58205-6434

Your assistance in providing information is greatly appreciated. If you have any questions, please call Mrs. Strom at 701-747-6394.

Sincerely,

WAYNE A. KOOP
Environmental Management Flight Chief

Attachment:
Environmental Assessment

**From:** Rundquist Kristen A Civ 319 CES/CEVC
**Sent:** Wednesday, August 25, 2004 2:29 PM
**To:** Carter Tracy K Civ 319 CES/CEV
**Subject:** FW: No Public Comments on Integrated Natural Resources Management Plan (INRMP)

Please file in CEVA 54 B.

-----Original Message-----
**From:** Strom Diane M Civ 319 CES/CEVA
**Sent:** Wednesday, August 25, 2004 2:16 PM
**To:** Rundquist Kristen A Civ 319 CES/CEVC
**Subject:** No Public Comments on Integrated Natural Resources Management Plan (INRMP)

Neither I, nor the Public Affairs Office, received any public comments on the INRMP.

Diane Strom

-----Original Message-----
**From:** Gee Ashley K 1Lt 319 ARW/PA
**Sent:** Wednesday, August 25, 2004 1:54 PM
**To:** Strom Diane M Civ 319 CES/CEVA
**Cc:** Meridith Michael J 1Lt 319 ARW/PA
**Subject:** RE: Integrated Natural Resources Management Plan (INRMP)

No we did not.

V/R,

Lt Ashley Gee

> -----Original Message-----
> **From:** Strom Diane M Civ 319 CES/CEVA
> **Sent:** Wednesday, August 25, 2004 1:26 PM
> **To:** Gee Ashley K 1Lt 319 ARW/PA
> **Cc:** Meridith Michael J 1Lt 319 ARW/PA
> **Subject:** Integrated Natural Resources Management Plan (INRMP)
>
> The INRMP notice for public review was published in The Leader on 9 Jul 04, and the Grand Forks Herald on 8 and 10 Jul 04.
>
> Did your office receive any public comments or questions?
>
> Thanks for your assistance.
>
> Diane M. Strom, 319 CES/CEVA
> NEPA/EIAP Program
> Environmental Impact Analysis Process
> 525 Tuskegee Airmen Blvd
> Grand Forks AFB ND 58205-6434
> Phone (701) 747-6394
> Fax (701) 747-6155
> E-mail: diane.strom@grandforks.af.mil

**From:** Rundquist Kristen A Civ 319 CES/CEVC
**Sent:** Wednesday, August 25, 2004 1:15 PM
**To:** Carter Tracy K Civ 319 CES/CEV
**Subject:** FW: Grand Forks INRMP

**Importance:** High
Please File in CEVA 54B
-----Original Message-----
**From:** Summers Will J GS-13 AMC/A7VQ
**Sent:** Tuesday, August 24, 2004 5:05 PM
**To:** Rundquist Kristen A Civ 319 CES/CEVC
**Subject:** Grand Forks INRMP
**Importance:** High

Kirsten,
I reviewed the draft copy of the Grand Forks AFB Integrated Natural Resources Management Plan. I have provided my comments to you verbatim.
I found the plan is satisfactory to our needs, and any revisions may be made at the first annual update. This will allow us to resume our natural resources management, with a current working plan, so long as it is found acceptable by the USFWS and state DNR.
Please contact me if you have any questions.
V.resp.,
Will S.

William J. Summers, Natural Resources Manager
Headquarters, Air Mobility Command
DSN 779-0842/(618)229-0842
FAX: X-0257

James M. Waller, Chairman
Howard L. Warren, Chief Executive Officer

J.M. WALLER ASSOCIATES
MANAGING THE VISION

Charles W. Scott, R.A., President
James W. Emery, Jr., Chief Financial Officer

April 20, 2004

Ms. Kristen Rundquist
Natural Resources Program Manager
319 CES/CEVA
525 Tuskegee Airmen Blvd
Grand Forks AFB, ND 58205-6434

Subject: Transmittal of 2004-2008 INRMP Pre-Draft Update for Grand Forks AFB

Dear Ms. Rundquist:

Enclosed is one copy of the Pre-Draft INRMP for your review. Please provide comments within two weeks. It is important to note that not all of the information for the data layers for AICUZ Figure (Chapter 8, Figure 8.7-2) was received. If you will provide this information with your comments, we will update this figure.

Should you have any questions, please do not hesitate to call Julie Jeter, Mark Merrill or myself at (210) 822-8006.

Sincerely,

Samuel E. Garcia
Director, Consulting Operations

Enclosure
As stated

## STAFF SUMMARY SHEET

| | TO | ACTION | SIGNATURE (Surname), GRADE AND DATE | | TO | ACTION | SIGNATURE (Surname), GRADE AND DATE |
|---|---|---|---|---|---|---|---|
| 1 | 319 MSG/CCE | Coord | 03 6 Dec 04 | 6 | 319 ARW/CC | Sign | Col 20 Dec |
| 2 | 319 MSG/CD | Coord | | 7 | | | |
| 3 | 319 MSG/CC | Coord | Lt Col 13 Dec 04 | 8 | | | |
| 4 | 319 ARW/JA | Coord | MARK W. HANSON 13 Dec 04 | 9 | | | |
| 5 | 319 ARW/CCE | Coord | Capt 17 Dec 04 | 10 | | | |

| SURNAME OF ACTION OFFICER AND GRADE | SYMBOL | PHONE | TYPIST'S INITIALS | SUSPENSE DATE |
|---|---|---|---|---|
| Rundquist, GS-11 | 319 CES/CEVC | 7-4774 | kr | 20041223 |

| SUBJECT | DATE |
|---|---|
| GFAFB Integrated Natural Resources Mangement Plan (INRMP) 2004 | DEC 0 1 2004 |

SUMMARY

1. The revised Integrated Natural Resources Management Plan (INRMP) at atch 2 has received ND Game and Fish and US Fish & Wildlife Service approvals. Additionally, an environmental assessment on the actions necessary implement the INRMP has completed public advertisement and received no comments. The resultant Finding of No Significant Impact (FONSI) is at atch 1. Both documents require Wing Commander signature.

2. The Executive Summary section of the INRMP (ES-1 through ES-3) provides a brief discussion of the goals and objectives outlined in the document.

3. The AFI 32-7064, Integrated Natural Resources Management, mandates that an INRMP be updated every 5 years and implemented according to the Sikes Act (amended) of 1997. Correspondence concerning this revised INRMP, including AMC Natural Resources Manager coordination, is included in Appendix C within the INRMP.

4. RECOMMENDATION: 319 ARW/CC sign/approve the FONSI at tab 1and the INRMP at tab 2.

MARY C. GILTNER, GM-13, DAF
Deputy Base Civil Engineer

2 Tabs
1. FONSI
2. INRMP Approval Page

**DEPARTMENT OF THE AIR FORCE**
HEADQUARTERS 319TH AIR REFUELING WING (AMC)
GRAND FORKS AIR FORCE BASE, NORTH DAKOTA

13 December 2004

MEMORANDUM FOR 319 ARW/CC

FROM: 319 ARW/JA

SUBJECT: Environmental Assessment and Integrated Natural Resources Management Plan

1. **ISSUE/RECOMMENDATION:** The proposed Environmental Assessment and INRMP are legally sufficient.

2. **LAW**: National Environmental Policy Act – AFI 32-7064 Integrated Natural Resources Management Plan

3. **FACTS:** The integrated natural resources management plan (INRMP) has been prepared according to AFI 32-7064. This document appropriately serves as guidance for natural resources management at Grand Forks Air Force Base, North Dakota. The INRMP explains how GFAFB will manage natural resources in compliance with federal, state, and local requirements.

4. **DISCUSSION:** From a legal viewpoint, the proposed INRMP does not have a significant environmental impact. The INRMP is a fairly extensive documentation of natural resource issues at GFAFB. The proposed document is legally sufficient.

5. If you have any questions, I can be reached at ext. 7-3618.

Mark W. Hanson

MARK W. HANSON, GS-12, DAF
Chief, General Law

*Attorney client privilege material and/or attorney work product.*
*This document was prepared in direct or indirect anticipation of litigation. Not for release or transfer outside of the Air Force without specific approval of the originator or higher authority.*
*Not subject to discovery or release under P.L. 95-502 (5 USC 552).*

**Tracking Number: 3572**

| 319 CES/CEV General Correspondence | | | | |
|---|---|---|---|---|
| ECT | Integrated Natural Resources Management Plan - Final Signature | | | |
| RCV'D | 11/19/2004 | OPR NAME | Kristen Rundquist | |
| SUSPENSE | 12/23/2004 | OPR ORG | 319 CES/CEV / CEVC | |
| ACTION | JA - Please provide legal review -- 319 ARW/CC please sign approval page | | | |

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| CD | (Cllr) 13 Dec 04 | | | | |
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CCS
CCR mcn 17 Dec 04
CV
CC

# APPENDIX D
# FEDERAL and STATE DEPREDATION PERMITS and INTERAGENCY AGREEMENTS

DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE

3-201
(1/97)

# FEDERAL FISH AND WILDLIFE PERMIT

U.S. Fish and Wildlife Service
Migratory Bird Permit Office
P.O. Box 25486, DFC (60154)
Denver, Colorado 80225-0486
(303) 236-8171

2. AUTHORITY-STATUTES
16 USC 703-712

REGULATIONS *(Attached)*
50 CFR Part 13
50 CFR 21.41

1. PERMITTEE

GRAND FORKS AIR FORCE BASE
U.S. AIR FORCE
ATTN: MARY GILTNER, 319 CES/CEVP
525 TUSKEGEE AIRMAN BLVD.
GRAND FORKS AFB, ND 58205-6434
U.S.A.

MCG
CEV – FYA

3. NUMBER
**MB762754-0**

| 4. RENEWABLE | 5. MAY COPY |
|---|---|
| ☐ YES | ☐ YES |
| ☒ NO | ☐ NO |

| 6. EFFECTIVE | 7. EXPIRES |
|---|---|
| 02/10/2005 | 12/31/2005 |

8. NAME AND TITLE OF PRINCIPAL OFFICER *(If #1 is a business)*
MARY C. GILTNER
DEPUTY COMMANDER 319 CIVIL ENGINEER

9. TYPE OF PERMIT
DEPREDATION

10. LOCATION WHERE AUTHORIZED ACTIVITY MAY BE CONDUCTED

ON OR NEARBY RUNWAYS AND AT VARIOUS BUILDINGS AND LOCATIONS AT THE AIR FORCE BASE, GRAND FORKS, NORTH DAKOTA.

11. CONDITIONS AND AUTHORIZATIONS:

A. GENERAL CONDITIONS SET OUT IN SUBPART D OF 50 CFR 13, AND SPECIFIC CONDITIONS CONTAINED IN FEDERAL REGULATIONS CITED IN BLOCK #2 ABOVE, ARE HEREBY MADE A PART OF THIS PERMIT. ALL ACTIVITIES AUTHORIZED HEREIN MUST BE CARRIED OUT IN ACCORD WITH AND FOR THE PURPOSES DESCRIBED IN THE APPLICATION SUBMITTED. CONTINUED VALIDITY, OR RENEWAL, OF THIS PERMIT IS SUBJECT TO COMPLETE AND TIMELY COMPLIANCE WITH ALL APPLICABLE CONDITIONS, INCLUDING THE FILING OF ALL REQUIRED INFORMATION AND REPORTS.

. THE VALIDITY OF THIS PERMIT IS ALSO CONDITIONED UPON STRICT OBSERVANCE OF ALL APPLICABLE FOREIGN, STATE, LOCAL OR OTHER FEDERAL LAW.

C. VALID FOR USE BY PERMITTEE NAMED ABOVE.

**AND ANY OTHER PERSONS UNDER THE DIRECT CONTROL OF, UNDER, CONTRACT TO, OR EMPLOYED BY THE PERMITTEE ONLY TO THE EXTENT NECESSARY IN ACCOMPLISHING THE PURPOSE AUTHORIZED BELOW. SUBMIT A LIST OF SUBPERMITTEES WITH ANNUAL REPORT.**

Authorized Subpermittees: Everett Crouse, Samuel Losek, Richard Roseboom, Christopher Knauf, Matthew Coleman.

D. Permittee, and subpermittees, are authorized to take, transport and temporarily possess, **NO MORE THAN ONE-HUNDRED (100) CLIFF SWALLOWS *(Petrochelidon fulva)*, ONE-HUNDRED (100) BARN SWALLOWS *(Hirundo rustica)*,TWENTY-FIVE (25) MALLARDS *(Anas platyrhynchos)*, TWENTY-FIVE (25) BLUE WINGED TEALS *(Anas discors)*, TWENTY-FIVE (25) REDHEAD DUCKS *(Aythya americana)*, TWENTY-FIVE (25) RUDDY DUCKS *(Oxyura jamaicensis)*, TWENTY-FIVE (25) NORTHERN SHOVELERS *(Anas clypeata)*, TWENTY-FIVE (25) CANADA GEESE *(Branta canadensis)*, FIFTEEN (15) SWAINSON'S HAWKS *(Buteo swainsoni)*, FIFTEEN (15) RED-TAILED HAWKS, *(Buteo jamaicensis)*, ONE-HUNDRED (100) RING-BILLED GULLS *(Larus delawarensis)*, SEVENTY-FIVE (75) HORNED LARKS *(Eremophila alpestris)*, SEVENTY-FIVE (75) MOURNING DOVES *(Zenaida macroura)*, FIVE-HUNDRED (500) CLIFF SWALLOW NESTS *(Petrochelidon fulva)*, *FIVE*-HUNDRED (500) BARN SWALLOW NESTS *(Hirundo rustica)*,,** to alleviate a significant hazard to air navigation from migratory birds that are a threat to arriving or departing aircraft.

E. Failure to comply with ANY of these conditions listed may result in the immediate suspension of this permit.

F. Permittee must also comply with the attached Depredation Standard Conditions. **(PERMIT IS INVALID WITHOUT ATTACHED CONDITIONS).**

☒ ADDITIONAL CONDITIONS AND AUTHORIZATIONS ALSO APPLY

12. REPORTING REQUIREMENTS

ANNUALLY BY JANUARY 31 FOR THE PRECEDING CALENDAR YEAR ENDING DECEMBER 31.

| ISSUED BY | TITLE | DATE |
|---|---|---|
| [signature] | CHIEF, MBPO, REGION 6 | 02/10/2005 |

**STANDARD CONDITIONS**
**MIGRATORY BIRD DEPREDATION PERMITS**
**(50 CFR Part 13; 50 CFR 21.41)**

Standard conditions for depredation permits are below. Failure to comply with the conditions of your permit could be cause for suspension of the permit. If you have questions regarding the conditions of your permit, refer to the regulations or contact the migratory bird permit office that issued your permit. Regulations and contact information are available on the Internet at: http://permits.fws.gov/ltr/ltr.shtml.

1. You, and any subpermittees, must carry a legible copy of this permit, and display it upon request, whenever you are exercising its authority.

2. You may not exercise the authorization granted by this permit contrary to the laws of the applicable State, County, Municipal, or Tribal government, or any other applicable law.

3. You are not authorized to take, capture, or harass Bald or Golden Eagles or federally listed threatened or endangered species.

4. You may not use blinds, pits or other means of concealment, decoys, duck calls, or other devices to lure or entice birds within gun range.

5. If you use a shotgun to take birds, it can be no larger than 10 gauge and it must be fired from the shoulder. You must use a nontoxic shot listed in 50 CFR 20.21(j). (See http://migratorybirds.fws.gov/cfr/nontoxicshot.pdf)

6. To minimize lethal take of birds, you are required to continually apply nonlethal methods of harassment alternately with lethal control.

7. You are not authorized to take any birds, nests, or eggs, or to release birds on Federal or State lands or other public or private property without additional written authorization, permission, or permits from the applicable Federal or State agency, landowner, or custodian.

8. Unless otherwise specified on the face of the permit, birds, nests or eggs taken under this permit must be (1) turned over to the U.S. Department of Agriculture for official purposes, (2) donated to a public educational or scientific institution as defined in 50 CFR 10, or (3) completely destroyed by burial or incineration.

9. You must maintain records of the activities conducted under your permit for 5 years from the date of expiration of the permit (50 CFR 13.46), including the following information: species (common name); date taken; location where taken; number of birds killed or relocated; number of eggs, or nests with eggs, taken or relocated; name of person taking birds; and the final disposition of the birds or eggs.

10. You must keep all records relating to the permitted activities at the location(s) identified in writing by you to the issuing office.

11. Acceptance of this permit authorizes the Service to inspect any wildlife held, and to audit or copy any permits, books, or records required to be kept by the permit and governing regulations.

(6/21/2004)

DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE

3-201
(1/97)

# FEDERAL FISH AND WILDLIFE PERMIT

**U.S. Fish and Wildlife Service**
**Migratory Bird Permit Office**
**P.O. Box 25486, DFC (60154)**
**Denver, Colorado 80225-0486**
**(303) 236-8171**

1. PERMITTEE

GRAND FORKS AIR FORCE BASE
U.S. AIR FORCE
ATTN: MARY GILTNER, 319 CES/CEVP
525 TUSKEGEE AIRMAN BLVD.
GRAND FORKS AFB, ND 58205-6434
U.S.A.

2. AUTHORITY-STATUTES
16 USC 703-712

REGULATIONS *(Attached)*
50 CFR Part 13
50 CFR 21.41

3. NUMBER
**MB762754-1** AMENDMENT

| 4. RENEWABLE | 5. MAY COPY |
|---|---|
| ☐ YES | ☐ YES |
| ☒ NO | ☐ NO |

| 6. EFFECTIVE | 7. EXPIRES |
|---|---|
| 08/09/2005 | 12/31/2005 |

8. NAME AND TITLE OF PRINCIPAL OFFICER *(If #1 is a business)*
MARY C. GILTNER
DEPUTY COMMANDER 319 CIVIL ENGINEER

9. TYPE OF PERMIT
DEPREDATION

10. LOCATION WHERE AUTHORIZED ACTIVITY MAY BE CONDUCTED

ON OR NEARBY RUNWAYS AND AT VARIOUS BUILDINGS AND LOCATIONS AT THE AIR FORCE BASE, GRAND FORKS, NORTH DAKOTA.

11. CONDITIONS AND AUTHORIZATIONS:

A. GENERAL CONDITIONS SET OUT IN SUBPART D OF 50 CFR 13, AND SPECIFIC CONDITIONS CONTAINED IN FEDERAL REGULATIONS CITED IN BLOCK #2 ABOVE, ARE HEREBY MADE A PART OF THIS PERMIT. ALL ACTIVITIES AUTHORIZED HEREIN MUST BE CARRIED OUT IN ACCORD WITH AND FOR THE PURPOSES DESCRIBED IN THE APPLICATION SUBMITTED. CONTINUED VALIDITY, OR RENEWAL, OF THIS PERMIT IS SUBJECT TO COMPLETE AND TIMELY COMPLIANCE WITH ALL APPLICABLE CONDITIONS, INCLUDING THE FILING OF ALL REQUIRED INFORMATION AND REPORTS.

