IOWA ARMY AMMUNITION PLANT

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN AND ENVIRONMENTAL ASSESSMENT

2007-2011

Gene Stout and Associates
Loveland, CO

and

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Cheyenne, WY

Environmental Branch

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN AND ENVIRONMENTAL ASSESSMENT

Iowa Army Ammunition Plant

ENDORSEMENT

This Integrated Natural Resources Management Plan meets the requirements of the Sikes Act (16 USC 670a *et seq.*) as amended.

Approving Officials:

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Commander
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DEC 12 2006
Date

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December 12, 2006
Date

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5/4/07
Date

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Iowa Army Ammunition Plant

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IOWA ARMY AMMUNITION PLANT REVIEW

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PREFACE

Integrated management plans for natural and cultural resources provide resource managers with the "how to" and the justification to carry out Department of Defense's conservation goals. Integrated Natural Resource Management Plans support the military mission by providing for sustained use of its land, sea, and air space; protecting valuable natural and cultural resources for future generations; meeting all legal requirements; and promoting compatible multiple uses of those resources.

Ms. Sherri Goodman
Former Deputy Under Secretary of Defense (Environmental Security)

Iowa Army Ammunition Plant... a critical Department of Defense munitions production and storage facility.

Producing and storing the munitions troops need to win on battlefields around the globe and conserving natural resources . . . Iowa Army Ammunition Plant is proving that the two missions are compatible and even complement each other.

For 65 years, Iowa Army Ammunition Plant has supported the U.S. Armed Forces. The installation has risen to the needs of the nation in times of peace and war, and the workforce and surrounding community have tremendous pride in the Plant's role in support of the nation's defense. The logistical support provided by the installation is first-rate today, just as it was when our troops needed ammunition on the Normandy beachhead, the Inchon landing, the Afghanistan Mountains, the Persian Gulf desert, and other battlefields across the globe.

Iowa Army Ammunition Plant's lands and natural resources are important to the military mission and to the region as a whole. A stewardship responsibility came with the acquisition of these lands. Iowa Army Ammunition Plant is committed to excelling in this stewardship role. This Integrated Natural Resources Management Plan is the Plant's plan of action for the conservation of natural resources entrusted to the U.S. Army.

The plan is for a 5-year period, but the philosophy behind this plan is for a much longer period of time. Iowa Army Ammunition Plant is committed to an ecosystem management approach to its natural resources program. This approach will help protect biological diversity and allow informed decisions to be made regarding the use of natural resources to support both the military mission and needs of the region and the nation.

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN AND ENVIRONMENTAL ASSESSMENT

IOWA ARMY AMMUNITION PLANT

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It is our obligation to ensure that our Soldiers today – and the Soldiers of the future – have the land, water, and air resources they need to train; a healthy environment in which to live; and the support of local communities and the American people.[1]

Purpose

This Integrated Natural Resources Management Plan (INRMP) guides implementation of the natural resources program on Iowa Army Ammunition Plant (IAAAP), Middletown, Iowa from May 4, 2007 (date of final approval signature) through May 4, 2012. The program conserves IAAAP's land and natural resources and helps ensure compliance with environmental laws and regulations. The INRMP also helps ensure the maintenance of quality lands to accomplish IAAAP's critical military mission on a sustained basis.

Environmental Compliance

General

Preparation and implementation of this INRMP are required by the Sikes Act (16 USC 670 *et seq.*) and Army Regulation (AR) 200-3 (*Natural Resources - Land, Forest, and Wildlife Management*) (Department of the Army 1995). Additional INRMP guidance is provided by the Department of Defense, principally a November 1, 2004 memorandum, *Implementation of Sikes Act Improvement Amendments: Supplemental Guidance concerning INRMP Reviews,* issued by the Assistant Deputy Under Secretary of Defense.

This INRMP helps IAAAP comply with other federal and state laws, most notably laws associated with environmental documentation, wetlands, federal-listed species, migratory birds, and wildlife management in general. Compliance requirements at least partially affecting implementation of the INRMP are listed in Section 1.4, *Compliance Requirements* and Appendix 1.4.6. This plan describes how IAAAP will implement provisions of AR 200-3 (Department of the Army 1995) and local regulations, principally IAAAP Regulation 420-1 (*Hunting and Fishing Regulation*).

National Environmental Policy Act

The National Environmental Policy Act (NEPA) requires disclosure of environmental impacts created by proposed major federal actions. 32 CFR Part 651 (*Environmental Analysis of Army Actions, Federal Register Vol. 67, No. 61, March 29, 2002*) and the Council on Environmental Quality (Implementing Guidelines for NEPA, 40 CFR Parts 1500-1508) recommend an Environmental Assessment (EA) be completed for natural resources management plans. 32 CFR Part 651 outlines NEPA compliance requirements of proposed Army actions. Recognizing the efficiencies and benefits associated by combining the INRMP and its associated EA into one document, this plan has been developed to satisfy both requirements. The INRMP has been reorganized from the Army Guidelines to accommodate NEPA documentation within the plan.

Sikes Act

The Sikes Act[2] states, *The Secretary of Defense shall carry out a program to provide for the conservation and rehabilitation of natural resources on military installations. To facilitate the program, the Secretary*

[1] Robert J. Schoomaker, U.S. Army Chief of Staff, and R.L. Brownlee, Acting Secretary of the Army. Excerpt from *The Army Strategy for the Environment, "Sustain the Mission – Secure the Future"*

[2] The Sikes Act referenced in this INRMP is as amended, including Public Law 105-85, the Sikes Act Improvement Act of 1997.

of each military department shall prepare and implement an integrated natural resources management plan for each military installation ...

The Sikes Act (16 USC 670 *et seq*.) requires that, consistent with the use of military installations to ensure the preparedness of the Armed Forces, each INRMP shall, where appropriate and applicable, provide for:

- fish and wildlife management, land management, forest management, and fish and wildlife-oriented recreation;
- fish and wildlife habitat enhancement or modifications;
- wetland protection, enhancement, and restoration where necessary for support of fish or wildlife;
- integration of, and consistency among, the various activities conducted under the INRMP;
- establishment of specific natural resources management objectives and time frames for proposed actions;
- sustained use by the public of natural resources to the extent such use is not inconsistent with the needs of fish and wildlife resources management;
- public access to the military installation that is necessary or appropriate for sustained use by the public of natural resources to the extent that the use is not inconsistent with the needs of fish and wildlife resources, subject to requirements necessary to ensure safety and military security;
- enforcement of natural resource laws and regulations;
- no net loss in the capability of military installation lands to support the military mission of the installation; and
- such other activities as the Secretary of the military department considers appropriate.

The Sikes Act also requires or provides for:

- regular review of this INRMP and its effects, not less often than every five years;
- provisions for spending hunting and fishing permit fees exclusively for the protection, conservation, and management of fish and wildlife, including habitat improvement and related activities in accordance with the INRMP;
- exemption from procurement of services under Office of Management and Budget Circular A-76 and any of its successor circulars; and
- priority for contracts involving implementation of this INRMP to state and federal agencies having responsibility for conservation of fish or wildlife.

This INRMP includes these items if they are applicable to natural resources management and land use at IAAAP.

Endangered Species Act

This INRMP has the signatory approval of the U.S. Fish and Wildlife Service (USFWS). This signature approval includes agreement that the INRMP complies with the Endangered Species Act. Review of the INRMP is informal consultation with regard to the Endangered Species Act.

Per provisions of the 2004 National Defense Authorization Act[3], this INRMP "*provides a benefit to the species for which critical habitat is proposed for designation*." U.S. Fish and Wildlife Service policy

[3] Section 318, Military Readiness and Conservation of Protected Species, National Defense Authorization Act of 2004.

states that, where applicable, federal critical habitat designation is not warranted if the INRMP includes certain criteria, which are summarized in Section 4.8.1.1, *Critical Habitat*.

Scope

The INRMP will provide the basis and criteria for protecting and enhancing natural resources using landscape and ecosystem perspectives, consistent with the military mission. The INRMP applies to organizations internal and external to IAAAP that are involved with or interested in the management or use of IAAAP natural resources and lands.

Relationship to the Military Mission

This INRMP supports the military mission by protecting and enhancing lands upon which the mission is critically dependent. The INRMP also describes recreational opportunities associated with natural resources to installation and local and regional communities.

The INRMP describes the effects of the military mission on natural resources and means to mitigate these effects. However, this INRMP does not evaluate IAAAP's military mission, nor does it replace any requirement for environmental documentation of the military mission at IAAAP.

Partnerships

This INRMP cannot be implemented by IAAAP alone. IAAAP has forged partnerships with various agencies to manage its natural resources. Major partners in the implementation of this INRMP are the Iowa Department of Natural Resources (IDNR) and the USFWS. Other partners in this effort include other federal and state agencies, universities, contractors, nongovernmental organizations, and private citizens. This INRMP was developed and will be implemented according to principles within the Memorandum of Understanding developed by the DoD, USFWS, and International Association of Fish and Wildlife Agencies[4].

INRMP Implementation Summary

This INRMP is designed to provide direct input into the budget process. The INRMP (chapters 4, 5, and 7) describes specific projects with justifications, timelines, and budgets. Each project with its goals and objectives and timelines are listed in Appendix 7.4. Section 7.5, *Implementation Funding Options* lists each project by funding source and provides estimated costs to implement during fiscal years 2007-2011.

Costs and Benefits

- **Costs:** This INRMP will cost about $2,767,000 for FY 07 - FY 11 to implement. Funding will be primarily from revenues generated from agricultural leases and the sale of hunting and fishing permits.
- **Military Mission Benefits:** Implementation of this INRMP will improve the quality of land and conditions for the production and storage of munitions at IAAAP. It will improve the capability for long range planning at IAAAP.
- **Environmental Benefits:** The INRMP provides the basis for the conservation and protection of natural resources. It will help reduce vegetation loss, soil erosion, and the potential for environmental pollution, while providing biodiversity conservation. Plan implementation will increase overall knowledge of the operation of IAAAP ecosystems through surveys and research.

[4] *Memorandum of Understanding among the Department of Defense and the U.S. Fish and Wildlife Service and the International Association of Fish and Wildlife Agencies for a Cooperative Integrated Natural Resource Management Program on Military Installations*. January 2006.

- **Other Benefits:** Both community relations and IAAAP's environmental image, internal and external to Defense, will be enhanced. Quality of life for the IAAAP community and its neighbors will be improved. INRMP implementation will decrease long-term environmental costs and reduce personal and installation liabilities from environmental noncompliance.

INRMP Organization

This INRMP is organized in distinct categories.

- Chapter 1 describes general relationships between natural resources management and the overall IAAAP mission. It lists compliance requirements, describes the natural resources management philosophy as a whole, describes regional programs, and provides a summary of the NEPA process and alternatives used to develop the EA portion of this INRMP.
- Chapter 2 identifies responsible parties and their roles in implementation of this INRMP.
- Chapter 3 describes the affected environment (physical, biological, and human) at IAAAP, including a description of the military mission and land management units.
- Chapter 4 describes natural resources programs within the responsibility of the Environmental Division at IAAAP, using specific project descriptions.
- Chapter 5 describes programs directly related to natural resources, using specific project descriptions, some of which are under the responsibility of other IAAAP organizations.
- Chapter 6 identifies unresolved issues.
- Chapter 7 provides means used for implementing this INRMP, including organization, personnel, external assistance, data analysis, project summary, funding, and command support.
- Chapter 8 describes the overall environmental consequences of implementing this INRMP and provides a conclusion to the EA.
- **References** documents all sources referenced in this INRMP.
- **Agencies and Persons Consulted** identifies local, state, and federal agencies and individuals consulted by the preparers of this INRMP for their expertise.
- **Plan Preparers** identifies individuals, with their qualifications, who prepared this document.
- The **Distribution List** identifies all agencies, organizations, and individuals to whom copies of this INRMP were sent.
- The **Acronyms** section lists all acronyms used and their meaning.
- **Appendices** contain information or data relevant to natural resources management on IAAAP.

For those who are primarily interested in natural resources projects planned for 2007-2011, they are described in chapters 4, 5, and 7; summarized for budget purposes in sections 7.5, *Implementation Funding Options* and 7.6, *INRMP Implementation Costs*; and summarized by project with abbreviated goals and objectives in Appendix 7.4.

Monitoring INRMP Implementation

The INRMP will be evaluated through monitoring programs, including the Environmental Performance Assessment System, the Environmental Quality Report, and reviews by the Northwest Region Installation Management Agency and other interested parties. The list of INRMP goals and objectives in Appendix 7.4 can provide a basis for evaluating plan implementation.

NEPA Findings and Conclusions

Findings based on the incorporated EA indicate that, under the Preferred Alternative (implementation of this INRMP), potential consequences would be either no significant adverse effects or beneficial effects

on each resource area. The affected environment would not be significantly adversely affected by proceeding with the Preferred Alternative. No significant adverse cumulative effects would be expected. Therefore, the preparation of an Environmental Impact Statement is not required, and the preparation and publication of a Finding of No Significant Impact is appropriate.

Summary

The INRMP outlines steps required to meet Department of Defense, U.S. Army, and IAAAP legal and moral obligations to provide for the stewardship of the natural resources on IAAAP, while enabling the accomplishment of the military mission. The INRMP has been developed through cooperation with appropriate regulatory agencies. As a public document, it will support and perpetuate the military mission while fostering stewardship and goodwill for IAAAP, the U.S. Army, and the Department of Defense. This INRMP will not resolve all existing and/or future environmental issues. It does, however, provide the guiding strategy, personnel, and means to minimize and work toward resolution of such issues.

1.0 POLICY, COMPLIANCE, AND NEPA INTEGRATION

The Army Strategy for the Environmental Vision[5]

Sustain the Mission – Although much is changing, certain things remain constant. The Army's primary mission is to defend the United States – its people, its land, and its heritage. Our core values endure.

Secure the Future - … a sustainable Army simultaneously meets current as well as future mission requirements worldwide, safeguards human health, improves quality of life, and enhances the natural environment.

Meet the Challenges - … we are transforming how we fight, how we train, how we do business, and how we interact with others in order to continually improve and provide for the Nation's security.

The Army Strategy for the Environmental Goals[6]

- Foster a Sustainability Ethic – Foster an ethic within the Army that takes us beyond environmental compliance to sustainability.
- Strengthen Army Operations – Strengthen Army operational capability by reducing our environmental footprint through more sustainable practices.
- Meet Test, Training and Mission Requirements – Meet current and future training, testing, and other mission requirements by sustaining land, air, and water resources.
- Minimize Impacts and Total Ownership Costs – Minimize impacts and total ownership costs of Army systems, materiel, facilities, and operations by integrating the principles and practices of sustainability.
- Enhance Well–being – Enhance the well-being of our soldiers, civilians, families, neighbors and communities through leadership in sustainability.
- Drive Innovation – Use innovative technology and the principles of sustainability to meet user needs and anticipate future Army challenges.

This Army commitment to natural resources management is further emphasized in Army Regulation 200-3 (*Natural Resources - Land, Forest, and Wildlife Management*) (Department of the Army 1995), which requires that Integrated Natural Resources Management Plans be developed and maintained for all Army installations, as well as establish policy, procedures, and responsibilities for Army lands and their natural resources.

1.1 Natural Resources Mission

Natural Resources Mission

Provide professional management and stewardship of natural resources at Iowa Army Ammunition Plant to achieve optimum, sustainable use of Army lands, promote

[5] *Sustain the Mission, Secure the Future – The Army Strategy for the Environment.*
[6] *Sustain the Mission, Secure the Future – The Army Strategy for the Environment.*

biodiversity and ecosystem functionality, provide opportunities for multiple compatible uses of natural resources, and comply with environmental laws.

1.2 Natural Resources Goals and Objectives

IAAAP has developed the below natural resources goals and objectives to directly support goals within the Army Strategy for the Environment. These objectives, and those more specific in chapters 4, 5, and 7 (as summarized in Appendix 7.4) serve as a checklist to monitor the success of the INRMP. Some objectives fit more than one category. When this occurs, the most-fitting category was chosen.

Goal 1. Provide quality natural resources as a critical asset upon which to accomplish the military mission of IAAAP.

Objective 1. Ensure no net loss in the capability of IAAAP lands to support existing and projected military operations.

Objective 2. Maintain quality lands through monitoring and damage minimization, mitigation, and rehabilitation.

Goal 2. Comply with laws and regulations that pertain to management of IAAAP's natural resources.

Objective 1. Manage natural resources within the spirit and letter of environmental laws, particularly the Sikes Act upon which this INRMP is predicated.

Objective 2. Protect, restore, and manage sensitive species and wetlands.

Objective 3. Use procedures within NEPA to make informed decisions that include natural resources considerations and mitigation.

Objective 4. Ensure IAAAP's natural resources program is consistent with the protection of cultural and historic resources.

Objective 5. Implement this INRMP within the framework of Army policies and regulations.

Objective 6. Protect and manage threatened and endangered species and critical habitat in accordance with the Endangered Species Act, NEPA, AR 200-3, USFWS regulations and agreements, and other applicable laws or guidance from higher headquarters.

Goal 3. Manage natural resources on IAAAP to assure good stewardship of public lands entrusted to the care of the Army.

Objective 1. Use adaptive ecosystem management strategies to protect, conserve, and enhance native fauna and flora with an emphasis on priority species and biodiversity enhancement.

Objective 2. Monitor and manage soils, water, vegetation, and wildlife on IAAAP with a consideration for all biological communities and human values associated with these resources.

Objective 3. Provide human-valued products of renewable natural resources when such products can be produced in a sustainable fashion without significant negative impacts on the military mission or other natural resources.

Objective 4. Provide professional enforcement of natural resources-related laws.

Objective 5. Involve the surrounding community in the IAAAP natural resources program.

Objective 6. Ensure the IAAAP natural resources program is coordinated with other agencies and conservation organizations with similar interests.

Goal 4. Improve the quality of life of the IAAAP community and general public through high quality natural resources-based recreational opportunities.

Objective 1. Provide high quality opportunities for hunting and fishing and other consumptive recreational activities within biological and recreational carrying capacities of the resources.

Objective 2. Provide conservation education opportunities.

The ability to achieve these goals, including direct support of the military mission, depends directly on the health and condition of natural resources at IAAAP. Properly functioning ecological conditions at the Plant provide the vegetation, soil, and water resources needed to support military operations. These same conditions provide opportunities for outdoor recreation that are important assets to both military and civilian communities associated with IAAAP.

1.3 Support of Installation Goals

Implementation of this INRMP will support the mission of IAAAP. The natural resources staff at IAAAP is committed to supporting the military mission, providing stewardship of resources entrusted to the Army, enhancing the quality of life of the IAAAP and surrounding communities, and being a valued member of the overall IAAAP team. Implementation of this INRMP will demonstrate those qualities.

1.4 Compliance Requirements

The INRMP is the primary mechanism for compliance with natural resources laws and regulations. Federal, state, and local laws and regulations may apply to proposed management actions in this plan.

1.4.1 Sikes Act

The Sikes Act, states, *The Secretary of Defense shall carry out a program to provide for the conservation and rehabilitation of natural resources on military installations. To facilitate the program, the Secretary of each military department shall prepare and implement an integrated natural resources management plan for each military installation ...*

The Sikes Act (16 USC 670 *et seq*.) requires that, consistent with the use of military installations to ensure the preparedness of the Armed Forces, each INRMP shall, where appropriate and applicable, provide for:

- fish and wildlife management, land management, forest management, and fish and wildlife-oriented recreation;
- fish and wildlife habitat enhancement or modifications;
- wetland protection, enhancement, and restoration where necessary for support of fish or wildlife;
- integration of, and consistency among, the various activities conducted under the INRMP;

- establishment of specific natural resources management objectives and time frames for proposed actions;
- sustained use by the public of natural resources to the extent such use is not inconsistent with the needs of fish and wildlife resources management;
- public access to the military installation that is necessary or appropriate for sustained use by the public of natural resources to the extent that the use is not inconsistent with the needs of fish and wildlife resources, subject to requirements necessary to ensure safety and military security;
- enforcement of natural resource laws and regulations;
- no net loss in the capability of military installation lands to support the military mission of the installation; and
- such other activities as the Secretary of the military department considers appropriate.

The Sikes Act also requires or provides for:

- regular review of this INRMP and its effects, not less often than every five years;
- provisions for spending hunting and fishing permit fees exclusively for the protection, conservation, and management of fish and wildlife, including habitat improvement and related activities in accordance with the INRMP;
- exemption from procurement of services under Office of Management and Budget Circular A-76 and any of its successor circulars; and
- priority for contracts involving implementation of this INRMP to state and federal agencies having responsibility for conservation of fish or wildlife.

1.4.2 National Environmental Policy Act

NEPA requires disclosure of environmental impacts created by proposed major federal actions. The intent of NEPA is to better inform decision-makers of potential impacts from proposed projects and to utilize this information early in the project planning process. 32 CFR Part 651, *Environmental Analysis of Army Actions* and the Council on Environmental Quality Implementing Guidelines for NEPA (40 CFR Parts 1500-1508) recommend an EA be completed for natural resources management plans.

1.4.3 Migratory Bird Legal Instrumentalities

Migratory Bird Treaty Act

The Migratory Bird Treaty Act is an international agreement among the United States, Canada, and Mexico that protects designated species of birds. Most birds are protected under the Migratory Bird Treaty Act, with some exceptions. Birds classified as migratory also include species that occupy IAAAP throughout the year. A complete list of species of migratory birds protected by the Migratory Bird Treaty Act is in 50 CFR 10.13.

The Migratory Bird Treaty Act controls the taking of these birds, their nests, eggs, parts, or products. The Act states that it is unlawful "at any time, by any means or in any manner, to pursue, hunt, take, capture, kill, attempt to take, attempt to capture, or attempt to kill, purchase, offer to purchase, deliver for shipment, ship, export, import, cause to be shipped, deliver for transport, transport or cause to be transported, carry or cause to be carried, or receive for shipment, transportation, carriage, or export, possess, offer for sale, sell, offer to sell, barter, offer to barter, any migratory bird, any part, nest, or egg of any such bird, or any part, nest, or egg thereof;" unless and except as permitted by regulations in the Migratory Bird Treaty Act.

All persons, organizations, and agencies, are liable for prosecution for violations and must follow permitting requirements for taking migratory birds. Special purpose permits may be requested and issued that allow for the relocation or transport of migratory birds for management purposes.

Executive Order 13186

Executive Order 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds* required the DoD and the USFWS to establish a memorandum of understanding (MOU) that will promote the conservation of migratory bird populations (Federal Resister, Volume 71, Number 168, 51580-51585, August 30, 2006).

This MOU specifically pertains to the following categories of DoD activities:

- natural resource management activities, including, but not limited to, habitat management, erosion control, forestry activities, agricultural outleasing, conservation law enforcement, invasive weed management, and prescribed burning;
- installation support functions, including but not limited to the maintenance, construction or operation of administrative offices, road construction, water treatment facilities, storage facilities, housing, motor pools, non-tactical equipment, laundries, recreation activities, shops and landscaping;
- operation of industrial activities;
- construction or demolition of facilities relating to these routine operations; and
- hazardous waste cleanup.

In summary, both DoD and the USFWS agree to:

- emphasize an interdisciplinary, collaborative approach to migratory bird conservation within the geographic framework of the North American Bird Conservation Initiative, Bird Conservation Regions;
- strive to protect, restore, enhance, and manage habitat of migratory birds, and prevent or minimize the loss or degradation of habitats on DoD-managed lands;
- work with willing landowners to prevent or minimize the loss or degradation of migratory bird habitats on lands adjacent or near military installation boundaries;
- promote collaborative projects;
- provide training opportunities to DoD natural resources personnel on migratory bird issues, to include bird population and habitat inventorying, monitoring methods, and management practices that avert detrimental effects and promote beneficial approaches to migratory bird conservation;
- participate in the Interagency Council for the Conservation of Migratory Birds to evaluate implementation of the MOU;
- promote migratory bird conservation internationally, as it relates to wintering, breeding, and migration habitats of birds that breed on DoD lands; and
- promote and undertake ecologically sound actions to curb the introduction in the wild of exotic or invasive species harmful to migratory birds.

In summary, DoD shall:

- follow all migratory bird permitting requirements for non-military readiness activities that are subject to 50 CFR parts 21.22 (banding or marking), 21.23 (scientific collecting), 21.26 (special

Canada Goose permit), 21.27 (special purposes), or 21.41 (depredation) (no permit is required to take birds in accordance with Parts 21.43–21.47 (depredation orders));

- encourage incorporation of comprehensive migratory bird management objectives in the preparation of DoD planning documents, including INRMPs, Pest Management Plans, Installation Master Plans, NEPA analyses, and non-military readiness elements of Bird Aircraft Strike Hazard documents;
- incorporate conservation measures addressed in Regional or State Bird Conservation Plans in INRMPs;
- consistent with imperatives of safety and security, allow the USFWS and other partners reasonable access to military lands for conducting sampling or survey programs;
- prior to starting any activity that is likely to affect populations of migratory birds: 1) identify migratory bird species likely to occur in the area of the proposed action and determine if any species of concern could be affected by the activity; 2) assess and document, through the project planning process, using NEPA when applicable, the effect of the proposed action on species of concern using the best available demographic, population, or habitat association data in the assessment of effects upon species of concern; and 3) engage in early planning and scoping with the USFWS relative to potential impacts of a proposed action to proactively address migratory bird conservation and to initiate appropriate actions to avoid or minimize the take of migratory birds;
- manage military lands and non-military readiness activities in a manner that supports migratory bird conservation, giving consideration to the following factors: 1) habitat protection, restoration, and enhancement; 2) fire and fuels management practices; 3) invasive species and aquatic nuisance species management practices; 4) communications towers, utilities, and energy development; and 5) recreation and public use;
- develop and implement new and/or existing inventory and monitoring programs, at appropriate scales, using national standardized protocols, to evaluate the effectiveness of conservation measures to minimize or mitigate take of migratory birds, with emphasis on those actions that have the potential to significantly impact species of concern;
- advise the public of the availability of this MOU through a notice published in the Federal Register; and
- in accordance with DoD INRMP guidance, promote timely and effective review of INRMPs with respect to migratory bird issues with the USFWS and respective state agencies.

In summary, the USFWS shall:

- work with DoD by providing recommendations to minimize adverse effects upon migratory birds from DoD actions;
- through the Division of Migratory Bird Management, maintain a Web page on permits that provides links to all offices responsible for issuing permits and permit application forms for take of migratory birds;
- provide essential background information to the DoD when requested to ensure sound management decisions;
- work to identify special migratory bird habitats (*i.e*., migration corridors, stop-over habitats, ecological conditions important in nesting habitats) to aid in collaborative planning;
- through the Ecological Service Field Office, provide to DoD, upon request, technical assistance on migratory bird species and their habitats;
- in accordance with USFWS *Guidelines for Coordination with DoD and Implementation of the 1997 Sikes Act* (2005), work cooperatively with DoD in the development, review and revision of INRMPs; and

- review and comment on NEPA documents and other planning documents forwarded by military installations.

In summary, both DoD and the USFWS understand the following.

- This MOU will not change or alter requirements associated with the Migratory Bird Treat Act, Endangered Species Act, NEPA, Sikes Act, or other statutes or legal authority.
- Responsibilities established by this MOU may be incorporated into existing DoD actions; however, DoD may not be able to implement some responsibilities identified in the MOU until DoD has successfully included them in formal planning processes. This MOU is intended to be implemented when new actions are initiated as well as during the initiation of new, or revisions to, INRMPs, Pest Management Plans, and non-military readiness elements of Bird Aircraft Strike Hazard plans. It does not apply to ongoing DoD actions for which a NEPA decision document was finalized prior to, or within 180 days of the date this MOU is signed.
- This MOU in no way restricts either Party from participating in similar activities with other public or private agencies, governments, organizations, or individuals.
- An elevation process to resolve any dispute between the Parties regarding a particular practice or activity is in place and consists of first attempting to resolve the dispute with the DoD military installation and the responsible Ecological Services Field Office. If there is no resolution at this level, either Party may elevate the issue to the appropriate officials at the applicable Military Service's Chain of Command and USFWS Regional Offices. In the event that there is no resolution by these offices, the dispute may be elevated by either Party to the headquarters office of each agency.
- This MOU is neither a fiscal nor a funds obligation document. Any endeavor involving reimbursement, contribution of funds, or transfer of anything of value between the Parties will be handled in accordance with applicable laws, regulations, and procedures, including those for government procurement and printing. Such endeavors will be outlined in separate agreements that shall be made in writing by representatives of the Parties and shall be independently authorized by appropriate statutory authority.
- The Parties shall schedule periodic meetings to review progress and identify opportunities for advancing the principles of this MOU.
- This MOU is intended to improve the internal management of the executive branch and does not create any right or benefit, substantive or procedural, separately enforceable at law or equity by a party against the United States, its agencies or instrumentalities, its officers or employees, or any other person.
- Modifications to the scope of this MOU shall be made by mutual consent of the Parties, through issuance of a written modification, signed and dated by both Parties, prior to any changes.
- Either Party may terminate this instrument, in whole or in part, at any time before the date of expiration by providing the other Party with a written statement to that effect.

Final Rule – Migratory Bird Permits; Take of Migratory Birds by Department of Defense

Section 315 of the 2003 National Defense Authorization Act provides that, not later than one year after its enactment, the Secretary of the Interior (Secretary) shall exercise authority under Section 704(a) of the Migratory Bird Treaty Act to prescribe regulations to exempt the Armed Forces for the incidental taking of migratory birds during military readiness activities authorized by the Secretary of Defense or the Secretary of the military department concerned. The Authorization Act further requires the Secretary to promulgate such regulations with the concurrence of the Secretary of Defense.

The USFWS published a final rule (50 CFR Part 21, Federal Register Volume 72, Number 39, February 28, 2007, pp 8931-8950) that basically exempts the Armed Forces for the incidental taking of migratory birds during military readiness activities. This rule "… *authorizes such take, with limitations, that result from military readiness activities of the Armed Forces. If any of the Armed Forces determine that a proposed or an ongoing military readiness activity may result in a significant adverse effect on a population of a migratory bird species, then they must confer and cooperate with the Service (USFWS) to develop appropriate and reasonable conservation measures to minimize or mitigate identified significant adverse effects*."

This rule only includes military readiness activities. It specifically does not include routine operation of installation operating support functions (*e.g*., administrative offices, military exchanges or commissaries, water treatment facilities, storage facilities, schools, housing, motor pools, laundries, recreation activities, shops, mess halls), operation of industrial activities, or construction or demolition of facilities relating to these routine operations.

"*The rule does not authorize take under the ESA* (Endangered Species Act). *If a military readiness activity may affect a listed species, the Armed Forces retains responsibility for consulting with the Service under section 7(a)(2) of the ESA. Similarly, if a military readiness activity is likely to jeopardize the continued existence of a species proposed for listing, the Armed Forces retain responsibility for conferring with the Service in accordance with section 7(a)(4) of the ESA.*"

"*Withdrawal of authorization may be proposed if the Secretary determines that failure to do so is likely to result in a significant adverse effect on a population of a migratory bird species and one or more of the following circumstances apply: (A) The Armed Forces have not implemented conservation measures that (i) are directly related to protecting the migratory bird species affected by the proposed military readiness activity; (ii) would significantly reduce take of migratory birds species affected by the military readiness activity, (iii) are economically feasible, and (iv) do not limit the effectiveness of military readiness activities.*
(B) The Armed Forces fail to conduct mutually agreed upon monitoring to determine the effects of a military readiness activity on migratory bird species and/or the efficacy of the conservation measures implemented by the Armed Forces. (C) The Armed Forces have not provided reasonably available information that the Secretary has determined is necessary to evaluate whether withdrawal of take authorization for the specific military readiness activity is appropriate."

The rule assumes that installations will use the NEPA process to determine whether an ongoing or proposed military readiness activity is "*likely to result in a significant adverse effect on the population of a migratory bird species of concern.*" If such significant adverse effects are likely, an installation would be required to confer with the USFWS to develop appropriate conservations measures to minimize or mitigate such significant adverse effects.

1.4.4 Endangered Species Act

This INRMP has the signatory approval of the USFWS. This signature approval includes agreement that the INRMP complies with the Endangered Species Act. Review of the INRMP is informal consultation with regard to the Endangered Species Act.

Per provisions of the 2004 National Defense Authorization Act, this INRMP "*provides a benefit to the species for which critical habitat is proposed for designation*." The USFWS policy states that, where applicable, federal critical habitat designation is not warranted if the INRMP includes certain criteria, which are summarized in Section 4.8.1, *Federal-listed Species Management Practices*.

1.4.5 Army Regulations

AR 200-3 (*Natural Resources-Land, Forest, and Wildlife Management*) (Department of the Army 1995) provides policy, procedures, and responsibilities for the conservation, management, and restoration of land and its natural resources consistent with the military mission and national policies. It requires the preparation, implementation, and monitoring of an Integrated Natural Resources Management Plan for each installation. This regulation also requires an annual internal review of INRMPs by the Army.

AR 200-4 (*Cultural Resources Management*) (Department of the Army 1997b) provides guidelines for integrating cultural resources issues into an INRMP. Guidelines focus on cultural resources compliance requirements that are generated as a result of ecosystem management activities, contributions that cultural resources studies can make to ecosystem management decisions, and human activities, including those practiced by Native Americans, that should be supported and sustained in development and implementation of an ecosystem management plan.

AR 200-5 (*Pest Management*) (Department of the Army 1999) establishes policy and procedures for installation pest management programs, emphasizing integrated pest management techniques. Installation pest management plans and installation INRMPs must be consistent with each other.

1.4.6 List of Laws and Regulatory Instruments

Appendix 1.4.6 lists the most significant, but not complete, federal and state laws and regulations and other regulatory instruments that govern implementation of this INRMP.

1.5 Biodiversity Conservation and Ecosystem Management

Biological diversity (biodiversity) refers to the variety and variability among living organisms and the environment in which they occur. Biodiversity has meaning at various levels including ecosystem diversity, species diversity, and genetic diversity. The Department of Defense has developed *A Department of Defense (DoD) Biodiversity Management Strategy* (The Keystone Center 1996). This Strategy identifies five reasons to conserve biodiversity on military lands:

(1) ***sustain natural landscapes*** required for the training and testing necessary to maintain military readiness;
(2) ***provide the greatest return on the Defense investment*** to preserve and protect the environment;
(3) ***expedite the compliance process*** and help avoid conflicts;
(4) ***engender public support*** for the military mission; and
(5) ***improve the quality of life*** for military personnel.

The Keystone Center report (1996) notes that the challenge is *to manage for biodiversity in a way that supports the military mission*. This strategy identifies the INRMP as the primary vehicle to implement biodiversity protection on military installations. The model process developed within the strategy includes the following principles:

- support the military mission;
- use joint planning between natural resources managers and military operations personnel;
- integrate biodiversity conservation into INRMP and other planning protocols;
- involve internal and external stakeholders up front;
- emphasize the regional (ecosystem) context;
- use adaptive management;
- involve scientists and use the best science available; and

- concentrate on results.

IAAAP will use ecosystem management to guide its program in the next five years and beyond. This management strategy enables the Plant to conduct its military mission while conserving natural resources, which provide the natural setting for that mission. Adaptive management is an important component of ecosystem management. Adaptive management involves implementing the best option, testing that option's results, and modifying implementation accordingly.

1.6 INRMP and NEPA Integration

This INRMP is an action-forcing document that triggers NEPA compliance requirements. 32 CFR Part 651 and AR 200-3 (1995) state that INRMPs will normally use EA procedures.

32 CFR Part 651, *Environmental Analysis of Army Actions* requires the integration of the NEPA process early in project planning to ensure that planning and decision-making reflect environmental values, prevent delays, and minimize potential conflicts. The Council on Environmental Quality Implementing Guidelines for NEPA (40 CFR Parts 1500-1508) require environmental analyses and documentation under NEPA be integrated as much as practicable with other environmental reviews, laws, and executive orders. 32 CFR Part 651 specifically identifies the integration or concurrent development of natural resources management plans with appropriate NEPA analysis and documentation. Recognizing efficiencies and benefits associated by combining the INRMP and its associated EA into one document, this plan has been developed to satisfy both requirements.

To assist in identifying elements of the NEPA analysis, the following are specific locations within this INRMP where required EA sections (40 CFR Part 1508.9(b)) are embedded:

- Purpose of and Need for Action - Section 1.6.1, *Purpose, Need, and Rationale*;
- Description of Alternatives including the Proposed Action - Section 1.6.4, *Alternatives*; chapters 4, 5, and 7;
- Description of Affected Environment - Chapter 3;
- Analysis of Environmental Consequences - Chapter 8;
- Analysis of Cumulative Impacts - Section 8.3, *Cumulative Effects*;
- Agencies and Persons Consulted;
- Distribution List; and
- Appendices.

1.6.1 Purpose, Need, and Rationale

IAAAP proposes to implement its Integrated Natural Resources Management Plan 2007-2011 at Iowa Army Ammunition Plant, Middletown, Iowa. The purpose of the EA is to identify and evaluate environmental consequences of implementing the proposed plan, in accordance with NEPA, the Council on Environmental Quality regulations, and 32 CFR Part 651. This combined INRMP/EA documents existing natural resources practices and can be used as an effective tool for future planning and decision-making purposes.

1.6.2 Scope

The Preferred Alternative is restricted to implementation of the INRMP. Environmental effects of implementing this plan at IAAAP are the focus of EA aspects integrated into this plan.

1.6.3 Impact Analysis

The analysis process involved the review of IAAAP natural resources-related data collected by IAAAP,

other governmental agencies, universities, and contractors. The process involved interviews with IAAAP personnel involved with natural resources management.

The objective of this analysis is to provide an evaluation of environmental consequences of an implementable INRMP for IAAAP that can guide the Plant in the following activities:

- meeting military mission requirements,
- achieving natural resources management goals, and
- meeting legal and policy requirements, including those associated with NEPA, that are consistent with national natural resources management strategies.

1.6.4 Alternatives

NEPA requires the preparer of an EA to define and consider reasonable alternatives to the proposed action. Reasonable alternatives are those that are technically implementable. The Army reviewed possible management actions to determine the viability of implementing the actions while continuing to achieve its mission. The Army also considered all federal and state laws and regulations governing natural resources management to incorporate their requirements into proposed management actions.

There are issues that will not be considered in analysis sections as they take precedence over almost all management options. First and foremost, IAAAP's military mission must not be compromised. Therefore, such options as returning large areas (igloo storage area) to pre-IAAAP conditions, *ie*. removing igloos, or significantly increasing agricultural cropland, which would inhibit the Plant from performing its mission, will not be considered. The exception might be the adoption of restrictions or alterations to standard operating procedures to meet requirements of laws, such as the Endangered Species Act or the Clean Water Act.

Secondly, issues of safety and security must also remain uncompromised. Safety and security are high priorities of operations at IAAAP and are directly related to maintaining the military mission. Therefore, management options, such as opening IAAAP to unrestricted access for recreational use, will not be considered.

1.6.4.1 Preferred Alternative: INRMP Implementation (Proposed Management)

The Preferred Alternative would be to continue to implement those portions of the Integrated Natural Resources Management Plan, 2001 Revision (IAAAP 2000) that are pertinent to an evolving natural resources program with changes in programs that will enable IAAAP to improve its environmental stewardship and compliance programs requirements while also effectively and efficiently supporting the military mission. The Preferred Alternative is fully described in this INRMP, 2007-2011.

This INRMP presents information on the management of natural resources on IAAAP. It also describes the setting, identifies known natural resources, describes the human environment that affects natural resources, and describes how IAAAP will be managed to sustain ecological functions, protect federal-listed and other plant and wildlife species, provide sustained military use, and support outdoor recreational uses. Major emphasis will be placed on proactive management to reduce the potential for negative environmental impacts due to the installation's military mission.

The Preferred Alternative is viable. The Preferred Alternative ***will*** be described in chapters 4, 5, and 7 within sections titled **Proposed Management**, and environmental consequences regarding implementation of the Preferred Alternative will be analyzed in Chapter 8.

1.6.4.2 No Action Alternative: Continue Existing Management

The No Action Alternative would be to continue management to support the military mission, as outlined in the INRMP, 2001 Revision (IAAAP 2000). Alternative 2 is viable. The No Action Alternative ***will*** be described in chapters 4, 5, and 7 within sections titled **Current Management**, and environmental consequences regarding implementation of the No Action Alternative will be analyzed in Chapter 8.

1.6.4.3 Alternatives Considered but Eliminated

No Management. The No Management Alternative would be to not manage natural resources at IAAAP. This alternative is similar to the manner in which the Plant was managed prior to the passage of many environmental laws in the late 1960s through early 1970s and before the creation of professional natural resources management in the early 1980s. This is not a viable alternative. Laws and executive orders on endangered species, water quality, federal land management, outdoor recreation, etc., as well as Department of Defense and Department of the Army policies, preclude implementation of the No Management Alternative. This alternative ***will not*** be further discussed.

Compliance Management

The Compliance Management Alternative would be to implement only those portions of the INRMP required to maintain compliance with laws. Compliance with laws, such as the Endangered Species Act and National Environmental Policy Act, would ensure implementation of some programs but would ignore other programs within the INRMP. It is a lower intensity natural resources program that is reactive to violations of laws or threats of lawsuits.

Amendments to the Sikes Act require INRMPs to include programs (Section 1.4.1, *Sikes Act*) such as wildlife management, land management, fish and wildlife habitat management, etc. The Sikes Act further requires implementation of programs identified within the INRMP. Therefore, each program within the INRMP is compliance driven unless it is specifically identified as optional (dependent upon additional funding, dependent upon future conditions, etc.). Thus, the Compliance Management Alternative is virtually identical to the Preferred Alternative, full implementation of the INRMP. The Compliance Management Alternative ***will not*** be further discussed in analysis sections.

Other Management Options

Virtually every major natural resources program at IAAAP (fish and wildlife, agricultural outlease, etc.) has many options other than ones selected for the INRMP. For example, there are many different strategies with regard to white-tailed deer harvest management, just as there are many different options for managing small pond fisheries and a wide variety of agricultural land management options. Many of these interact with each other. For example, changing the agricultural land management program would impact turkey, deer, and other game species management, and impacts would be different among those species.

Possible options create thousands of potential combinations, each of which could be an alternative to the proposed action. Various laws, compliance documents, Army regulations, etc. prohibit the implementation of many of these possibilities. For example, closing IAAAP to hunting is not a viable option due to public law and Department of Army policy. On the other hand, changing the grazing rotation scheme to improve vegetation management is an option, and there are many choices. The same would be true of changing the prescribed burning program or changing the fisheries management strategy.

Other management options were considered and dismissed from further consideration for various reasons (*e.g.*, ecological value, cost/benefit analyses, military mission compatibility) during development of the INRMP. Management programs and projects selected for the Proposed Action are based on knowledge and experience from years of professional management of IAAAP natural resources and the best scientific

knowledge, research, and opinions available. The Other Management Options Alternative ***will not*** be further discussed in analysis sections.

1.6.4.4 Alternatives Summary

Each management section in chapters 4, 5, and 7 has two major subsections:

- **Current Management**, which is the No Action Alternative and describes ongoing activities or activities planned in the previous INRMP; and
- **Proposed Management**, which is the Preferred Alternative and describes planned activities in a project format.

Chapter 8, *Environmental Consequences and Conclusions*, analyzes environmental consequences of continuation of the Current Management and implementation of the Proposed Management.

1.6.5 Issues Not Considered to be Potentially Significant

NEPA defines scoping as *an early and open process for determining the scope of issues to be addressed and for identifying significant issues related to the proposed action* (40 CFR 1501.7). These issues are used to develop alternative actions, including mitigation measures, and to evaluate environmental consequences of those actions. Many personnel identified in *Agencies and Persons Contacted* and *Plan Preparer* sections) have discussed issues and concerns regarding natural resources management at IAAAP. This scoping resulted in the elimination of some potential issues, as identified below.

Physiography, Topography, and Geology

Neither the Proposed Action nor its alternatives would affect physiography, topography, or geologic resources.

Petroleum and Mineral Resources

Neither the Proposed Action nor its alternatives would affect petroleum or mineral resources that may be found on IAAAP. There are no plans to find or develop such resources on IAAAP.

Climate

Neither the Proposed Action nor its alternatives would affect the climate.

Noise Environment

Neither the Proposed Action nor its alternatives would affect the IAAAP noise environment. Proposed natural resources management would not create significant noise.

Air Quality

Air quality is regulated at the national level through regulations promulgated under the Clean Air Act of 1970 and its subsequent amendments. The Clean Air Act requires state or local governments to monitor ambient levels of pollutants that have federal standards. IAAAP has an exemption for prescribed burning from the Iowa Department of Water, Air, and Waste Management (Mason & Hanger Corporation 1991).

The use of fire is limited on IAAAP, which annually prescribed burns about 20 - 60 acres, mostly to restore and maintain prairie areas. All burning is done in accordance with IAAAP Fire Department protocols. Appropriate officials and organizations are notified prior to any fire activity. Other activities (vehicle emissions, dust, etc.) generate relatively insignificant concerns for air quality.

Hazardous and Toxic Materials
Even though some areas at IAAAP may have contamination by hazardous or toxic materials, neither the Proposed Action nor its alternatives would affect the generation or cleanup of these materials. If such materials were discovered during natural resources management activities, this information would be reported to the Environmental Branch for action, if needed.

Facilities, Public Services, and Utilities
Neither the Proposed Action nor its alternative would significantly affect IAAAP facilities, public services, or utilities (*e.g.*, buildings, transportation system, communications system, water supply, stormwater drainage, sewage treatment, solid waste energy use). All facilities, public services, and utilities would continue to be maintained and operated in accordance with required permits and capabilities of the systems. Under both alternatives, the demand for utilities and roads would not be expected to change; therefore, neither alternative would affect facilities, public services, or utilities.

Socioeconomics
IAAAP is a significant employer in southeastern Iowa. The Army staff includes 19 and the prime contractor employs 700-800. Neither the Proposed Action nor its alternatives would have any significant effects on socioeconomic factors in the general IAAAP region.

Environmental Justice
Executive Order No. 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* [59 Federal Regulation No. 32], issued in February 1994, provides that *each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.* The Proposed Action and its alternatives would be confined to IAAAP.

In terms of categories recognized by the U.S. Census, residents of Middletown are White (92.3 percent), Black (2.6 percent), Hispanic (2.4 percent), other races (1.5 percent), two or more races (1.3 percent), other Asian (0.9 percent), and American Indian (0.6 percent) (www.city-data.com). Races in Burlington are similar to those in Middletown. In communities near IAAAP, there are no concentrations of minority or low income groups that may be affected by natural resources management on the Plant. Neither the Proposed Action nor its alternatives would have significant or disproportionate adverse effects on minority or low-income populations.

Environmental Health and Safety Risks for Children
Executive Order No. 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, [62 Federal Regulation No. 78] was issued in April 1997. This Executive Order directs each federal agency to *ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health or safety risks*. Sensitive areas for exposure to children are schools and family housing areas. Environmental health and safety risks are attributable to products that a child might come in contact with or ingest as well as safety around IAAAP. Proposed natural resources management is within boundaries of IAAAP.

IAAAP has only two family housing units on the property, but there are private residences immediately adjacent to the Plant. However, children are generally not exposed to natural resources management activities on IAAAP. The exception would be children who participate in outdoor recreation at IAAAP. There is a requirement by the state of Iowa for children who hunt to attend a hunter safety class, and this is applicable to those using IAAAP. IAAAP requires hunters and anglers to attend a mandatory safety briefing prior to participating in recreational activities. Neither the Proposed Action nor its alternatives

would have significant or disproportionate adverse effects on children or pose health or safety risks.

1.6.6 Interagency Coordination and Public Review

Interagency coordination is invited through the INRMP/EA development process using personal communications and reviews of drafts. Drafts of this INRMP/EA were used to inform decision makers and the public of likely environmental and socioeconomic consequences of implementing the Preferred Alternative and its alternatives. Native American groups were notified of the development of this INRMP/EA and were invited to participate, per the *American Indian and Alaska Native Policy* (Department of Defense 1998).

Comments received during meetings and discussions as well as responses to requests for reviews with agency representatives, Native American tribes, or members of the general public were used for development of the final INRMP/EA. Appendix 1.6.6 includes comments received from agencies that reviewed this INRMP/EA. The public, Native American tribes, and agencies were notified of the findings and conclusions of the EA by announcement of the Finding of No Significant Impact in local newspapers and the availability of the INRMP/EA for public review for 30 days prior to implementation of the Preferred Action, this INRMP, by IAAAP. The Finding of No Significant Impact was published in the *Hawkeye*, and the INRMP was available from IAAAP.

2.0 RESPONSIBLE AND INTERESTED PARTIES

We must strive to become systems thinkers if we are to benefit from the interrelationships of the triple bottom line of sustainability: mission, environment, and community.[7]

2.1 Iowa Army Ammunition Plant

IAAAP is a government-owned, contractor-operated installation. American Ordnance LLC is the operating contractor for IAAAP.

2.1.1 Commanding Officer

The IAAAP Commanding Officer implements policies and directives of the Department of the Army and bears ultimate responsibility for management of natural resources on IAAAP, including its land and wildlife. Acting through the Installation Management Division, the Commanding Officer is responsible for (Department of the Army 1995):

- providing for funding and staffing of natural resources management professionals and other resources required to effectively manage natural resources on IAAAP;
- planning land utilization to avoid or minimize adverse effects on environmental quality and provide for sustained accomplishment of the mission;
- entering into appropriate cooperative plans (16 USC 670a) with state and federal conservation agencies for the conservation and development of fish and wildlife, soil, outdoor recreation, and other resources;
- ensuring ongoing and timely coordination of current and planned land uses between mission, natural resources, environmental, legal, and master planning;
- inspecting and reviewing mitigation measures that have been implemented or recommended for the protection of natural resources as prescribed in environmental documentation in accordance with 32 CFR Part 651;
- ensuring all IAAAP land users are aware of and comply with procedures and requirements necessary to accomplish objectives of this INRMP together with laws, regulations, and other measures designed to comply with environmental quality objectives;
- appointing a natural resources management professional as the Plant Natural Resources Coordinator; and
- the final authority for approving this INRMP.

2.1.2 Installation Management Division

The Installation Management Division, acting primarily through the Natural Resources Manager, is responsible for (Department of the Army 1995):

- developing and implementing programs to ensure the inventory, delineation, classification, and management of all applicable natural resources to include: wetlands, scenic areas, threatened and endangered species, sensitive and critical habitats and other natural resource areas of special interest;
- providing for the training of natural resources personnel;
- implementing this INRMP;

7 Robert J. Schoomaker, U.S. Army Chief of Staff, and R.L. Brownlee, Acting Secretary of the Army. Excerpt from *The Army Strategy for the Environment, "Sustain the Mission – Secure the Future"*

- reviewing all environmental documents (*e.g*. environmental assessments and impact statements and remedial action plans) and construction designs and proposals to ensure adequate protection of natural resources, ensuring that technical guidance as presented in this INRMP is adequately considered;
- coordinating with local, state, and federal governmental and civilian conservation organizations relative to natural resources management for IAAAP;
- managing all phases of the natural resources program for IAAAP with appropriate natural resources management personnel; and
- coordinating the Plant pest control program.

2.1.2.1 Environmental Branch

The Environmental Branch is responsible for land, forest, fish and wildlife, and cultural resources management at IAAAP. The Environmental Branch also ensures compliance with federal and state environmental laws and regulations. Personnel include two Environmental Specialists and a Natural Resources Manager.

General responsibilities of the Natural Resources Manager include

- administering the hunting and fishing program;
- managing wildlife and conducting related research;
- managing agricultural leases;
- managing forest resources;
- managing wetland resources;
- pest management;
- NEPA compliance;
- determining natural resources budget requirements;
- cooperating with the IDNR on regulations governing harvest of fish and wildlife on IAAAP;
- coordinating with safety and security personnel to ensure hunting and fishing activities do not adversely impact the military mission of IAAAP;
- operating wildlife check stations to collect biological and other data during hunting seasons;
- ensuring federal, state, and IAAAP laws and regulations pertaining to natural resources and the environment are enforced; and
- cultural resources management.

2.1.2.2 Administrative Branch

The Administrative Branch is responsible for training, personnel and purchase support, and public affairs.

2.1.2.3 Property Branch

The Property Branch is primarily responsible for all property within the installation except for property that is a natural resource.