B. THE VALIDITY OF THIS PERMIT IS ALSO CONDITIONED UPON STRICT OBSERVANCE OF ALL APPLICABLE FOREIGN, STATE, LOCAL OR OTHER FEDERAL LAW.

C. VALID FOR USE BY PERMITTEE NAMED ABOVE.

**AND ANY OTHER PERSONS UNDER THE DIRECT CONTROL OF, UNDER, CONTRACT TO, OR EMPLOYED BY THE PERMITTEE ONLY TO THE EXTENT NECESSARY IN ACCOMPLISHING THE PURPOSE AUTHORIZED BELOW. SUBMIT A LIST OF SUBPERMITTEES WITH ANNUAL REPORT.**

Authorized Subpermittees: Everett Crouse, Richard Roseboom, Sandra Chandler, Eric Fortwengler, and, Kenneth Langert

D. Permittee, and subpermittees, are authorized to take, transport and temporarily possess, **NO MORE THAN ONE-HUNDRED (100) CLIFF SWALLOWS *(Petrochelidon fulva)*, ONE-HUNDRED (100) BARN SWALLOWS *(Hirundo rustica)*,TWENTY-FIVE (25) MALLARDS *(Anas platyrhynchos)*, TWENTY-FIVE (25) BLUE WINGED TEALS *(Anas discors)*, TWENTY-FIVE (25) REDHEAD DUCKS *(Aythya americana)*, TWENTY-FIVE (25) RUDDY DUCKS *(Oxyura jamaicensis)*, TWENTY-FIVE (25) NORTHERN SHOVELERS *(Anas clypeata)*, TWENTY-FIVE (25) CANADA GEESE *(Branta canadensis)*, FIFTEEN (15) SWAINSON'S HAWKS *(Buteo swainsoni)*, FIFTEEN (15) RED-TAILED HAWKS, *(Buteo jamaicensis)*, ONE-HUNDRED (100) RING-BILLED GULLS *(Larus delawarensis)*, SEVENTY-FIVE (75) HORNED LARKS *(Eremophila alpestris)*, SEVENTY-FIVE (75) MOURNING DOVES *(Zenaida macroura)*, FIVE-HUNDRED (500) CLIFF SWALLOW NESTS *(Petrochelidon fulva)*, *FIVE*-HUNDRED (500) BARN SWALLOW NESTS *(Hirundo rustica)*,**, to alleviate a significant hazard to air navigation from migratory birds that are a threat to arriving or departing aircraft.

E. Failure to comply with ANY of these conditions listed may result in the immediate suspension of this permit.

F. Permittee must also comply with the attached Depredation Standard Conditions. **(PERMIT IS INVALID WITHOUT ATTACHED CONDITIONS).**

G. Permit amended to change names of subpermittee's in Block 11.C.

☒ ADDITIONAL CONDITIONS AND AUTHORIZATIONS ALSO APPLY

12. REPORTING REQUIREMENTS

ANNUALLY BY JANUARY 31 FOR THE PRECEDING CALENDAR YEAR ENDING DECEMBER 31.

| ISSUED BY | TITLE | DATE |
|---|---|---|
| [signature] | CHIEF, MBPO, REGION 6 | 08/09/2005 |

**DIRECTOR'S PERMIT**

North Dakota Game and Fish Department
Administrative Services Div. SFN 6049

No. 0204

Date June 28, 2005

Permission is hereby granted to: Mary Giltner, 319 CES/CD, 6434 525 Tuskegee Airman Blvd., Grand Forks AFB 58205-

To take migratory birds such as: cliff and barn swallows, various species of gulls and waterfowl including ducks and geese. No threatened or endangered species will be taken. Permit needed to reduce hazards to aircraft and facilities as stated in your letter of June 24, 2005.

This permit void after 07/31/08

Director

DEPARTMENT OF THE AIR FORCE
319TH CIVIL ENGINEER SQUADRON
GRAND FORKS AIR FORCE BASE, NORTH DAKOTA

JUN 2 4 2005

MEMORANDUM FOR ND Game and Fish Department, Wildlife Division
Attn: Mr. Michael Johnson
100 North Bismarck Expressway
Bismarck ND 58501-5095

FROM: 319 CES/CD
525 Tuskegee Airmen Blvd
Grand Forks AFB ND 58205-6434

SUBJECT: Request for Renewal of Directors Permit # 0126 (Migratory Birds)

1. This letter is to notify you that Grand Forks AFB may have a need to take migratory birds as part of our Bird Aircraft Strike Hazard Program (BASH). The taking of migratory birds will only occur when absolutely necessary for health and safety reasons. We anticipate the need to take cliff swallows, barn swallows, various species of gulls, and various species of waterfowl that includes ducks and geese. Please advise us of any special concerns you may have with regard to any of the aforementioned species populations.

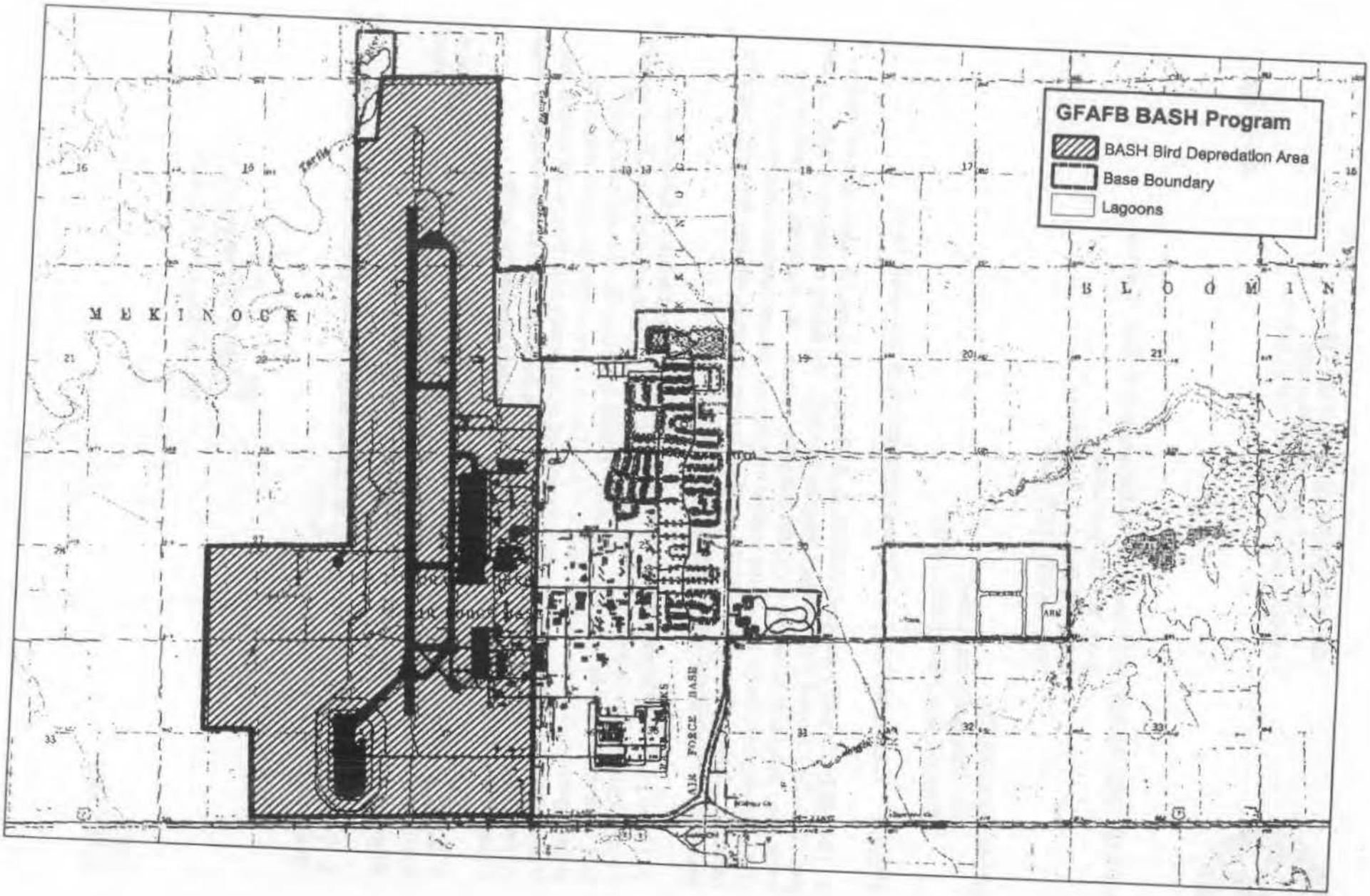
2. Grand Fork's BASH program includes various scare tactics and habitat modifications. Twelve propane scare cannons are along with 11 mm and 12 mm scare cartridges. Bioaccoustics have been utilized but have proven ineffective. Habitat modifications include maintaining airfield grass heights between 9-14 inches. Flight Control (goose repellant) is utilized on the lagoon grassy area to prevent geese from resting and subsequently migrating to the airfield area. Airfield drainage ditches have been evaluated and slope design changed to allow proper drainage. Cut and fallen decaying trees have been removed to eliminate perches for hawks.

3. Migratory birds will only be taken if non-lethal control measures fail to eliminate the threat to installation aircraft. No threatened or endangered species will be taken. If the need arises to take migratory birds, we will document our actions and notify you of the results.

4. Questions concerning this matter can be directed to Mr. Wayne Koop, Environmental Management Flight Chief, at (701) 747-4590.

MARY C. GILTNER, DAFC
Deputy Base Civil Engineer

Atch
BASH Map


GFAFB BASH Program
BASH Bird Depredation Area
Base Boundary
Lagoons
MEKINOCK
BLOOMIN
AIR FORCE BASE

ROUTING AND TRANSMITTAL SLIP

Date
21-Jun-05

| | To: (Name, office symbol, room number, building, Agency/Post) | Initials | Date |
|---|---|---|---|
| | CEVP | | |
| 1. | CEV | | 21 Jun 05 |
| 2. | CD | | 22 Jun. |
| 3. | | MCO | |
| 4. | | | |
| 5. | | | |

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|---|---|---|---|---|---|
| | Action | | File | | Note and Return |
| | Approval | | For Clearance | | Per Conversation |
| | As Requested | | For Correction | | Prepare Reply |
| | Circulate | | For Your Information | | See Me |
| | Comment | | Investigate | 3 | Signature |
| 1,2,3 | Coordination | | Justify | | |

REMARKS

Letter to ND Game and Fish for Directors Permit # 0126 (Migratory Birds) – BASH Program

[redacted]

DO NOT *use* this form as a RECORD of approvals, concurrences, disposals, clearances, and similar actions

FROM: *(Name, org. symbol, Agency/Post)*
***Linda Fuglestad, BASH Program Manager***

Room No. - Bldg.

Phone No. 747-4655

**OPTIONAL FORM 41** (Rev. 1-94)
Prescribed by GSA

Mary — Current permit below expires 31 Jul of don taking birds on flightline. This pkg is for renewal. Wkap 22Jan. sign LTR pls →



**DIRECTOR'S PERMIT**

North Dakota Game and Fish Department
Administrative Services Div. SFN 6049

No. 0126

Date 12/20/02

Permission is hereby granted to: Mary Giltner, GM-13, Deputy Civil Base Engineer, 525 Tuskegee Airmen Blv., GFAFB 58205-6434

To take migratory birds such as: cliff and barn swallows, various species of gulls and various species of waterfowl including ducks and geese. No threatened or endangered species will be taken. Permit needed to reduce hazards to aircraft and facilities as stated in your letter of 12/16/02

This permit void after 07/31/05

Director

[redacted]

DPRD-762754. 12/31/2004
GRAND FORKS AIR FORCE BASE
U.S. AIR FORCE
ATTN: MARY GILTNER, 319 CES/CEVP
525 TUSKEGEE AIRMAN BLVD.
GRAND FORKS AFB, ND 58205-6434
U.S.A.

U.S. FISH & WILDLIFE .VICE - MIGRATORY BIRD PERMIT OFFICE
P.O. Box 25486, DFC (60154), Denver, Colorado 80225-0486
(303) 236-8171

# DEPREDATION - ANNUAL REPORT

**PERMIT NUMBER:**

**ANNUAL REPORT YEAR:** 2004

**REPORT DUE DATE:** JANUARY 31, 2005

**Phone:** 701-747-4655

**Email:** linda.fuglestad@grandforks.af.mil

**INSTRUCTIONS:** Please provide (type or print) the information requested below for all activities conducted under your permit during the report year, and return the completed report to the above address by the due date. Use of this form is not mandatory, but the same information must be submitted. A supplemental sheet is available if needed. Filing an annual report is a condition of your permit. Failure to file a timely report could result in suspension of your permit. You must submit a report even if you had no activity during the year. Please make sure you sign and date the certification below before submitting your report. (Ref. 50 CFR parts 13, 21 & 22)

| Species (Common Name) | Month Taken | LOCATION (County & State) | NUMBER OF BIRDS KILLED | NUMBER OF BIRDS RELOCATED* | NUMBERS OF Eggs Taken** | NUMBERS OF Eggs Relocated* | NUMBERS OF Nests Affected | FINAL DISPOSITION (WHAT YOU DID WITH THE BIRDS, EGGS, OR CARCASSES) |
|---|---|---|---|---|---|---|---|---|
| No takes | for | 2004 | | | | | | |
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* Relocated in the wild. ** Taken = destroyed, addled, oiled, removed from wild.

**CERTIFICATION:** I certify that the information in this report is true and correct to the best of my knowledge. I understand that any false statement herein may subject me to the criminal penalties of 18 U.S.C. 1001.

Signature: Mary Giltner Date: 1-4-05

OMB No. 1018-0022 Expires 04/30/2004

FWS form 3-202-9 (Rev 02/01)

DEPARTMENT OF THE AIR FORCE
319TH CIVIL ENGINEER SQUADRON
GRAND FORKS AIR FORCE BASE, NORTH DAKOTA

MEMORANDUM FOR SEE DISTRUBITION LIST (Atch 4) MAR 0 2 2005

FROM: 319 CES/CD

SUBJECT: Requirements for US Migratory Bird Subpermitees

1. This letter is to inform all subpermitees under the US Fish and Wildlife Migratory Bird Depredation Permit of their responsibilities. All permitees will read and become familiar with the regulations contained in Title 50, part 13 and 21 Code of Federal Regulations (CFR) specifically the following:

   a. This permit does not alleviate any requirements under State and local laws.

   b. All subpermitees are required to carry a copy of the permit whenever depredating.

   c. Record all depredations and submit reports weekly to CEV.

   d. Depredation is to be used as a last resort.

   e. Dead birds will be bagged and disposed of in a dumpster.

   f. Do not take Endangered or Threatened species.

   g. Take only those species listed on the permit.

   h. Do not exceed the authorized take limit.

   i. Do not destroy any swallow nests that contain eggs.

2. Questions or concerns can be addressed to CEV at 7-4655.

MARY C. GILTNER, GM-13, DAF
Deputy Base Civil Engineer

Attachments:
1. Depredation Permit
2. Depredation Map
3. Title 50 CFR Part, 13 and 21
4. Distribution List - Subpermittees

SUPPLEMENTAL SHEET

**DEPREDATION - ANNUAL REPORT** **REPORT YEAR: 2004** **SUPPLEMENTAL PAGE NO:**

**PERMITTEE:** _____ **PERMIT NUMBER:** _____ (FWS form 3-202-9(Rev 02/01))

| Species (Common Name) | Month Taken | Location (County & State) | Number of Birds Killed | Number of Birds Relocated | Numbers of Eggs Taken* | Numbers of Eggs Relocated** | Numbers of Nests Affected | Final Disposition (What you did with the birds, eggs, or carcasses) |
|---|---|---|---|---|---|---|---|---|
| NO Takes | for | 2004 | | | | | | |
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* Relocated in the wild ** Taken = destroyed, addled, oiled, removed from wild.

## STAFF SUMMARY SHEET

| | TO | ACTION | SIGNATURE (Surname), GRADE AND DATE | | TO | ACTION | SIGNATURE (Surname), GRADE AND DATE |
|---|---|---|---|---|---|---|---|
| 3 1 | 319 MSG/CC | ~~Coord~~ Approve | [signature] Col 15 Jan 03 | 6 | [redacted] | | |
| | 319 ARW/SE | Coord | [signature] 23 Dec | 7 | | | |
| 2 | 319 ARW/JA | Coord | [signature] 29 Dec 03 Written Legal completed. | 8 | | | |
| | 4 | | | 9 | | | |
| | 5 | | | 10 | | | |

| SURNAME OF ACTION OFFICER AND GRADE | SYMBOL | PHONE | TYPIST'S INITIALS | SUSPENSE DATE |
|---|---|---|---|---|
| Olson GS-11 | 319 CES/CEVP | 7-4655 | lo | |

SUBJECT: 2004 Bird Depredation Permit

DATE: 19 DEC 2003

SUMMARY

1. The Migratory Bird Depredation Permit application (tab 1) is necessary to conduct Bird Aircraft Strike Hazard operations. The application does not include base lagoon areas because the Wildlife Services District Office has advised against depredation on the lagoons (tab 4). Additionally, a required separate application for Migratory Bird Depredation/Nest Removal is at tab 2.

2. At tab 3, a summary of damage abatement actions currently employed at GFAFB, as reported by the State Director of Animal and Plant Health Inspection Service, is provided to support base applications.

3. RECOMMENDATION: Request 319 ARW/SE/JA coordination. MSG/cc approve release of memo.

[signature]
PATRICK F. FOGARTY, Lt. Col, USAF
Base Civil Engineer

Tabs
1. Migratory Bird Depredation Permit
2. Migratory Bird Depredation /Nest Removal Permit
3. Migratory Bird Damage Project Report
4. Lagoon Site Visit Report

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 319TH AIR REFUELING WING (AMC)
GRAND FORKS AIR FORCE BASE, NORTH DAKOTA

21 JAN 2004

MEMORANDUM FOR MIGRATORY BIRD PERMIT OFFICE
U.S. Fish and Wildlife Services
P.O. Box 25486, DFC (60154)
Denver, Colorado 80225-0486

FROM: 319 CES/CD
525 Tuskegee Airmen Blvd
Grand Forks AFB ND 58205-6434

SUBJECT: Request for Permit to Remove Migratory Bird Nests

1. Grand Forks AFB requests a Depredation Nest Removal Permit to protect human health and to prevent aircraft mishap and loss. Grand Forks AFB Bird Aircraft Strike Hazard program includes various management techniques such as scare tactics and habitat modification. Nest removal will be used only as a last resort.