2.1.3 Other Installation Organizations

Implementation of this plan requires the assistance of other organizations on the installation. Such organizations include the Contract Branch, which is responsible for oversight of contracts with the Operating Contractor.

2.2 Other Defense Organizations

2.2.1 Northwest Region Installation Management Agency

The Northwest Region Installation Management Agency, located in Rock Island, Illinois, is responsible for providing technical guidance to the IAAAP natural resources program by:

- assisting with program implementation and conducting staff visits to IAAAP,
- ensuring that effective natural resources stewardship is an identifiable and accountable function of management, and
- providing technical review of the INRMP.

2.2.2 Army Environmental Center

The Army Environmental Center, located at Aberdeen Proving Ground, Maryland, provides oversight and centralized management and execution of Army environmental programs and projects. It has support capabilities in the areas of NEPA, endangered species, cultural resources, environmental compliance, and related areas. The Army Environmental Center is responsible for the agriculture and forestry reimbursable programs and distributes the funding back to installations.

2.2.3 Joint Munitions Command

The Joint Munitions Command, located at Rock Island Arsenal, Illinois, is responsible for command and control of IAAAP and other ammunition plants. Natural resources funding flows to the installation through the Joint Munitions Command. Joint Munitions Command is a subordinate command of the Army Field Support Command and is responsible for installation environmental compliance funding in addition to production, storage, and logistical issues related to ammunition.

2.2.4 U.S. Army Corps of Engineers

Several districts of the U.S. Army Corps of Engineers assist IAAAP with natural and cultural resource issues and guidance. The U.S. Army Corps of Engineers provides agricultural leasing services and monitors lease provisions for the Natural Resources Manager at IAAAP. The U.S. Army Corps of Engineers also provides services in the areas of Clean Water Act, Section 404 jurisdictional wetland permitting and guidance, and cultural resources management planning. In addition, the U.S. Army Corps of Engineers provides contractual support to the installation.

2.3 Other Federal Agencies

2.3.1 U.S. Fish and Wildlife Service

The USFWS is a signatory cooperator in implementation of this INRMP in accordance with the Sikes Act. Appendix 1.6.6 contains USFWS comments on the draft INRMP and IAAAP responses to those comments. Appendix 2.3.1 contains specific items of agreement among the USFWS, the IDNR, and IAAAP, as required by the Sikes Act.

2.3.2 U.S. Department of Agriculture

The U.S. Department of Agriculture provides IAAAP with project support and review, as well as comment and approval, of agricultural plans for the installation. The U.S. Department of Agriculture is involved with identifying the location and extent of Clean Water Act, Section 404 jurisdictional wetlands on the installation. In addition, the Natural Resources Conservation Service of the U.S. Department of Agriculture provides assistance with erosion and sedimentation plans and advises on soil productivity.

2.4 Iowa Department of Natural Resources

The State of Iowa, functioning through the Director IDNR, provides assistance in managing wildlife, consulting on forest management practices, managing threatened and endangered species, and assisting with enforcement. In accordance with the Sikes Act, IDNR is a signatory cooperator in implementation of this INRMP. Appendix 1.6.6 contains IDNR comments on the draft INRMP and IAAAP responses to those comments. Appendix 2.3.1 contains specific items of agreement among the IDNR, USFWS, and IAAAP, as required by the Sikes Act.

2.5 Native American Tribes

The United States has a unique legal relationship with Indian tribal governments as set forth in the Constitution of the United States, treaties, statutes, executive orders, and court decisions. Since the formation of the Union, the United States has recognized Indian tribes as domestic dependent nations under its protection. Executive Order 13175 and the *American Indian and Alaska Native Policy* (Department of Defense 1998) establish regular and meaningful consultation and collaboration with Indian tribal governments. IAAAP provides a process that permits elected officials and other representatives of Indian tribal governments to provide meaningful and timely input on actions or policies that might be of tribal interest, such as those that may affect sacred or Indian cultural sites. Two tribes, the Sac and Fox Tribe and Iowa Tribe, claim ancestral use of the lands on IAAAP.

2.6 Des Moines County

Des Moines County, Iowa has a cooperative agreement with IAAAP for maintenance of roadside vegetation and prairie areas and controlling noxious weeds on the Plant. Appendix 2.6 contains the agreement.

2.7 Universities

IAAAP has used the expertise from universities to provide specialized knowledge. For example, the Botany Department at the University of Iowa conducted an extensive botanical survey on IAAAP in 1995 (Horton *et al*. 1996). Iowa State University has cooperatively developed crop test plots on IAAAP, and the Iowa State University Health Department has collected wildlife samples (blood and ticks) for chronic wasting disease and lyme disease studies and mosquitoes for West Nile research.

2.8 Municipalities

Communities adjacent to or in proximity of IAAAP are positively affected by natural resources management on the installation. IAAAP provides opportunities for general public hunting and fishing. There are no significant conflicts between natural resources management on IAAAP and surrounding communities. IAAAP management enhances surrounding wildlife populations with animals moving off-Plant, which offers more consumptive and nonconsumptive opportunities.

2.9 Contractors

American Ordnance LLC is the operating contractor for IAAAP. IAAAP uses contractors for many programs associated with natural resources including NEPA documentation, INRMP preparation, cultural resources surveys, water quality studies, and other similar projects.

2.10 Other Interested Parties

The Nature Conservancy is the primary non-governmental organization with an interest in IAAAP's natural resources program. The Iowa field office of The Nature Conservancy, together with the University of Iowa, completed a floristic and biotic community and sensitive species assessment on IAAAP in 1995.

Nonprofit organizations have donated and erected wood duck (*Aix sponsa*) nest boxes in suitable habitats within the installation. Local organizations (*e.g.*, Des Moines County Conservation Board and Pheasants Forever) are actively involved with natural resource programs (*e.g.*, habitat and native species restoration) on the installation.

3.0 AFFECTED ENVIRONMENT

We do not own this land; we are caretakers of the land and the plant and animal species that inhabit it. The American people entrust the land to our care, and we shall fulfill their trust. We shall conserve and protect these resources for the future.[8]

3.1 General Background

Most information in this section is taken from the *Integrated Natural Resources Management Plan, Iowa Army Ammunition Plant, Middletown, Iowa, 2001 Revision* (IAAAP 2000). Other sources are specifically referenced.

3.1.1 Location

IAAAP is located about five miles west of the city of Burlington and immediately south of Middletown, Iowa in Des Moines County, in southeastern Iowa (Figure 3.1.1). U.S. Highway 34 borders the northern section of IAAAP. The installation is easily accessible from the Burlington Municipal Airport and the Burlington Northern Railroad.

3.1.2 Neighbors

The area surrounding IAAAP is mostly agricultural cropland and pastureland. Small businesses, such as general stores or gas stations and rural homes, are located around the periphery of the installation. The community of Middletown borders the installation to the immediate north. The population of Middletown was estimated to be 522 in 2004 (www.city-data.com). Other communities near IAAAP include Augusta, Danville, and Burlington. Burlington is the nearest larger community and had an estimated population of 25,579 in 2004 (www.city-data.com).

3.1.3 Acreage and Acquisition

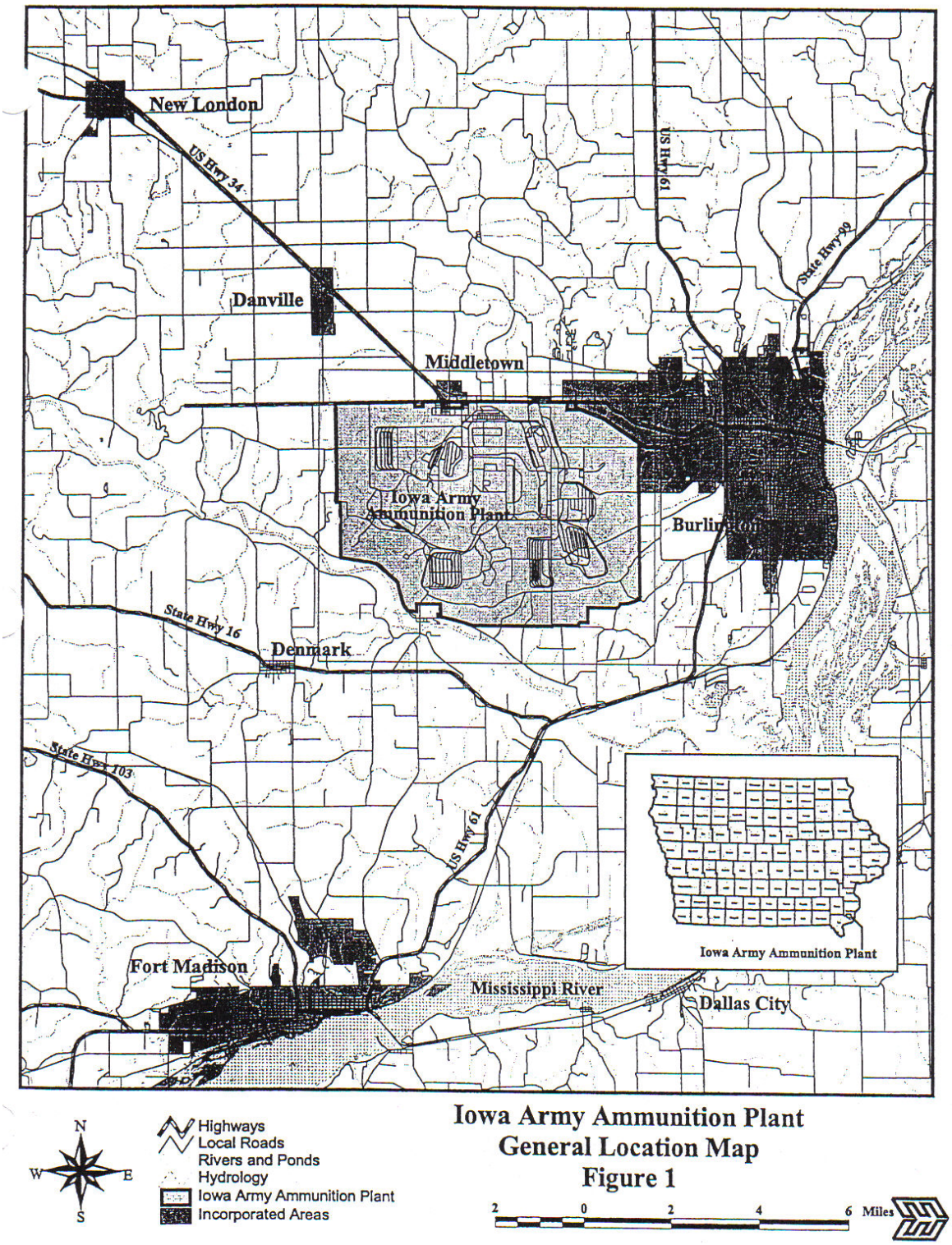
In 1940 the present-day location of the Plant was selected for World War II-era ammunition production. Homes and other structures were purchased to facilitate construction of the Iowa Ordnance Plant, a shell-loading and munitions facility. At the time the U.S. Government took possession of the new plant location, the property included about 20,450 acres of what had once been about 200 farms, six school districts, several cemeteries and churches, and the Des Moines County Farm for the Indigent (Earth Tech, Inc. 2002). Today IAAAP consists of 19,011 acres (personal communication, IAAAP Property Office 2005).

3.1.4 Installation History

The Iowa Ordnance Plant was dedicated in July 1941, nine months after the land for the installation was acquired. The installation was one of several throughout the United States that were established as part of the country's increasing military involvement in World War II. Production of ammunition began in September 1941 and continued daily until the end of World War II in August 1945. During this period, the installation produced artillery rounds, ammunition components, and large aerial bombs. Immediately after World War II, installation work was limited to long-term storage, surveillance, renovation, demilitarization, and reconditioning of wartime munitions.

[8] Robert M. Walker, former Assistant Secretary of the Army, Testimony before Congress, July 11, 1995.

Figure 3.1.1 Iowa Army Ammunition Plant Location



Source: IAAAP 2000

As part of the renovation of the installation during the post World War II period, private contractors rehabilitated the installation's Line 1 for the Atomic Energy Commission. Line 1 assembled sealed components into nuclear weapons from 1948 until 1975, when its functions were relocated to Texas.

Ammunition production at the Iowa Ordnance Plant expanded significantly beginning in June 1950 at the onset of the Korean conflict. Both conventional and nuclear weapons were produced there during the conflict. Production and number of personnel tapered off at the end of the conflict until the mid-1960s, when the United States became more involved in the Vietnam War. Vietnam era production at the installation included artillery rounds, grenade components, demolition blocks, antipersonnel mines, mortar rounds, and assorted components. IAAAP continued to produce a similar line through the 1970s.

During the 1980s, buildings were upgraded, and modern production facilities and equipment were added. In the early 1990s, demilitarization of conventional ammunition became a primary mission of the installation. Demilitarization is the disassembly and disposal of old or obsolete ammunition. This mission continues today.

The installation is also the foremost provider of high-precision warheads and munitions in the nation's defense industrial base and is involved in research, development, production, inspection, assembly, and testing. Within the scope of capabilities, however, there are specific areas of national and international pre-eminence, such as pressing. The installation is recognized as a world leader in the high-, medium-, and low-volume production of pressed warheads. The installation has approximately 500 acres in the fire area that closely support development and production, which are based on the rapid feedback of test results.

Today, IAAAP is used to produce and store ammunition, to perform research, and to develop warheads and large-caliber projectiles. Other activities include forestry, grazing, agriculture, and outdoor recreation, including hunting and fishing.

3.1.5 Military Mission

3.1.5.1 Mission of IAAAP

IAAAP produces ammunition for all branches of the U.S. Armed Forces and for foreign military sales to our allies. IAAAP's primary mission is to load, assemble, and pack munitions. Current production of large caliber munitions includes 120-millimeter tank rounds; warheads for tube-launched, optically tracked, wire-guided and Hellfire missiles; and a family of scatterable mine systems. Demilitarization of conventional ammunition was made a part of the mission in 1992 (Mason & Hanger Corporation 1995).

3.1.5.2 IAAAP Population and Tenants

American Ordnance, LLC employs about 700 persons at IAAAP. There are about 20 government personnel on staff at IAAAP. There are numerous third-party tenants operating under arrangements with American Ordnance, LLC, and all have fairly small operations and few personnel on the Plant.

3.1.5.3 Natural Resources Needed to Support the Military Mission

IAAAP has adequate land area to support the mission. Open space provided by IAAAP's acreage is essential to the military mission. The importance of open space is due to quantity distance requirements associated with ammunition production and storage areas. A specified quantity distance arc is associated with each production and storage area and is required primarily for safety reasons. Quantity distance arcs restrict other types of uses and access to such areas.

Open space aids in security and is important for the Plant's demilitarization and testing operations. Open space provides options for siting specific demilitarization sites or test areas. Open space also provides options for the amount and type of buffer area surrounding such sites. Natural resources management is an important aspect of maintaining IAAAP's open space. A large area (7,500 acres) on IAAAP is used for explosive buffers and is leased for agricultural and grazing purposes.

Vegetation plays an important role at IAAAP for both the military mission and environmental protection. Vegetation is important in maintaining the Plant's open space as well as providing reduced fire hazard by using specific vegetation. The Army also recognizes the need to minimize damage to vegetation, lest the military environment be compromised, and problems, such as soil erosion, make it unsuitable for future use. Viable water resources are also needed to accomplish the mission at IAAAP.

3.1.5.4 Effects of the Military Mission on Natural Resources

Compared to the surrounding area, IAAAP has retained much of the natural character of the landscape, acting as a refuge for some plants, animals, and natural communities. Much of the land at IAAAP is undeveloped. Nonetheless, threats to these resources arise from military activities.

The industrial nature of the mission does not involve land-disturbing activities and is not expected to expand during the period of this INRMP (2007 through 2011). Handling and disposing of industrial materials is performed in compliance with relevant state, federal, and DoD requirements. These activities do not have an adverse effect on natural resources, and compliance requirements are related to resources protection and/or remediation (*e.g.*, water quality, air quality, training).

Munitions Production and Demilitarization

The installation has installed a closed-loop, pinkwater treatment system that decreases the use of potable water in munitions production. All munition items accepted for demilitarization are disassembled to recycle salvageable materials. Explosives, propellants, and steel casings are made available for resale to Army-approved buyers. IAAAP designed, fabricated, and installed two closed-chamber detonation and recycling mechanisms. This equipment allows for the recovery of metals from primers and tracers. Air emissions from the equipment are in compliance with state permits.

The installation recycles the carbon from carbon filter columns used to treat explosive-contaminated wastewater. This procedure reduces purchasing of new carbon and eliminates treatment of about 10,000 pounds of carbon annually.

Dumpster buckets are located throughout the installation. These buckets collect unrecoverable, non-hazardous, non-explosive solid waste from offices, cafeterias, and households. All solvent-, adhesive-, and paint-contaminated wipes are collected for disposal. These practices significantly reduce the amount of material requiring treatment at the contaminated waste processor as explosive-contaminated waste.

IAAAP recycles scrap explosive materials to reduce the quantity that must be treated in the explosive waste incinerator as hazardous waste. Trinitrotoluene (TNT)-contaminated cardboard tops and bottoms are recycled by vacuuming off the TNT and selling the cardboard to local paper recycling contractors.

Past Military Mission Impacts on Natural Resources

Initial development of IAAAP with its buildings, roads, railroads, igloos and magazines, and associated infrastructure had a significant impact associated with the military mission on IAAAP natural resources. Development of these facilities drastically altered farm lands and natural areas and changed the character of the Plant area indefinitely.

Military Training
Training at IAAAP has occurred on 2,840 acres under two former training licenses. However, military training is not an installation mission. The training area included the buffer zone around the cantonment area. This area is horseshoe shaped and extends wherever there are no lines, yards, or production facilities. Previous training activities consisted of bivouacking, digging, grading, and vehicular training. Training affected natural resources, primarily causing erosion and vehicular terrain damage in designated training areas.

Training did not impede the production of munitions on the installation. A license for use of IAAAP lands for training was approved among the Iowa National Guard, local Army Reserve units, and the installation in 1984. This license expired in November 1989; however, training continued at the installation, and more than 2,000 soldiers from four units used the installation for unit training (IAAAP 2000). Utilization increased to 4,070 soldiers within six units in 1990 (Mason & Hanger Corporation 1991). In 1995 five units used the installation for unit training until September 1995 when training was stopped, due to the training unit's refusal to provide NEPA documentation for its training activities.

Units that trained at IAAAP were the Iowa Army National Guard, 224th Engineer Battalion, which included the Headquarters and Headquarters Company and Companies A, B, C, and D. Company C of the 682nd also trained at IAAAP. The 682nd is based in Davenport, Iowa. The Iowa Military Academy, a medical battalion training group at Camp Dodge, has also trained at IAAAP. It used the training areas to practice take-off and landing maneuvers. However, the primary use of IAAAP was by the 224th Engineer Battalion. Current training activities are conducted under a Facilities Use Agreement. The timing, amount, and type of training are very controlled. The acres used for training are shrinking due to sustainability, safety, and environmental issues.

U.S. Environmental Protection Agency's National Priorities List
In 1990 IAAAP was listed on the U.S. Environmental Protection Agency's National Priorities List due to contamination from past industrial practices. IAAAP's objective is to clean up the environment to natural levels and be deleted from the National Priorities List. Line 1 Facilities, located in the northeastern portion of IAAAP, reportedly generated the greatest volume of explosive waste and pinkwater from 1948 until 1975. Pinkwater is a hazardous by-product of munition production. In 1948 an earthen embankment was constructed along the upper reaches of Brush Creek to impound wastewater discharged from Line 1.

IAAAP's objectives led to remedial activities on the installation, which involved land disturbance. IAAAP performed several cleanup activities:

- Groundwater and surface water contamination were detected at and near the Inert Disposal Area. The remedy to ensure long-term protection of human health and the environment included building an impermeable cover or cap over the Inert Disposal Area and performing groundwater monitoring at the site.
- Wetland Construction: Wetlands have been developed to enhance the IAAAP Environmental Stewardship Program. This project developed three new wetlands at Line 1 lagoon, Line 800 lagoon, and the Inert Disposal Area sedimentation basins.
    - The wetland at the borrow site has been filled with drainage water, creating about three acres of surface water. Native invading wetland vegetation has created habitats for waterfowl, furbearers, herpetofauna, and fish.
    - Lines 1 and 800 wetlands primarily function as filtration and wildlife habitat. These areas were planted with flora that specializes in breaking down contaminants.

- The Inert Disposal Area wetland will retain storm water runoff after construction. The area is currently a soil repository but will eventually be converted to a wetland that will remain as a wetland after cleanup is complete.

Although the INRMP is not the appropriate mechanism for dealing with contamination issues, it is a tool to the Installation Restoration Program in gathering information and managing natural resources in a manner that will avoid unnecessary injury from Installation Restoration Program response actions. The Natural Resources Manager continues to provide support and technical expertise to the Installation Restoration Program.

Future Military Mission Impacts on Natural Resources

It is difficult to quantify effects of future military missions on natural resources at IAAAP. If basic mission, land area, and intensity of missions remain unchanged, mission impacts on natural resources will remain similar to those today. IAAAP's primary mission is not likely to change, nor in this era of declining resources, is the size of its land area. However, this may not be true for mission intensity.

Unit Changes

The Army is being forced to make do with less in terms of both quantity and quality of training lands. Effective training resources must be managed so as to not exceed the optimum training carrying capacity of sites to ensure the long-term use of the resource can be guaranteed. Base Realignment and Closure is a reality, and other military missions may look toward IAAAP to fulfill their future training needs. New missions would need to be closely scrutinized to determine their compatibility with the current mission and resources of IAAAP.

Environmental Stewardship

There are numerous positive effects of the military mission on natural resources. The most general and most significant on IAAAP is its commitment to natural resources management, including minimizing and mitigation of military mission damage. This natural resources commitment is beneficial for both natural resources in general and people who use natural resources products.

The environmental, geographic, political, and economic components of the installation are enhanced by cooperation between the Army, state and local agencies, academia, and private individuals. These entities strive to protect the environment from future adverse environmental impacts and to remediate areas that have been impacted by past industrial practices at IAAAP.

The presence of IAAAP continues to preserve native ecosystems by preventing development and by ensuring that land uses are conducted in a manner that protects the environment. Natural resources considerations and safety demands associated with the production and storage mission limit the extent of other potentially damaging land uses.

3.1.5.5 Effects of Natural Resources or Their Management on the Military Mission

Environmental constraints at IAAAP are related to maintaining and/or exceeding relevant compliance requirements for groundwater, storm water, air, endangered species, and other resources. These constraints affect IAAAP's ability to perform its military mission; however, they significantly benefit the installation's natural communities. By virtue of being a military installation, most resources at IAAAP have retained values often lost in areas less protected. Wetlands and the many functions they provide, such as acting as a filtration system and water retention areas, may have been lost without IAAAP establishment. Natural systems are advantageous to and often enhance the military mission.

The agricultural program has the highest degree of impact on the mission of IAAAP. Foremost, the proper use of grazing, haying, and crop production results in a significant reduction in fire hazard and maintenance costs across the Plant. These areas would normally be mowed or sprayed with herbicide at a significant cost to the government. The agricultural program also provides a significant source of income for the Plant and to the Department of Army Agricultural Reimbursable Account.

Negative aspects of natural resources management are relatively minor. These include increased traffic from the agricultural lessees and occasional stray livestock. There have been no mission conflicts with wetlands or threatened or endangered species on IAAAP. Most wetlands occur well away from production areas, and it is unlikely that conflicts with the mission and wetland conservation will occur over the next five years.

IAAAP is known as a military installation that provides high quality white-tailed deer and turkey hunting. This, along with recreational fishing, has had an effect on the Plant's ability to perform its mission. Security and safety issues are of concern when allowing the Plant community, as well as the general public, to access Plant areas that would otherwise be off-limits. Procedures for allowing access have been developed and implemented. In general, these procedures require extra effort by IAAAP, particularly for hunting. IAAAP has adapted to impacts that management of its natural resources has imposed on the military mission and is proving that they are not mutually exclusive.

3.2 Physical Environment and Climate

3.2.1 Physiography and Topography

IAAAP is in the Southern Iowa Drift Plain (Prior 1991). The highest elevation in the county, 862 feet above mean sea level (ft msl), is located about three miles southwest of Yarmouth. The lowest elevation, about 520 ft msl, lies at a point where the Skunk River enters the Mississippi River at the southeastern boundary of the county. Vertical intervals between lowlands and adjoining uplands generally range from 50 to 120 feet. Elevations at IAAAP range from 732 ft msl along the northern extent of the installation, to about 544 ft msl throughout the extensive southern area of Long Creek and Skunk River.

3.2.2 Geology

Approximately one million years ago, the first of the Pleistocene glaciers began to form in Iowa. The third glacial epoch, the Illinoian, pushed west from the Labradiorean Center and entered Iowa only in the southeastern part of the state. Here the ice pushed the Mississippi River westward, and for a time the river flowed around the western edge of the lobe of ice; when the ice melted, the river returned to its former channel. In the area of the Illinoian ice sheet, the glacial drift averaged 30 feet deep.

During interglacial periods, loess was deposited on the glacial drift. Loess is windblown material composed principally of silt with small amounts of sand and clay and is the basis for the development of very good soil. It is found in many places throughout the state, including the installation.

The land of southern Iowa has been subjected to erosion by water longer than the land in northern Iowa. Rivers have deepened their channels; intervening lands, frequently more than 200 feet higher in elevation than the floodplains, are well drained. Southern Iowa is described as a maturely dissected plain.

According to the Seismic Risk Map, the Burlington area of Iowa is located in Zone 1, an area relatively free of earthquakes (Mason & Hanger Corporation 1995).

3.2.3 Petroleum and Mineral Resources

No known oil or mineral deposits exist within IAAAP (Mason & Hanger Corporation 1995).

3.2.4 Soils

Des Moines County soils are loess-covered glacial till that formed under prairie and forest vegetation. Native tall-grass prairie once occurred on the nearly level and gently sloping soils in uplands. These soils developed in loess. Steeper areas formed in glacial till and had native vegetation of trees. Trees also occurred along the alluvial bottomland associated with the Mississippi and Skunk rivers (Soil Conservation Service 1983).

With exception of developing soils associated with rivers and drainages, soils on IAAAP belong to either the Mollisols or Alfisols soil orders. Mollisols are relatively fertile soils and are characterized by a soft surface character, a high base saturation (generally indicative of fertile soil), and a dark color due to abundant humus. Alfilsols are also relatively fertile soils with moderate to high base saturation. The U.S. Corn Belt occurs mainly on Alfisols and Mollisols and has one of the most intensive forms of agriculture (Steila 1976). Agriculture plays a major role in Des Moines County with almost 56% of the county designated as prime farmland.

Twenty-seven soil series are mapped by the Natural Resource Conservation Service as occurring on the installation (Soil Conservation Service 1983). Many series are present only in small areas on IAAAP. Soil Conservation Service (1983) includes soils maps of IAAAP. Maps showing soils on IAAAP are available in the IAAAP Natural Resources office. Soil series are described in detail by the Soil Conservation Service (1983) and are summarized in Appendix 3.2.4.

Prime Farmland

IAAAP encompasses several areas designated as prime farmland (IAAAP 1997). Prime farmland, as defined by the U.S. Department of Agriculture, is land that is best suited to producing food, feed, forage, fiber, and oilseed crops. It is of major importance in providing the nation's short- and long-range needs for food and fiber (Soil Conservation Service 1983). Almost 75% of the soil series represented on the installation meet criteria for prime farmland.

Soil Erodibility

In general, IAAAP soils are not considered highly erodible. Most soils have an erosion T factor of 5 (5 tons per acre per year) (Appendix 3.2.4). An erosion factor, T, as defined by the U.S. Department of Agriculture, is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. There is a potential for erosion by water at earth-covered magazines and from overgrazing in leased lands.

3.2.5 Water Resources

3.2.5.1 Surface Water

About 20 miles of streams are located on IAAAP (Mason & Hanger Corporation 1991). There are three major drainages and numerous minor drainages within the installation. Long Creek is in the western part of the installation and flows into Mathes Lake before leaving the installation on its southern boundary. Brush Creek is more centrally located and leaves the installation in the extreme southeastern corner. Spring Creek drains the eastern part of the installation. Long Creek is in the Skunk River watershed. Skunk River is located adjacent to the southern border of the installation and is a major tributary of the Mississippi River, which is about eight miles east of IAAAP. Brush and Spring creeks drain directly into the Mississippi River (Figure 3.2.5.1). Flint Creek drains 75-100 acres of the installation on the northern edge.

These drainages primarily flow from northwest to southeast on the installation. The three creeks are relatively small, averaging six feet wide and six inches deep. About 90% of the watershed for Long Creek is located outside IAAAP. All of the Brush Creek watershed (6,300 acres) and most of the Spring Creek watershed (8,600 acres) are on the installation. The watershed of Long Creek is impounded in two places by Stump Lake (Lake #18) and Mathes Lake (Lake #19) (Mason & Hanger Corporation 1991).

Almost all crop and pasture lands had tile drains installed before the land was purchased by the government. Tile drainage systems have been maintained by lessees as part of lessee services. There are also about 500 miles of drainage ditches on the installation (Mason & Hanger Corporation 1991).

Surface Water Quality

IAAAP operates under the National Pollutant Discharge Elimination System Permit authorized under Iowa Code Section 455B.174, and Rule 567-64.3, Iowa Administrative Code, and issued by the Director of the Iowa Department of Natural Resources. The permit regulates point source discharges and establishes monitoring requirements and effluent pollutant limitations on the discharges. The IAAAP permit allows industrial discharges at fourteen locations, sanitary discharges from two domestic treatment plants, and monitoring of non-point source storm water runoff at two locations. Discharges from the units are to Brush Creek, Long Creek, and an unnamed tributary of the Skunk River. Brush Creek and Long Creek are also tributaries of the Skunk River.

3.2.5.2 Floodplains

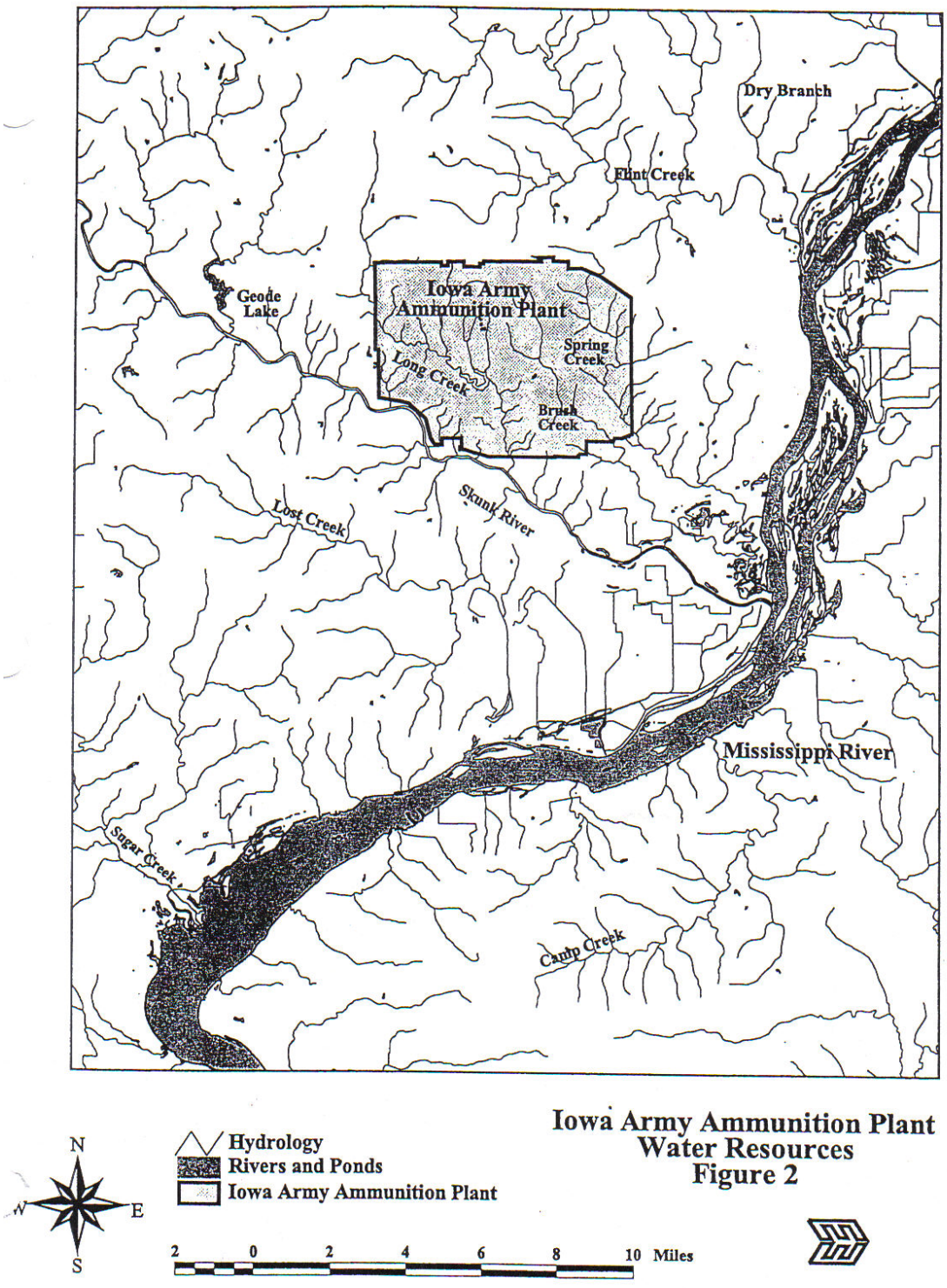
Floodplains can be defined as lowland, typically flat areas adjoining surface waters, including, at a minimum, that area subject to a one percent or greater chance of flooding in any given year. The magnitude of a floodplain depends on numerous factors, including the size of the watercourse, size of the watershed, topography adjacent to the watercourse, soils and geology, and density of development in the watershed and adjoining the watercourse. Floodplains on IAAAP consist primarily of riparian areas associated with the Plant's streams. Figure 3.2.5.1 shows surface water features of IAAAP and the surrounding area.

3.2.5.3 Groundwater

The town of Burlington provides IAAAP with drinking water. The thick sequence of shale-dominated, Pennsylvanian bedrock underlying central and southwestern Iowa is a poor source of groundwater for wells (Prior 1991). Four major aquifers exist in the IAAAP area (U.S. Army Corps of Engineers 1985), the Mississippian, Devonian, Jordan sandstone, and Cambrian-Ordovician. The Mississippian aquifer is 250 - 500 feet below ground surface and has a yield of less than 20 gallons per minute.

Water quality is fair to good with a high mineral content. The Devonian aquifer is 750 - 1,000 feet below ground surface. In the vicinity of IAAAP, the yield is only 20 - 50 gallons per minute. Water quality is fair to poor with a very high mineral content. The Jordan sandstone, which is part of the Cambrian-Ordovician aquifer, is 1,850 - 2,000 feet in depth. It yields 1,000 gallons per minute and is the source of water for most industry and cities in southeast Iowa that do not use river or stream water. Water is hard, but quality is fair. It is less highly mineralized than the Mississippian and Devonian aquifers.

Figure 3.2.5.1 Iowa Army Ammunition Plant Surface Water Resources



Source: IAAAP 2000

3.2.6 Climate

IAAAP's mid-continental location and the amount of rainfall received per year characterize the climate as "humid continental long summer" (Sage 1976). This climatic type brings moisture from the Gulf of Mexico, providing adequate rainfall at the right time of year and ensuring temperatures high enough for lush growth of corn, a major crop on IAAAP, during a long growing season. The southeastern section of Iowa is wetter and warmer than most in the state.

In general, winters are mild with infrequent heavy storms. Winter ice storms are common with one or two destructive ice storms each year (U.S. Army Corps of Engineers 1985). Annual average precipitation is about 35 inches. The average temperature in winter is 25 degrees Fahrenheit (°F) and the average summer temperature is 73°F. The average length of the growing season is 183 days, with the last killing frost occurring on about May 9 and the first frost occurring on about October 18. IAAAP is in an area of moderate tornado frequency as determined by the U.S. Weather Service (Mason & Hanger Corporation 1991). Monthly weather parameters collected by the U.S. Weather Service (www.weather.com) for Middletown, Iowa are shown in Table 3.2.6.

Table 3.2.6 Summary of Middletown, Iowa Climate Data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Avg. High	30°F	36°F	49°F	62°F	72°F	82°F	85°F	83°F	76°F	65°F	49°F	35°F
Avg. Low	15°F	21°F	31°F	43°F	54°F	63°F	67°F	65°F	57°F	46°F	33°F	21°F
Mean	23°F	29°F	40°F	52°F	63°F	72°F	76°F	74°F	67°F	55°F	41°F	28°F
Avg. Precip.	1.31 in	1.54 in	2.96 in	3.61 in	4.40 in	4.45 in	4.48 in	3.86 in	3.60 in	2.91 in	2.72 in	2.10 in
Record High	70°F 1989	72°F 1976	88°F 1986	92°F 1986	94°F 1987	104°F 1988	103°F 1987	105°F 1983	97°F 1985	91°F 1997	78°F 1999	71°F 1998
Record Low	-23°F 1977	-26°F 1996	-6°F 1978	11°F 1982	29°F 1976	40°F 1977	46°F 1971	42°F 1986	30°F 1984	18°F 1972	-2°F 1977	-20°F 1989

3.3 Biological Resources

3.3.1 Ecoregion

IAAAP is within the Prairie Parkland (Temperate) Province. Upland forest in this province is dominated by oak (*Quercus* spp.) and hickory (*Carya* spp.) and is part of the oak-hickory forest of the Eastern Broadleaf Forest (Bailey 1995). This extensive ecoregion is found from Canada to Oklahoma and is typified by gently rolling plains with steep bluffs bordering some valleys. Grasses were the dominant native vegetation; however, due to the favorable climate and soils, most tall grass prairie lands were cultivated, and little native vegetation remains. The area in and around IAAAP is representative of current prairie conditions. Native grassland vegetation was dominated by big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), switchgrass (*Panicum virgatum*), and Indian grass (*Sorghastrum nutans*) with many species of wildflowers and legumes.

At the regional level, the ecoregion has been further classified for the purpose of water quality assessment and management. This classification places IAAAP within the Southern Iowa Rolling Loess Prairie Ecoregion as it transitions into the Central Irregular Plains Ecoregion (Griffith *et al*. 1994).

Mature landscape in the region provides wintering habitat for passerines and raptors. There are uncommon nesting occurrences of the Long-eared Owl (*Asio otus*), and Dickcissell (*Spiza americana*) reach their greatest abundance in this plain. Many vascular plants found along riparian areas of rivers and streams are species that migrated northward from the Ozark Plateau, such as sycamore (*Platanus occidentalis*). Bats are common in areas that are well dissected by streams and have mature riparian habitat.

3.3.2 Flora

3.3.2.1 Vegetation Types

Vegetative community types on IAAAP are floodplain forest, upland oak-hickory forest, hill prairie, native prairie, wetland, and leased areas (hay and grazing areas and agricultural areas). Maps showing vegetation types occurring on IAAAP are available in the IAAAP Natural Resources office.

Floodplain Forest

Floodplain forests occur in the floodplains of Long, Brush, and Spring creeks. Dominant species include box elder (*Acer negundo*), black walnut (*Juglans nigra*), black willow (*Salix nigra*), eastern cottonwood (*Populus deltoides*), sycamore, bitternut hickory (*Carya cordiformis*), shagbark hickory (*Carya ovata*), chinquapin oak (*Quercus muhlenbergii*), red oak (*Quercus rubra*), and white oak (*Quercus alba*). Gooseberry (*Ribes* sp.), sedge (*Carex* spp.), trillium (*Trillium* spp.), poison ivy (*Rhus radicans*), and dense tangles of green-briar (*Smilax* sp.) often trace the floodplain margin.

Oak-Hickory Forest

Oak-hickory forests occur predominately on southern, western, and eastern slopes and adjacent rolling uplands of stream valleys. White oak, red oak, chinquapin oak, mockernut hickory (*Carya tomentosa*), shagbark hickory, and bitternut hickory are the major canopy dominants on higher elevated and better-drained sites. Black locust (*Robinia pseudoacacia*), hard maple (*Acer saccharum*), and wild cherry (*Prunus* spp.) are found on disturbed sites.

Prairies

Hill prairies occur on dry, well-drained silt loam and clay loam soils of steep bluffs and ridge crests and appear as openings in oak-hickory forests. Big bluestem is the dominant species. Other characteristic species of the hill prairie include field pussytoes (*Antennaria neglecta*), a sedge (*Carex medaii*), pale purple coneflower (*Echinacea pallida*), gerardia (*Gerardia grandiflora*), hawkweed (*Hieracium*), slender bush-clover (*Lespedeza virginica*), hoary puccoon (*Lithospermum canescens*), beardtongue (*Penstemon pallidus*), buttercup (*Ranunculus fasciularis*), and gray goldenrod (*Solidago nemoralis*).

Wetland

Wetlands are discussed in Section 3.3.2.5, *Wetlands*.

Hay and Grazing Areas

Hay and grazing areas are primarily vegetated by tall, smooth brome grass (*Bromus inermis*). In 2005 there where 1,575 acres of grazing and 5,532 acres of row crop/hay outleases.

Agricultural Areas

The primary agricultural crops are corn and soybeans. Other crops include alfalfa hay and small amounts of wheat and oats. In 2005 there where 5,532 acres of agricultural row crop/hay on IAAAP.

3.3.2.2 Floral Inventory

Plant communities present on IAAAP are typical of the ecoregion. There are 503 species of vascular plants present on IAAAP, representing 97 families and 303 genera (Horton *et al*. 1996). Species richness on IAAAP for vascular plants is 26% of those recorded statewide by Eilers and Roosa (1994, as reported by Horton *et al*. 1996). The Natural Resources Manager maintains a list of flora known to occur on IAAAP.

The Natural Resources Management Plan (Mason & Hanger Corporation 1990) contains results of a 1974 to 1978 forest inventory for 10 timber compartments on IAAAP.

3.3.2.3 Special Status Flora

No federally-listed plant species have been recorded on IAAAP. Six state-listed threatened vascular plant species have been identified on the Plant. Blue ash (*Fraxinus quadrangulata*), Virginia-snakeroot (*Aristolochia serpentaria*), pagoda plant (*Blephilia ciliata*), false hellebore (*Veratrum woodii*), slender ladies-tresses (*Spiranthes lacera*), and winged monkeyflower (*Mimulus alatus*) are state threatened species occurring on the installation. Although the butternut (*Juglans cinerea*), a former federal candidate species, is not included on the current list of candidate species, it is important to monitor these trees on IAAAP since most of the installation's population is dying from butternut canker fungus (Horton *et al*. 1996).

The western prairie fringed orchid (*Platanthera praeclara*) (federally-listed threatened and state-listed threatened) and the prairie bush clover (*Lespedeza leptostachya*) (federally-listed threatened and state-listed threatened) have a potential to occur statewide based on historical records and habitat distribution. These species are not known to occur on IAAAP.

3.3.2.4 Areas of Special Interest

Native prairie areas on IAAAP are of special interest. The installation has relatively undisturbed native prairie communities. These sites are usually less than one acre. One site is on the east boundary, behind D Yard; another site is southwest of Stump Lake, northwest of Test Fire where the railroad track splits. Wetlands are also of special interest on IAAAP. Wetlands are discussed in Section 3.3.2.5, *Wetlands*.

3.3.2.5 Wetlands

The U.S. Congress enacted the Clean Water Act in 1972 to *restore and maintain the chemical, physical, and biological integrity of the Nation's waters*. Section 404 of the Clean Water Act delegates jurisdictional authority over wetlands to the Corps of Engineers and the Environmental Protection Agency. Waters of the United States protected by the Clean Water Act include rivers, streams, estuaries, and most ponds, lakes, and wetlands. The Corps of Engineers and the Environmental Protection Agency jointly define wetlands as .. *areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.*

The USFWS defines wetlands to include a variety of areas that fall into one of five categories:

- areas with hydrophytes and hydric soils, such as those commonly known as marshes, swamps, and bogs;
- areas without hydrophytes but with hydric soils, such as flats where drastic fluctuation in water levels, wave action, turbidity, or high concentration of salts may prevent the growth of hydrophytes;

- areas with hydrophytes but nonhydric soils, such as margins of impoundments or excavations where hydrophytes have become established but hydric soils have not yet developed;
- areas without soils but with hydrophytes, such as the seaweed-covered portion of rocky shores; and
- wetlands without soils and without hydrophytes, such as gravel beaches or rocky shores without vegetation.

Wetland functions and values include but are not limited to ground water recharge, ground water discharge, flood flow alteration, sediment stabilization, sediment or toxicant retention, nutrient removal or transformation, production export, wildlife diversity/abundance, aquatic diversity/abundance, uniqueness/ heritage, and recreation. Executive Order 11990, *Protection of Wetlands* (1977) and the Clean Water Act (1977) require no net wetland losses on federal lands in the United States.

In 1992 the Soil Conservation Service conducted a preliminary wetlands investigation on IAAAP by aerial survey. This delineation met the needs of the installation natural resources program in terms of location of wetlands. The findings of the preliminary fly-over indicated about 600 acres of wooded wetlands. In general, these are within floodplains of Long, Brush, and Spring creeks (palustrine wetlands) and/or are associated with impoundments (lacustrine wetlands). Findings were delineated on aerial photographs, but wetlands were not classified. Non-wooded wetlands are typically dominated by tall perennial grasses, such as bur-reed (*Sparganium eurycarpum*), reed canary grass (*Phalaris arundinacea*), arrow root (*Sagittaria* sp.), water plantain (*Alisma triviale*), pond weed (*Potamogeton* sp.), duck weed (*Lemna* sp.), smartweed (*Polygonum* sp.), and a variety of sedges.

In 1999 a National Wetlands Inventory was conducted on the installation by the USFWS (Swords *et al*. 1999). IAAAP contains 113.2 acres of wetland. Forested wetlands are the dominant type, representing about 50 percent of the installation's wetlands. The next most common type is unconsolidated bottoms ("ponds"), which comprise about 24 percent of the wetlands. IAAAP contains 57.3 miles of linear wetlands including rivers and streams (3.1 miles of wetlands and 54.2 miles of rivers and streams respectively). Wetland acreages are as follows: Emergent Wetland – 14.7 acres, Scrub/Shrub Wetland (Broad-leaved Deciduous) – 10.8 acres, Forested Wetland – 60.2 acres (Temporarily Flooded – 56.5 acres and Seasonally Flooded – 3.7 acres), and Unconsolidated Bottom – 27.5 acres (Swords *et al*. 1999). Maps showing wetlands and deepwater habitats on the Plant are available in the IAAAP Natural Resources office.

3.3.3 Fauna

3.3.3.1 General

IAAAP's wildlife species include animals indigenous to the Southern Iowa Drift Plain. The installation is known to have 503 species of vascular plants, 24 species of mammals, 103 species of breeding birds, 9 species of reptiles, 9 species of amphibians, 31 species of fish, and 29 species of insects (Horton *et al*. 1996). The Natural Resources Manager maintains a list of fauna known to occur on IAAAP.

Mammals

Mammals known to occur on IAAAP include the white-tailed deer (*Odocoileus virginianus*), eastern cottontail (*Sylvilagus floridanus*), eastern fox and eastern gray squirrel (*Sciurus niger* and *S. carolinensis*), raccoon (*Procyon lotor*), coyote (*Canis latrans*), red and gray fox (*Vulpes vulpes* and *Urocyon cinereoargenteus*), beaver (*Castor canadensis*), striped skunk (*Mephitis mephitis*), opossum (*Didelphis virginiana*), badger (*Taxidea taxus*), muskrat (*Ondantra zibethica*), and woodchuck (*Marmota monax*). Thirty mammal species have been recorded on IAAAP.

Birds
Surveys have confirmed 103 species of breeding birds on IAAAP. Birds commonly found on IAAAP include the Wild Turkey (*Meleagris gallopavo*), Northern Bobwhite Quail (*Colinus virginianus*), American Woodcock (*Philohela minor*), American Crow (*Corvus brachyrhynchos*), Turkey Vulture (*Cathartes aura*), Red-tailed Hawk (*Buteo jamaicensis*), Mourning Dove (*Zenaidura macroura*), Red-headed Woodpecker (*Melanerpes erythrocephalus*), American Robin (*Turdus migratorius*), European Starling (*Sturnus vulgaris*), Northern Cardinal (*Cardinalis cardinalis*), Song Sparrow (*Melospiza melodia*), Red-winged Blackbird (*Agelaius phoeniceus*), Eastern Meadowlark (*Sturnella magna*), and American Goldfinch (*Carduelis tristis*).

Fish
Thirty-three fish species have been confirmed in IAAAP waters. Fish species commonly found on the Plant include the yellow and black bullhead (*Ameriurus natalis* and *A. melas*), green sunfish (*L. cyanellus*), largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), channel catfish (*Ictalurus punctatus*), central stoneroller (*Campostoma anomalum*), spotfin shiner (*Cyprinella spiloptera*), common shiner (*Luxilus cornutus*), bigmouth shiner (*Notropis dorsalis*), suckermouth minnow (*Phenacobius mirabilis*), and creek chub (*Semotilus atromaculatus*).

Reptiles and Amphibians
Nine reptile species and nine amphibian species have been documented on IAAAP. Reptiles occurring on the Plant include the snapping turtle (*Chelydra serpentina*), western painted turtle (*Chrysemys picta*), black rat snake (*Elaphe obsoleta*), northern water snake (*Natrix sipedon*), brown snake (*Storeria dekayi*), western spiny softshell (*Trionyx spinifer*), eastern hognose snake (*Heterodon platyrhinos*), blue racer (*Coluber constrictor*), and eastern (redside) garter snake (*Thamnophis sirtalis*). Amphibians occurring on IAAAP include the American toad (*Bufo americanus*), northern spring peeper (*Hyla crucifer*), gray treefrog (*H. chrysoscelis*), Blanchard's cricket frog (*Acris crepitans*), western chorus frog (*Pseudacris triseriata*), bullfrog (*Rana catesbeiana*), green frog (*R. clamitans*), Plains leopard frog (*R. blairi*), and pickerel frog (*R. palustris*).

Mollusks
Gastropods identified on IAAAP include *Physa* species, *Fossaria* species, *Planorbella* species, and unidentified *succinid*. Unidentified shells of Sphaeriacean clams have been found, and seven species of mussels (*Amblema plicata*, *Anodonta grandis*, *Lampsilis ovata*, *Lasmigona complanata*, *Quadrula quadrula*, *Toxolasma parvus*, and *Villosa iris*) have been documented on IAAAP.

Insects
Twenty-nine species of dragonflies and damselflies have been recorded on IAAAP. Various other insects and invertebrates, such as worms, beetles, and grubs, are common on IAAAP (Chenger 2003).

3.3.3.2 Special Status Fauna
Two federally-listed species are known to occur on IAAAP, the Indiana bat (*Myotis sodalis*) (federally-endangered) and the Bald Eagle (*Haliaeetus leucocephalus*) (federally-threatened). Horton *et al*. (1996) documented the Bald Eagle, and Tetra Tech EM Inc. (1998) captured two Indiana bats on IAAAP. Bald Eagles observed on the Plant are transient and are occasionally found at Lake Mathes. Indiana bats captured on the Plant were lactating, and radio tracking of these individuals indicated they forage on IAAAP. An Endangered Species Management Plan (Tetra Tech EM Inc. 2001) has been prepared for the Indiana bat on IAAAP (see section 4.8.1, *Federal-listed Species Management Practices*).

Horton *et al*. (1996) documented the Double-crested Cormorant (*Phalacrocorax auritus*) (state-listed endangered) on IAAAP. However, Double-crested Cormorants are no longer listed in Iowa (Iowa Conservation Commission [571] Chapter 77, Endangered and Threatened Plant and Animal Species). The USFWS (Milligan and Grady 1996) performed a comprehensive drainage basin survey on IAAAP in 1987, which documented the orangethroated darter (*Etheostoma spectabile*) (state-listed threatened) in Brush and Spring creeks. A 1997 survey confirmed these findings. The western worm snake (*Carphophis amoenus vermis*) (state-listed threatened) was recorded on IAAAP in 1979 by the USFWS. Army regulations require consideration of state-listed species in all Army actions.