2. Barn and Cliff Swallows are major species of concern. Nest removal will be isolated to flight line buildings. It is estimated one hundred nests will need to be removed. The majority of the nests are partially built. The mud nests are destroyed when washed from the bldgs.

3. Attached is a Migratory Bird Damage Project Report prepared by Mr. Phil Mastrangelo, USDA/APHIS along with a map delineating the areas of concern for nest removal.

4. Records are maintained at the address listed below.

319 CES/CEV
525 Tuskegee Airmen Blvd
Grand Forks AFB, ND 58205-6434

5. Our point of contact for this request is Ms. Linda Olson at 701-747-4655.

MARY C. GILTNER
Deputy Base Civil Engineer

Attachments:
1. Permit Application Form
2. Migratory Bird Damage Project Report
3. Delineation Map
4. List of Sub-permitees

Department of the Interior
U.S. Fish & Wildlife Service

Expires 4/30/2004
OMB No. 1018-0022

# Federal Fish and Wildlife License/Permit Application Form

**Return to:**

Migratory Bird Permit Office
U.S. Fish and Wildlife Service
P.O. Box 25486, DFC (60154)
Denver, Colorado 80225-0486
(303) 236-8171

**Type of Activity:**

Migratory Bird – Depredation / Nest Removal

## A. Complete if applying as an individual

| 1.a. Last name: | 1.b. First name: | 1.c. Middle name or initial: | 1.d. Suffix |
|---|---|---|---|
| | | | |

| 1.e Doing business as (dba): | 2.a. Street Address (line 1): | 2.b. Street Address (line 2): |
|---|---|---|
| | | |

| 2.c. Street address (line 3): | 3.a. City: | 3.b. County: | 3.c. Province: | 3.d. State: |
|---|---|---|---|---|
| | | | | |

| 3.e. Zip code or postal code: | 3.f. Country (only for non-commercial): | 4. Date of birth (mm/dd/yyyy): | 5. Social Security No: |
|---|---|---|---|
| | | | |

| 6. Occupation: | 7. List of any business, agency, organizational, or institutional affiliation associated with the wildlife or plants to be covered by this license or permit: |
|---|---|
| | |

| 8. Home telephone number: | 9. Work telephone number: | 10. Fax number: | 11. E-mail address: |
|---|---|---|---|
| | | | |

## B. Complete if applying as a business, corporation, public agency or institution

| 1.a. Name of business, agency, or institution: | 1.b. Doing business as (dba): | 2. Tax identification no.: |
|---|---|---|
| GRAND FORKS AFB | UNITED STATES AIR FORCE | 1001 |

| 3.a. Street address (line 1): | 3.b. Street address (line 2): | 3.c. Street address (line 3): |
|---|---|---|
| 319 CES/CEVP | 525 TUSKEGEE AIRMEN BLVD | |

| 4.a. City: | 4.b. County | 4.c. State: | 4.d. Zip code: |
|---|---|---|---|
| GRAND FORKS AFB | GRAND FORKS | ND | 58205-6434 |

| 5.a. Principal officer - Last name: | 5.b. First name: | 5.c. Middle name or initial | 5.d. Suffix |
|---|---|---|---|
| GILTNER | MARY | C. | |

| 5.e. Principal officer title: | 6. Describe the type of business, agency, or institution: |
|---|---|
| DEPUTY COMMANDER CIVIL ENGINEER | NATIONAL DEFENSE |

| 7. Home telephone number: | 8. Work telephone number: | 9. Fax number: | 10. E-mail address: |
|---|---|---|---|
| 701-791-0546 | 701-747-4761 | 701-747-4869 | mary.giltner@grandforks.af.mil |

## C. All applicants complete

1. Do you currently have or have you had any Federal Fish and Wildlife License or Permit?
   Yes ☒ If yes, list the number of the most recent license or permit you hold: MB762754-0 No ☐

2. Have you obtained any required state or foreign government approval to conduct the activity you propose?
   Yes ☐ If yes, provide a copy of the license or permit. No ☐ Not Required ☒

3. Attachments: Complete the additional pages of this application. Application will not be considered complete without these pages. Incomplete applications may be returned.

4. Enclose check or money order payable to the U.S. FISH AND WILDLIFE SERVICE in the amount of $25.
   Institutions which qualify under 50 CFR 13.11(d)(3) may be exempt from fees. EXEMPT FEDERAL AGENCY

5. Certification: I hereby certify that I have read and am familiar with the regulations contained in Title 50, Part 13, of the Code of Federal Regulations and the other applicable parts in subchapter B of Chapter I of Title 50, and I further certify that the information submitted in this application for a license or permit is complete and accurate to the best of my knowledge and belief. I understand that any false statement herein may subject me to the criminal penalties of 18 U.S.C. 1001.

| Signature (in ink) of applicant or person responsible for permit in Block A or B | 7. Date (mm/dd/yyyy): |
|---|---|
| Mary Giltner | 01/21/2004 |

## LIST OF SUBPERMITTEES FOR DEPREDATION (NEST REMOVAL)

1. Everett Crouse
2. Stephen Chicosky
3. Patrick McCormack
4. Christopher Knauf
5. Matthew Coleman
6. Scott Seeley
7. Kenneth Coffman

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 319TH AIR REFUELING WING (AMC)
GRAND FORKS AIR FORCE BASE, NORTH DAKOTA

21 JAN 2004

MEMORANDUM FOR MIGRATORY BIRD PERMIT OFFICE
U.S. Fish and Wildlife Services
P.O. Box 25486, DFC (60154)
Denver, Colorado 80225-0486

FROM: 319 CES/CD
525 Tuskegee Airman Blvd
Grand Forks AFB ND 58205-6434

SUBJECT: Request for Migratory Bird Depredation Permit

1. Grand Forks AFB requests a Depredation Permit to protect human health and to prevent aircraft mishap and loss. Grand Forks AFB Bird Aircraft Strike Hazard program includes various management techniques such as scare tactics and habitat modification. Depredation will only occur as a last resort.

2. Attached is a Migratory Bird Damage Project Report prepared by Mr. Phil Mastrangelo, USDA/APHIS along with a map delineating the areas of concern for depredation. Depredation will only occur around the flight line area.

3. Depredation records are maintained at the address listed below.

319 CES/CEV
525 Tuskegee Airmen Blvd
Grand Forks AFB, ND 58205-6434

4. Our point of contact for this request is Ms. Linda Olson at 701-747-4655.

MARY C. GILTNER
Deputy Base Civil Engineer

Attachments:
1. Permit Application Form
2. Migratory Bird Damage Project Report
3. Delineation Map
4. List of Subpermitees

Department of the Interior
U.S. Fish & Wildlife Service

Expires 4/30/2004
OMB No. 1018-0022

# Federal Fish and Wildlife License/Permit Application Form

**Return to:**

Migratory Bird Permit Office
U.S. Fish and Wildlife Service
P.O. Box 25486, DFC (60154)
Denver, Colorado 80225-0486
(303) 236-8171

**Type of Activity:**

Migratory Bird – Depredation

## A. Complete if applying as an individual

| 1.a. Last name: | 1.b. First name: | 1.c. Middle name or initial: | 1.d. Suffix |
|---|---|---|---|
| | | | |

| 1.e Doing business as (dba): | 2.a. Street Address (line 1): | 2.b. Street Address (line 2): |
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| 2.c. Street address (line 3): | 3.a. City: | 3.b. County: | 3.c. Province: | 3.d. State: |
|---|---|---|---|---|
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| 3.e. Zip code or postal code: | 3.f. Country (only for non-commercial): | 4. Date of birth (mm/dd/yyyy): | 5. Social Security No: |
|---|---|---|---|
| | | | |

| 6. Occupation: | 7. List of any business, agency, organizational, or institutional affiliation associated with the wildlife or plants to be covered by this license or permit: |
|---|---|
| | |

| 8. Home telephone number: | 9. Work telephone number: | 10. Fax number: | 11. E-mail address: |
|---|---|---|---|
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## B. Complete if applying as a business, corporation, public agency or institution

| 1.a. Name of business, agency, or institution: | 1.b. Doing business as (dba): | 2. Tax identification no.: |
|---|---|---|
| GRAND FORKS AFB | UNITED STATES AIR FORCE | 1001 |

| 3.a. Street address (line 1): | 3.b. Street address (line 2): | 3.c. Street address (line 3): |
|---|---|---|
| 319 CES/CEVP | 525 TUSKEGEE AIRMEN BLVD | |

| 4.a. City: | 4.b. County | 4.c. State: | 4.d. Zip code: |
|---|---|---|---|
| GRAND FORKS AFB | GRAND FORKS | ND | 58205-6434 |

| 5.a. Principal officer - Last name: | 5.b. First name: | 5.c. Middle name or initial | 5.d. Suffix |
|---|---|---|---|
| GILTNER | MARY | C. | |

| 5.e. Principal officer title: | 6. Describe the type of business, agency, or institution: |
|---|---|
| DEPUTY COMMANDER CIVIL ENGINEER | NATIONAL DEFENSE |

| 7. Home telephone number: | 8. Work telephone number: | 9. Fax number: | 10. E-mail address: |
|---|---|---|---|
| 701-791-0546 | 701-747-4761 | 701-747-4869 | mary.giltner@grandforks.af.mil |

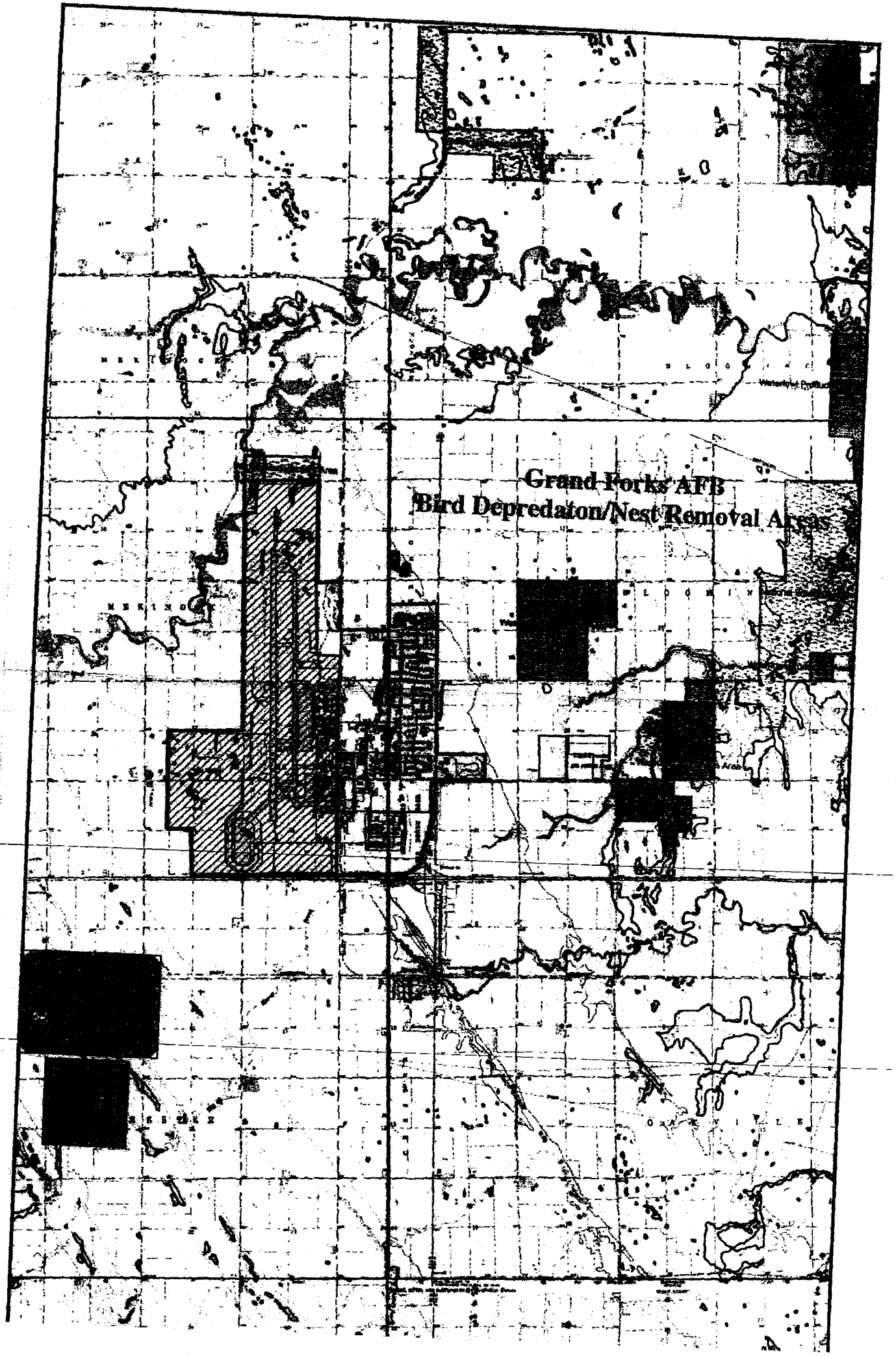
## C. All applicants complete

1. Do you currently have or have you had any Federal Fish and Wildlife License or Permit?
   Yes ☒ If yes, list the number of the most recent license or permit you hold: MB762754-0 No ☐
2. Have you obtained any required state or foreign government approval to conduct the activity you propose?
   Yes ☐ If yes, provide a copy of the license or permit. No ☐ Not Required ☒
3. Attachments: Complete the additional pages of this application. Application will not be considered complete without these pages. Incomplete applications may be returned.
4. Enclose check or money order payable to the U.S. FISH AND WILDLIFE SERVICE in the amount of $25.
   Institutions which qualify under 50 CFR 13.11(d)(3) may be exempt from fees. EXEMPT FEDERAL AGENCY
5. Certification: I hereby certify that I have read and am familiar with the regulations contained in Title 50, Part 13, of the Code of Federal Regulations and the other applicable parts in subchapter B of Chapter I of Title 50, and I further certify that the information submitted in this application for a license or permit is complete and accurate to the best of my knowledge and belief. I understand that any false statement herein may subject me to the criminal penalties of 18 U.S.C. 1001.

| 6. Signature (in ink) of applicant or person responsible for permit in Block A or B | 7. Date (mm/dd/yyyy): |
|---|---|
| Mary C Giltner | 01/21/2004 |

## LIST OF SUBPERMITEES FOR DEPREDATION

1. Everett Crouse
2. Stephen Chicosky
3. Patrick McCormack
4. Christopher Knauf
5. Matthew Coleman


Grand Forks AFB
Bird Depredaton/Nest Removal Areas

USDA United States Department of Agriculture
Animal and Plant Health Inspection Service
Wildlife Services
2110 Miriam Circle, Suite A
Bismarck ND 58501-2502
(701) 250-4405

December 1, 2003

Kelly Gonzales
U.S. Fish and Wildlife Service
P.O. Box 25486
Denver Federal Center
Denver, CO 80225-0486

Dear Kelly,

The Grand Forks Air Force Base (North Dakota) is in the process of renewing its depredation permit for 2004. Grand Forks AFB uses an integrated damage abatement program to mitigate aviation hazards created by the presence of various bird species. Attached is a summary of the damage abatement actions currently employed at Grand Forks AFB.

Renewal of their depredation permit would allow the inclusion of lethal control as means for enhancing the non-lethal harassment programs. Therefore I strongly recommend that a depredation permit be issued for the following birds and nests:

| Species | Number Requested for Permit |
|---|---|
| Cliff swallow | 100 |
| Barn swallow | 100 |
| Mallard | 25 |
| Blue wing teal | 25 |
| Redhead | 25 |
| Ruddy duck | 25 |
| Northern shoveler | 25 |
| Canada goose | 25 |
| Swainson's hawk | 15 |
| Red-tailed hawk | 15 |
| Ringed bill gull | 100 |
| Horned lark | 75 |
| Mourning dove | 75 |
| Cliff swallow nests | 500 |
| Barn swallow nests | 500 |

These would be the maximum numbers of birds/nests taken under the authority of a depredation permit. In all likelihood, the number of birds/nests actually taken would be less than the number authorized.

Please contact me if you need additional information.

Phil Mastrangelo
State Director

U. S. DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
WILDLIFE SERVICES

# MIGRATORY BIRD DAMAGE PROJECT REPORT

**1. COOPERATOR NAME, ADDRESS AND TELEPHONE NUMBER:**
(Include business/agency name, if appropriate)
Grand Forks Air Force Base
525 Tuskegee Airman Blvd.
Grand Forks AFB, ND 58205-6434
Attn: Mary Giltner
TELEPHONE: HOME: _____ WORK 701-747-4655

**2. LOCATION OF DAMAGE**
Grand Forks Air Force Base
3. COUNTY Grand Forks 4. STATE ND

**5. RESOURCE**

| A. RESOURCE CATEGORY | B. SPECIFIC RESOURCE(S) DAMAGED | C. NATURE OF DAMAGE |
|---|---|---|
| [ ] Agriculture [ ] Natural Resources [X] Property [X] Human Health/Safety | Aircraft and human health & safety | Damage to equipment (from bird droppings), threat to human health |

**6. DAMAGE ESTIMATE**

| A. QUANTITY OF LOSS AND UNIT OF MEASURE (pounds, acres, each, etc.) | B. DOLLAR LOSS (if available) | LOSS CONFIRMED BY WS |
|---|---|---|
| | [ ] Per unit (Dollar loss) [ ] Total | [ ] YES [X] NO |

| D. DURATION/TIME PERIOD OF DAMAGE | E. DATE ASSISTANCE REQUEST | F. DATE OF INVESTIGATION | G. INVESTIGATION TYPE |
|---|---|---|---|
| Throughout the year | 11/25/03 | 12/1/03 | [X] Site Visit [X] Phone [X] Letter [ ] Other |

**7. MIGRATORY BIRD SPECIES**

| A. DEPREDATING SPECIES | B. NUMBER INVOLVED | C. COMMENTS |
|---|---|---|
| 1 Cliff Swallows | up to 500 nests | Nests on buildings and other structures |
| 2 Barn Swallows | up to 500 nests | Nests on buildings and other structures |
| 3 See attached letter for other species | | |
| 4 | | |

**8. WILDLIFE SERVICES ASSISTANCE PROVIDED**

A. TYPE OF ASSISTANCE PROVIDED
[ ] Direct Control [ ] Equipment Loan [X] Other (specify) [ ] Supplies [ ] Technical Assistance
Assistance with depredation permit application, site visit to assess problems at lagoons.