3.4 Human Environment

3.4.1 Cultural Resources

Cultural Resources include, but are not limited to, buildings, structures, prehistoric and historic archeological sites, native sacred sites, and cemeteries.

3.4.1.1 Cultural Resources Inventory

Archeological surveys performed on IAAAP revealed that 13,836 acres of the Plant have potential to yield archeological resources. Surveys found that other areas had been disturbed and do not require additional study (IAAAP 2000). To date, 304 sites have been recorded on IAAAP, yielding 82 prehistoric, 164 historic, and 45 combination sites. For many of these sites, eligibility for listing in the National Register of Historic Places (NRHP) has not been determined, and their evaluations remain to be completed.

IAAAP has 1,190 architectural resources. A preliminary reconnaissance-level survey indicated that 402 buildings from the World War II and Cold War periods may be eligible for listing in the NRHP. However, a historic context would required before a formal determination of eligibility can be made.

There are no cultural resources formally listed in the NRHP or nominated to it, and no potential traditional cultural properties have been identified on IAAAP. IAAAP has a current Integrated Cultural Resources Management Plan (Earth Tech, Inc. 2002).

3.4.1.2 National Register of Historic Places Eligibility

Eligibility of archeological sites for inclusion in the NRHP is the principal criterion determining management prescriptions. Generally, sites fall into one of three categories with regard to NRHP eligibility.

- ***Eligible***: These sites have been determined eligible for the NRHP and therefore are subject to protection. They should not be affected without consultation per Section 106 of the National Historic Preservation Act and development of a plan to mitigate adverse effects.
- ***Ineligible***: These sites have been determined ineligible for the NRHP and do not require protection from adverse effects.
- ***Potentially eligible***: Further investigation is required to determine NRHP eligibility. Therefore, these sites are potentially eligible for the NRHP and require protection until determinations of eligibility can be made.

No IAAAP buildings that predate the establishment of the installation have been surveyed. The evaluation of these structures and some Cold War era buildings has not been completed.

3.4.2 Land Uses

The Plant mission determines land use patterns in the vicinity of production and storage areas on IAAAP. Outlying lands are used for a variety of purposes, including agriculture, wildlife habitat, and forest land. Table 3.4.2 shows primary land uses and acreage. An individual tract of land may have multiple uses occurring in the same tract. IAAAP vegetation coverage and land uses are highly variable, and uses overlap one another.

Table 3.4.2 IAAAP Land Use Descriptions and Acreage

Primary Use	Acreage
Semi-improved Grounds	1,453
Improved Grounds	97
Unimproved Grounds	17,461
Agricultural Outleases	7,107
Roads and Railroads	800
Buildings and Structures	89
Idle Areas	1,584
Forest Areas	7,766
Ponds, Lakes, and Streams	106
Total	19,011

Semi-improved Grounds

There are about 1,453 acres of semi-improved grounds on IAAAP, including production facilities (700 acres), such as buildings, load lines, and small arms ranges; demolition and test areas and clear zones (100 acres); security clear areas (119 acres), including acreage adjacent to roads, railroads, and utility right-of-ways; and roadside utilities (534 acres).

Improved Grounds

There are about 97 acres of improved grounds on IAAAP consisting of administrative lawns, ball fields, drill fields, and cemeteries. The Shilo Cemetary is the only remaining active cemetery on IAAAP. IAAAP transferred ownership of the installation housing area, including 42 structures and 112 acres to the city of Middletown in 1997.

Unimproved Grounds

There are about 17,461 acres of unimproved grounds on IAAAP, including roads and railroads (800 acres), buildings and structures (89 acres), agricultural outleases (7,107 acres), idle areas (1,584 acres), forested areas (7,766 acres), and ponds, lakes, and streams (106 acres).

Leased Areas

Agricultural outleases comprise a major portion of acreage considered unimproved grounds on IAAAP. The installation has 53 grazing, hay, and crop leases on 7,107 acres. These 53 leases include 43 crop leases (including one for hay production only) and 10 grazing and hay leases (see Section 4.10, *Agricultural Outleases*, Figure 4.10.1).

Wildlife Habitat

Wildlife habitat consists primarily of the acreage considered unimproved grounds, including agricultural outleases, idle areas, forested areas, and ponds, lakes, and streams (17,461 acres) on IAAAP. These areas are maintained as wildlife habitat and buffer.

Hunting and Fishing Areas
Areas open to hunting on IAAAP are scattered throughout the Plant. Figure 3.4.2 shows areas open to recreational use on IAAAP. Recreation units consist of about 775 acres each.

Fishing is permitted only on the 83-acre George H. Mathes Lake #18, Stump Lake #19, and four other ponds: #04, #23, #32, and #40. All recreational users are required to meet licensing requirements specified in IAAAP Regulation 420-1.

3.4.3 Facilities and Utilities

3.4.3.1 Overview
Most of IAAAP is undeveloped rural area, comprised primarily of buffer areas surrounding storage and production areas. Unimproved Grounds (lakes, roads, buildings, land not available for development, etc.) account for most of IAAAP's land. Land area descriptions are discussed in Section 3.4.2, *Land Uses*. IAAAP is an industrial complex with production areas, storage areas, a 500-acre test fire area, a maintenance area, and a cantonment area.

3.4.3.2 Transportation System

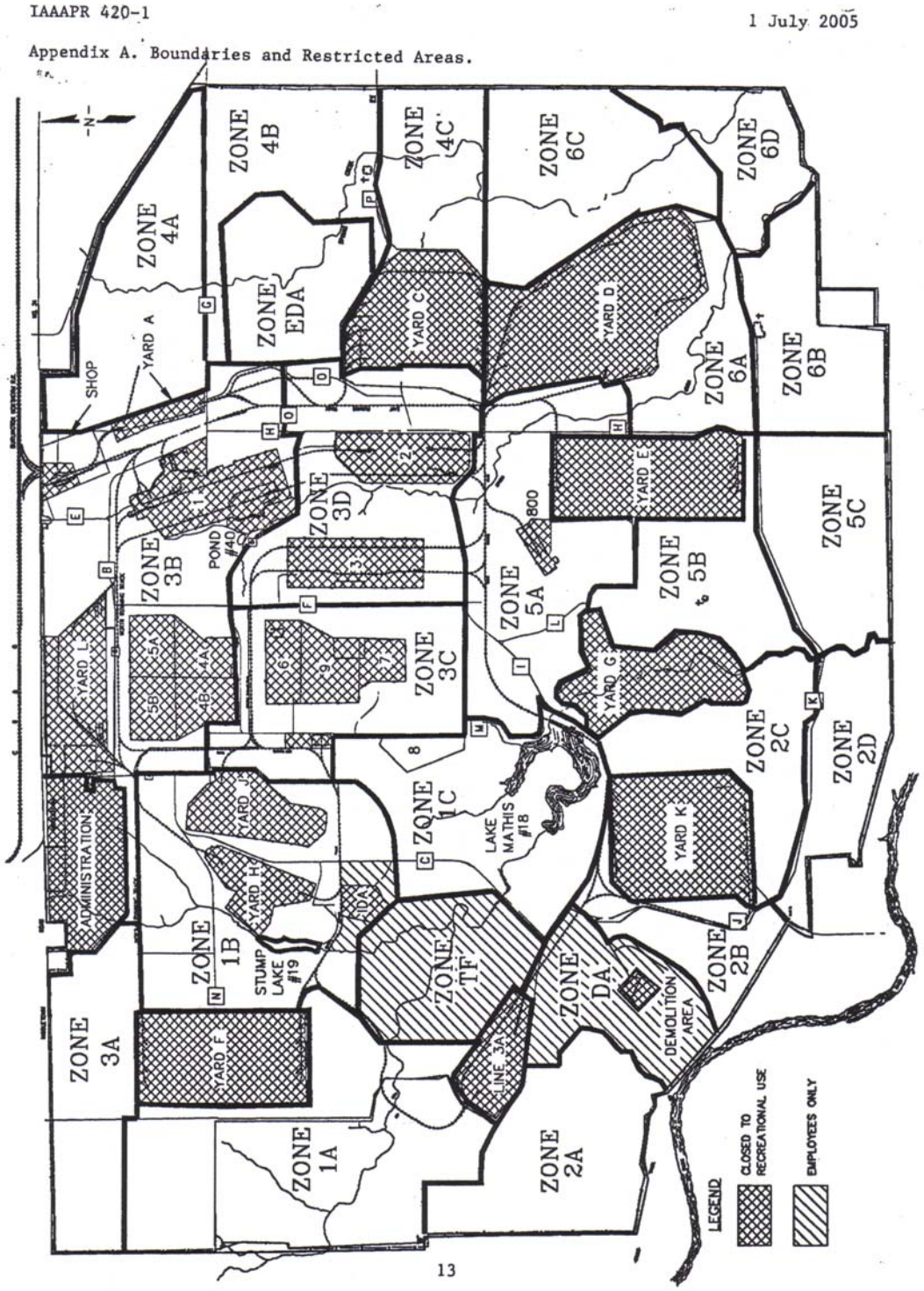
Road System
U.S. Highway 34, which runs along part of the northern border, is the major east-west highway near IAAAP. The closest major north-south highway is U.S. Highway 61. U.S. Highway 61 is the main highway between Fort Madison and Burlington. It intersects with U.S. Highway 34 in Burlington. State Highway 16 crosses the state east to west and intersects U.S. Highway 61 just south of the Plant.

IAAAP has 149 miles of roads within its boundaries (Mason & Hanger Corporation 1995). Most roads are gravel. Fourteen miles of gravel roads have been maintained using agricultural funding over the last few years to provide access to agricultural areas on IAAAP.

Railway System
There are three rail lines in southeastern Iowa: the Burlington Northern Railroad; the Atchison, Topeka, and Santa Fe Railroad; and the Norfolk and Western Railroad. The nearest AMTRAK depot is located in Burlington. IAAAP's railway system interconnects with the Burlington Northern Railroad at the northern installation boundary. This is the only railroad operating in the city of Burlington. There are more than 100 miles of railroad line within the installation. The Santa Fe Railroad runs east, west, and southwest and crosses the Mississippi River on a combination highway/railway bridge at Fort Madison. The Norfolk and Western Railroad interconnects with the Burlington Northern Railroad at Peoria, Illinois, and Quincy, Iowa (U.S. Army Corps of Engineers 1985).

Airports
The nearest airport is the Burlington Municipal Airport, located on the southern edge of Burlington. The next nearest airport is in Galesburg, Illinois. The closest local service airports are Fort Madison and Mount Pleasant, Iowa. Cedar Rapids, Iowa and Moline, Illinois are the best value airports.

Figure 3.4.2 Recreational Areas on Iowa Army Ammunition Plant



3.4.3.3 Water Supply
Water is purchased under a long-term contract with the Burlington Regional Water Works, which draws water from the Mississippi River. The Burlington Municipal Water Works has the capacity to treat 15 million gallons per day. Its peak demand, which occurs in summer, is about 12 million gallons per day. Water is pumped to the City of Burlington's distribution center from the water treatment plant. The water is then pumped to a series of storage towers. The primary storage tower has a 1 million-gallon capacity (U.S. Army Corps of Engineers 1985). One electrical pump on the installation distributes water throughout IAAAP.

A secondary source of potable water was provided by wells located within the installation. Prior to 1977 water was obtained from George H. Mathes Lake and treated at a waterworks on the installation (U.S. Army Corps of Engineers 1985). These systems are no longer operational. IAAAP's distribution center supplies water to Middletown through a meter in the administration area. Middletown has no storage capacity or alternate water system. The installation provides water to the U.S. Army Reserve Center located west of IAAAP, and the installation transports water to the city of Danville (U.S. Army Corps of Engineers 1985).

3.4.3.4 Waste Water System
IAAAP has two sewage treatment plants. The main wastewater treatment plant consists of a two-stage high rate trickling filter plant, which includes primary and final settling with separate digestion and rotary distributors. It has a capacity of treating 800,000 gallons per day.

3.4.3.5 Range Facilities
IAAAP has a test fire area comprised of a horizontal range, vertical stand, and active test firing. IAAAP has one small arms range, a demilitarization operation area, and a number of igloos-magazines.

3.4.3.6 Projected Changes to Facilities
IAAAP does not anticipate changes to facilities at this time.

3.4.4 Hazardous and Toxic Materials
Past construction and production activities at IAAAP have resulted in some areas being contaminated. These activities and restoration efforts are discussed in Section 3.1.5.4, *Effects of the Military Mission on Natural Resources*.

3.4.5 Outdoor Recreation
IAAAP is a large, relatively undeveloped, open space. This open space and outdoor recreation opportunities associated with it are perhaps IAAAP's best natural attributes in terms of community quality of life. With ever-increasing time to pursue recreational interests, the IAAAP community and general public will likely place more demand on the Plant's natural resources.

Hunting and fishing are the primary outdoor recreation activities allowed on IAAAP. However, trapping and mushroom, nut, and berry harvesting is allowed on IAAAP. Other outdoor recreation activities are not allowed due to safety and security concerns.

4.0 NATURAL RESOURCES MANAGEMENT

This chapter includes those programs that are implemented specifically for natural resources conservation. Some, such as pest management and cantonment area management, may be within responsibilities of organizations other than Natural Resources, but items discussed in this INRMP emphasize those facets of these programs that are conducted by the Natural Resources Program.

Programs are described in terms of their status and recent history (**Current Management**) followed by proposed project(s) (**Proposed Management**), if appropriate. These projects are intended to relate implementation of this INRMP to the budget process (see Section 7.5).

Projects are described in a goal(s)-objective(s) format to provide process descriptions that are compatible with adaptive management analyses and overall INRMP implementation monitoring processes. All goals and objectives are summarized in tabular format in Appendix 7.4.

Each project has a summary description at the beginning of the Proposed Management section. The format is as follows:

Project: Title
Justification: Laws, regulations, or policy compliance (*e.g.*, participation in regional initiatives; Sikes Act, Endangered Species Act, AR 200-3, stewardship)
Project Timing: Dates to be accomplished, by objective (*e.g.*, 2007, 2007-08, indefinitely, uncertain)
Regulatory Coordination: Agencies with whom coordination is required

4.1 History of Natural Resources Management

Prior to 1974, the Long Creek Conservation Club managed natural resources on IAAAP. IAAAP hired its first land manager in 1974, a contractor employee, to manage the installation's fish and wildlife resources. In 1994 this function was transferred to the government staff due to natural resources being an inherently governmental function, per Sikes Act (16 USC 670, as amended). A cooperative effort between IDNR, USFWS, and IAAAP has resulted in many management programs, such as the restocking of Wild Turkey and Ruffed Grouse (*Bonasa umbellus*), Canada Goose, and Swan reintroduction programs on the Plant.

4.2 Ecosystem Management Coordination and Planning

4.2.1 Ecosystem Management Coordination

4.2.1.1 Current Management

Natural resources management on military installations must be coordinated with the military mission to support the mission as well as effectively conserve natural resources. At IAAAP this coordination is accomplished by the Natural Resources Manager in cooperation with American Ordnance LLC personnel.

As discussed in Section 2.3, *Other Federal Agencies*, Section 2.4, *Iowa Department of Natural Resources*, Section 2.7, *Municipalities*, and Section 2.9, *Other Interested Parties*, IAAAP has much in common with other federal and state agencies, municipalities, and other parties interested in Iowa ecosystems. Cooperating with other organizations to manage and protect IAAAP and surrounding ecosystems is a significant commitment.

4.2.1.2 Proposed Management

Project: Ecosystem Management Coordination
Justification: Participation in regional initiatives, stewardship
Project Timing: All objectives - ongoing indefinitely
Regulatory Coordination: None required

Goal 1. Use coordinated planning to manage natural resources to sustain military mission capability.

Objective 1. Coordinate natural resources planning with planning for the sustainment of the military mission.

Goal 2. Promote and participate in regional planning for natural resources conservation at scales larger than IAAAP.

Objective 2. Coordinate with and support regional planning and programs.

Objective 3. Coordinate with and support military regional planning and programs.

4.2.2 Integrated Natural Resources Management Planning

4.2.2.1 Current Management

This INRMP must be reviewed annually by IAAAP, as stipulated in AR 200-3 (Department of the Army 1995). The list of goals and objectives (Appendix 7.4) can be used to guide the review and adjust programs, per the adaptive management process. This INRMP must be reviewed and approved at least every five years or when major changes are made to the natural resources program. The next major update is scheduled for FY 11 with implementation to begin in FY 12.

4.2.2.2 Proposed Management

Project: Integrated Natural Resources Management Planning
Justification: Sikes Act compliance, AR 200-3, stewardship
Project Timing: Objective 1 - annually; objective 2 - 2011
Regulatory Coordination: USFWS and IDNR

Goal. Use coordinated planning to fully integrate the natural resources program at IAAAP.

Objective 1. Internally review this INRMP annually using project goals and objectives to guide reviews; revise projects and budgets as required; review changes annually with the USFWS and IDNR.

Objective 2. Update the INRMP at least every five years or when major changes are made to the natural resources program; coordinate this update with the USFWS and IDNR. (This will require the next INRMP update to begin in 2011.)

4.3 Soils Management

4.3.1 Current Management

IAAAP has a complete soil inventory (Soil Conservation Service 1983). Descriptions of soils on IAAAP are in Section 3.2.4, *Soils*. No additional general soils surveys are required during the next five years.

Protection is the primary mechanism used to manage soil resources on IAAAP. For example, the following principles are followed when facility-siting decisions are made.

- New facilities normally will be sited on lands currently developed.
- Whenever possible, buildings slated for demolition on the outside edge of the cantonment area will be demolished first, and the land will be returned to a more natural grassland or woodland habitat.
- Whenever possible, new testing sites will be established on sites now or formerly occupied by testing sites.
- New faculties will be established on undeveloped land only if currently or previously developed lands are not available to meet the needs of the facilities.

Prevention and correction of soil erosion on IAAAP is accomplished by improving vegetative cover and installing supporting engineering measures. Potential erosion problems can be overcome by planting stabilizing vegetation and/or planting legumes of low palatability to grazers (Mason & Hanger Corporation 1991). Vegetation provides effective control of erosion for most sites. Even on slopes, vegetation is used effectively where combined with other control measures.

Land rehabilitation work on IAAAP is not normally dependent upon intensive heavy equipment work with massive land reshaping. Projects strive to minimize damage to vegetation and to use natural drainages. Care is taken to ensure that heavy equipment operations do not disturb native vegetation more than absolutely necessary. This is especially true in areas with more erodible soils due to the difficulty in revegetating these areas.

Contour farming is practiced as part of the conservation tillage program. Contour farming significantly reduces erosion and runoff by following natural contours of the land. In areas where cropland is gently sloping and smooth, with a stable topsoil and high infiltration capacity, soil and water loss can be reduced by a factor of up to four by conducting planting and tillage parallel to field contours (Dunne and Leopold 1978). Grass-lined terraces have been constructed in agricultural areas to help minimize erosion.

Road drainage maintenance is important to control sedimentation. General road maintenance and construction is done within provisions of the contract for IAAAP operation by American Ordnance LLC.

Earth-covered magazines are a special concern at IAAAP where ammunition storage is a significant activity. Steep sides of earth-covered magazines are susceptible to erosion. Storage areas are primarily vegetated with smooth brome grass. Ammunition storage areas may be grazed, and cattle tend to cut paths on igloo sides, leading to erosion. IAAAP has fenced earth-covered magazines to restrict cattle from these areas. The Natural Resources office monitors and maintains cattle stocking rates on the Plant to minimize soil compaction and erosion. Other management issues with storage igloos are animal burrowing and tree roots penetrating the slopes, which are addressed on a case-by-case basis.

A project underway at IAAAP with erosion potential is construction of an 8-mile section of fence along the southern portion of the installation. This project included clearing a 50-foot width along the entire route. Measures are being taken to reduce erosion, such as silt fences, land contouring, and revegetation. Timber removed during construction was purchased by the contractor, and the project was coordinated with the USFWS with regard to possible effects to the Indiana bat.

4.3.2 Proposed Management

Project: Soils Management
Justification: Maintaining the capability of military lands to support the military mission (Sikes Act), compliance with the Clean Water Act, stewardship
Project Timing: All objectives - indefinitely, as needed
Regulatory Coordination: None required

Goal. Repair damaged soils and use soil parameters to manage military activities, protect soil stability, restore installation lands, and conserve wildlife habitat.

Objective 1. Use improvement of vegetative cover and contour farming to prevent soil erosion.

Objective 2. Ensure that roads are maintained and upgraded as necessary.

Objective 3. Consider soils management in implementation of the agricultural grazing program.

Objective 4. Use soil inventory data to make decisions regarding land use, rehabilitation options, and wildlife habitat management options.

4.4 Water Resources Management

AR 200-1, *Environmental Protection and Enhancement*, (Department of the Army 1997a) establishes the following objectives for water resources on Army lands.

- Conserve all water resources.
- Control or eliminate sources of pollution to surface or ground waters through conventional or innovative treatment systems.
- Demonstrate leadership in attaining the national goal of zero discharge of water pollutants.
- Provide drinking water that meets applicable standards.
- Cooperate with federal, state, and local regulatory authorities in forming and implementing water pollution control plans.
- Control or eliminate runoff and erosion through sound vegetative and land management practices.
- Consider nonpoint source pollution abatement in all construction, installation operations, and land management plans and activities.

An additional Army requirement is the preparation and implementation of a Stormwater Management Plan. Attainment of most of the above objectives is not the responsibility of Army installation natural resources programs, but some of them, especially the last two, are clearly natural resources management concerns. The Environmental Branch is responsible for monitoring pollution levels and pollution control on IAAAP.

4.4.1 Current Management

Monitoring
Water quality reflects environmental pollution. Surface water monitoring at IAAAP emphasizes runoff from production areas. Monitoring is also performed to determine the quality of water entering the installation. This monitoring primarily measures the effects of activities upstream from the installation. Brush, Long, and Spring creeks and a tributary of Spring Creek are monitored for upstream and/or for production effects. Long Creek is monitored at the entrance to Mathes Lake to gather information on

effects of upstream agriculture. Long Creek is monitored near Bridge H16 (downstream from production lines) for such things as explosives, metals, and biological oxygen demand.

Groundwater is one of IAAAP's most valuable natural resources. Long-term monitoring is designed to test for total metals, explosives, volatile organic compounds, and semi-volatile organic compounds. A total of over 300 wells are monitored on an as-needed basis. There is also some pesticide and radionuclide testing of groundwater. Some mission-associated groundwater contamination exists both on and off of IAAAP.

Management
Most water quality laws and regulations are not the responsibility of the Natural Resources office at IAAAP and are thus not within this INRMP. Erosion is a significant threat to water quality, and it has locally significant impacts. Decades of formal land management have greatly enhanced IAAAP's capability to protect water quality from sedimentation. Sections 4.3 - *Soil Management,* 4.6.1.2 - *Wetland Management,* 4.10 - *Agricultural Outleases,* 4.11 - *Pest Management,* and 5.4 - *NEPA* specifically reduce negative impacts to water quality or mitigate such damage.

IAAAP has many terraces on agricultural fields. These terraces detain water, causing sediment to drop out. The water slowly drains via tile pipes to the nearest ditch or waterway. A by-product of this system of terraces is an increased runoff of pesticides. IAAAP will work to reduce terracing. The installation has increased the use of grassed waterways, instead of terraces, which increases the retention of both sediment and pesticides on the land and reduce deposition in surface water. Pesticide runoff may be reduced by as much as 70% by grass waterways. This will create a significant improvement in surface water quality.

IAAAP is committed to the protection of water quality and its associated values on IAAAP watersheds and on watersheds that drain from the Plant. IAAAP controls or eliminates runoff and erosion through sound vegetative and land management practices and considers nonpoint source pollution abatement in all construction, operations, and land management plans and activities.

4.4.2 Proposed Management

Project: Water Resources Management
Justification: Stewardship
Project Timing: All objectives - indefinitely, as needed
Regulatory Coordination: U.S. Army Corps of Engineers (Clean Water Act objectives)

Goal. Protect surface water quality at IAAAP.

Objective 1. Use site-specific water testing for natural resources programs, such as erosion control and pond management.

Objective 2. Use water quality data to make decisions regarding land use, restoration options, and fish and wildlife habitat management options.

Objective 3. Control or eliminate runoff and erosion that could affect surface waters.

Objective 4. Consider nonpoint source pollution abatement in construction, operations, and land management plans and activities.

4.5 Forest Management

Forests on IAAAP are either pre-acquisition farm woodlots, which were often grazed both before acquisition and during the first 10 years of acquisition, or areas that have grown since acquisition (which makes them relatively young). Prior to 1970, mixed hardwood stands were managed under a modified uneven-aged management system. Between 1970 and 1977, installation forests were managed under an even-aged system using growth rates to determine harvests, which were accomplished using group selection and small clearcuts. Since then, individual stands have been managed using uneven-aged management, a 100+-year rotation, and a 10-year cutting cycle (Mason & Hanger Corporation 1990). Based on the forest management plan (Mason & Hanger Corporation 1990), IAAAP was divided into 10 compartments (stands of forest with similar species, size classes, and stocking).

The forest inventory was performed using a variable plot cruise by the IDNR District Forester. In 1992 to 1994 field data were collected to update this inventory. This inventory includes stand-specific data for the 10 forest compartments. It includes sawtimber volumes, 10-year incremental growth of sawtimber, data by size classes, and recommendations for timber stand improvement (Geode Resource Conservation and Development 1994). Timber stand improvement is defined as improvements to timber stands that do not involve intermediate or final commercial harvest.

Forest resources on IAAAP are relatively young, and quality sawtimber is available. It will likely be another 10 - 20 years before some walnut sawtimber becomes available. It is too costly to actively manage the limited forest resources on the Plant. Management is primarily in the form of protection, such as prohibiting the use of screw-in tree stands. Any future forest inventory should include more detailed information regarding undergrowth. This would be useful for making harvest/regeneration decisions, as well as for evaluating the overall forest ecosystem.

The 1974 to 1978 inventory indicated 7,766 acres under management, with an estimated 10,170,000 board feet of merchantable volume (Mason & Hanger Corporation 1991 and 1990). The last timber sale on IAAAP was in 1983 (Mason & Hanger Corporation 1990), although, a salvage cut was performed in 2000 to remove trees with oak wilt and prevent the spread of the disease (IAAAP 2000). From 1977 through 1990, tree planting for forest regeneration was stopped because of extensive deer damage. In 1992, 80 acres of mixed hardwoods were planted, but they failed to mature due to heavy deer pressure and improper selection of soil types. Discovery of the Indiana bat on IAAAP in 1998 significantly affected forest management planning on the installation. Management of the Indiana bat is via the *Endangered Species Management Plan and Environmental Assessment for the Indiana Bat, Myotis sodalis, Iowa Army Ammunition Plant, Des Moines, Iowa* (Tetra Tech EM Inc. 2001). The ESMP specifies management prescriptions for forest management.

4.5.1 Current Management

IAAAP has limited commercial forest resources. Army policy with regard to commercial forest products includes the following requirements[9]:

- continue the evolvement from commercial-oriented forest management to ecosystem-oriented forest management that gives first priority to mission requirements;
- include planning and NEPA analysis in all timber sale decisions;
- incorporate forest management into INRMPs;
- assure natural resources managers are available and as free as possible of commercial influence;

[9] Memorandum for Assistant Chief of Staff for Installation Management from Ray Clark, Principal Deputy Assistant Secretary of the Army (Installations and Environment), 2000, *Army Forest Resources Conservation.*

- ensure natural resources professionals need not rely exclusively on the economic returns of commodity production to accomplish landscape management, compliance, and stewardship; and
- eliminate pressure to conduct unsustainable forest management.

IAAAP manages its forest resources, but not for commercial value. Forest ecosystem management is considered a wildlife habitat program. IAAAP's forestry management emphasizes support of the military mission, enhancement of ecosystem integrity, protection of watersheds, management of wildlife habitat, and provisions for outdoor recreation. Forest management practices on IAAAP reflect USFWS Indiana bat guidelines, as specified in Appendix 4.8.1.1. This appendix includes management prescriptions and implementation portions of the *Endangered Species Management Plan and Environmental Assessment for the Indiana Bat, Myotis sodalis, Iowa Army Ammunition Plant, Des Moines County, Iowa* (Tetra Tech EM, Inc. 2001).

Employees of IAAAP are authorized to cut firewood on the installation for a cost of $10 per pickup truck load. Only dead and downed trees can be cut. Appendix 4.5 includes details regarding the firewood program on IAAAP.

4.5.2 Proposed Management

Project: Forest Management
Justification: Maintaining the capability of military lands to support the military mission (Sikes Act), stewardship
Project Timing: All objectives - ongoing indefinitely
Regulatory Coordination: USFWS regarding Indiana bats

Goal. Manage the forest ecosystem to support the military mission and maintain ecosystem integrity.

Objective 1. Use ecosystem-focused management with emphasis on the military mission, enhancement of ecosystem integrity, protection of watersheds, management of wildlife habitat, provisions for outdoor recreation, and possibly production of commercial forest products.

Objective 2. Implement forest management prescriptions (Tetra Tech EM, Inc. 2001) to preserve summer habitat for the Indiana bat on IAAAP.

Objective 3. Ensure that natural resources personnel are as free as possible of commercial influence to accomplish landscape management, compliance, and stewardship.

Objective 4. Plant trees as necessary to mitigate projects that damage or remove wildlife habitat and to enhance existing wildlife habitat.

Objective 5. Consider the issue of deer damage when using tree planting as a forestry technique.

4.6 Habitat Management

General fish and wildlife habitat management programs are described in this section, including wetland management. Forest management is described in Section 4.5. Programs to manage and protect sensitive and listed species are described in Section 4.8. Programs designed to manage special interest areas are described in Section 4.9. Fire management aspects of habitat management (*i.e.*, prescribed burning) are described in Section 4.13.

4.6.1 Current Management

4.6.1.1 Inventory and Monitoring

Floral Inventory
Horton *et al*. (1996) established a list of vascular plants for IAAAP. A forest inventory was conducted from 1974 to 1978 on IAAAP. Natural Resources personnel add to the list of known species on IAAAP as discoveries are made. These studies are useful both as benchmarks for future comparisons and as basic references for current and future management and studies. Appendix 3.2.2.2 includes the list of plants known to occur on the Plant.

Vegetative Mapping
Vegetative communities mapping of IAAAP was completed by Tetra Tech EM Inc. in 2001. Maps should be periodically updated.

4.6.1.2 Wetland Management

Inventory
Inventory of wetlands on IAAAP is discussed in Section 3.3.2.5, *Wetlands*. IAAAP has no particular need for further general wetland surveys since adequate wetlands information for the Plant is readily available. Maps showing wetlands and deepwater habitats on IAAAP are available in the IAAAP Natural Resources office.

Management
Wetlands protection is required by Executive Order 11990, *Protection of Wetlands*. Protection and maintenance of habitat are the primary thrust of wetlands management on IAAAP. The quality of wetland watersheds affects the quality of downstream wetland plant and animal communities.

IAAAP has constructed wetlands on three sites; Line 1, Line 800, and the Line 1 borrow site. These sites are associated with a project to use phytoremediation to remove residual TNT from soils and surface water. A fourth wetland is planned for the Inert Disposal Area to retain storm water runoff. The area is currently a soil repository.

Environmental clearance review is the primary means of detecting threats to wetlands on IAAAP. The Natural Resources Manager reviews actions that may affect wetlands. The Clean Water Act (1977), Section 404, requires that a permit be obtained for any activity that may affect "waters of the United States, including wetlands." The U.S. Army Corps of Engineers has the primary responsibility for administering the Section 404 permitting process. If necessary, projects with potential impacts are referred to the Corps of Engineers to determine if jurisdictional wetlands are implicated, establish mitigation procedures, and/or obtain permits. Wetland-affecting projects require NEPA documentation.

Activities in wetlands that require federal permits include but are not limited to:

- placement of fill material, ditching activities when the excavated material is sidecast,
- mechanized land clearing,
- land leveling, most road construction, and
- dam construction.

The Corps of Engineers permit process requires coordination with the USFWS and the State Historic Preservation Office to allow for the assessment of potential impacts to protected species and cultural resources.

IAAAP takes the following measures to protect and manage wetlands:

- encourage project managers to coordinate early with the Environmental Branch to determine adverse impacts to wetlands;
- constrain development to avoid wetland impacts to the maximum extent possible and mitigate unavoidable impacts;
- review Operation and Maintenance programs that potentially impact wetlands, and develop procedures and guidelines to avoid loss of wetland functions;
- pursue water quality management procedures that protect wetlands from excessive silt-laden runoff (*e.g*., reduce tillage, plant grasses, use silt fences); and
- consider impacts of forestry operations on wetlands, especially wooded wetlands.

Other sections of this INRMP have provisions to protect water quality and, therefore, wetlands: Section 4.3, *Soils Management* and Section 4.4, *Water Resources Management*.

4.6.1.3 Terrestrial Habitat Management

General
Wildlife habitat on the Plant is in excellent condition with some of the best habitats in the Midwest. Providing quality habitat for indigenous plants and animals is the primary mission of the natural resources program. Habitats are managed by maintaining edge areas, providing well-distributed water sources, and other maintenance, such as invasive species control, prescribed burning, and agricultural crops. Protection of riparian areas and wetlands and restoration of native prairie areas enhance the variability of wildlife habitats available on IAAAP.

Below habitat management practices on IAAAP are categorized as a means to discuss them. However, there is overlap within these sections as well as with other sections of this INRMP. Agricultural area, including hay and grazing area, management is a significant program directly related to management of terrestrial habitats on IAAAP. Section 4.10, *Agricultural Outleases*, discusses these programs.

Prairie Areas
Areas of IAAAP have relatively undisturbed native prairie communities, which are usually less than one acre. One area is on the eastern boundary, behind D Yard; and another is southwest of Stump Lake and northwest of Test Fire where the railroad track splits.

IAAAP has established about 40 acres of native grass prairie since about the early-1990s. Primary factors in successful prairie restoration on IAAAP include proper site selection, use of local genotype seeds, planting in spring, and using local experts and resources as necessary. IAAAP has a goal of restoring prairie on 50 total acres in 5 - 10 acre blocks. In 1992 Pheasants Forever, Des Moines County Conservation Board, and IAAAP planted 3.8 acres to native grasses as a demonstration project to draw public attention to native grass prairie.

Remnant prairie sites and established prairie areas are managed to protect native grasses. Eastern red cedars (*Juniperus virginiana*), common prairie invaders, are cut, and the areas are prescribe burned

following removal. Development on prairie sites is generally avoided. Prairie areas provide habitat for numerous wildlife species.

Brush pile wildlife habitat is created on IAAAP as a by-product of native prairie restoration. This is important habitat for game and nongame birds and mammals. There are no plans to specifically build brush piles on IAAAP, but brush pile construction as part of other land clearing projects is done on an opportunistic basis.

Invasive Species Control
Eastern red cedar control is discussed above, under *Prairie Areas*. Multiflora rose (*Rosa multiflora*) is a problem in many areas of the Midwest. IAAAP is using an integrated pest management tactic of killing this noxious plant with disease. Rose rosetta disease is spread to unaffected multiflora bushes using grafts. This is effective, but labor intensive. Boy Scouts have assisted with this effort.

Musk thistle (*Carduus nutans*) is a problem in grazing areas and on earth-covered magazines. Mechanical and chemical means of control have been used for musk thistle. Garlic mustard (*Alliaria petiolata*) has been spreading throughout the installation in forested areas and along edge habitat. Biological control agents are the only true option for control of garlic mustard. Teasel is a roadside/pasture invader on IAAAP. Mechanical and chemical methods of control are used. Section 4.11, *Pest Management*, discusses noxious plant control further.

For the Plant to succeed in control of these invasive species, manpower, equipment, and funding are required. These management measures for invasive species on IAAAP are the best combination of options to meet the Plant's vegetative management needs at a reasonable cost. IAAAP is dedicated to the prevention of introduction of invasive species as well as their control, per Executive Order 13112, *Invasive Species*.

Nest Boxes
Artificial nests are a recognized tool for Wood Ducks (*Aix sponsa*), geese, and certain other waterfowl species. Artificial nests also have been used to manage such diverse species as the American Kestrel (*Falco sparverius*), Eastern Bluebird (*Sialia sialis*), and others. Artificial nest boxes are a significant habitat program at IAAAP. No impoundments on the installation are specifically managed for waterfowl; however, some waterfowl projects have been performed that attract certain species. Wood Duck nest boxes have been placed throughout the installation, and Canada Goose nest barrels were established to encourage the propagation of the species. This introduction program has been so successful that some platforms should be removed due to goose nuisance problems. Consideration should also be given to applying nest box management to the Pileated Woodpecker (*Dryocopus pileatus*).

IAAAP has about 70 Eastern Bluebird nest boxes. These are ideal projects for Scouts and other conservation organizations. Bluebird nest boxes must be cleaned out and maintained each March. Nest boxes unused by Bluebirds are a favorite night roost for Black-capped Chickadees (*Parus atricapillus*). This program could expand to 100 Bluebird boxes, if there are enough volunteers available to construct and maintain the boxes.

4.6.1.4 Aquatic Habitat Management
IAAAP has 42 widely-distributed ponds and lakes. With exception of Mathes Lake, only five impoundments are managed for bluegill, redear (*Lepomis microlophus*), bass, white crappie (*Pomoxis annularis*), and catfish. Due to small size and shallow water conditions, many ponds do not support a fishery population; therefore, amphibian habitat is the focus of management of many of these water

bodies. Only Mathes Lake is managed to support a greater variety of fish, including walleye (*Sander vitreus*) and hybrid striped bass (*Morone saxatilis* x *M. chrysops*).

Several old pond dams are washed out on IAAAP. Repair of these dams would be ideal troop-training projects for military engineering units with heavy equipment capacity. If the opportunity affords itself, the functionality of these ponds as amphibian breeding sites should be assessed prior to authorization of dam repair. If the pond and surrounding habitat are not considered quality amphibian breeding habitat, the pond dam should be repaired. During the repair process, ponds should be deepened as best suited to the site. Similarly, small ponds that go dry should be dug out if troop-training opportunities are available. Repair activities in and around ponds should be coordinated with appropriate outside agencies.

High sedimentation can result in the loss of ponds that support fisheries and also a gradual decline in capacity of larger lakes. This is especially critical for Mathes Lake, which has lost 22 of its original 105 acres. Mathes Lake has a railroad trestle across the dam, so the dam cannot be removed and replaced. Therefore, a 4-foot concrete wall was constructed in front of the spillway to deepen the lake.

Stump Lake (Lake 19) had relatively large amounts of sediment in the upper basin. The U.S. Army Corps of Engineers completed removal of about 60,000 cubic yards of sediment and increased the height of the dam in 2002. Spoils were used as cover for closure of the inert landfill on IAAAP.

Sunken brush piles, reefs, logs, stumps, gravel, and other objects provide cover that promotes fish breeding. These structures provide security for fish fry, make defense of nests easier, and concentrate larger predator fish. Fish structure projects have been accomplished on an opportunistic basis IAAAP, often using volunteer labor. One source of material for these projects is cedars and other trees removed from areas that are being converted to native prairie. The trees are sunk into ponds or anchored into lakes to keep them from flushing during flooding.

4.6.2 Proposed Management

Project: Habitat Management
Justification: Maintaining the capability of training lands to support the military mission (Sikes Act); compliance with Executive Order 13112, *Invasive Species*; stewardship
Project Timing: Objective 3 and 21 - 2007; objective 20 - 2008; objective 5, 16, and 19 - uncertain; objective 11 - by 2011; other objectives - ongoing indefinitely
Regulatory Coordination: U.S. Army Corps of Engineers (Clean Water Act objectives)

Goal 1. Monitor vegetative communities that are indicators of ecosystem integrity, capability of lands to support military missions, status of sensitive species or communities, and other special interests.

Objective 1. Update the flora inventory as new species are found through field observations, site-specific surveys, sensitive plant species surveys, and other projects.

Objective 2. If plants that are federal-listed are found on IAAAP, develop an inventory/monitoring program for these species.

Objective 3. Periodically update a vegetation map for IAAAP.

Goal 2. Manage wetlands to ensure “no net loss” per Executive Order 11990.

Objective 4. Maintain a database on wetland resources at IAAAP.

Objective 5. Develop a wetland at the Inert Disposal Area when the area is no longer used as a soil repository.

Objective 6. Use site-specific surveys to evaluate wetland resources if potential wetland impacts are proposed.

Objective 7. Use the environmental review process to protect wetlands.

Objective 8. Provide certified jurisdictional wetland delineations (and permit application, if necessary) if a project is planned in a suspected wetland.

Objective 9. Maintain wetlands quality through active management (*e.g.*, prescribed burning), if necessary.

Goal 3. Manage wildlife species habitats based on conservation needs, distribution and threats, population trends, importance of areas to species, potential for population and/or habitat management, and human interests.

Objective 10. Maintain terrestrial habitats, primarily through the agricultural outlease program.

Objective 11. Expand native prairie areas to 50 total acres, through appropriate grazing management, reintroduction efforts, and prescribed burning.

Objective 12. Control invasive species, such as eastern red cedar and mulitflora rose, using integrated pest management techniques.

Objective 13. Continue the artificial nest box program as a significant habitat program at IAAAP.

Objective 14. Remove goose platforms as necessary to minimize goose nuisance problems.

Objective 15. Consider applying nest box management to the Pileated Woodpecker on IAAAP.

Objective 16. Expand the Bluebird nest box program to 100 boxes if volunteers are available to construct and maintain the boxes.

Goal 4. Maintain and enhance the natural diversity of aquatic communities on IAAAP.

Objective 17. Manage Lake Mathes to support a greater variety of fish and the five other primary impoundments on IAAAP for bluegill, redear, bass, white crappie, and catfish.

Objective 18. Manage the small, shallow ponds on IAAAP for amphibian habitat.

Objective 19. Repair washed out pond dams as troop-training projects for military engineering units with heavy equipment capacity.

Objective 20. Construct silt retention dams in the Mathes Lake watershed and add rip-rap to the Mathes Lake spillway to form a fish barrier.

Objective 21. Improve the boat ramp area at Mathes Lake, possibly installing a shelterhouse and providing porta-potties.

Objective 22. Install fish structure on an opportunistic basis using volunteer labor.

4.7 Fish and Wildlife Management

Native species biodiversity conservation is a cornerstone of ecosystem management. IAAAP is taking appropriate steps via this INRMP and numerous studies and reports that have preceded it to ensure that overall biodiversity is not compromised at the Plant. Wildlife population management directly influences populations as opposed to the soil, water, and vegetation management practices and protective measures, which indirectly affect populations, as discussed in other sections of this INRMP.

The overall fish and wildlife management goal is to maintain populations in accordance with species priorities, population ecology, population health considerations, and habitat capacities. General fish and wildlife population management programs are described in this section. Specific habitat management programs are described in Section 4.6, *Habitat Management*. Programs to manage and protect sensitive and listed animal species are described in Section 4.8, *Rare and Listed Species Management*. Pest species management related to natural resources programs is described in Section 4.11, *Pest Management*.

4.7.1 Current Management

4.7.1.1 Inventory and Monitoring

Information on species occurrence has been collected through numerous projects. Section 3.3.3, *Fauna* discusses faunal species found on IAAAP.

White-tailed Deer

White-tailed deer are the primary wildlife species regularly monitored on IAAAP. Harvest indicates herd growth from low levels in 1961 through 1966. Winter counts indicated an increasing herd in the mid-late 1970s. Harvest levels remained fairly stable until about 1980. The herd apparently grew rapidly in the early 1980s as indicated by both harvest and census data, peaking in 1985 when 1,843 deer were harvested. Exceptionally large harvests from 1983 through 1988 apparently helped reduce herd size considerably. The herd fell to the point where no hunting was done in 1992. Hunting resumed in 1993. The herd began increasing until 1995 when a cold, wet spring apparently resulted in high fawn mortality, which decreased herd size, as verified by the 1996 census. Hunting was not allowed in 2001 due to heightened security prompted by the September 11 terrorist attack.

Monitoring techniques for deer populations include seasonal spotlight surveys, aerial census, and harvest check station data. All three techniques complement each other.

Spotlight Surveys

Spotlight census began in 1995 when two surveys were conducted in August and September. These surveys have continued but with more emphasis on maintaining census protocols to ensure that yearly data comparisons are reliable. This requires 5 - 10 years of consistent data before changes in spotlight count data can be correlated with deer population trends. Since 1996 spotlight counts have been used to estimate sex ratios, stock numbers, and health in the herd. Presunset counts are used to track changes in recruitment. Deer census protocol includes the following:

- Two sets of counts will be conducted annually, one in April and one between 15 July and 15 August. The April count determines stock numbers. The summer count determines sex ratios and

recruitment. It is important to survey deer while they are foraging in hay and soybean fields, as they are more visible there than in corn fields. Conducting this count earlier would underestimate fawn populations since they are not all moving with adult deer prior to mid-July. Separate evening fawn counts will be conducted in mid-late August to estimate fawn survival.

- If rain or fog interrupts a survey, it will be repeated. A repeat is the preferred alternative since deer often become inactive or highly active before a storm arrives.
- Spotlight counts will begin at dusk are generally completed in 3 - 4 hours.
- Survey routes will not vary. A minimum of two people are required to conduct the surveys. Binoculars will be used to help determine sex. Any uncertainties will be classified as unknowns. Unknowns will not be included in buck:doe or doe:fawn calculations, but they will be included in the total.
- The spotlights used will have at least one million candlepower.

Aerial Surveys

The IDNR conducts annual fixed winged aerial transect counts that include IAAAP. The IDNR conducted counts in 1994 - 2007 with exception of 1998 and 2005 due to lack of snow cover.

IAAAP has a goal of achieving a 2:1 sex ratio for its deer herd with no higher than a 3:1 ratio (females: males) acceptable. The installation also has a goal of a winter herd of 800 - 1,000 animals. The Army's 1994 and 1995 helicopter surveys found 800 and 828 deer respectively, and the 1996 survey showed 590 deer (just below the lower end of the objective). With the helicopter no longer affordable, IAAAP switched to spotlight and forward looking infrared radar counts. In March 2003 the first forward looking infrared radar count was conducted and showed 1,500 deer in the spring herd, no doubt due to the effect of no hunting in 2001. A second forward looking infrared radar count should be conducted in 2007 or 2008.

Harvest Check Stations

Overall deer herd health is monitored using harvest check stations. Legally harvested deer are checked prior to being transported off IAAAP. Data collected includes sex, zone harvested, field-dressed weight, and number of tines (if antlered). The Natural Resources Manager ages harvested deer when he is available. Photographs are taken of bucks with particularly nice racks. Reproductive data are not taken since previous studies showed that reproductive data were not particularly needed for harvest management decisions.

Past studies of ticks from harvested deer proved that Lyme disease is found on IAAAP. At least two confirmed cases of this disease in humans have been documented on the installation. Tissue studies have been conducted on deer, but no significant disease indicators were found during the study. No additional disease or parasite studies on deer are planned at this time.

Wild Turkey

Wild Turkeys were transplanted onto IAAAP as part of an IDNR turkey restoration program. Reintroduction to IAAAP began in 1974, and Wild Turkeys have done so well that IAAAP has been used as a source of birds for transplanting to other regions. Prior to 1995, about 100 Wild Turkeys were trapped and removed by the IDNR from IAAAP annually. In 1995, 50 birds (10 toms and 40 hens) were removed for transplanting. Turkeys are no longer trapped at IAAAP. IAAAP harvest data are collected and includes weight, hunting zone, spur length, and beard length.

IAAAP monitors effects of turkey hunting through the collection of harvest data. Turkey sighting data is combined with harvest and hunter success data to help evaluate harvest goals.

Other Game Species
Other game species are monitored using harvest data. Harvest generally reflects relative population size, and this information is adequate for the management of other IAAAP game species. Harvest data for the eastern fox squirrel, eastern gray squirrel, eastern cottontail, Bobwhite Quail, Ring-necked Pheasant, American Woodcock, American Crow, and coyote are collected by Security personnel at installation gates.

Fish
Prior to 1989 voluntary creel surveys were used to monitor fish harvests on IAAAP, but this practice was dropped at the recommendation of the USFWS due to unreliability and insufficient voluntary compliance (Milligan 1987). Fish harvested are reported to Security personnel at installation gates. This provides adequate monitoring of fish harvest on most impoundments.

Other Species
Other species are not formally monitored other than through incidental observations for abundance and general health. Such observations are normally made by the Natural Resources Manager while performing other management operations.

4.7.1.2 Fish and Wildlife Population Management
The manipulation of fish and wildlife populations is an important aspect of fish and wildlife management. Human use of sustainable resources is a critical aspect of ecosystem management. This use includes hunting, trapping, and fishing on IAAAP. Army Regulation 200-3 (*Natural Resources - Land, Forest, and Wildlife Management*) requires the management of game and sport fish to ensure sustainability of harvests and protection of species involved.

Section 4.14, *Outdoor Recreation* includes recreational aspects of game management. Below descriptions of harvest strategies do not include detailed historic harvest data, which are available at the IAAAP Natural Resources office. IAAAP Regulation 420-1, *Hunting and Fishing Regulation* outlines responsibilities, eligibility, safety, etc. for hunting and fishing on the installation. Figure 3.4.2 shows areas open to recreation, including hunting.

IAAAP is a separate Wildlife Unit, which means harvest regulations are designed specifically for its lands. Game harvest is controlled by IDNR with regard to general harvest regulations. IAAAP has the option to be stricter within IDNR regulations for seasons, methods of take, and limits. This gives the advantage of providing more flexibility to manage hunting within needs of the military mission. For example, shotgun hunting could be prohibited in certain areas due to nearby ammunition storage.

White-tailed Deer
Annual harvest of white-tailed deer is the primary control measure used for the Plant's deer population. The number of deer harvested on IAAAP has been relatively consistent over the past several years, especially when compared to fluctuations in harvest in the 1980s (see Section 4.7.1.1, *Inventory and Monitoring*, under White-tailed Deer). Since September 11, 2001 IAAAP has been under a herd reduction regime. The number of deer harvested in 2002, 2003, and 2004 was 532, 601, and 429 respectively. A total of 439 deer were harvested during 2005; 97 bucks, 37 buck fawns, and 305 females. The number of deer hunters during the 2004 and 2005 seasons was 214 and 259 respectively. IAAAP can sustain an annual harvest of 300-400 animals.

IAAAP's archery season normally runs from early October through early December (1 October - 2 December in 2005) and a late season of about mid-December through early January (19 December - 10

January in 2005). Two shotgun (slugs-only) deer seasons are held during the archery break, an early season (3 - 7 December in 2005) and a late season (10 - 18 December in 2005). The bag limit is such that a hunter may take no more than one antlered deer during these combined seasons. Party hunting, during gun season only, is allowed in Iowa (whereby a hunter may shoot a deer for another member of his or her hunting party).

Iowa allows two muzzleloader deer seasons, an early season (15 - 23 October in 2005) and a late season (19 December - 10 January in 2005). Iowa also has a youth deer hunt (17 September - 2 October in 2005). IAAAP bag limits and harvest goals change annually.

A special requirement on IAAAP is that all deer hunters must harvest an antlerless deer prior to harvesting an antlered deer. Furthermore, the antlered deer must be harvested in the same season as the antlerless deer. The IAAAP deer hunting program is set up for Iowa residents as the installation is a special hunt area under IDNR regulations, and special hunt area deer tags are not issued to nonresidents.

Somewhat related to harvest is the matter of deer within the fenced D Yard (655 acres) and Yard F (360 acres) where no hunting is permitted. There were concerns that deer were trapped inside this area, but it appears that at least some move in and out of the yard, probably under the fence in low areas. The Natural Resources Manager monitors this population, and if it ever appears to be overpopulated, bow hunting would be utilized as a control measure.

The Plant's deer management philosophy has been refined during the last several years. Management of white-tailed deer on IAAAP focuses on maintaining the population slightly below or at the carrying capacity of the range to allow for an upward trend in habitat condition. The change in philosophy has allowed IAAAP to develop into a quality management area, providing both quality animals and quality hunting experiences and opportunities.

Turkeys

The Wild Turkey population on IAAAP is healthy; the goal for the population is to allow it to reach habitat carrying capacity. The Plant uses harvest to manage its turkey population.