B. RECOMMENDED ACTION(S)
[X] Harassment or Hazing Techniques [ ] Lethal Trapping [ ] Trap and Relocate [ ] Habitat Alteration and/or Barriers [X] Shooting [ ] Other (specify)
Lethal control to reinforce non-lethal harassment, removal of nests from buildings and other structures.

C. METHODS ATTEMPTED, RESULTS, COMMENTS
See attached documentation provided by the Grand Forks Air Force Base.

**9. DEPREDATION PERMIT**

10. WILDLIFE SERVICES RECOMMENDS PERMIT BE ISSUED: [X] Yes (If "YES" suggested conditions of permit) [ ] No
See species and numbers on attached cover letter.

**10. WS INVESTIGATOR NAME AND ADDRESS (Print)**

PHILIP M. MASTRANGELO
USDA/APHIS/WILDLIFE SERVICES
2110 MIRIAM CIRCLE, SUITE A
BISMARCK ND 58501-2502
TELEPHONE: 701-250-4405

11. WS INVESTIGATOR'S SIGNATURE: Philip Mastrangelo DATE: 12-1-03

**12. FOR USE BY DEPREDATION PERMIT AGENCY**

WS FORM 37 (ND-10/01) 1. PERMITTING AGENCY 2. STATE OFFICE 3. INVESTIGATOR 4. RESOURCE OWNER

DEPARTMENT OF THE AIR FORCE
319TH CIVIL ENGINEER SQUADRON
GRAND FORKS AIR FORCE BASE, NORTH DAKOTA

MEMORANDUM FOR U.S. Dept of Agriculture, Animal and Plant Health
Inspection Service, Wildlife Services
Attn: Mr. Phil Mastrangelo

FROM: 319 CES/CEVP
525 Tuskegee Airmen Blvd
Grand Forks AFB ND 58205-6434

SUBJECT: Request for Migratory Bird Damage Project Report (WS Form 37)

1. Grand Forks AFB requests a completed WS Form 37 (Migratory Bird Damage Project Report) as part of the application process for a Migratory Bird Depredation/Nest Removal Permit. The taking of birds will only occur when absolutely necessary for safety and health reasons. We anticipate to take swallows, starlings, gulls, hawks and various species of waterfowl to include ducks and geese.

2. Bird Aircraft Strike Hazard Program includes various scare tactics and habitat modifications. Twelve propane scare cannons have been utilized for eight years along with 11 mm and 12 mm scare cartridges, which have been in place for 10 years. Bioacoustics have been utilized in the past but have been found to be ineffective. Habitat modifications include maintaining airfield grass heights between 7-14 inches. Flight Control (goose repellant) is utilized on the lagoon grassy area to prevent geese from resting and subsequently migrating to the airfield area. Airfield drainage ditches have been evaluated and slope design changed to allow proper drainage. Cut and fallen decaying trees have been removed to eliminate perches for hawks. Bird-X repellant is applied to flight line bldgs to prevent roosting and nests.

3. The attached page lists the names of birds involved in aircraft strikes within the last two years.

Linda L. Olson

LINDA OLSON, GS-11
Management, Agronomist

## LIST OF BIRDS INVOLVED IN BIRD AIRCRAFT STRIKE

1. Cliff Swallow
2. Mallard
3. Blue Wing Teal
4. Redhead
5. Ruddy duck
6. Northern shoveler
7. Canada goose
8. Swainson hawk
9. Red-Tailed hawk
10. Ringed bill gull
11. Horned lark
12. Mourning Dove
13. Barn Swallows

USDA United States Department of Agriculture
Animal and Plant Health Inspection Service
Wildlife Services
2110 Miriam Circle, Suite A
Bismarck ND 58501-2502
(701) 250-4405

December 1, 2003

Kelly Gonzales
U.S. Fish and Wildlife Service
P.O. Box 25486
Denver Federal Center
Denver, CO 80225-0486

Dear Kelly,

The Grand Forks Air Force Base (North Dakota) is in the process of renewing its depredation permit for 2004. Grand Forks AFB uses an integrated damage abatement program to mitigate aviation hazards created by the presence of various bird species. Attached is a summary of the damage abatement actions currently employed at Grand Forks AFB.

Renewal of their depredation permit would allow the inclusion of lethal control as means for enhancing the non-lethal harassment programs. Therefore I strongly recommend that a depredation permit be issued for the following birds and nests:

| Species | Number Requested for Permit |
|---|---|
| Cliff swallow | 100 |
| Barn swallow | 100 |
| Mallard | 25 |
| Blue wing teal | 25 |
| Redhead | 25 |
| Ruddy duck | 25 |
| Northern shoveler | 25 |
| Canada goose | 25 |
| Swainson's hawk | 15 |
| Red-tailed hawk | 15 |
| Ringed bill gull | 100 |
| Horned lark | 75 |
| Mourning dove | 75 |
| Cliff swallow nests | 500 |
| Barn swallow nests | 500 |

These would be the maximum numbers of birds/nests taken under the authority of a depredation permit. In all likelihood, the number of birds/nests actually taken would be less than the number authorized.

Please contact me if you need additional information.

Phil Mastrangelo
State Director

U. S. DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
WILDLIFE SERVICES

# MIGRATORY BIRD DAMAGE PROJECT REPORT

**1. COOPERATOR NAME, ADDRESS AND TELEPHONE NUMBER:**
(Include business/agency name, if appropriate)
Grand Forks Air Force Base
525 Tuskegee Airman Blvd.
Grand Forks AFB, ND 58205-6434
Attn: Mary Giltner
TELEPHONE: HOME: _____ WORK 701-747-4655

**2. LOCATION OF DAMAGE**
Grand Forks Air Force Base
3. COUNTY Grand Forks 4. STATE ND

**5. RESOURCE**

| A. RESOURCE CATEGORY | B. SPECIFIC RESOURCE(S) DAMAGED | C. NATURE OF DAMAGE |
|---|---|---|
| ☐ Agriculture ☐ Natural Resources ☒ Property ☒ Human Health/Safety | Aircraft and human health & safety | Damage to equipment (from bird droppings), threat to human health |

**6. DAMAGE ESTIMATE**

| A. QUANTITY OF LOSS AND UNIT OF MEASURE (pounds, acres, each, etc.) | B. DOLLAR LOSS (if available) ☐ Per unit (Dollar loss) ☐ Total | LOSS CONFIRMED BY WS ☐ YES ☒ NO |
|---|---|---|
| | | |

| D. DURATION/TIME PERIOD OF DAMAGE | E. DATE ASSISTANCE REQUEST | F. DATE OF INVESTIGATION | G. INVESTIGATION TYPE |
|---|---|---|---|
| Throughout the year | 11/25/03 | 12/1/03 | ☒ Site Visit ☒ Phone ☒ Letter ☐ Other |

**7. MIGRATORY BIRD SPECIES**

| A. DEPREDATING SPECIES | B. NUMBER INVOLVED | C. COMMENTS |
|---|---|---|
| 1 Cliff Swallows | up to 500 nests | Nests on buildings and other structures |
| 2 Barn Swallows | up to 500 nests | Nests on buildings and other structures |
| 3 See attached letter for other species | | |
| 4 | | |

**8. WILDLIFE SERVICES ASSISTANCE PROVIDED**

A. TYPE OF ASSISTANCE PROVIDED
☐ Direct Control ☐ Equipment Loan ☒ Other (specify)
☐ Supplies ☐ Technical Assistance
Assistance with depredation permit application, site visit to assess problems at lagoons.

B. RECOMMENDED ACTION(S)
☒ Harassment or Hazing Techniques ☐ Lethal Trapping ☐ Trap and Relocate
☐ Habitat Alteration and/or Barriers ☒ Shooting ☐ Other (specify)
Lethal control to reinforce non-lethal harassment, removal of nests from buildings and other structures.

C. METHODS ATTEMPTED, RESULTS, COMMENTS
See attached documentation provided by the Grand Forks Air Force Base.

**9. DEPREDATION PERMIT**

10. WILDLIFE SERVICES RECOMMENDS PERMIT BE ISSUED: ☒ Yes (If "YES" suggested conditions of permit) ☐ No
See species and numbers on attached cover letter.

**10. WS INVESTIGATOR NAME AND ADDRESS (Print)**

PHILIP M. MASTRANGELO
USDA/APHIS/WILDLIFE SERVICES
2110 MIRIAM CIRCLE, SUITE A
BISMARCK ND 58501-2502
TELEPHONE: 701-250-4405

**12. FOR USE BY DEPREDATION PERMIT AGENCY**

11. WS INVESTIGATOR'S SIGNATURE: Philip Mastrangelo DATE: 12-1-03

WS FORM 37 (ND-10/01) 1. PERMITTING AGENCY 2. STATE OFFICE 3. INVESTIGATOR 4. RESOURCE OWNER

DEPARTMENT OF THE AIR FORCE
319TH CIVIL ENGINEER SQUADRON
GRAND FORKS AIR FORCE BASE, NORTH DAKOTA

MEMORANDUM FOR U.S. Dept of Agriculture, Animal and Plant Health
Inspection Service, Wildlife Services
Attn: Mr. Phil Mastrangelo

FROM: 319 CES/CEVP
525 Tuskegee Airmen Blvd
Grand Forks AFB ND 58205-6434

SUBJECT: Request for Migratory Bird Damage Project Report (WS Form 37)

1. Grand Forks AFB requests a completed WS Form 37 (Migratory Bird Damage Project Report) as part of the application process for a Migratory Bird Depredation/Nest Removal Permit. The taking of birds will only occur when absolutely necessary for safety and health reasons. We anticipate to take swallows, starlings, gulls, hawks and various species of waterfowl to include ducks and geese.

2. Bird Aircraft Strike Hazard Program includes various scare tactics and habitat modifications. Twelve propane scare cannons have been utilized for eight years along with 11 mm and 12 mm scare cartridges, which have been in place for 10 years. Bioacoustics have been utilized in the past but have been found to be ineffective. Habitat modifications include maintaining airfield grass heights between 7-14 inches. Flight Control (goose repellant) is utilized on the lagoon grassy area to prevent geese from resting and subsequently migrating to the airfield area. Airfield drainage ditches have been evaluated and slope design changed to allow proper drainage. Cut and fallen decaying trees have been removed to eliminate perches for hawks. Bird-X repellant is applied to flight line bldgs to prevent roosting and nests.

3. The attached page lists the names of birds involved in aircraft strikes within the last two years.

Linda L. Olson

LINDA OLSON, GS-11
Management, Agronomist

## LIST OF BIRDS INVOLVED IN BIRD AIRCRAFT STRIKE

1. Cliff Swallow
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8. Swainson hawk
9. Red-Tailed hawk
10. Ringed bill gull
11. Horned lark
12. Mourning Dove
13. Barn Swallows

USDA

United States
Department of
Agriculture

Marketing and
Regulatory
Programs

Animal and
Plant Health
Inspection
Service

Wildlife
Services

South Dakota
District Office

420 S. Garfield
Ave. Suite 300
Pierre, SD 57501
(605) 224-8692

November 25, 2003

Linda S. Olson
319th CES/CEV
525 Tuskgee Airmen Blvd
Grand Forks AFB, ND 58205-6434

RE: Site Visit - Goose Hazards/Sewage Lagoons

Dear Ms. Olson:

This letter is to follow up on my site visit to the Grand Forks AFB on 9/22 and 9/23 of 2003. The site visit concerned Canada goose activity associated with the sewage lagoons east of the airbase and their influence on aircraft safety.

I met with you on the afternoon of 9/22. We discussed the issues and concerns that the Air Force has with respect to the lagoons. We observed the lagoons. You briefly showed me around the airbase and showed me where the runway is located. I spent the remaining part of the afternoon and evening driving around the airbase and surrounding area to become familiar with the habitat features of the area.

The following morning (9/23), I observed area goose activity from 07:30am until approximately 10:00am. I met with you again that morning to observe goose activity on the lagoons. You also provided me a map of the area which I had requested. We attempted to meet the base BASH coordinator but he was unavailable.

**Background**

~~Anecdotal information provided to me by~~ Linda Olson and other base personnel:

- Small numbers of geese are present on the lagoons during the summer months and are the major concern
- Larger numbers of migrating geese will use the lagoons during the spring and fall
- Air Force BASH personnel are uncertain as to the influence the lagoons may have on goose activity
- Air Force BASH personnel are uncertain if anything can be done to minimize goose activity at the lagoons
- ~~Geese seem to favor the middle part of the lagoons~~
- There are no records that geese have been struck by Air Force aircraft
- Approximately half of the geese leaving the lagoons will fly over the airfield
- Geese leave the area altogether during the winter months as the lagoons freeze
- Geese are rarely present on the base or airfield
- Geese only roost at the lagoons and do not feed there

- The repellent "Flight Control" has been used on cracked corn at the lagoons without success
- Hunting at the lagoons is currently not permitted and goose numbers at the lagoons typically increase once the hunting season begins

**Observations**

Four sewage lagoons are located one mile east of the airbase and 2.7 miles east of the active runway. The sewage lagoons total approximately 180 acres and vary in shape and size. The largest lagoon is 2210' X 1478' or 75 acres. The smallest is 900' X 1195' or 25 acres.

The area surrounding the airbase is a mixture of various agricultural lands and numerous wetlands, almost all of which are attractive to geese or other waterfowl. In addition, Kelly Slough National Wildlife Refuge attracts large numbers of geese to the area is located approximately 3 miles northwest of the base.

The airfield and airbase consist of considerable turf areas that are kept mowed and are potentially attractive to geese, however base personnel indicate that goose activity on the base is rare.

Geese were present on the lagoons in the afternoon of 9/22. Other birds observed on the lagoons were mallards, American coots, blue-winged teal, northern shoveler, ruddy ducks, pied-billed grebes and great-blue herons.

Several small groups of geese (4 to 20) were observed flying over the airfield between 8:30am and 10:00am on 9/23. None of these geese were flying to or from the lagoons at this time.

**Discussion and Recommendations**

Grand Forks AFB should be commended for being proactive in recognizing and addressing potential strike hazards associated with sewage lagoons. It should be pointed out that Wildlife Services findings are based solely on anecdotal information and the brief observations made at the Grand Forks AFB over a 24 hour period. This site visit amounts to a snapshot in time and should not be considered an in depth, comprehensive study into this wildlife issue. Wildlife Services provides it's best biological judgment as to whether or not these lagoons pose a significant threat to aircraft.

Sewage lagoons are inherently attractive to geese. They provide water, protection from predators and often times food. There is no doubt that geese and other waterfowl are attracted to the sewage lagoons east of Grand Forks AFB. There are two issues of importance regarding the lagoons. First, does the presence of the lagoons significantly

increase the potential for goose strikes with Air Force aircraft and secondly, what can be done to minimize the attractiveness of the lagoons?

The habitat around Grand Forks AFB is dominated by agriculture attractive to geese ( i.e. wheat, barley, corn, sunflower, dry beans, soybeans, hay and pasture grasses). Areas around Grand Forks AFB provide water for geese including several permanent and intermittent ponds, streams, marshes, wetlands, and areas with temporary standing water. The water in the area is from surface and ground water sources. The area is pitted with many poorly drained depressions, flats and swells. The seasonal high water table is above or near the surface. Typically, water sources are plentiful in the area throughout the year. Native giant Canada geese nest in the local area and large numbers of migrating geese utilize this attractive habitat in the spring and fall.

In consideration of the substantial goose habitat of the area surrounding Grand Forks AFB, and considering that the lagoons lie 2.7 miles from the runway, Wildlife Services does not believe that the lagoons, by themselves, significantly influence goose activity over and around Grand Forks AFB. This in no way suggests that Grand Forks AFB does not have significant goose hazards. It does. Nor does it suggest that the lagoons don't play a part in those hazards. They do. But so does Kelly Slough and all of the other wetland and agricultural lands in the area. Unless these other attractants are substantially reduced, it is unlikely that the elimination of the lagoons will significantly reduce goose activity in the area or the potential for goose strikes.

Wildlife Services has been asked to comment on whether or not geese should be kept off of the lagoons, and if so, how it should be done.

If geese could be completely excluded from the lagoons, through netting or some other method, this would of course eliminate the lagoons as an attraction and should be implemented. However, due to the size of the lagoons and the seasonal maintenance that would be required in this harsh environment, complete exclusion may not be feasible.

The alternative to complete exclusion is to implement a very substantial harassment program that would include barriers (fencing, overhead wires), pyrotechnics, (cracker shells, rockets, 15 mm bangers and screamers), propane exploders, visual scare devices (flagging, mylar scare tape, various scarecrows) and regular shooting of individual geese to reinforce the non lethal techniques being implemented. This would require constant monitoring and harassment by an adequate labor force to keep geese off the lagoons at all times. Wildlife Services **does not** recommend this approach. It will not eliminate the lagoons as an attraction, and it will likely cause geese to spend more time in the air around Grand Forks AFB creating additional hazards to aircraft. Likewise, the hunting of geese on the lagoons, with or without decoys will have the same effect. It is safer for aircraft if the geese are allowed to loaf on the lagoons, 2.7 miles from the runway, than it is to have geese frequently moving from spot to spot around the airbase.

The habits, movements, and numbers of geese undoubtedly vary seasonally in the Grand Forks AFB area and warrant further study. The diverse habitat around Grand Forks AFB influences not only goose activity but other hazardous birds and wildlife capable of causing multiple bird strike engine ingestions and damaging collisions. To properly identify the seasonal wildlife hazards that exist in the Grand Forks AFB area, and to determine the best approaches to minimizing those hazards, Wildlife Services recommends that a year long Wildlife Hazard Assessment be conducted by a trained and qualified wildlife biologist.

Please let me know if you have any questions about this report or need any further information or explanation. Feel free to contact me if I can provide any other assistance or if you wish to pursue a Wildlife Hazard Assessment.

Thank you for the assistance that you and your staff provided me during my visit.

Sincerely

Timothy L. Pugh

Timothy L. Pugh
District Supervisor

cc: Phil Mastrangelo, Wildlife Services, Bismarck, ND

# DEPARTMENT OF THE AIR FORCE

HEADQUARTERS 319TH AIR REFUELING WING (AMC)
GRAND FORKS AIR FORCE BASE, NORTH DAKOTA

29 December 2003

MEMORANDUM FOR 319 MSG/CC

FROM: 319 ARW/JA

SUBJECT: Legal Review – 2004 Bird Depredation Permit

1. Proposed depredation permit has been reviewed and is legally sufficient. Recommend 319 MSG/CC approve the release of the proposed memorandum.

2. Depredation of birds without a permit results in a violation of the Migratory Bird Treaty Act. Under the permit, GFAFB may take migratory permits when necessary for health or safety reasons, including bird aircraft strike hazard (BASH) program implementation. The proposed action is consistent with Executive Order 13186 (10 January 2003) that outlines responsibilities of Federal Agencies to protect Migratory Birds.

3. If you have any questions about these comments, please contact me at 7-3606.

MARK W. HANSON, GS-12, DAF
Chief, General Law

I concur.

BARR D. YOUNKER, JR., Lt Col, USAF
Staff Judge Advocate

*Attorney client privilege material and/or attorney work product. This document was prepared in direct or indirect anticipation of litigation. Not for release or transfer outside of t he Air Force without specific approval of the originator or higher authority. Not subject to discovery or release under P.L. 95 -502 (5 USC 552).*

# APPENDIX E
# PRESCRIBED BURNING GUIDELINES

# Prescribed Burning Guidelines

*Source: www.greatplains.org/npresource/tools/burning/burning.htm*

Prescribed Burning Guidelines
in the Northern Great Plains
by
Kenneth F. Higgins
Arnold D. Kruse
James L. Piehl
U.S. Fish and Wildlife Service

The use of fire to manage grasslands for wildlife is a relatively new management option for resource managers in the Northern Great Plains (NGP). Nearly all of the burning during the past 20-25 years has been conducted without the aid of specific guidelines for the region. This state-of-the-art set of recommendations was compiled because of this void.

Records of 902 grassland fires (primarily on U.S. Fish and Wildlife lands), personal experiences, and synopses of other published fire research were used in developing the guidelines in this manual.

Fifty-two percent of the 902 fires were in native prairie grasslands with lesser amounts in tame and native grass plantings, wetlands, and woodlands.

Prescription grassland fires averaged 31 ha (77 acres) per burn. The personnel needed to safely conduct a grassland fire depended on the size of the burn, the kind of firebreaks, available equipment, and weather conditions. Costs and hours of effort to conduct fires were inversely related to burn area size. Cost ratios are extremely high for fires of less than 4 ha (10 acres). They are essentially the same for burns of 16 to 113 ha (40 to 280 acres).

The two primary reasons for burning grasslands are wildlife habitat improvement and native prairie restoration. Fire use steadily increased between 1965 and 1984, but the greatest increase occurred following workshop instruction in 1978.

These guidelines present a set of reasons, criteria, techniques, and examples of simple prescriptions which aid in the planning and execution of a safe and effective prescribed burning program for wildlife enhancement in grassland areas of the NGP.

This resource is based on the following source (Northern Prairie Publication 0732):

Higgins, Kenneth F., Arnold D. Kruse and James L. Piehl. 1989. Prescribed burning guidelines in the Northern Great Plains. U.S. Fish and Wildlife Service, Cooperative Extension Service, South Dakota State University, U.S. Department of Agriculture EC 760. 36 pp.

This resource should be cited as:
Higgins, Kenneth F., Arnold D. Kruse and James L. Piehl. 1989. Prescribed burning guidelines in the Northern Great Plains. U.S. Fish and Wildlife Service, Cooperative Extension Service, South Dakota State University, U.S. Department of Agriculture EC 760. Jamestown, ND: Northern Prairie Wildlife Research Center Home Page. http://www.npwrc.usgs.gov/resource/tools/burning/burning.htm (Version 16JUL97).

Contents

DISCLAIMER: Several older photographs used in this publication show burn crews without appropriate personal protective equipment. Current Department of Interior (DOI) requirements include Nomex shirts and pants, leather gloves and boots, hardhat, goggles, and fire shelter. Requirements may be found in the DOI Departmental Manual, chapter 910, DM 1; in the USFWS Service Refuge Manual, chapter 6RM 7.8c; in the USFWS Service Manual, part 241 FW 7.1; or in the USFWS Fire Management Preparedness and Planning Handbook, FWS 621 section 1.5.3.

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Basic patterns of burning grasslands

Basic way to conduct a burn

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Mop-up
Site cleanup
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Appendix B -- A brief fire plan for a low risk site
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Appendix D -- A burn site evaluation form
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# APPENDIX F
# ANNUAL UPDATE NOTES

## Annual INRMP Updates
## Worksheet

| Change Number & Date of Change | INRMP Chapter & Page No. | Description of Action |
|---|---|---|
| 1.<br>Date: DEC 2005 | Chapter: 5<br>Page #: | Edits were based on USFWS from Denver comments. |
| 2.<br>Date: DEC 2005 | Chapter: 7<br>Page #: | Edits were based on USFWS from Denver comments. |
| 3.<br>Date: DEC 2005 | Chapter:<br>Page #: | All maps were updated with latest GeoBase CIP, and any other environmental updates. |
| 4.<br>Date: | Chapter:<br>Page #: | |
| 5.<br>Date: | Chapter:<br>Page #: | |
| 6.<br>Date: | Chapter:<br>Page #: | |
| 7.<br>Date: | Chapter:<br>Page #: | |
| 8.<br>Date: | Chapter:<br>Page #: | |
| 9.<br>Date: | Chapter:<br>Page #: | |
| 10.<br>Date: | Chapter:<br>Page #: | |
| 11.<br>Date: | Chapter:<br>Page #: | |
| 12.<br>Date: | Chapter:<br>Page #: | |
| 13.<br>Date: | Chapter:<br>Page #: | |
| 14.<br>Date: | Chapter:<br>Page #: | |
| 15.<br>Date: | Chapter:<br>Page #: | |
| 16.<br>Date: | Chapter:<br>Page #: | |

# APPENDIX G
# INSTRUCTION FOR BOW HUNTING DEER ON GFAFB

GRANDFORKSAFBI32-XXXX

BY ORDER OF THE BASE COMMANDER

GRAND FORKS AFB INSTRUCTION 32-XXXX

03 Dec 2002

Civil Engineering

BOW HUNTING

OPR: 319 CES/CEVA (Ms. Heidi Durako)

Certified by: 319 CES/CC (Lt Col Douglas G. Tarbett)

Pages: /Distribution: F

---

This instruction establishes procedures for control of hunting on Grand Forks AFB, ND. This instruction applies to all organizations and individuals on Grand Forks AFB.

**Attachment 1: Glossary of References**
**Attachment 2: Map of Bow Hunting Location**
**Section 1: Responsibilities**
**Section 2: Policies**
**Section 3: Removal and Disposition of Injured Wildlife**
**Section 4: Permit Fees**
**Section 5: Deer Hunting and Permit Procedures**

**Section 1. RESPONSIBILITIES.** The primary purpose of this instruction is to implement a hunting program on Grand Forks AFB. Various directives including the Sikes Act, DoD Directive 4700.4, and AFI 32-7064 set forth the policies and procedures for the management of base natural resources, including wildlife.

**Section 2. POLICIES.**

2.1. Individual hunters:

2.1.1. Will report all game violations set forth in this regulation and North Dakota State laws to the State Game Warden.

2.1.2. Are responsible for strict compliance with this instruction and North Dakota State laws.

2.2. The Commander, 319th Civil Engineer Squadron (319 CES/CC) will be responsible for all aspects of the management of fish and wildlife on Grand Forks AFB and the development of a 5-year fish and wildlife plan. The base Natural Resource Manager (319 CES/CEVA) will carry out the day-to-day activities at the direction of 319 CES/CC.

2.3. 319 CES/CEVA is responsible for taking permit applications, conducting drawings, collecting fees, and issuing applicable permits for hunting within the confines of Grand Forks AFB.

2.4. The Staff Judge Advocate ensures this instruction is in compliance with DoD, federal, state, and local laws.

2.5. Veterinarian Services, 319 AMDS/SGGZV, will advise the 319th Civil Engineer Squadron, Pest Management Element (319 CES/CEOIN) on the disposition of wounded and trapped animals and wildlife.
2.6. Security forces will enforce this instruction within the confines of Grand Forks AFB and will maintain a liaison with state and federal conservation enforcement agencies. In the event Security Forces witnesses a violation they will detain individual for local law enforcement personnel.

**Section 3. REMOVAL AND DISPOSITION OF INJURED WILDLIFE:**

3.1. The security forces and 319 CES/CEOIN will, when necessary and in conjunction with 319 AMDS/SGGZV, destroy animals that may be injured or diseased.
3.2. 319 AMDS/SGGZV will, on a case-by-case basis, determine the extent of involvement needed by the veterinarian's office.

**Section 4. PERMIT FEES:**

4.1. Will be reviewed annually by 319 CES/CEV, with recommended changes forwarded to the Commander, 319th Mission Support Group (319 MSG/CC) as necessary.
4.2. Will be collected by 319 CES/CEVA from the sale of base hunting permits. The collection of fees is required by the Sikes Act (16 USC 670) and is to be deposited to the DoD fish and wildlife fund for future use on Grand Forks AFB for the protection, conservation and management of fish and wildlife. The initial fee will be set at $10 per permit, payable at the time of issuance by personal check or money order.

**Section 5. DEER HUNTING AND PERMIT PROCEDURES:**

5.1. A deer archery season may be authorized on an annual basis by the 319 MSG/CC with the advice of 319 CES/CEVA. The archery season will coincide with the State of North Dakota deer archery season, in accordance with state law. The specific dates of the hunt within the confines of Grand Forks AFB will be established and public notice given by 319 CES/CEVA annually. Notice will be given through the base newspaper, electronic bulletin board, and E-mail, where appropriate, approximately one month before hunting season.
5.2. All active-duty military, DoD civilians, retirees, and dependents, who can legally hunt in the State of North Dakota, are eligible to apply for permits and participate in hunting activity.
5.3. The actual number of permits issued will be based on land area available for safe hunting on Grand Forks AFB per season and the land use will be validated at the Facilities Board. Permits will be issued on a lottery basis. Applications for permits will be taken up until two weeks before season, at which time a drawing will be held to determine permit holders. Permits will be valid for specific periods of time, which may be more restrictive than the North Dakota State hunting season. The applications will be received by 319 CES/CEVA.
5.4. Hunter requirements. All persons who participate in archery deer season on Grand Forks AFB must have in their possession the following:
5.4.1. A North Dakota hunting license with a valid deer bow hunting license, and
5.4.2. A Grand Forks AFB hunting permit.
5.5. A firearm deer hunting season will not be authorized in conjunction with this instruction.
5.6. All deer taken or wounded will be reported to 319 CES/CEVA at 7-4774. All State of North Dakota deer registration and reporting procedures are and will remain the responsibility of the individual hunter.

5.7. The location of the hunt will be the unimproved area on the northwest corner of the base commonly referred to as CE Park, which is located outside of the base perimeter fence. Hunting will not be allowed within 200 feet of any building or dwelling located within the authorized hunting area. Hunting will cease in areas where training or other activities are occurring. Maps showing the designated hunting area will be distributed with permits.
5.8. During periods when hunters are in the field, temporary signs will be erected by 319 CES/CEVA warning others entering area that hunting is taking place.
5.9. Hunting may be done from aboveground tree stands. Ground-level hunting is permitted. All stands used will be nonpermanent in nature. All tree-stands will have the name and phone number of owner either stenciled on or affixed to the stand. At no time will nails, screws, or other foreign matter be put in trees for the purpose of erecting a stand or climbing a tree, with the exception of commercially designed, screw-in steps. All tree-stand material will be removed from the woods at the end of the authorized period.
5.10. All North Dakota state laws will apply in accordance with Deer Hunting Guide published by the North Dakota Game and Fish Department.

MARSHALL K. SABOL, Colonel, USAF
Commander

**Attachment 1**

**GLOSSARY OF REFERENCES**

Sikes Act, 16 USC 670
DoD Directive 4700.4
AFI 32-7064, Integrated Natural Resource Management

# APPENDIX H
# AIR FORCE HAY LEASE FOR GFAFB

NO. DACA45-1-98-6053

# DEPARTMENT OF THE AIR FORCE LEASE

## FOR HAY PURPOSES

## LOCATED ON

## GRAND FORKS AIR FORCE BASE, NORTH DAKOTA

## (Parcel 1, 1,088.2 acres)

**THIS LEASE**, made on behalf of the United States, between the Secretary of the Air Force, hereinafter referred to as the Secretary, and **Mr. Steven R. Martin, 2655 14th Avenue N.E., Emerado, North Dakota 58228**, hereinafter referred to as the lessee.

**WITNESSETH:**

That the Secretary, by authority of Title 10, United States Code, Section 2667, and for the consideration set forth herein, hereby leases to the lessee the property shown and/or described on **Exhibit "A"**, hereinafter referred to as the premises, for **hay crop** purposes only, and in accordance with the **Land Use Regulations and Special Conditions** as set forth in Exhibit **"B"**, said exhibits are attached hereto and made a part hereof.

**THIS LEASE** is granted subject to the following conditions:

**1. TERM**

Said premises are hereby leased for a term of **five (5)** hay crop-years, beginning **8 July 1998** and ending **28 February 2003**, but revocable at will by the Secretary. The first crop-year will be from 8 July 1998 to 28 February 1999. The second and any subsequent crop-year will be from 1 March to 28/29 February of the following year.

**2. CONSIDERATION**

**a.** The lessee shall pay rental in advance to the United States in the amount of **Four Thousand and 00/100 Dollars ($4,000.00)** per annum, payable annually to the "FAO USAED-OMAHA", and forwarded by the lessee to the DEPARTMENT OF THE ARMY, OMAHA DISTRICT, CORPS OF ENGINEERS, ATTN: CENWO-RE-PC, 215 North 17th Street, Omaha, Nebraska 68102-4978.

**b.** All rent and other payments due under the terms of this lease must be paid on or before the date they are due in order to avoid the mandatory sanctions imposed by the Debt Collection Act of 1982 (31 U.S.C. Section 3717). This statute requires the imposition of an interest charge for the late payment of debts owed to the United States; an administrative charge to cover the costs of processing and handling delinquent debts; and the assessment of an additional penalty charge on any portion of a debt that is more than 90 days past due. The provisions of the statute will be implemented as follows:

(1) The United States will impose an interest charge, the amount to be determined by law or regulation, on late payment of rent. Interest will accrue from the due date. An administrative charge to cover the cost of processing and handling each late payment will also be imposed.

(2) In addition to the charges set forth above, the United States will impose a penalty charge of six percent (6%) per annum on any payment or portion thereof, more than ninety (90) days past due. The penalty shall accrue from the date of delinquency and will continue to accrue until the debt is paid in full.

(3) All payments received will be applied first to any accumulated interest, administrative and penalty charges and then to any unpaid rental or other payment balance. Interest will not accrue on any administrative or late payment penalty charge.

**3. NOTICES**

All correspondence and notices to be given pursuant to this lease shall be addressed, if to the lessee, to **Mr. Steven Martin, 2655 14th Avenue N. E., Emerado, North Dakota 58228; phone (701) 594-5488**, and if to the United States, to the District Engineer, Omaha District Corps of Engineers, ATTN: CENWO-RE-MM, 215 North 17th Street, Omaha, Nebraska 68102-4978, or as may from time to time otherwise be directed by the parties. Notice shall be deemed to have been duly given if and when enclosed in a properly sealed envelope addressed as aforesaid, and deposited postage prepaid in a post office regularly maintained by the United States Postal Service.

**4. AUTHORIZED REPRESENTATIVES**

Except as otherwise specifically provided, any reference herein to "Secretary", "District Engineer", or "said officer", includes their duly authorized representatives. Any reference to "lessee" shall include any sublessees, assignees, transferees, successors and their duly authorized representatives.

**5. SUPERVISION BY THE INSTALLATION COMMANDER**

The use and occupation of the premises shall be subject to the general supervision and approval of the **Base Commander, Grand Forks Air Force Base, North Dakota, or his duly authorized representatives**, hereinafter referred to as said officer, and to such rules and regulations as may be prescribed from time to time by said officer.

**6. APPLICABLE LAWS AND REGULATIONS**

The lessee shall comply with all applicable Federal, state, county and municipal laws, ordinances and regulations wherein the premises are located.

**7. CONDITION OF PREMISES**

The lessee acknowledges that it has inspected the premises, knows its condition, and understands that the same is leased without any representation or warranties whatsoever and without obligation on the part of the United States to make any alterations, repairs or additions thereto.

**8. TRANSFERS AND ASSIGNMENTS**

Without prior written approval of the District Engineer, the lessee shall neither transfer nor assign this lease, nor sublet the premises or any part thereof, nor grant any interest, privilege or license whatsoever in connection with this lease. Failure to comply with this condition shall constitute a noncompliance for which the lease may be revoked immediately by the District Engineer.

**9. COST OF UTILITIES**

The lessee shall pay the cost, as determined by the officer having jurisdiction over the premises, of producing and/or supplying any utilities and other services furnished by the Government or through Government-owned facilities for the use of the lessee, including the lessee's proportionate share of the cost of operation and maintenance of the Government-owned facilities by which such utilities or services are produced or supplied. The Government shall be under no obligation to furnish utilities or services. Payment shall be made in the manner prescribed by the officer having such jurisdiction.

**10. PROTECTION OF PROPERTY**

The lessee shall keep the premises in good order and in a clean, safe condition by and at the expense of the lessee. The lessee shall be responsible for any damage that may be caused to the property of the United States by the activities of the lessee under this lease, and shall exercise due diligence in the protection of all property located on the premises against fire or damage from any and all other causes. Any property of the United States damaged or destroyed by the lessee incident to the exercise of the privileges herein granted, shall be promptly repaired or replaced by the lessee to a condition satisfactory to said officer, or at the election of said officer, reimbursement made therefor by the lessee in an amount necessary to restore or replace the property to a condition satisfactory to said officer.

**11. RENTAL ADJUSTMENT**

In the event the United States revokes this lease or in any other manner materially reduces the leased area or materially affects its use by the lessee prior to the expiration date, an equitable adjustment will be made in the rental paid or to be paid under this lease. Where the said premises are being used for farming purposes, the lessee shall have the right to harvest, gather and remove such crops as may have been planted or grown on said premises, or the District Engineer may require the lessee to vacate immediately and, if funds are available, compensation will be made to the lessee for the value of the remaining crops. Any adjustment of rent or the right to harvest, gather and remove crops shall be evidenced by a written supplemental agreement, executed by the District Engineer; PROVIDED, however, that none of the provisions of this paragraph shall apply in the event of revocation because of noncompliance by the lessee with any of the terms and conditions of this lease and in that event, any remaining crops shall become property of the United States upon such revocation.

**12. RIGHT TO ENTER**

**a.** The right is reserved to the United States, its officers, agents and employees to enter upon the premises at any time and for any purposes necessary or convenient in connection with Government purposes; to make inspections; to remove timber or other materials, except property of the lessee; to flood the premises and/or to make any other use of the lands as may be necessary in connection with Government purposes, and the lessee shall have no claims for damages on account thereof against the United States or any officer, agent or employee thereof.