Spring turkey hunting season should begin soon after most hens have been bred and are thus largely separated from vulnerable toms. This period changes slightly from year to year. Iowa has four separate spring turkey seasons, with the first one beginning on the Monday closest to 13 April (16-19 April in 2007). The four seasons last 4, 5, 7, and 19 days, respectively. Iowa also has a youth season before the other seasons begin (13-15 April in 2007). In 2007 these seasons will be held between 13 April and 20 May. Hunters may harvest one tom per permit but no more than two toms during the combined spring seasons. About 45-50 turkeys are taken annually on IAAAP, mostly during the spring seasons.

Fall turkey season was opened for the first time in many years on IAAAP during fall 1995. Fall 2006-2007 turkey hunting seasons include fall gun (16 October - 1 December), fall bow (1 October - 1 December and 18 December - 10 January). The bag limit is one either-sex bird per license, but no more than three total birds.

Other Game Species

Quail

There are no population trend data available for quail on IAAAP. Bobwhite Quail have been at low levels since the 1970s when a series of severe winters caused a major population decline. Quail harvest requires little census input due to hunter-caused mortality largely compensating for natural mortality rather than

adding to it. Also, hunting pressure (and resulting mortality) tends to be directly correlated to quail population density. Hunters will not spend time afield if a reasonable opportunity for harvest does not exist. Thus, it is extremely unlikely that quail harvest would ever be high enough to lower the population to levels which would result in too few birds the following breeding season. The Iowa quail season generally is open from the last Saturday in October through 31 January. The bag limit has been eight birds daily.

Woodcock

There are reasonably good numbers of American Woodcock on IAAAP, and numbers appear to be fairly constant. In 1995 IAAAP initiated the first Woodcock hunt on the installation. Woodcock season is from mid-September through mid-November with a daily bag limit of five birds.

American Crow

American Crows are not hunted much on IAAAP. However, the population is healthy, and numbers appear to be steadily increasing. Crow hunting is allowed from mid-October through the end of November and from mid-January through the end of March. There are no bag limits.

Waterfowl

There is limited hunting of waterfowl or geese on IAAAP. Following dramatic declines in many important duck species for almost 30 years, duck numbers have made good comebacks throughout most of their range in North America.

Rabbits

There are few eastern cottontail rabbits on IAAAP, and rabbit hunting is relatively unimportant. There are no data on population trends, except to note continuing low numbers. The season for cottontail rabbits is from September 1st through February. The daily bag limit is 10.

Squirrels

Fox squirrels are plentiful on IAAAP; gray squirrels are less abundant. Neither are hunted to any significant degree. Numbers appear to be relatively stable. Squirrel season is from September 1st through January with a daily bag limit of six combined (fox or gray) squirrels.

Pheasants

Ring-necked Pheasant numbers are declining statewide, and this appears to be the case on IAAAP. Pheasant season in Iowa was from 29 October through 10 January in 2005 with a daily bag of three birds. Pheasants could become an important game species on IAAAP if numbers were to recover. In the past, a Ring-necked Pheasant stocking program was implemented as a cooperative effort between the IDNR and IAAAP. Although successful, pen-reared birds experienced high mortality rates when released into the wild. Declining habitat and predation appear to be the primary problems with this bird's recovery.

Furbearers

Furbearers are managed by the IDNR using controlled hunting and trapping for species producing annual surpluses. IAAAP uses state-established furbearer seasons and regulations. In Iowa, furbearers are beaver, badger, mink, muskrat, raccoon, skunk, opossum, weasel, coyote, groundhog, and red and gray fox. Although trapping of foxes is permitted by IDNR, it is discouraged by IAAAP due to so few foxes inhabiting the Plant. Trapping and hunting regulations are described in Iowa Hunting and Trapping Regulations, which are published annually by the IDNR.

Trapping of all furbearers is permitted by the IDNR, but only foxes, groundhogs, raccoons, opossums, and coyotes may be hunted. IAAAP restricts hunting to coyotes and raccoons. Hunting is only allowed during daylight hours. IAAAP also discourages the trapping of foxes and requires that foxes accidentally caught be released, unless they have broken leg bones. The civet cat (spotted skunk), bobcat, and otter are completely protected in Iowa. IDNR is looking to open regulated otter trapping in the fall of 2006.

Fish

Fish management is directed at maintaining a harvestable surplus of game fish. Each pond is an entity in itself and may experience population fluctuations over the short and long terms, stemming from fish harvest, enforced regulations, stocking, fish kills, pond productivity, aquatic weed infestation, etc. Primary species emphasized in the IAAAP fisheries program are bass, bluegill, redear, and catfish.

Fish Harvest Management

Fishing on IAAAP is allowed on Mathes Lake #18, Stump Lake #19, and ponds #04, #23, #32, and #40. Fishing regulations are identical to State limits, except that some IAAAP regulations are more restrictive (daily limits, length limit, etc.). Figure 3.4.2 shows areas open to recreation, including fishing. Regulations, permits, bag limits, procedures, etc., applicable to fishing on the Plant are discussed in Section 4.14, *Outdoor Recreation*.

Fish Population Control

Fish population control for game species consists of recreational harvest, which is managed through bag and other limits established for the Plant. There has been little need for direct control of undesirable species in Plant ponds.

Fish Stocking

Stocking of game species has been performed using recommendations provided by the USFWS through a cooperative agreement; however, that agreement expired in 2003. The USFWS provided maintenance stocking of walleye and striped bass hybrids in Mathes Lake to predate on the abundant gizzard shad (*Dorosoma cepedianum*). Channel catfish are generally stocked in new impoundments or to supplement natural reproduction. Some natural channel catfish reproduction has been noted in Mathes Lake. The installation has occasionally purchased non-vulnerable to predation (8-inch or larger) channel catfish for supplemental stocking. The USFWS provided fingerling fish to restock Stump Lake following completion of the rehabilitation project in 2002. Smallmouth bass (*Micropterus dolomieu*) have been stocked in the emergency water reservoir, and reproduction has occurred. IAAAP continues to rely on the USFWS for stocking recommendations. IAAAP (2000) includes information on fish stocking for specific waterbodies on IAAAP.

IAAAP has about 200 anglers annually. An average of $800 to $1,000 is spent annually to purchase fish, primarily catfish and walleye.

Other Species

In 1988 IAAAP was used as a transplant site for restoration of Ruffed Grouse (*Bonasa umbellus*); 80 birds were released. This release was marginally successful. In 2000 three different individuals sighted grouse on the installation, which were the only reported sightings within the last several years. Additional transplants onto IAAAP are a possibility if desired by the IDNR and approved by the Army.

During 1991 - 1995, 240 Canada Geese were released onto IAAAP by the IDNR. These birds have done well and are reproducing. This program was enhanced by the volunteer efforts of the Oquawaka Conservation Club, Illinois, which donated an aerator to keep water open and constructed more than 20 goose nest platforms.

IAAAP was a participant in the Iowa America wildlife diversity/nongame program by serving as a rearing site for Trumpeter Swans (*Olor buccinator*). Two pairs were put into a fenced area in 1994; one pair survived until the program was discontinued in 1999, due to mission requirements. This pair was relocated from IAAAP to an authorized swan rehabilitator.

The natural resources program, as a whole, results in excellent habitat for songbirds, raptors, and other nongame species. Specific management actions are not undertaken for nongame species, with exception of the Bluebird nest box program, and such management is not anticipated during 2007-2011. All nongame mammal, bird, and reptile species, with exception of European Starlings (*Sturnus vulgaris*) and House Sparrows (*Passer domesticus*), are completely protected by state law. If nongame numbers decline, IAAAP will use research and/or management programs to deal with individual or groups of species.

Rogers (1995) indicated that the forest bird community at IAAAP is dominated by permanent residents and short-distance Nearctic migrants. Nearctic migrants comprise less than half of the most common species during summer. Nearctic migrants steadily drop in abundance on IAAAP as summer progresses. Species diversity of forest and forest-edge birds is fairly high, indicating that habitat requirements are being met on the installation. It is suspected that this is a fairly recent phenomenon considering the relatively young age of most of the forests. Rogers (1995) theorized that IAAAP could be of regional significance to songbird populations in southeast Iowa in that it may be supplying colonists to maintain populations at less suitable sites, such as scattered small forest tracts.

Neotropical Birds

A number of studies have implicated that highly fragmented forests with increased edge, especially agricultural/forest edge, are major factors producing reduced fitness of neotropical migrants. This is due to increased rates of predation and Brown-headed Cowbird (*Molothrus ater*) parasitism. There is also evidence that food supply varies with fragment size. In Australia, Zanette *et al*. (2000) found that prey biomass was significantly lower in small forest fragments (~55 acres) than in large (>400 acres) fragments. With these factors in play, IAAAP could be a population sink for forest-nesting neotropical migrants.

According to the Breeding Bird Survey, grassland bird populations have shown steeper, more consistent, and more geographically widespread declines than any other guild of North American bird species. Factors that may be contributing to this decline are habitat loss through urbanization, agriculture and succession, agricultural (haying) and grazing practices, and increased fragmentation and edge.

IAAAP enhances habitat quality for neotropical migrants and nearctic grassland and forest dwelling birds. Priority is given to creating larger blocks of grassland habitat by strategically converting some cool season hay leases to warm season grass hay leases, increasing the size of existing prairies, establishing only “light grazing” leases, and/or retiring low to marginal crop lands and converting them to warm season grasslands. To the greatest extent possible, these areas are connected to establish larger blocks of suitable grassland habitat. If need be, wooded ditches, fence rows, and small isolated woodlots within the grassland area can be removed to reduce perch sites for Cowbirds and habitat for predators, such as raccoons.

IAAAP connects blocks of forest patches to reduce forest fragmentation. Indigenous tree species are planted in forest openings, and natural succession is allowed in old fields adjacent to forest blocks. Removing isolated forest patches is also considered if it benefits grassland restoration. The intent is to

create larger blocks of higher quality habitat that results in reduced parasitism and predation rates. Any tree removal is done in accordance with the Indiana bat Endangered Species Management Plan.

Reptiles and Amphibians
Reptiles and amphibians are not specifically managed on IAAAP; however, small and shallow water areas are protected to support breeding amphibians on the installation. Fish are not stocked in these water bodies to improve amphibian breeding success. Vegetation buffers are allowed to develop around these areas as dispersal and travel corridors, and the use of pesticides within or around these areas is avoided.

Populations of reptiles and habitat conditions on the installation are unknown. It is assumed that ample cover and resources exist for snakes, lizards, and land turtles to satisfy food and cover requirements. If certain areas do not provide adequate cover, such as downed logs and wooden debris, cover boards are randomly placed within the area. These can also be used for monitoring purposes. Sufficient habitat exists for aquatic turtles on the installation, and continued protection of these aquatic habitats benefits these turtles.

Agricultural practices, roadways, and human fear of these creatures are probably factors that may affect reptile populations, especially snakes, on IAAAP. An effort is made to educate installation personnel on the benefits of reptiles, especially snakes. The Natural Resources Manager is available for removal or relocation of snakes found in unwanted areas.

IAAAP may consider initiating a reptile and amphibian monitoring program. This effort would involve early and late spring anuran call surveys, use of drift fences for capture and release, randomly placed cover boards, and visual surveys of aquatic turtles. Over time, a standardized monitoring program would provide valuable information on population trends of reptile and amphibian species and possible environmental health issues at IAAAP.

4.7.2 Proposed Management

Project: Fish and Wildlife Management
Justification: Stewardship, Sikes Act compliance
Project Timing: All objectives - ongoing indefinitely
Regulatory Coordination: None required

Goal 1. Regularly monitor species that are indicators of ecosystem integrity and other special interests.

Objective 1. Perform white-tailed deer census and monitoring; collect harvest data at check stations; and conduct supplemental census as required.

Objective 2. Monitor Wild Turkey populations in conjunction with deer census and the collection of harvest data.

Objective 3. Perform small game and fish population data collection through reporting requirements at installation gates.

Objective 4. Monitor other species through incidental observations for abundance and general health.

Goal 2. Maintain fish and wildlife populations at optimal levels in accordance with species priorities, population ecology, population health considerations, and habitat capacities.

Objective 5. Use established hunting seasons, procedures, methods, etc. to maintain white-tailed deer and turkey populations at or slightly below carrying capacities.

Objective 6. Maintain small game and furbearers within habitat carrying capacities.

Objective 7. Manage fisheries resources to maintain a harvestable surplus and use recreational harvest to manage game fish populations.

Objective 8. Stock fish to support recreational fishing use.

Objective 9. Investigate options and/or regional facilities (commercial operations) to procure fish for stocking.

Objective 10. Consider neotropical migrants and nearctic grassland and forest dwelling birds in grassland and forest habitat management.

Objective 11. Protect small and shallow water areas as reptile and amphibian habitats; ensure ample cover and resources exist for snakes, lizards, and land turtles to satisfy food and cover requirements; and educate installation personnel on benefits of reptiles, especially snakes.

Objective 12. Investigate the feasibility of additional surveys for nongame birds and reptiles and amphibians on IAAAP with emphasis on species of concern as funding, personnel, and time allows.

4.8 Rare and Listed Species Management

Sections 3.3.2.3, *Special Status Flora* and 3.3.3.2, *Special Status Fauna* discuss the status of species that are federal and/or state endangered, threatened, or species in need of conservation at IAAAP.

4.8.1 Federal-listed Species Management Practices

The federal Endangered Species Act of 1973, as amended (Act) requires lands under the jurisdiction of the Department of the Army to conserve listed species. As defined in the Act, conservation is the use of all methods and procedures necessary to bring any listed species to the point where protections provided by the Act are no longer necessary. Section 7 of the Act requires the Army to formally consult and confer with the USFWS if any action by the Army may affect a listed species or critical habitat.

AR 200-3 (Department of the Army 1995) states (Section 11-2(a-e)) that the Army has five primary requirements under the Endangered Species Act:

1) to conserve listed species,
2) not to “jeopardize” listed species,
3) to “consult” and “confer”,
4) to conduct a biological assessment, and
5) not to "take" listed fish and wildlife species or to remove or destroy listed plant species.

IAAAP is committed to these five primary requirements.

4.8.1.1 Current Management

The Indiana bat and the Bald Eagle are federal-listed species known to occur on IAAAP. Management of the Indiana bat is via the *Endangered Species Management Plan and Environmental Assessment for the Indiana Bat, Myotis sodalis, Iowa Army Ammunition Plant, Des Moines, Iowa* (Tetra Tech EM Inc.

2001). The ESMP specifies management prescriptions for forest management; agricultural management; construction, demolition, and environmental remediation; training exercises; hunting and other outdoor recreation; operating contractor activates; test firing; and monitoring the Indiana bat and its habitat, implementing an awareness program, and communicating with the USFWS. Compliance with the ESMP is evaluated through an annual compliance checklist, which the IAAAP Natural Resources Manager is responsible for completing.

The ESMP specifies that minor updates should be completed annually and major revisions once every five years, or as required. Most of the plan remains valid and management prescriptions and implementation sections are in Appendix 4.8.1.1. The primary update/revision is for the total estimated cost of conservation actions (Page ES-3 of the ESMP) and the estimated level of effort and cost by management prescription (Table 2 of the ESMP). A supplement updating this information has been inserted in Appendix 4.8.1.1.

Bald Eagles documented on IAAAP are transients, which occasionally occur at Mathes Lake. Management specific to the Bald Eagle on IAAAP is not warranted. Management activities described in other sections of this INRMP, such as 4.6 - *Habitat Management*, 4.9 - *Special Interest Area Management*, 4.10 - *Agricultural Outleases*, and 4.13 - *Fire Management*, are performed in accordance with requirements of the ESMP and benefit flora and fauna in general.

Critical Habitat

The Endangered Species Act was revised via the National Defense Authorization Act of 2004, which states that, "*The Secretary [of the Interior] shall not designate as critical habitat any lands or other geographical areas owned or controlled by the Department of Defense, or designated for its use, that are subject to an integrated natural resources management plan prepared under section 101 of the Sikes Act (16 U.S.C. 670a), if the Secretary determines in writing that such plan provides a benefit to the species for which critical habitat is proposed for designation*. Based on this, the USFWS has determined that, where applicable, federal critical habitat designation is not warranted if the INRMP includes the following three criteria:

1. The plan provides a conservation benefit to the species. Cumulative benefits of the management activities identified in a management plan, for the length of the plan, must maintain or provide for an increase in a species' population or the enhancement or restoration of its habitat within the area covered by the plan [*i.e.*, those areas deemed essential to the conservation of the species]. A conservation benefit may result from reducing fragmentation of habitat, maintaining or increasing populations, ensuring against catastrophic events, enhancing and restoring habitats, buffering protected areas, or testing and implementing new conservation strategies.

- Flora and fauna inventory and monitoring, habitat management, wildlife population management, non-game species protection, and numerous other projects discussed in this INRMP will provide a cumulative conservation benefit to federal-listed species on IAAAP.

2. The plan provides certainty that the management plan will be implemented. Persons charged with plan implementation are capable of accomplishing objectives of the management plan and have adequate funding for the management plan. They have the authority to implement the plan and have obtained all necessary authorizations or approvals. An implementation schedule (including completion dates) for the conservation effort is provided in the plan.

- The Commander has the authority to implement the INRMP, which will be accomplished primarily by the Natural Resources Manager, as scheduled (Appendix 7.4) and budgeted (Section 7.5, *Implementation Funding Options* and Section 7.6, *INRMP Implementation Costs*).

3. The plan provides certainty that the conservation effort will be effective. The following criteria will be considered when determining the effectiveness of the conservation effort. The plan includes (1) biological goals (broad guiding principles for the program) and objectives (measurable targets for achieving the goals); (2) quantifiable, scientifically valid parameters that will demonstrate achievement of objectives and standards for these parameters by which progress will be measured are identified; (3) provisions for monitoring and, where appropriate, adaptive management; (4) provisions for reporting progress on implementation (based on compliance with the implementation schedule) and effectiveness (based on evaluation of quantifiable parameters) of the conservation effort are provided; and (5) a duration sufficient to implement the plan and achieve benefits of its goals and objectives.

- Goals, objectives, and long-term ecosystem needs, based on land use sustainability for the IAAAP mission, have been analyzed and considered extensively in collaboration with persons contacted while preparing this plan. Goals and objectives are defined for the plan as a whole (Section 1.3) and each project within the plan (chapters 4, 5, and 7, as summarized in Appendix 7.4). The INRMP will be evaluated through monitoring programs, including the Environmental Performance Assessment System, the Environmental Quality Report, and reviews by the Northwest Region Installation Management Agency and other interested parties.

Birds of Conservation Concern
Birds of Conservation Concern includes species that are of concern because of (a) documented or apparent population declines, (b) small or restricted populations, or (c) dependence on restricted or vulnerable habitats. These birds are listed with the intent of avoiding future designations of these species under the Endangered Species Act. The USFWS updates the list of Birds of Conservation Concern on a 5-year cycle. The 2002 report (USFWS) lists 276 species.

IAAAP is in Bird Conservation Region 22, which lists 35 birds of conservation concern, 11 of which are documented on IAAAP. Other species known to occur at IAAAP that are also listed in this region are the Mourning Dove (*Zenaida macroura*), American Woodcock (*Scolopax minor*), Mallard (*Anas pltayrhynchos*), and Wood Duck (*Aix sponsa*) as species of game birds below desired condition and the Northern Bobwhite as a non-migratory bird species of concern (www.dodpif.org).

Surveys
Surveys have been performed on IAAAP for threatened and endangered species (Horton *et al*. 1996). IAAAP plans to perform a biological survey during 2008, per requirements of the ESMP.

4.8.1.2 Proposed Management

Project: Federal-listed Species Management
Justification: Endangered Species Act
Project Timing: Objective 3 - 2008, other objectives - ongoing indefinitely
Regulatory Coordination: U.S. Fish and Wildlife Service

Goal. At a minimum, sustain residential or migratory populations of endangered, threatened, or special status species and their habitats at current levels, with the long-term goal of conserving listed species and their habitats in accord with specific Recovery Plans and the Endangered Species Act.

Objective 1. Implement requirements of the Endangered Species Act, as stated by AR 200-3.

Objective 2. Implement Indiana bat management prescriptions specified in the ESMP (Tetra Tech EM Inc. 2001).

Objective 3. Update the ESMP.

Objective 4. Survey for federal-listed species other than the Indiana bat, if any such species are likely to occur on the Plant.

Objective 5. If species other than the Indiana bat that are federal-listed are discovered on IAAAP or if species already known on the Plant become federal-listed, consult with the USFWS and develop an inventory/monitoring program and management plan for these species.

4.8.2 Other Sensitive Species Management Practices

4.8.2.1 Current Management

Six state-listed threatened vascular plant species have been identified on IAAAP. These are discussed further in Section 3.3.2.3, *Special Status Flora*. Two state-listed threatened faunal species have been documented on IAAAP. These are discussed further in Section 3.3.3.2, *Special Status Fauna*.

IAAAP understands the importance of sensitive species that may not be federal-listed, particularly since these species have the potential to become federal-listed, potentially affecting the military mission on the Plant. Thus, even though it is more difficult to justify funding specifically for the management of these species, IAAAP will protect and manage them as funding permits.

4.8.2.2 Proposed Management

Project: Nonfederal-listed Species Management
Justification: Stewardship
Project Timing: All objectives - ongoing indefinitely
Regulatory Coordination: None required

Goal. Monitor and manage nonfederal-listed, special status plant and animal species on IAAAP during 2007-2011 to the degree possible with available funding.

Objective 1. Consider state-protected and other species of concern in all IAAAP actions.

Objective 2. Whenever possible, use actions designed for non-listed species to protect or manage other sensitive species.

4.9 Special Interest Areas Management

Cultural resources protection is included in Section 5.3 (*Cultural Resources Protection*). Below sections describe programs to protect other special interest areas on IAAAP.

4.9.1 Current Management

Designation of special protection status for unique or fragile areas is an important management tool. It is more cost effective to put use restrictions on some areas to minimize damage or disturbance than to mitigate damage or disturbance. For example, damage to exotic species-dominated grasslands is generally

easier to repair than damage to native grasslands. Thus, it makes both biological and economic sense to provide a higher degree of protection for the little remaining native grassland than for the more prevalent annual grasslands.

IAAAP has several areas of relatively undisturbed native prairie communities. Prairie areas on IAAAP are discussed further in Section 4.6.1.3, *Terrestrial Habitat Management*, under *Prairie Areas*. Wetlands are another resource of special interest on the installation. Wetland management is described in Section 4.6.1.2, *Wetland Management*.

Provisions for management of Special Interest Areas on IAAAP will be in accordance with AR 200-3, which requires that Special Interest Areas have the following provisions.

- Current military uses will not be impaired.
- Future military uses will not be excluded solely on the Special Interest Area identification.
- The area will not be totally excluded from public access unless public use is considered unsafe and/or incompatible with mission activities.

4.9.2 Proposed Management

A specific project for management of special interest areas on IAAAP is not necessary as these areas are included in other sections of the INRMP.

4.10 Agricultural Outleases

4.10.1 Current Management

General

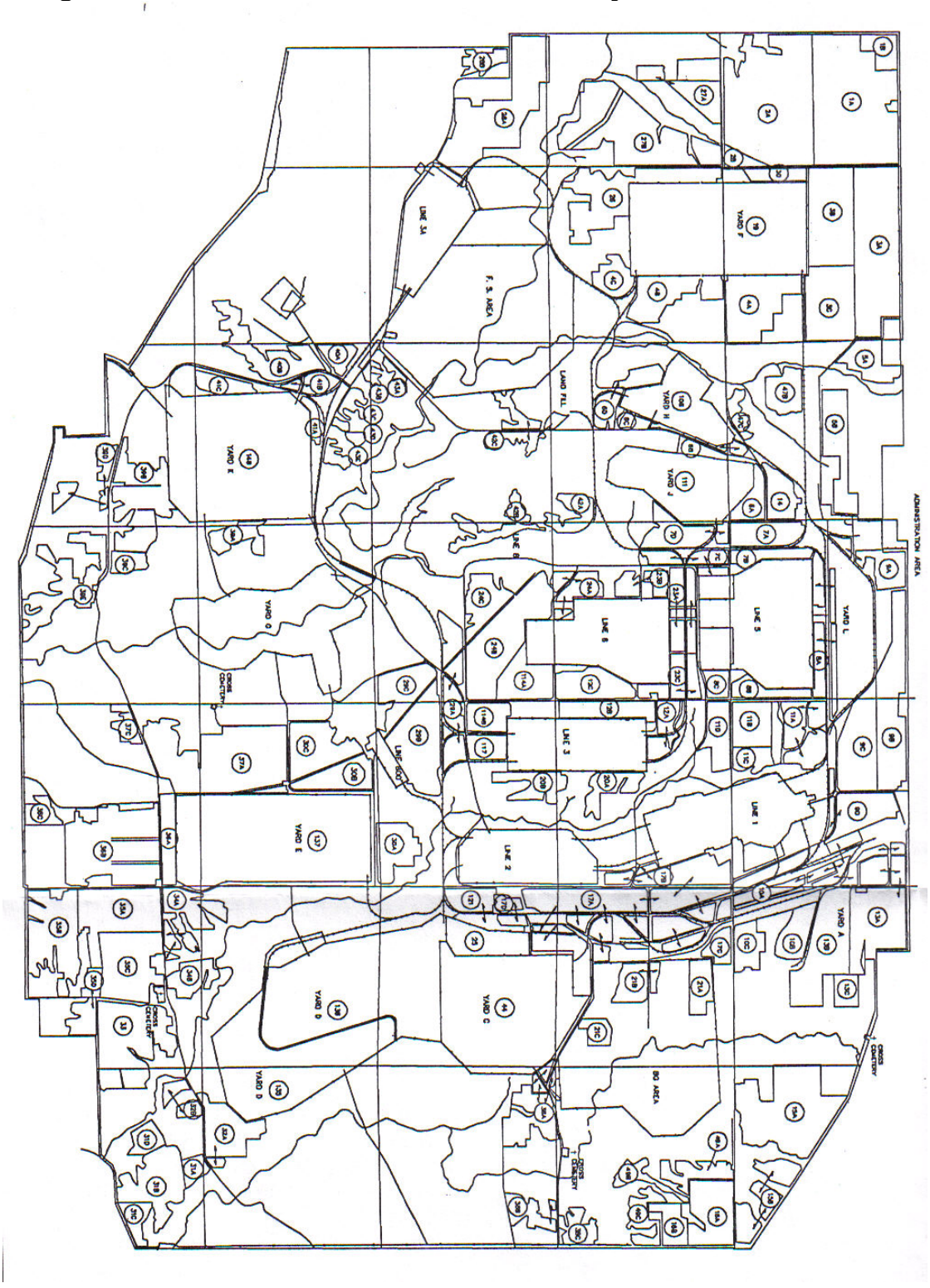
IAAAP has one of the Army's largest agricultural programs. Agricultural programs include row crops, hay, and cattle grazing. Some agricultural land has been converted to native grass prairie.