**b.** The lessee expressly agrees to make no claim under flood insurance issued under any Federal Government program for loss to any property of the lessee located on the premises which arises from or is incident to the flooding of the premises by the Government.

**13. INDEMNITY**

The United States shall not be responsible for damages to property or injuries to persons which may arise from or be incident to the exercise of the privileges herein granted, or for damages to the property of the lessee, or for damages to the property or injuries to the person of the lessee's officers, agents, servants or employees or others who may be on the premises at their invitation or the invitation of any one of them, and the lessee shall hold the United States harmless from any and all such claims, not including damages due to the fault or negligence of the United States or its contractors.

**14. RESTORATION**

On or before the expiration date of this lease or its termination by the lessee, the lessee shall vacate the premises, remove the property of the lessee and restore the premises to a condition satisfactory to said officer. If, however, this lease is revoked, the lessee shall vacate the premises, remove said property and restore the premises to the aforesaid condition within such time as the District Engineer may designate or as otherwise specified by the provisions of the condition on **RENTAL ADJUSTMENT**. In either event, if the lessee shall fail or neglect to remove said property and restore the premises, then, at the option of the District Engineer, the property shall either become the property of the United States without compensation therefor, or the District Engineer may cause the property to be removed and no claim for damages against the United States or its officers or agents shall be created by or made on account of such removal and restoration work. The lessee shall also pay to the United States on demand any sum which may be expended by the United States in restoring the premises after the expiration, revocation or termination of this lease.

**15. NONDISCRIMINATION**

The lessee shall not discriminate against any person or persons or exclude from participation in the lessee's operations, programs or activities conducted on the leased premises, because of race, color, religion, sex, age, handicap or national origin.

**16. SUBJECT TO EASEMENTS**

This lease is subject to all existing easements, or those subsequently granted, as well as established access routes for roadways and utilities located, or to be located, on the premises, provided that the proposed grant of any new easement or route will be coordinated with the lessee, and easements will not be granted which will, in the opinion of the District Engineer, interfere with the use of the premises by the lessee.

**17. SUBJECT TO MINERAL INTERESTS**

This lease is subject to all outstanding mineral interests. As to federally owned mineral interests, it is understood that they may be included in present or future mineral leases issued by the Bureau of Land Management (BLM) which has responsibility for mineral development of Federal lands. The Secretary will provide lease stipulations to BLM for inclusion in said mineral leases that are designed to protect the premises from activities that would interfere with the lessee's operations or would be contrary to local law.

**18. TERMINATION**

This lease may be terminated by the lessee at any time by giving at least sixty (60) days notice thereof, in writing, to the District Engineer. In the case of such termination, no refund by the United States of any rental previously paid shall be made and payment in full of all rent becoming due during the notice period will be required. In the event the effective date of termination occurs after the start of the grazing, planting or harvesting season, as specified in the Land Use Regulations, any rent due for the balance of the annual term, or the rental due for the remaining term if the lease is for less than one year, shall be due and payable on or before the date of such termination.

**19. PROHIBITED USES**

**a.** Certain soil conservation practices may be required by the Land Use Regulations which are identified as rental offsets. By acceptance of such offsets, the lessee agrees that he will not accept any Federal or state cost-sharing payments or subsidies for the same soil conservation practices.

**b.** The lessee shall not construct or place any structure, improvement or advertising sign on the leased premises or allow or permit such construction or placement without prior written approval of the District Engineer.

**20. PROTECTION OF NATURAL RESOURCES**

The lessee shall use the premises in accordance with the attached Land Use Regulations and shall at all times: (a) maintain the premises in good condition and free from weeds, brush, washes, gullies and other erosion which is detrimental to the value of the premises for agricultural purposes; (b) cut no timber, conduct no mining operations, remove no sand, gravel or kindred substances from the premises; (c) commit no waste of any kind, nor in any manner substantially change the contour or condition of the premises, except changes required to accomplish soil and water conservation measures and as may be authorized by said officer.

**21. DISPUTES CLAUSE**

**a.** Except as provided in the Contract Disputes Act of 1978 (41 U.S.C. 601-613) (the Act), all disputes arising under or relating to this lease shall be resolved under this clause and the provisions of the Act.

**b.** "Claim", as used in this clause, means a written demand or written assertion by the lessee seeking, as a matter of right, the payment of money in a sum certain, the adjustment of interpretation of lease terms, or other relief arising under or relating to this lease. A claim arising under this lease, unlike a claim relating to this lease, is a claim that can be resolved under a lease clause that provides for the relief sought by the lessee. However, a written demand or written assertion by the lessee seeking the payment of money exceeding $100,000 is not a claim under the Act until certified as required by subparagraph c.(2) below. The routine request for rental payment that is not in dispute is not a claim under the Act. The request may be converted to a claim under the Act, by this clause, if it is disputed either as to liability or amount or is not acted upon in a reasonable time.

**c.** **(1)** A claim by the lessee shall be made in writing and submitted to the District Engineer for a written decision. A claim by the Government against the lessee shall be subject to a written decision by the District Engineer.

**(2)** For lessee claims exceeding $100,000, the lessee shall submit with the claim a certification that:

**(i)** The claim is made in good faith;

**(ii)** Supporting data is accurate and complete to the best of the lessee's knowledge and belief; and

**(iii)** The amount requested accurately reflects the lease adjustment for which the lessee believes the Government is liable.

**(3)** **(i)** If the lessee is an individual, the certificate shall be executed by that individual.

**(ii)** If the lessee is not an individual, the certification shall be executed by:

**(A)** A senior company official in charge at the lessee's location involved; or

**(B)** An officer or general partner of the lessee having overall responsibility of the conduct of the lessee's affairs.

**d.** For lessee claims of $100,000 or less, the District Engineer must, if requested in writing by the lessee, render a decision within 60 days of the request. For lessee-certified claims over $100,000, the District Engineer must, within 60 days, decide the claim or notify the lessee of the date by which the decision will be made.

**e.** The District Engineer's decision shall be final unless the lessee appeals or files a suit as provided in the Act.

f. At the time a claim by the lessee is submitted to the District Engineer or a claim by the Government is presented to the lessee, the parties, by mutual consent, may agree to use alternative means of dispute resolution. When using alternate dispute resolution procedures, any claim, regardless of amount, shall be accompanied by the certification described in paragraph c.(2) of this clause, and executed in accordance with paragraph c.(3) of this clause.

g. The Government shall pay interest on the amount found due and unpaid by the Government from (1) the date the District Engineer received the claim (properly certified if required), or (2) the date payment otherwise would be due, if that date is later, until the date of payment. Simple interest on claims shall be paid at the rate, fixed by the Secretary of the Treasury, as provided in the Act, which is applicable to the period during which the District Engineer receives the claim and then at the rate applicable for each 6-month period as fixed by the Treasury Secretary during the pendency of the claim. Rental amounts due to the Government by the lessee will have interest and penalties as set out in the Condition on **CONSIDERATION.**

h. The lessee shall proceed diligently with performance of the lease, pending final resolution of any request for relief, claim, appeal, or action arising under the lease, and comply with any decision of the District Engineer.

**22. ENVIRONMENTAL PROTECTION**

a. Within the limits of their respective legal powers, the parties to this lease shall protect the premises against pollution of its air, ground and water. The lessee shall comply with any laws, regulations, conditions or instructions affecting the activity hereby authorized if and when issued by the Environmental Protection Agency, or any Federal, state, interstate or local governmental agency having jurisdiction to abate or prevent pollution. The disposal of any toxic or hazardous materials within the premises is specifically prohibited. Such regulations, conditions or instructions in effect or prescribed by the said Environmental Protection Agency, or any Federal, state, interstate or local governmental agency are hereby made a condition of this lease. The lessee shall not discharge waste or effluent from the premises in such a manner that the discharge will contaminate streams or other bodies of water or otherwise become a public nuisance.

b. The lessee will use all reasonable means available to protect the environment and natural resources, and where damage nonetheless occurs arising from activities of the lessee, the lessee shall be liable to restore the damaged resources.

c. The lessee must obtain approval in writing from said officer before any pesticides or herbicides are applied to the premises.

**23. HISTORIC PRESERVATION**

The lessee shall not remove or disturb, or cause or permit to be removed or disturbed, any historical, archeological, architectural or other cultural artifacts, relics, remains or objects of antiquity. In the event such items are discovered on the premises, the lessee shall immediately notify said officer and protect the site and the material from further disturbance until said officer gives clearance to proceed.

**24. SOIL AND WATER CONSERVATION**

The lessee shall maintain, in a manner satisfactory to said officer, all soil and water conservation structures that may be in existence upon the premises at the beginning of or that may be constructed by the lessee during the term of this lease, and the lessee shall take appropriate measures to prevent or control soil erosion within the premises. Any soil erosion occurring outside the premises resulting from the activities of the lessee shall be corrected by the lessee as directed in writing by the District Engineer.

**25. TAXES**

Any and all taxes imposed by the state or its political subdivisions upon the property or interest of the lessee in the premises shall be promptly paid by the lessee. If and to the extent that the property owned by the Government is later made taxable by state or local governments under an Act of Congress, the lease shall be renegotiated.

**26. COVENANT AGAINST CONTINGENT FEES**

The lessee warrants that no person or selling agency has been employed or retained to solicit or secure this lease upon an agreement or understanding for a commission, percentage, brokerage or contingent fees, excepting bona fide employees or established commercial or selling agencies maintained by the lessee for the purpose of securing business. For breach or violation of this warranty, the United States shall have the right to annul this lease without liability or, in its discretion, to require the lessee to pay, in addition to the lease rental or consideration, the full amount of such commission, percentage, brokerage or contingent fee.

**27. OFFICIALS NOT TO BENEFIT**

No member of or delegate to Congress or resident commissioner shall be admitted to any share or part of this lease or to any benefits to arise therefrom. However, nothing herein contained shall be construed to extend to any incorporated company if this lease is for the general benefit of such corporation company.

**28. SEVERAL LESSEES**

If more than one lessee is named in this lease, the obligations of said lessees herein named shall be joint and several obligations.

**29. MODIFICATIONS**

This lease contains the entire agreement between the parties hereto, and no modifications of this agreement, or waiver, or consent hereunder shall be valid unless the same be in writing, signed by the parties to be bound or by a duly authorized representative, and this provision shall apply to this condition as well as other conditions of this lease.

**30. DISCLAIMER**

This lease is effective only insofar as the rights of the United States in the premises are concerned. The lessee shall obtain any permit or license which

may be required by Federal, state or local statute in connection with the use of the premises. It is understood that the granting of this lease does not preclude the necessity of obtaining a Department of the Army permit for activities which involve the discharge of dredge or fill material or the placement of fixed structures in the waters of the United States, pursuant to the provisions of Section 10 of the Rivers and Harbors Act of 3 March 1899 (33 USC § 403), and Section 404 of the Clean Waters Act (33 USC § 1344).

**Prior to the execution of this lease the following site specific Conditions Nos. 31 and 32 were added hereto and made a part hereof:**

**31. SOIL CONSERVATION**

That the lessee agrees, as part of the conditions of the lease, that he will not accept any Government cost-sharing payment for soil conservation practices required by this lease. Further, the lessee agrees that he will not accept any other Government or state subsidy based on the lease without the written approval of the District Engineer.

**32. ENVIRONMENTAL BASELINE SURVEY**

An Environmental Baseline Survey (EBS) documenting the known history of the property with regard to the storage, release or disposal of hazardous substances thereon, is attached hereto and made a part hereof as **Exhibit "C"**. Upon expiration, revocation or relinquishment of this lease, another EBS will be conducted by both parties that will document the environmental condition of the property at that time. A comparison of the two surveys will assist the said officer in determining any environmental restoration requirements. Any such requirements must be completed by the lessee, at the lessee's expense.

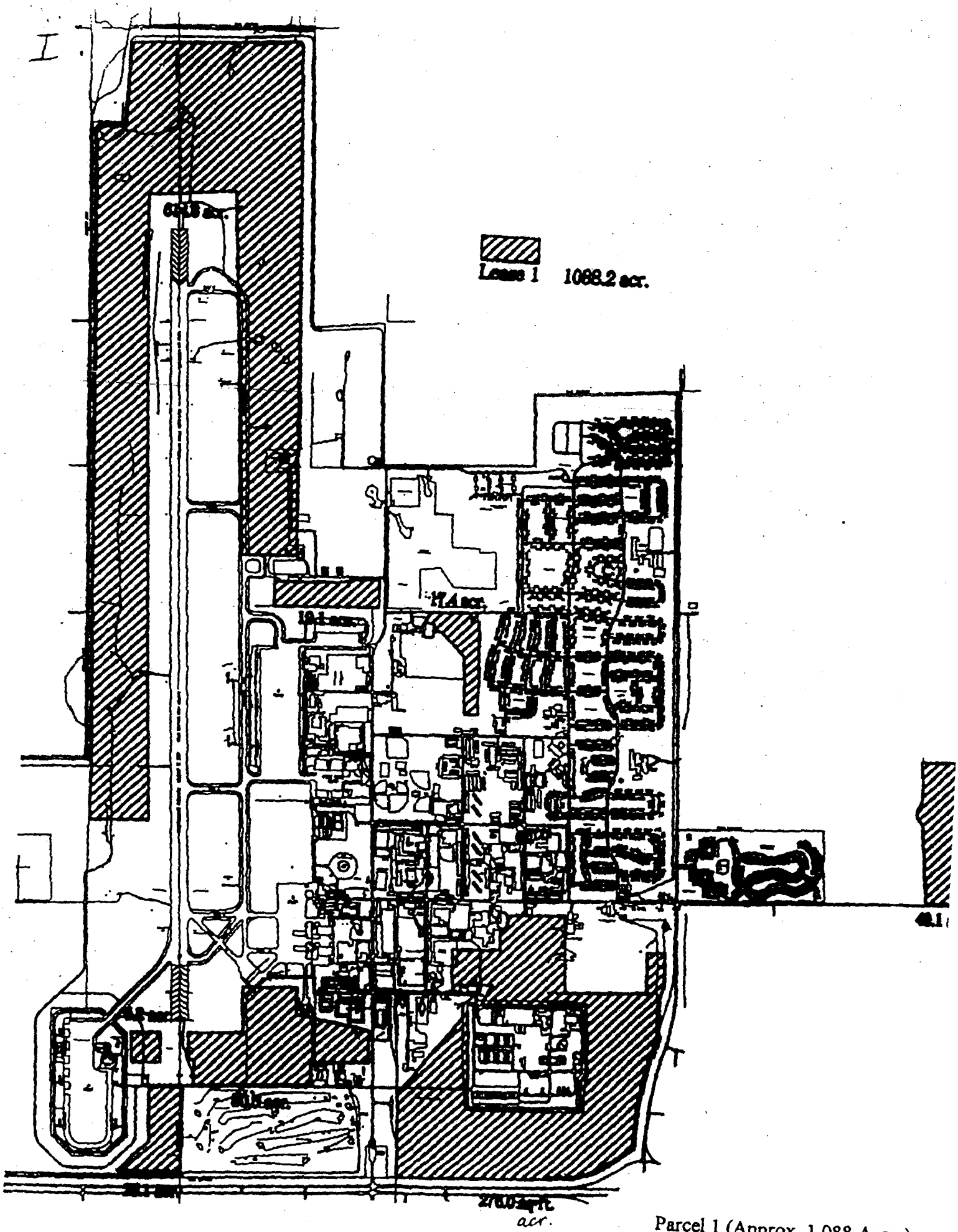
**THIS LEASE** is not subject to Title 10, United States Code, Section 2662, as amended.

**IN WITNESS WHEREOF** I have hereunto set my hand by authority of the Secretary of the Air Force this 31st day of July, 1998.

JAMES A. HAWKINS
Brigadier General, USAF
Commander

**THIS LEASE** is also executed by the lessee this 14 day of July, 1998.

**STEVEN MARTIN**
**2655 14TH AVENUE N.E.**
**EMERADO, NORTH DAKOTA 58228**




Parcel 1 (Approx. 1,088 Acres)
Exhibit A to
Lease # DACA45-1-08-6053

EXHIBIT "B"
LAND USE REGULATIONS
GRAND FORKS AIR FORCE BASE, NORTH DAKOTA

1. General Instructions.

   a. The lessee agrees to furnish all equipment and labor and to conduct all farming operations in accordance with the lease, recognized principles of good land management, and the land use practices set forth herein. All operations shall be accomplished in a timely manner without further notice and at no expense to the Government unless otherwise provided. Prior to initial right-of-entry being granted to the leased property, the lessee will present in person, his award notice to the Base Civil Engineer or his representative so that the lessee's management plan and the conditions of leasing may be mutually discussed.

   b. Verbal Agreements will not be honored. Any change in the Land Use Regulations herein, that is, crop changes, land maintenance, etc., shall be approved in writing by the District Engineer prior to lessee proceeding with change of farming operations. Any such agreement will be reduced to writing in the form of a "Supplemental Agreement" to the lease or an authorization letter from the Contracting Officer.

   c. The lessee and is employees shall at all times comply with all applicable Base Regulations and Departments of the Army or Air Force directives, and will be issued proper identification badges and automobile decals.

   d. In addition to the Land Use Regulations set forth herein, the use and occupation of the leased premises shall be subject to the general supervision and approval of the Base Civil Engineer Officer, Grand Forks Air Force Base, North Dakota, having immediate jurisdiction over the property and such rules and regulations regarding ingress and egress, safety, sanitation and security as may be prescribed by time from time to time.

2. Hay Production and Vegetation Control. Subject to maintenance and safety requirements and to the exclusion of roads, structures, and installed equipment, it is intended that the leased premises be utilized for hay production in a manner which will maintain the area in an attractive condition, relatively free of weeds, brush, ragged vegetation, or dry combustible debris. The lessee assumes responsibility for the full utilization of the property covered by this lease. All leased areas which can be traversed and are not mowed for hay production shall be mowed at least once each year, prior to 15 September, to a height of not less than 7 inches nor higher than 14 inches. Except for areas utilized for hay production, and mowing areas where maximum vegetative height is specified by the Base civil Engineer, or his representative, the lessee shall clip, spray, or otherwise limit vegetative height (except desirable trees) to 36 inches. When vegetative residue is of such density that it will smother, shade, or in any other way deter subsequent vegetative growth, or where dried material constitutes a fire hazard, such material will be removed by the lessee as his property. The lessee shall arrange his work so that when the grasses and/or hay is cut, chopped, swathed, winrowed, raked, or piled, it will be baled, chopped, or otherwise harvested and hauled away immediately. Except for landing areas, which necessitate bale pickup daily, bales will not be permitted to remain scattered longer than 7 days (weather permitting). All hay shall be removed from the premises within 30 days after harvesting or if the Base civil Engineer allows, will be stacked or stored on the Base at locations designated by him.

3. General Mowing. All leased areas, which can be traversed, even though not used for hay, will be mowed as needed in accordance with the vegetation control requirements of paragraph 2 above. The lessee's equipment shall be operated in such a manner as to prevent damage to airfield lighting fixtures and to prevent the throwing of vegetation, rock and other debris onto the paved runways, taxiways, and aprons.

4. Failure to comply with Mowing Requirements. If at any time during the lease period, the lessee fail to have available the required operating equipment to adequately perform all work called for in the lease; such failure may be considered a breach of contract and shall be sufficient reason for revocation of the lease.

5. Grazing Prohibited. The grazing of livestock on any part of the leased area is prohibited.

Parcel 1 (Approx. 1,088 Acres)
Exhibit B to
Lease #DACA45-1-98-6053

6. Herbicides and Insecticides. The lessee will not discharge or apply any substance to the leased premises or operate it in any manner which would cause pollution to the ground water, surface waters, or air to the extent that is would be prejudicial to the health of human, animal, or aquatic life. Herbicides, insecticides, and other agricultural chemicals will be used only when there are no practical alternative methods. Prior to their use the lessee will secure written approval of the chemical, the rate, and the method of application to include North Dakota State certified pesticide application number from the Base Civil Engineer or his representative. Burning of chemical containers on the Base is prohibited. The lessee shall assume full responsibility for applications of herbicides and/or pesticides in accordance with the provisions of the Environmental Protection Agency (EA). Damage resulting from the use of chemical spray by the lessee, either to the leased premises, adjacent property, and/or life shall be a lessee responsibility.

7. Brush and Weed Control. An active and effective weed and brush control program must be conducted on the entire leased area at the lessee's expense. If thistles are present, the lessee shall, annually, at his expense, by early spraying and/or timely mowing, prevent the spread of this noxious weed, eliminate it from the leased premises, and prevent its re-infestation. All pesticide applications must be in accordance with applicable federal and state legal requirements.

8. Hay Operation. The lessee will schedule is operations as directed by the Base civil Engineer, Grand Forks Air Force Base, and must be prepared at all times to move his equipment with minimum notice when working in areas in close proximity to the airfield pavement. All work will be performed in a manner that will result in a minimum of interference to Base activities. Access to the leased areas will be designated by the Base Civil Engineer.

9. Entry Prior to Expiration. The lessee agrees to allow another operator to enter upon the leased premises in the fall preceding expiration or termination of this lease for the purpose of preparing the land for planting those areas where the crops grown under this lease have been harvested.

10. Equipment, Materials, Parking and Storage. All equipment shall be furnished, serviced, and maintained by the lessee and shall be equipped with adequate mufflers and safety devices. Equipment, when not in use, will be parked in areas designated by the Base Civil Engineer. Areas for overnight parking of equipment during active operations shall be designated at a location not closer than 750 feet from the centerline of the runway or nor within 100 feet of the taxiway, but shall not be further than 2,098 feet from the area of the haying operation. Fuel, oil, grease, maintenance tools, twine, wire, repair parts, and/or equipment attachments shall remain on mobile vehicles. At the end of the growing season, all equipment and materials will be removed from the leased premises. The construction of pit or trench silos or the ensiling of forage on the leased premises is prohibited. Catalytic converter equipped vehicles will not be permitted to stand, park or be driven on areas where vegetation or other combustible material beneath the vehicle may catch fire from converter heat.

11. Crossing of Runways and Taxiways. No vehicles shall travel along any taxiway or runway nor any vehicle enter areas bounded by runways or taxiways except by crossing at the time and on the taxiway designated by the control tower. The procedure for obtaining permission to enter the runway and clear zone areas will be established by the Base Civil Engineer. The lessee will immediately remove any dirt, grass, mud or other debris from the taxiways or runways which are deposited by equipment crossing said taxiways or runways.

12. Identification and Removal of Equipment. All equipment, while operating in the landing and clear zone areas shall be identified by means of a flag on a staff attached to and flying above the vehicle. The flag will not be less than 3 feet square, and will be of a checkered pattern of international orange and white (of not less than one-foot squares) or high visibility yellow on each side. Any night operations, if permitted by the Base Operations Officer, must also be marked by battery operated, low intensity, red flasher lights on all equipment. In the event of an emergency, the lessee will immediately move his equipment as far as possible away from the active runway. Procedures to indicate such an emergency will be formulated by the Base Civil Engineer.

13. Two-Way Communication Equipment. All two-way communication equipment, two-way radios, citizens band radios, radiotelephones, etc., in vehicles used by the lessee or is employees while on the Base must be registered with the Base Land Mobile Radio (LMB). The registration must be done at the time of obtaining decals for the vehicles or immediately after the installation of the above described communication equipment in the vehicles that have decals.

14. Security. Transmission of any information concerning Grand Forks Air Force Base or its mission is against Federal regulations. Each lessee will be required to sign an agreement that neither he nor any of his employees will transmit information about the Base.

15. Crop Production to be Allowed.

    a. Areas designated as hay harvesting areas on Exhibit "A": The lessee will be allowed to either harvest the existing alfalfa cropland/native grasses for hay crop only or may plow any or all areas and re-seed with an alfalfa/brome grass mixture at the following rate: 3.25 pounds of pure live Alfalfa seed together with 3.5 pounds of live Brome Grass seed per acre. If the lessee elects to plow and reseed all or a portion of the harvestable hay area, lessee will be required to plant a nurse crops consisting of oats or barley applied at a rate not to exceed one-half (1/2) bushel per acre the first year that the area(s) are reseeded. The following rates of fertilizer will be applied, if needed, annually: 50 pounds of Nitrogen and 50 pounds of Phosphate per acre.

# APPENDIX I
# BIRD AIRCRAFT STRIKE HAZARD PLAN FOR GFAFB

# DEPARTMENT OF THE AIR FORCE

HEADQUARTERS, 319TH AIR REFUELING WING (AMC)
GRAND FORKS AIR FORCE BASE, NORTH DAKOTA

28 Feb 03

MEMORANDUM FOR SEE DISTRIBUTION (Annex E)

FROM: 319 ARW/CC
460 Steen Blvd
Grand Forks AFB ND 58205-6231

SUBJECT: 319 ARW OPLAN 91-202, Bird Aircraft Strike Hazard (BASH) Plan

1. Attached is a BASH plan providing guidance for bird strike hazard reduction in areas where flying operations are conducted. This plan is effective upon receipt.

2. This plan will be reviewed annually and will be updated as appropriate. Tasked organizations will review the plan and forward comments to 319th Wing Safety as necessary. The office of primary responsibility for this plan is 319 ARW/SEF, ext. 3842.

3. This supersedes 319th Wing OPLAN 91-202, dated March 2001.

4. Asterisks denote changes.

SCOTT R. PHILLIPS, Colonel, USAF
Commander

# ADMINISTRATION AND SECURITY INSTRUCTIONS

1. The long title of this plan is the 319 ARW OPLAN 91-202 (Bird Aircraft Strike Hazard). The short title is the BASH PLAN.

2. The classification of this document is UNCLASSIFIED.

3. This document is designated "FOR OFFICIAL USE ONLY" and will be handled in accordance with AFI 37-138. Reproduction and distribution of this plan is restricted to authorized use.

## Record of Changes

| Change Number | Date | Date Posted | Posted By |
|---|---|---|---|

## Record of Annual Review

| Reviewed By | Date Reviewed | Remarks |
|---|---|---|

# PLAN SUMMARY

1. PURPOSE. To provide a base program to minimize bird strikes to aircraft by identifying hazards and applying risk controls to eliminate or lower the risk of bird strikes.

2. CONDITIONS FOR EXECUTION. This plan is based on hazards from both resident and seasonal bird populations. Implementation of specific portions of this plan is continuous, while other portions will be implemented as required by bird activity.

3. * Operational Risk Management (ORM). The basic tenants of ORM will be followed in the execution/application of this plan. All agencies will be engaged to assess risks and apply risk controls when appropriate.

4. OPERATIONS TO BE CONDUCTED.

a. Specific operations include:

(1) Designate PHASE periods based on historic bird strike data.

(2) Establishment of a Bird Hazard Working Group (BHWG).

(3) Procedures for reporting hazardous bird activity and altering or discontinuing flying operations.

(4) Provisions to disseminate information to all assigned and transient aircrews for specific bird hazards and procedures for avoidance.

(5) Procedures to eliminate or reduce environmental conditions that attract birds to the airfield.

(6) Procedures to disperse birds on the airfield by:

(a) Tasked organizations, as listed in ANNEX A.

(b) Provide supporting plans and checklists as required.

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# BASIC PLAN

References:

| | |
|---|---|
| AFM 10-401 | Planning Formats and Guidance |
| UFC 3-260-01 | Airfield and Heliport Planning and Design |
| AFI 32-1053 | Pest Management Program |
| AFI 32-7064 | Integrated Natural Resources Management |
| AFM 32-1076 | Design Standards for Visual Air Navigation Facilities |
| AFI 32-7042 | Solid and Hazardous Waste Compliance |
| AFI 32-7063 | Air Installation Compatible Use Zone |
| DOD 4150.7 | Pest Management Program |
| AFI 91-202 | The US Air Force Mishap Prevention Program |
| AFI 91-204 | Investigating and Reporting US Air Force Mishaps |
| AFPAM 91-212 | BASH Management Techniques |
| BASH Team Staff Assistance Visit Reports | |
| Field Guides to Regional Birds | |
| Compiled Listing of Base Bird Strikes | |

1. **Situation:**

a. General. A bird aircraft strike hazard exists at Grand Forks AFB and its vicinity due to resident and migratory bird species. Daily and seasonal bird movements create various hazardous conditions. This plan establishes procedures to minimize the hazard at Grand Forks AFB. No single solution exists to this BASH problem and a variety of techniques and organizations are involved in the control program. This plan is designed to:

(1) Establish a BHWG and designate responsibilities to its members.

(2) Establish procedures to identify high hazard situations, alert supervisors and aircrews, and provide guidance and an effective process to limit or discontinue flying operations when warranted.

(3) Establish aircraft and airfield operating procedures to avoid high-hazard situations.

(4) Provide means of disseminating bird hazard information to all assigned and transient aircrews and procedures for bird avoidance.

(5) Establish procedures and guidelines to decrease airfield attractiveness to birds IAW AFI 32-7064.

(6) Provide guidelines for dispersing birds when they congregate on the airfield.

b. Airfield and local area maps. They include a detailed description of the base and its surroundings. This information is available in the Integrated Natural Resources Management Plan through 319 CES/CEV, ext. 4774, and covers the following areas:

- Base location (county, state)
- Base size (acres)
- Base elevation
- General topography
  - Significant terrain features
  - Rivers, lakes, ponds
  - Developed areas
- Landfill locations
- Sewage ponds
- Golf course
- Other significant bird attractions

2. **Execution:**

a. Concept of Operations:

(1) Reducing the bird strike hazard at GFAFB requires a cooperative effort between several base organizations. The OPR for coordinating this plan is the 319 ARW/SEF.

(2) BHWG

(a) Function. Collects, compiles, and reviews data on bird strikes. Identifies and recommends action to reduce hazards. Recommends changes in operational procedures.

(b) Authority. The BHWG submits all recommendations to the 319 ARW/CV, for approval. Implementation is through the normal chain of command.

(c) Composition. The chairman is the 319 ARW/CV. As a minimum, the group will consist of the following representatives: 319 ARW/CV, Operations Group CC, 319 ARW Flight Safety, Airfield Operations (Chief, Airfield Management), Airfield Operations Flight Commander, Civil Engineering CEV, and representatives from other tasked organizations (ANNEX A) as required.

(d) Meeting Schedule. Quarterly during PHASE I, monthly during PHASE II, (ANNEX D) or as deemed necessary by the chairman of the BHWG. The BHWG will meet separate from the Quarterly Airfield Operations Board.

b. Tasks: ANNEX B outlines the tasks and responsibilities for each organization.

# TASKED ORGANIZATIONS:

Tasked organizations are members of the BHWG. The tasked organizations will designate primary and secondary members.

1. ORGANIZATIONS:

319 ARW/CV
319 ARW/SEF
319 ARW/CP
319 ARW/CPM
319 OG/CC
319 OG/OGV
319 OSS/OSAA
319 OSS/OSAB/D
319 OSS/OSO
905 ARS/CC
906 ARS/CC
911 ARS/CC
912 ARS/CC
319 MXG/CC
319 CES/CEV

# TASKS AND RESPONSIBILITIES

1. **319 ARW/CV:**

a. Chairs BHWG or designates a representative.

b. Approves recommendations of the BHWG.

2. **319 ARW/SEF:**

a. Declares and disseminates bird watch condition upgrades on GFAFB (ANNEX D).

b. Coordinates with Base Operations, recommends bird watch condition downgrades when it is safe to do so.

c. Ensures base-wide compliance with AFI 91-202, U.S. Air Force Mishap Prevention Program.

d. Performs an annual evaluation of the BASH program.

e. Reports all bird aircraft strikes and hazards IAW AFI 91-202 and 91-204.
HQ AFSC, AMC and locally developed metrics will be used to collect and analyze data for bird hazard identification (categorize), unacceptable trends, and potential quick corrective action. This data will be briefed during the BHWG.

f. Coordinates semi-annually with the Wing Migratory Bird Program Manager (BPM, 319 CE/CEVA) on all local bird strikes and hazards.

g. Identifies and forwards non-fleshy bird remains (feather, beak, or foot) to the Smithsonian Institution in Washington D.C. for identification.

3. **319 ARW/CP:**

a. Disseminates bird watch conditions for GFAFB, (ANNEX D).

b. Notifies agencies as identified in Annex D Item 4 when bird watch condition moderate or severe is declared.

c. When an aircrew encounters or calls in bird activity, Command Post will complete their checklist and inform other flight crews as identified in Annex D Item 5 (a).

4. **319 ARW/CPM**

a. Notifies agencies of hangars/buildings requiring nest removal.

b. Complete Nest Removal Tracking Sheets and forward to CE/CEV (September) for annual U.S. Fish and Wildlife reports (ATTACHMENT 2).

5. **319 OG/CC:**

a. Issues specific guidance for aircrews on procedures to be followed under bird watch conditions (ANNEX D).

b. Issues specific guidance to the Command Post concerning actions required to implement this plan (ANNEX D).

c. Monitors planned flying schedule and makes operational changes to avoid areas and times of known hazardous bird concentrations, mission permitting. Consideration shall be given to the following during periods of increased bird activity:

(1) * Continue to apply measures under the low, moderate, and severe conditions giving consideration to placing aircraft in holding away from bird activity until they are dispersed or move of their own accord.

(2) Avoid scheduling takeoffs/landings at dawn/dusk plus or minus 1 hour during PHASE II (ANNEX D) if mission permits.

(3) Reschedule local training or transition elsewhere. Select transition bases based on bird hazard data from the US Fish and Wildlife Service or HQ AFSC BASH Team (such as the Bird Avoidance Model) available from Squadron/Wing Flight Safety Offices.

(4) Discontinue/do not attempt Tactical Arrivals and Departures procedures (TAD).

(5) Make full-stop landings.

6. **319 OG/OGV:**

~~a. Reviews with 319 OG/CC, changes to existing procedures for BASH potential.~~

b. Regularly monitors aircrew preflight briefings to ensure current BASH conditions are briefed.

7. **319 OSS/OSAA:**

a. Declares and disseminates bird watch condition upgrades on GFAFB, (ANNEX D).

b. * Acts as central authority in downgrading the bird watch condition when it is safe to do so.

c. * Notifies 319 ARW/CP who insures 319 OG/CC is notified promptly of all upgrades/down grades.

d. Conducts daily airfield surveys. Non-fleshy bird remains (feather, beak, or foot) found on the airdrome will be forwarded to Wing Safety.

e. * Disseminates Bird Watch Conditions MODERATE and SEVERE as an Airfield Advisory.

f. Completes Bird Watch Condition tracking sheets for MODERATE or SEVERE conditions and forwards to Wing Safety by the end of the month for data collection and reporting (ATTACHMENT 1).

g. Provides initial and annual training for all individuals authorized to operate and transport airfield pyrotechnic devices. Documentation will be entered in individual's training records.

8. **319 OSS/OSAB/D:**

a. Reports observed bird activity and BWC changes to Base Operations, Chief of Airfield Management, or his designated representative.

b. *Aircrews are responsible to insure they are aware of the BWC prior to conducting and flying operations at GFAFB. Air Traffic Controllers will broadcast BWC in accordance with governing directives. Periods of heavy migratory activity (Phase II) will be announced on the ATIS. For other than AMC aircraft, continued operations are at their discretion and in accordance with their command directives.

c. Provides Airfield Management/Flight Safety expeditious access to the runway under bird watch condition MODERATE or SEVERE or as required.

d. Identifies radar targets as possible bird activity when appropriate to provide warning to pilots.

e. Recommends missed approaches or delayed takeoffs when visual bird hazards appear on the airfield or in the traffic pattern.

f. * Air Traffic Control will modify aircraft track and/or altitude once a bird strike or bird sightings are reported at pilot request.

9. **319 OSS/OSO:**

a. Appoints an Officer as the Bird Avoidance Action Planner (BAAP) when mission concerns dictate this action. (Deployments to areas where a high birdstrike potential exists)

b. Briefs tanker and transient AMC aircrews on the current bird threat.

c. Coordinates with 319 OSS/OSOS on the safest times to fly local transition in order to minimize the bird strike threat. Annotates the total number of missions falling within the "dusk/dawn" window on the cover of the flying schedule.

10. **FLYING SQUADRON CC'S/ FLIGHT SAFETY OFFICERS (FSOs):**

a. Ensure aircrews participate in the BASH reduction program by promptly reporting all bird strikes and hazardous conditions IAW this directive.

b. Ensure current bird activity data is available to aircrews via Bird Avoidance Model (BAM) website.

c. Ensure an adequate supply of current AF FORM 853 (Bird Strike Report) are available to aircrews.

d. Brief aircrews on seasonal bird hazards. Movies, articles, and other information will be used as appropriate to maintain awareness.

e. Brief aircrews to forward non-fleshy remains (feather, beak, or foot) taken from the aircraft following all known bird strikes to 319 ARW/SEF along with a completed AF FORM 853. These non-fleshy remains can be used for positive identification and are not to be discarded.

11. **319 MXG/CC:**

a. Reporting of bird strikes on aircraft:

(1) Issues specific guidance to personnel for the reporting of all discovered bird strikes on aircraft to MXG Quality Assurance office and Wing Flight Safety.

(2) Issues procedures for the preservation of non-fleshy bird remains (feather, beak, or foot) when discovered on aircraft.

b. Nest removal from MXG-owned hangars and buildings within the flightline area:

(1) Building custodians will inspect their facilities daily for swallow nests under construction (May-Aug). Nests will be reported to the MOC who will notify the appropriate agency for removal. Numbers of removed nests will be recorded by the MOC on the Nest Removal

Tracking Sheet and forwarded to CE/CEV annually for reporting to the Federal Fish and Wildlife Service. (ATTACHMENT 2)

(2) AMXS will be responsible for clearing nests from building/hangar 600, 602, 522, 807, and Bldg. 649 Bays 1 and 2. Provide MOC with all necessary information to complete Nest Removal Tracking Sheet.

(3) MXS will be responsible for clearing nests from building/hangar 601, 603, 605, 613, and Bldg. 649 Bay 3. Provide MOC with all necessary information to complete Nest Removal Tracking Sheet.

(4) Airfield Management will be notified for the remaining structures. Flight Safety is responsible for removal of these nests. Numbers of nests removed will be reported to CE/CEV for annual reporting to the Federal Fish and Wildlife Service. (ATTACHMENT 2)

12. **319 CES:**

a. Applies for and maintains depredation permits.

b. Collects Nest Removal Tracking Sheets and produces annual reports to the Federal Fish and Wildlife Service.

c. Provides a Natural Resource representative to the BHWG to monitor and advise the group of environmental modifications.

d. Develops procedures for removal or control of bird attractants.

e. Initiates surveys and writes environmental impact assessments and statements as required.

f. Conducts BASH surveys with Chief of Airfield Management and Wing Flight Safety when conditions dictate.

g. Addresses environmental issues impacting BASH potential.

h. Uses land management practices reducing BASH potential whenever possible.

i. Modifies airfield habitat consistent with runway lateral and approach zone management criteria IAW AFI 32-7063, Air Installation Compatible Use Zone. Habitat reduction to reduce BASH beyond the 1000' distance criterion is desired and will further reduce BASH potential.

j. Incorporates the following practices into the Integrated Natural Resources Management Plan:

(1) Grass Height Management. Mowing procedures shall maintain uniform grass height between 7 and 14 inches. Mowing frequency will be as needed to maintain height requirements. Coordinate mowing with periods of low flight activity. Grass must be cut before it goes to seed to discourage seed eating birds from utilizing the airfield. Long grass discourages flocking species from entering the airfield because reduced visibility disrupts interflock communication and flock integrity and also prevents predator detection. Grass normally should not exceed 14 inches, as high grass will attract some bird species and rodents that in turn attract raptors. Airfields with a variety of grass species may have a fast-growing strain reaching 14 inches sooner than the rest of the airfield. Mowing will be conducted when the average grass height reaches 14 inches. Higher grass height may be allowed if the airfield is leased for hay production (refer to AFI 32-7064). Obtain assistance in herbicide selection for weed control, appropriate grass seed selection, fertilization, and erosion control vegetation from the US Soil Conservation Service or the Agriculture Extension Service.

(2) Broad-leafed weed control. Broad leaf weeds will be kept to a minimum on the airfield. Apply herbicides as a last resort after other integrated pest management practices (i.e. mowing and cultivating) as necessary for control of weeds. Broad leaf weeds attract a variety of birds, may produce seeds or berries, and may limit grass growth.

(3) Planting bare areas. Bare areas are frequently used by birds as resting sites and should be eliminated on the airfield. Grass will be planted as necessary and appropriate irrigation maintained.

(4) Reducing edge effect. Edge effect refers to the highly attractive transition zone between two distinct habitat types (i.e., brush to grassland). The airfield will be maintained as uniformly as possible to reduce this effect.

(5) Leveling of airfield. High and low spots on the airfield should be leveled or filled to reduce attractiveness to birds and prevent standing water. Before leveling of airfield, work must be coordinated through 319 CES/CEV to ensure the protection of wetlands.

(6) Dead vegetation such as brush piles, hay bales, etc., will be covered or removed as soon as possible.

(7) Pest control. Invertebrates and rodents provide important food sources for many birds. Civil Engineering Pest Management Section should periodically survey and reduce these pests when required. Control of insects, earthworms, rodents, etc., through use of insecticides and rodenticides will be accomplished under the supervision of the base Pest Management Office and coordinate with EPA, local, state, and federal wildlife agencies to insure BASH plans do not violate any laws and required permits are obtained. Control should begin early in the spring. This must be coordinated with the approved control section of the Wildlife Management Plan.

(8) Drainage ditches. Ditches will be inspected regularly and kept clear and obstacle-free. Ditch sides will be maintained as steeply as possible to discourage wading birds and emergent

vegetation. Vegetation will be removed as often as necessary to maintain flow and discourage use by birds.

(9) Erosion control vegetation. Appropriate vegetation should be used for the region and should support the BASH reduction philosophy--i.e. do not control erosion-using plants, which produce seeds at heights below 14-18 inches.

(10) Agricultural crop outleasing. Outleasing of crops should be consistent with BASH reduction philosophy. Hay is a suitable crop for runway lateral and approach clearance zones when properly managed. Refer to AFI 32-7064 for program requirements.

(11) Eliminate roosting sites. Vegetation management of roost sites will control blackbird and starling roosts where possible. Trees will be pruned to reduce the number of perches available, and entire trees or stands removed if necessary.

(12) Removal of birds from buildings and hangars. Pigeons, sparrows, swallows and starlings frequently live in buildings and hangars and must be excluded. Denying access by screening windows, closing doors, and blocking entry holes is most effective. Other methods to be considered:

(a) "Bird-Proof". A sticky repellent manufactured by Bird-X. Pest Management will survey bird roosting sites and apply Bird-Proof where maximum numbers of birds will contact them.

(b) Pellet Guns. Shoot birds for a short-term solution. Experience shows all birds cannot be removed using this technique. Proper safety equipment is necessary. A depredation permit is required for all birds except pigeons, cowbirds, grackles, blackbirds, crows and magpies.

(c) Netting. Install under superstructure to exclude pest birds from roosting areas. Ensure no gaps or holes are present for birds to get through.

(d) "Flight Control". Goose repellent, sprayed on grass. Particularly effective in sewage lagoon area.

(e) Trapping/Removal. Use live traps baited with food and water to trap pest birds. Birds can be released away from the hangar.

(f) Design features. Consider structures with the support features located on the outside of the building to greatly reduce bird numbers. Consider this design when planning a new hangar.

(g) Door Coverings. Use netting or plastic strips suspended over the doors to exclude birds. Ensure no tears or holes are present to allow birds hangar access.

(h) Sharp Projections. Use in limited areas such as ledges, overhangs, or small places where birds cannot be allowed. Expense prohibits their use over the entire structure.

(i) Night Harassment. Use high-pressure air or water to make hangars an undesirable roosting site. Persistence is the key. (permit required)

(j) Bird Nest Removal. Use water or other means to wash/remove nests from hangars and buildings during nest construction IAW Annex B of this plan and the wildlife permit.

(16) Other animal hazards to aircraft. Use appropriate trapping methods for problem animals. Consider fencing for deer control. Shooting or trapping may remove some species or individual animals. Coordinate with the Natural Resource Manager, 319 CES/CEV, 7-4655 to obtain appropriate permits.

# REPORTS AND FORMS

1. **GENERAL.** This Annex outlines the procedures and forms required to report bird strikes IAW AFI 91-202 and 91-204 and to enhance the BASH program at GFAFB.

2. **AFI 91-202, NON DAMAGING BIRD STRIKE REPORT:**

The Safety Office will compile all reported bird strike data from completed AF FORM 853.

3. **AFI 91-204, DAMAGING BIRD STRIKE REPORT:**

Bird strikes resulting in reportable aircraft damage are reported by 319 ARW/SEF to appropriate agencies IAW AFI 91-204.

4. **ATTACHMENTS:**

a. Bird Condition Tracking Sheets to be completed for each BWC change.

b. Nest Removal Tracking Sheet to be completed and forwarded to CE/CEV for annual report to U.S. Fish and Wildlife Service.

5. **BIRD REMAINS IDENTIFICATION:**

a. Non-fleshy bird remains taken from aircraft or airfield following bird strikes will be forwarded to the Wing Safety Office. Small remains such as downy feathers can be used for positive identification, and are not to be discarded.

b. The Safety Office will forward all remains to the BASH Team for identification:

Smithsonian Institution Natural History Building
Division of Birds, ATTN: Dr. Carla Dove
NHBE 605 MRC 116
10th and Constitution Ave NW
Washington D.C. 20560

# BIRD HAZARD WARNING SYSTEM: OPERATION BIRD WATCH

1. **GENERAL**: This operation establishes procedures to be used for immediate exchange of information between ground agencies and aircrews concerning the existence and location of birds, which could pose a hazard to flight safety.

2. **BIRD WATCH CONDITIONS**: The following terminology will be used for rapid communications to disseminate bird activity information and implement unit operational procedures. Bird locations should be given with the condition code. Phase periods are determined by the BHWG.

a. PHASE I period. Indicates light bird activity. (Normally Dec through Mar)

b. PHASE II period. Indicates heavy bird activity. (Normally associated with migratory seasons)

c. Bird Watch Condition Definitions.

(1) Bird Watch Condition LOW. Normal bird activity on and above the airfield with a low probability of hazard.

(2) Bird Watch Condition MODERATE. Concentrations of 5 to 15 large birds or 15 to 30 small birds observable in locations which represent a probable hazard to safe flying operations. This condition requires increased vigilance by all agencies and extreme caution by aircrews.

(3) Bird Watch Condition SEVERE. Heavy concentration of birds, more than 15 large birds or 30 small birds on or above the runway, taxiways, in-field areas, and departure or arrival routes. Aircrews must thoroughly evaluate mission need before operating in areas under condition SEVERE.

(4) Bird Watch Alert. Weather, time of day, and seasonal conditions which make an influx of birds onto the airfield likely.

d. Declaration of a bird watch condition will be based on the following:

(1) Information relayed by airborne aircraft to ATC or Command Post.

(2) Ground observations and information passed to the Chief of Airfield Management (CAM), or his designated representative, the Tower Watch Supervisor, or Wing Flight Safety Officer/NCO.

3. **AUTHORITY**: During normal flight operations the authority to upgrade the bird watch condition is vested with the Chief of Airfield Management (CAM) or his designated representative, the Senior Air Traffic Controller, and Flight Safety Officer/NCO. The CAM (or designated representative) is the central authority in downgrading the bird watch condition. Conditions can be declared based on ground observations, pilot reports, radar observations, etc.

4. **COMMUNICATIONS**: *Bird watch conditions will be disseminated by the following means: During periods of flight operations, bird watch conditions will be posted at Base Operations. For any changes in the Bird Watch Condition, Base Operations will be the primary point of contact. When the Bird Hazard Condition changes the CAM will dispatch the Bird Harassment Team for investigation and dispersal. Base Operations will notify the Tower, Command Post, and RAPCON. Command Post will notify 319 OG/CC, Base Operations, Scheduling, Wing Safety, and the flying squadrons.

Base Operations personnel will post an Airfield Advisory for Bird Watch Condition MODERATE or SEVERE. Current bird conditions other than low will be included in the Automatic Terminal Information Service (ATIS) broadcasts.

5. **AIRCREW RESPONSIBILITIES AND PROCEDURES**:

a. *Anytime an aircrew is aware of bird activity that is a hazard to flying, they shall contact the control tower and report the following information:

(1) Call Sign

(2) Location

(3) Altitude

(4) Time of Sighting

(5) Type of bird (if known)

(6) Approximate number of birds

(7) Behavior of birds (soaring, flying to or from a location, direction of flight, etc.)

b. Condition SEVERE:

(1) For AMC-tasked missions, approval authority for non-AMC locations lies solely with the AMC/DO. Aircrews requesting waivers while at non-AMC locations will coordinate with the AMC/DO through the TACC. Recommended guidance during SEVERE BWC is to delay departures and arrivals until BWC is lowered. When a waiver is approved for operation during

SEVERE BWC at AMC locations, the OG/CC or higher must actively monitor launch and recovery of aircraft.

(2) Traffic Pattern, local takeoffs and landings are prohibited without OG/CC or higher approval; formation takeoffs are prohibited. Actions to be considered are: changing runways, delaying takeoffs and landings, diverting aircraft, changing pattern altitude, etc. Aircraft Commanders will inform tower of their intentions.

c. Condition MODERATE:

Initial takeoffs and final landings allowed only when departure and arrival routes avoid identified bird activity. Local IFR/VFR traffic pattern activity ceases.

d. Condition LOW:

All locations. Continue with normal operating procedures.

e. Bird Watch Alert:

f. In addition to the above bird watch conditions, a Bird Watch Alert may be declared. All aircrews should be aware of the increased likelihood of bird hazards to flight safety.

g. If a bird strike is known or suspected refer to Volume III of AFI 11-2KC-135.

h. *Aircrews are responsible for awareness of the BWC prior to conducting any flying operations at GFAFB.

6. **PROCEDURES FOR COMMAND POST**: If a bird activity report is received from ~~airborne aircraft, Base Operations will be notified and Command Post will complete appropriate~~ checklist.

7. **DOWNGRADING**: *Once a bird watch condition is declared every effort must be made to downgrade the condition commensurate with updated information. **Any recommendations to downgrade the bird watch condition must be coordinated through Base Operations.** Base Operations (CAM or designated representative) will approve the downgrading and notify OG/CC, Tower, RAPCON, and Command Post.

8. **AIRFIELD MANAGEMENT PROCEDURES**: During normal airfield surveillance, airfield management will monitor bird populations, grass height, drainage ditches, etc., and report problems to the appropriate OPRs for modifying or eliminating the problem. HQ AMC and locally developed metrics will be used to report bird watch conditions and harassment actions taken to the BHWG.

9. ***DEPREDATION**: Any requirement for killing birds and the desired method of depredation,

will be determined jointly by Airfield Management, Flight Safety, and the civil engineering squadron (CES). Once established, CES will ensure proper permits are procured from state and federal agencies prior to depredation activity. State and federal agency assistance is desirable.

# DISTRIBUTION

| ADDRESSES | NO. COPIES |
|---|---|
| HQ AFSC/SEFW, Kirtland AFB, NM | 1 |
| HQ AMC/SEF, Scott AFB, IL | 1 |
| 15 AF/SEF, Travis AFB, NJ | 1 |
| **UNIT** | |
| 319 ARW/CC | 1 |
| 319 ARW/CV | 1 |
| 319 ARW/SEF | 2 |
| 319 ARW/CP | 1 |
| 319 ARW/CPM | 1 |
| 319 ARW/XP | 1 |
| 319 OG/CC | 1 |
| 319 MSG/CC | 1 |
| 319 OG/OGV | 1 |
| 319 MXG/CC | 1 |
| 319 OSS/CC | 1 |
| 319 OSS/OSA | 4 |
| 319 OSS/OSO | 3 |
| 319 OSS/OSAA | 1 |
| 319 OSS/OSAO | 3 |
| 319 OSS/OSW | 1 |
| 319 CES/CC | 3 |
| 905 ARS/CC | 2 |
| 906 ARS/CC | 2 |
| 911 ARS/CC | 2 |
| 912 ARS/CC | 2 |
| 319 AMXS/CC | 1 |
| 319 MOS/CC | 1 |
| 319 MXS/CC | 1 |

Date

## ROUTING AND TRANSMITTAL SLIP

14 FEB 06

| TO: (Name, office symbol, room number, building, Agency/Post) | Initials | Date |
|---|---|---|
| 1. 319 CES/CEVC -- McCullough | | 2/14/06 |
| 2. 319 CES/CEV – Koop/Raknerud | | 2/14/06 |
| 3. 319 CES/CD -- Giltner | MCG | 2/17/06 |
| 4. 319 CES/CC -- Dewine | | 17 FEB 2006 |
| 5. | | |
| 6. | | |

| | Action | | File | | Note and Return |
|---|---|---|---|---|---|
| 1,2,3,4 | Approval | | For Clearance | | Per Conversation |
| | As Requested | | For Correction | | Prepare Reply |
| | Circulate | | For Your Information | | See Me |
| | Comment | | Investigate | 4 | Signature |
| | Coordination | | Justify | | |

REMARKS

Please sign SSS for signature approval on the updated Integrated Natural Resources Management Plan to comply with the Sikes Act.

DO NOT *use* this form as a RECORD of approvals, concurrences, disposals, clearances, and similar actions

Room No. - Bldg. 410

Phone No. 747-4774

**FROM:** *(Name, org. symbol, Agency/Post)*

*Kristen Rundquist, 319 CES/CEVC, Natural/Cultural Resources and Air Quality Program Manager*

**Tracking Number: 7474**

| 319 CES General Correspondence | | | |
|---|---|---|---|
| **SUBJECT** | GFAFB Integrated Nataural Resources Management Plan (INRMP) | | |
| DATE RCV'D | 1/1/1900 8:02:27 AM | OPR NAME | Rundquist |
| SUSPENSE | 3/14/2006 | OPR ORG | 319 CES / CEVC |
| ACTION | 319 ARW/CC approve updated INRMP to comply w/Sikes Act | | |

| **SQDN** | | | | | |
|---|---|---|---|---|---|
| **Off Sym** | **Initial/Date** | **Initial/Date** | **Initial/Date** | **Initial/Date** | **Initial/Date** |
| CC | | | | | |
| CD | | | | | |
| SUPERVISOR | | | | | |
| SUPERINTENDENT | | | | | |
| FLT CHF | | | | | |
| CSS | | | | | |
| CCF | | | | | |
| CEM | | | | | |
| CCQ | | | | | |
| CCS | | | | | |
| RETURN | | | | | |

| **GROUP** | | | | | |
|---|---|---|---|---|---|
| **Off Sym** | **Initial/Date** | **Initial/Date** | **Initial/Date** | **Initial/Date** | **Initial/Date** |
| CCS | SB 7Feb06 | | | | |
| CCA | | | | | |
| CCE | [illegible] 27 Feb 06 | | | | |
| CD | [illegible] 10 Mar 06 | | | | |
| CC | | | | | |
| RETURN | | | | | |

| **WING** | | | | | |
|---|---|---|---|---|---|
| **Off Sym** | **Initial/Date** | **Initial/Date** | **Initial/Date** | **Initial/Date** | **Initial/Date** |
| CC | [illegible] 3/21 | | | | |
| CV | [illegible] 21 Mar 06 | | | | |
| CCE | [illegible] 20 Mar | [illegible] 23 Mar | | | |
| CCS | [illegible] | | | | |
| CCC | | | | | |
| CCA | [illegible] / 15 Mar | | | | |
| RETURN | | | | | |