Agricultural leasing is the major commercial land use on IAAAP dating back to 1945. There are 43 crop leases (one for hay production only) on IAAAP (Figure 4.10.1). All leases are for 5-year periods, and 9 - 14 leases come up for renewal each year. Leases are drawn up by the Natural Resources Manager and once approved are submitted to the U.S. Army Corps of Engineers for issuance. Each lease is unique but deals with the same management issues (*e.g*., pest management, cultural resources).

Each lease has a management plan, as required by the Farm Bill (the Federal Agricultural Improvement and Reform Act of 1996 (FAIR)). Leases on highly erodible lands also have conservation compliance plans. Technical provisions and conservation practices for all tracts are coordinated with the Natural Resource Conservation Service and established as part of the Tract Management Plan. An example grazing lease and row crop lease are in Appendix 4.10.1.

Mason & Hanger Corporation (1991) includes records of income and value of lessee services from 1945 to 1987. In 1987 income was $381,354, and lessee services were valued at $630,840. In 1999 there was $765,000 in cash and $900,000 in services, including $650,000 in conservation benefits (*e.g*., wildlife food, cover, soil management, fire protection). The agricultural lease program now averages about $600,000 in cash annually.

Figure 4.10.1 Land Leases on Iowa Army Ammunition Plant



There are about 5,532 acres of agricultural row crops on the installation. Primary crops are corn and soybeans. Other crops include alfalfa hay and small amounts of wheat and oats. Most sites can be continually row-cropped. Fertilizer and lime are applied to all agricultural land through a contract, but lessees apply nitrogen as needed. Some agricultural areas on the installation are experiencing the breakdown of tile drainage systems. These systems will require replacement over the next 5-10 years to allow continued agricultural activities.

Rotational farming practices have been established on agriculture fields on IAAAP, and no-till farming is practiced. Typically, no-till farming is a method of growing crops that involves no seedbed preparation other than opening a small slit or punching a hole into the soil to place seed at the intended depth.

Persons operating on or leasing land at IAAAP are subject to all installation and government safety and security regulations. Penalties for violations of regulations may consist of verbal or written warnings, written reprimand, denial of entrance, fines, lease cancellations, or any combination thereof, depending upon the seriousness of the violation (IAAAP 1995).

Hay and Grazing Areas

There are 10 leases where grazing and/or haying can be conducted, which consist of about 1,575 acres of the installation (Figure 4.10.1). Lessees have the option to either graze and/or cut and bale the areas. Two areas are hay-only areas due to the susceptibility of earth-covered magazines to damage by cattle. All areas are primarily in tall, smooth brome grass. Five grazing/hay areas are within ammunition storage areas; three are fenced pastures in areas not suitable for row crops; and the other is hay-only in an ammunition storage area.

The grazing program has relatively minor effects on the overall IAAAP mission, especially considering the few areas affected. There is minor surface water pollution due to cattle getting into water and depositing excreta. Biodiversity is limited in these areas due to the predominance of one grass species. There is no recreation allowed in ammunition storage areas where grazing occurs, so there are no interactions. There is no military training in any areas within this program. The hay/grazing program saves the installation $80,000 to $90,000 annually in mowing cost avoidance.

Each tract of land has a grazing plan. Cattle are grazed at a rate of one animal unit per 2 - 3 acres. An animal unit is a cow/calf or a bull, and a heifer is 0.75 animal units. Grazing is permitted during May through November.

The grazing program depends on monitoring numbers of cattle grazed. The Natural Resources Manager physically counts cattle from the ground on an opportunistic basis or when there is any reason to believe that numbers might be excessive. Since cattle are in relatively small, fenced areas, this is easily achieved. All pasture tracts in the leased areas have had some soil remediation activities completed in the past. Water for the cattle is provided through farm ponds and small watercourses.

4.10.2 Proposed Management

Project: Agricultural Outlease Management
Justification: Compliance with Department of Defense policies
Project Timing: All objectives - ongoing indefinitely
Regulatory Coordination: None required

Goal. Provide opportunities for agricultural use of IAAAP when consistent with the military mission and native ecosystem functionality.

Objective 1. Update the General Land Use Regulation and individual tract management plans as needed to manage grazing, hay, and crop production activities on IAAAP.

Objective 2. Ensure that requirements of the General Land Use Regulation and individual tract management plans are followed.

Objective 3. Continue to apply fertilizer and lime to agricultural crop areas through a contract.

Objective 4. Replace clay tile as necessary during 2007-2011.

Objective 5. Continue grazing-related research to enhance efforts to restore native prairie areas and reduce the amount of area dominated by fescue.

Objective 6. Manage and protect land resources on IAAAP while maximizing land use and providing an economic resource to the natural resources program through agricultural outleases.

Objective 7. Include planning and NEPA analysis in agricultural outlease decisions.

4.11 Pest Management

4.11.1 Current Management

Responsibility for pest management on IAAAP is tripartite between the American Ordnance Pest Manager, the Natural Resources Manager, and agricultural lessees. The Natural Resources Manager is responsible for oversight of the pest management program and noxious weed control inside agricultural and forested areas. Other responsibilities include updating the Pest Management Plan (IAAAP 1998) and submission of a pesticide use report to Army Environmental Center.

American Ordnance, LLC is responsible for pest management activities within all improved areas included in the facilities use contract. These include structural pests and vegetation that would interfere with production activities or would otherwise degrade facilities. The American Ordnance, LLC pest controller has a pesticide applicators license from the state of Iowa.

Agricultural lessees are responsible for control of weeds and brush on their leases. This is limited to requirements outlined in the land use regulations and special use requirements of individual leases. To apply pesticides, either the agricultural lessee is state-certified or the lessee uses state-certified applicators.

IAAAP has a Pest Management Plan (IAAAP 1998), upon which most of the below discussion is based. This plan should be reviewed annually. The pest management plan identifies and prioritizes pests and their destructive effects to determine particular levels of protection.

Integrated pest management is used at IAAAP, and typically a combination of integrated pest management techniques is required to resolve a problem on a sustained basis. Integrated pest management includes the implementation and coordination of optimum sanitation, good structural design and maintenance of facilities, mechanical control, cultural control, biological control, and regulatory control. The integrated pest management comprehensive approach to pest control or prevention, using methods of

pest control in a compatible manner, avoids damage and minimizes adverse side effects to nontarget organisms and the environment.

Pest control efforts are implemented on the basis of surveillance. Pest surveys are used to determine the type of pest, extent of problem, and pest management technique most appropriate for safe, effective, and economic control.

The IAAAP pest management program is consistent with the directive (Office of the President 1994) to reduce pesticide use by using integrated pest management. IAAAP only uses chemical control when non-chemical techniques are inadequate or impractical. Furthermore, chemical control will not be used as a substitute for good sanitary practices or proper building maintenance.

All chemicals used on IAAAP are Environmental Protection Agency-approved. IAAAP has few problems with noxious weeds. However, there are requirements to control broadleaf weeds from intensively managed lawns and other common grassy areas. These weeds are somewhat controlled by non-chemical means, such as mowing or proper fertilization and watering to promote grass growth, but some chemical control is also used.

Undesirable vegetation also occurs near fire hydrants, around building foundations, and along sidewalks, fence lines, and other paved areas. It is difficult and expensive to regularly use weed eaters in these areas. Therefore, some areas are treated with chemicals, which provides relatively long-term control. In some cases, unwanted vegetation near paved areas can be bladed with a road grader. This technique is commonly used on road shoulders and open ground storage sites.

Reduced chemical use is a goal of the pest management program. The Plant understands both obvious and long-term threats to both humans and ecosystem functions from chemical abuses. Emphasizing surveillance before chemical application and using more efficient equipment and techniques to reduce chemical volume and toxicity will help ensure that threats are minimized.

IAAAP recognizes nine categories of pests that cause damage and require control or management:

- disease vectors and medically important arthropods (*e.g.*, mosquitoes, brown recluse spiders, bees, and wasps);
- quarantine pests in retrograde cargo;
- real property pests (*e.g.*, subterranean termites);
- stored product pests (*e.g.*, saw-toothed grain beetles and red flour beetles);
- ornamental plant and turf pests (*e.g.*, bagworm, aphids, scale insects, elm leaf beetle, green June beetle, armyworm, sod webworm);
- undesirable vegetation (*e.g.*, weeds);
- animal pests (*e.g.*, mice, birds, stray pets, occasionally coyotes);
- household and nuisance pests (*e.g.*, ants, cockroaches, crickets, beetles, mites, ticks); and
- other pest requirements (*e.g.*, road-killed carcasses, odor control).

In 1994 DoD approved three Measures of Merit that defined the course of Pest Management programs. These measures mandated a current pest management plan, DoD applicators certified within two years of employment and contract applicators certified before the start of work, and a 50% reduction in pesticide use during the 1994-2000 period. IAAAP maintains an approved Installation Pest Management Plan and

provides basic and refresher training for personnel certified for pesticide handling. DoD pesticide applicator refresher training is required every three years.

There have been significant reductions in the use of agricultural pesticides on IAAAP. According to lessee-supplied data, amounts of active ingredients have been reduced due to improved application techniques and new chemicals. The degree of reduction of pesticide use within the cantonment area is likely to be more than in agricultural areas.

Chemical herbicides have been used on the installation since 1941. Principal herbicides used include 2,4-D®, Crossbow WD®, Pramital 25E®, Roundup Ultra®, Tordon®, and others. These herbicides are used to control undesirable vegetation in railroad ballast, substations, parking lots, and rights-of-way.

In 2004 DoD issued new pest management measures of merit. These updated measures of merit are as follows.

1. Through the end of Fiscal Year 2010, 100% of DoD installations will have pest management plans prepared, reviewed, and updated annually by pest management professionals.

2. Through the end of Fiscal Year 2010, DoD will maintain the achieved reduction in annual pesticide use on DoD installations. This reduction goal is set at an average of the FY 2002 and 2003 usage, and pesticide applications by contractors shall be included.

3. Through the end of Fiscal Year 2010, 100% of DoD installation pesticide applicators will be properly certified (either by DoD or the appropriate state). Direct hire employees have a maximum of two years to become certified after initial employment. Contract employees shall have the appropriate state certification when the contract is let.

Pesticide application is managed to enhance wildlife habitat and to protect the environment and public health. Wetlands require special precautions when applying pesticides. The possibility of federal- and state-listed species occurring on IAAAP requires that special precautions be followed closely during any pest management activities that could affect these species. Most migratory bird species are federally protected.

To ensure that environmental issues are considered when applying pesticides, IAAAP follows precautionary statements on labels regarding contamination of water when pesticides are sprayed near wetlands. IAAAP takes special precautions during pest management activities that could affect special status species and coordinates and obtains approval of the USFWS for bird control activity, except for unprotected species.

The IAAAP Pest Management Plan discusses many aspects of pest management that are not directly within the scope of this INRMP, such as control of disease vectors and protection of facilities. Below discussions of animal and plant control are specific to the management of natural resources on IAAAP.

Animal Pests

The number and variety of birds, mammals, and other wildlife that inhabit the Plant require that outdoor applications of pesticides avoid nontarget organisms and aquatic environments. IAAAP minimizes spray drift and prevents pesticides from entering sensitive areas.

The Forest Management Plan (Mason & Hanger Corporation 1990) describes control measures for forest pests and diseases. Diseases such as rots and cankers are controlled by cutting defective trees. Insect,

rodent, other pests, and disease control are not extensively practiced in the IAAAP forest management program. Control is limited to removing certain species as much as possible within requirements of the ESMP. Mice, pocket gophers (*Geomys* spp.), and rabbits periodically cause extensive damage to tops of young trees.

Stray dogs and cats occasionally need to be captured on IAAAP. The IAAAP Security Guards are responsible for their capture. When possible, trapped animals are taken to the local humane society.

Feral cats and dogs can be very destructive to wildlife, as well as pose a threat to the health and safety of installation personnel. Cats are extremely detrimental to avian and small mammal populations. The installation will make efforts to capture these animals.

There are some problems with birds (*e.g.*, pigeons, starlings, sparrows) whose roosting or nesting in buildings may either damage or contaminate food products or other materials. The preferred control is screening or other blocking of access to such areas. Live trapping works for pigeons but not other birds. If these techniques fail, bait treated with Avitrol® is used to condition birds not to use baited areas.

Swallow nesting is a similar problem. Swallows are discouraged from nesting by screening or placing netting over areas where birds are not wanted. The Pest Management Plan (IAAAP 1998) describes a monofilament netting that works well. Nest removal is another option, but this option requires approval of the USFWS prior to use. Chemical control is not used on swallows.

Beavers create problems on IAAAP with regard to pond dams and other earthworks. They dig holes in dams and persist in damming spillways, which threaten stability of dams and block access. Overflow resulting from dammed areas leads to erosion of trails and roads. The Natural Resources Manager minimizes damage caused by beavers using trapping for control. If beaver removal is required outside of normal trapping season, permission is obtained from the IDNR.

Pest management personnel handle most other animal problems, which may include snakes, squirrels, coyotes, and rabid animals. Each problem is evaluated individually for appropriate action. Live traps are used for skunks and raccoons. Trapped animals are relocated off the main post area.

Non-Native/Noxious Plants

Non-native and/or noxious weeds pose threats to native habitats, sensitive species, and plant community composition and diversity. More specifically, they threaten wetland ecosystems, complicate land management projects, add to the cost of pest management, and in general, threaten ecosystem functionality. IAAAP is dedicated to the prevention or introduction of invasive species as well as their control, per Executive Order 13112, *Invasive Species*.

Multiflora rose, musk thistle, garlic mustard, teasel, and knapweed are noxious weeds requiring control on IAAAP. Control of these species is discussed in Section 4.6.1.3, *Terrestrial Habitat Management*, under *Invasive Species Control*.

4.11.2 Proposed Management

Project: Pest Management Support
Justification: Compliance with Executive Order 13112, *Invasive Species* and Presidential directive; stewardship
Project Timing: All objectives - ongoing indefinitely

Regulatory Coordination: None required

Goal. Control plant and animal species that affect natural resources management (*e.g.*, reduce ecosystem functionality, displace native species) or directly affect the military mission on IAAAP.

Objective 1. Update the Pest Management Plan annually.

Objective 2. Emphasize integrated pest management techniques to reduce the use of pesticides.

Objective 3. Ensure pesticide applicators are fully certified, including sending the Natural Resources Manager to the Pest Management Quality Assurance Evaluator course by FY 11.

Objective 4. Maintain the achieved reduction in annual pesticide use measured as an average of the FY 2002 and 2003 usage.

Objective 5. Control nuisance wildlife as needed to protect facilities and infrastructure and to support the military mission.

Objective 6. Prevent the introduction of and control invasive species, per Executive Order 13112, *Invasive Species*.

4.12 Cantonment Area Management

4.12.1 Current Management

Management of cantonment areas (administrative and production areas) on IAAAP is under the facility use contract. Primary objectives of grounds maintenance in developed areas are to maintain an aesthetically pleasing area, enhance safety and security, and maintain natural ecosystem functions as much as possible. In managing natural resources in developed areas, IAAAP acknowledges its responsibilities as listed in the White House Memorandum, *Environmentally and Economically Beneficial Practices on Federal Landscaped Grounds* (Office of the President 1994). The memorandum's requirements include:

- using regionally native plants for landscaping;
- using construction practices that minimize adverse effects on the natural habitat;
- reduce pollution by reducing the use of fertilizer and pesticides, using integrated pest management, recycling green waste, and minimizing runoff;
- implementing water-efficient practices; and
- creating demonstrations of these practices to promote their use elsewhere.

4.12.2 Proposed Management

A specific project for cantonment area management is not necessary as these functions are included in other sections of the INRMP. However, attention by the Natural Resources Manager should be focused on assisting and ensuring IAAAP is and remains in compliance with the 1994 Presidential directive.

4.13 Fire Management

General

In comparison to some woodlands and grasslands under private and public ownership, IAAAP has a greater fire occurrence potential. This is due primarily to the required use of the area by a large number of

personnel engaged in military mission operations. The ammunition production and storage mission of IAAAP makes the mission of providing adequate fire protection more complex and perhaps more costly than operations on other areas.

American Ordnance LLC has a fulltime Fire Department that is responsible for fire protection on IAAAP. The Fire Department is responsible for planning prescribed burns and controlling wildfires on the Plant.

Types of Fires
All fires can be classified as either wildfire or as prescribed fires. Wildfire is a free-burning fire requiring suppression. These fires burn with intensities capable of causing loss of life, detrimental impacts to natural resources, and damage to or destruction of man-made developments. Prescribed fires are the managed application of fire resulting from either planned or unplanned ignition. These fires are conducted in predetermined areas to produce the intensity of heat and rate of spread required for accomplishment of specific management objectives.

Fire is both a threat to natural resources and, if used properly, a valuable ecosystem management tool. Below sections describe means used by IAAAP to protect natural and human resources from wildfires and use fire to ensure continued ecosystem functionality.

4.13.1 Current Management

4.13.1.1 Integrated Wildland Fire Management Plan
The Army Wildland Fire Policy Guidance requires the development of an Integrated Wildland Fire Management Plan for Army installations. This plan is to be developed by the Installation Wildland Fire Program Manager, who at IAAAP is the Natural Resources Manager. The Guidance states that the Integrated Wildland Fire Management Plan may be within the INRMP. It further states that an EA is required for the plan. This combined INRMP/EA provides that NEPA documentation.

Appendix 4.13.1.1 is the IAAAP Integrated Wildland Fire Management Plan. It provides general policy and supports fire management sections of the INRMP. The IAAAP Integrated Wildland Fire Management Plan will be updated and further refined to meet the needs of IAAAP during the next five years.

There have been no reported woodland fires on IAAAP since acquisition (Mason & Hanger Corporation 1986). The IAAAP Fire Department is responsible for preventing and suppressing wildfires. The Forest Management Plan (Mason & Hanger Corporation 1990) includes a Fire Protection Plan, which is used by IAAAP. However, two items within that plan are no longer valid. The plan states that prescribed burning will not occur in hardwood stands, which is no longer true. The fire plan also has an appendix that shows locations and capacities of ponds on IAAAP. These capacities are outdated since sedimentation, changes to dams, and rehabilitation of some waterbodies have significantly changed some of this data.

Regular prescribed burning maintains fuel loading at reasonable levels; response time is rapid; and personnel and equipment are readily available to suppress (or manage) wildland fires. Thus, the IAAAP Integrated Wildland Fire Management Plan has some exceptions to the Army Wildland Fire Policy Guidance, which is within the authority of the IAAAP Commander.

4.13.1.2 Wildfire Management

Prevention
Strict adherence to fire-related restrictions on IAAAP minimizes the number of human-caused fires. Smoking by recreational users within the installation is not allowed, and items, such as flame producing devices (matches, lighters, flame-initiated hand-warmers, etc.) explosives, and explosive devices, are considered contraband on the installation.

Publicity
It is important to minimize the potential for wildfires. To accomplish this, installation personnel and those who visit IAAAP are made conscious of the need for fire prevention while understanding the importance of prescribed fire to the ecosystem.

Prescribed Burning
Using prescribed fires to reduce fuel loads creates conditions that make it difficult for a wildfire to start and spread. Should a wildfire occur within about three years following a prescribed burn, the fire will not burn as intensely and is much easier to contain due to the limited fuel buildup.

Containment/Suppression
Containment of wildfires is the responsibility of the IAAAP Fire Department. Fire suppression is provided by the Fire Department, which is manned fulltime during active production periods and equipped with structural, brush, and grass fire fighting apparatus. Fire fighters are trained in wildfire suppression. Various hand tools are carried on trucks to allow suppression in areas inaccessible to vehicles. Mutual aid agreements have been developed with several local fire departments.

Firebreaks
IAAAP has about three miles of 35-foot wide firebreaks that are disked annually. Firebreaks are rough disked and generally revert to green grass cover soon after disking. This cover minimizes erosion, although firebreaks in general, are on slopes less than 5%.

Roads, railroads, agricultural fields, streams, and other wet areas act as firebreaks, giving the installation an extensive firebreak system. Changes to this system are not planned.

4.13.1.3 Prescribed Burning
Prescribed burning is planned fire applied to a predetermined area under strict guidelines and parameters for ecosystem restoration, sensitive species habitat improvement, fuel reduction, control of undesirable species, and wildlife habitat improvement. IAAAP had many years of fire suppression management on an area that was originally prairie grassland. This prairie evolved with fire as a regular component of the ecosystem. Changes in the vegetative composition and, perhaps more important from a fire perspective, the fuel load have altered the area.

The fuel load on IAAAP is high and potentially dangerous in some areas, especially considering safety issues associated with the Plant's mission. Native vegetation is being crowded out by such species as eastern red cedar, which is beneficial to wildlife only if it is in the proper proportion. Additionally, prescribed burning is one of the most cost effective and efficient management tools available to managers for improving the overall nutritional quality of wildlife habitat.

During the mid-1990s IAAAP initiated a limited prescribed burning program emphasizing burning open areas during periods when fires could be kept cool and tightly controlled. Objectives were to prepare seedbeds for native grasses, manage prairies grasses, and provide timber stand improvement. Periodic

burning is especially important on unmowed uplands, which are dominated by bluegrass. The emphasis on returning lands to native prairie necessitates burning prior to seeding, at least twice, which is important to prepare the seedbed. This is especially true of sites dominated by brome grass. About 60 acres of brome grass were burned for this purpose in 1995. Following prairie establishment, it is important to periodically burn these areas to maintain prairie ecosystems. From 20 to 60 acres are burned annually on IAAAP, mostly to restore and maintain prairie areas. Burning for timber stand improvement has been limited.

IAAAP has an exemption for prescribed burning from the Iowa Department of Water, Air, and Waste Management (Mason & Hanger Corporation 1991). However, the installation does not normally use prescribed burning to reduce wildfire incidence or intensity. All burning is done in accordance with IAAAP Fire Department protocols.

Opportunities to prescribe burn are weather-dependent, and parameters for prescribed burning (wind speed, relative humidity, fuel moisture, and atmospheric conditions) must be followed closely. Prescribed burning is generally accomplished from early January through early April. However, based on location, current conditions, desired results, etc., burning may be performed outside these parameters. Prescribed burning that may affect potential Indiana bat (*Myotis sodalis*) summer habitat is restricted to the period outside the summer maternity dates of April 15 - September 15. The Natural Resources Manager provides the Fire Department a map of areas to be burned each year.

Realistic long range scheduling of prescribed burning is not feasible as annual burning conditions greatly affect burning schedules. However, IAAAP's goal is to burn about 50 acres annually during 2007-11. A long range burning plan is difficult to develop as there are many unpredictable variables that affect burning, such as weather, Fire Department personnel strength, and competing tasks. Such a plan must be developed as a flexible, evolutionary document.

4.13.2 Proposed Management

Project: Fire Management
Justification: AR 350-4, stewardship
Project Timing: All objectives - ongoing indefinitely
Regulatory Coordination: None required

Goal. Prevent and suppress wildfires; utilize prescribed burning to sustain or enhance mission capabilities and maintain ecosystem biodiversity and functionality.

Objective 1. Provide natural resources management-related recommendations relative to fire suppression activities and provide support as needed to the IAAAP Fire Department.

Objective 2. Annually update and refine the *Integrated Wildland Fire Management Plan* (Appendix 4.13.1.1) to meet needs of IAAAP and perform revisions every five years. Incorporate the annual Prescribed Burn Plan into the *Integrated Wildland Fire Management Plan*.

Objective 3. Ensure that the IAAAP community and the general public are aware of fire prevention requirements and educate them on benefits of prescribed burning as an integral part of the natural ecosystem.

Objective 4. Use prescribed burning to maintain the military mission and enhance IAAAP ecosystems with a goal of burning about 50 acres annually.

Objective 5. Provide the Fire Department a map of areas to be burned each year.

Objective 6. Maintain firebreaks and roads to provide for quick access for fire management and facilitate an effective prescribed burning program.

4.14 Outdoor Recreation

4.14.1 General

IAAAP is a large, relatively undeveloped, open space. This open space and outdoor recreation opportunities associated with it are perhaps IAAAP's best natural attributes in terms of community quality of life.

Outdoor recreation enhances the quality of life for military and civilian personnel. As such, Army lands with suitable natural resources are to be managed to allow outdoor recreational opportunities, consistent with the Sikes Act. For the purposes of this INRMP and to be consistent with AR 200-3 (Department of the Army 1995), outdoor recreation is defined as recreational programs, activities, or opportunities that depend on the natural environment. Developed or constructed facilities and activities, such as golf courses, tennis courts, baseball facilities, etc., are not included.

People and social uses/needs are an integral part of ecosystem management. The outdoor recreation program is based on providing quality experiences while sustaining ecosystem integrity. Activities that have a direct effect on species populations, such as game harvest, will be monitored for impacts. Special consideration will be given to protecting critical areas (*e.g.*, cultural resources sites, special interest areas) from negative impacts due to outdoor recreation. Outdoor recreation on IAAAP is limited to hunting, fishing, trapping, and mushroom, nut, and berry hunting activities.

Military Mission Considerations

The military mission has priority over outdoor recreation involving access to the Plant. If outdoor recreational activities are to continue to thrive on IAAAP, this military mission priority must not be compromised. If recreational or management activities conflict with military activities, the military mission comes first. IAAAP, consistent with its Army leadership role, has shown that producing and storing ammunition while providing quality recreational opportunities for military personnel, their families, civilian employees, and the general public can be achieved simultaneously.

It is the policy of the Commander to restrict certain activities and access to IAAAP in the interest of national defense and to restrict other activities as safety, security, and common sense dictate. The exercise of care, judgement, and cooperation with authorities is expected of all persons who enter the installation to hunt, fish, and trap.

Public Access

Public access is a tradition on IAAAP. There are several opportunities for the general public to participate in Plant activities. In maintaining a policy of public access to the greatest extent possible, the Plant relies on a responsible public to adhere to restrictions placed on range access.

Paragraph 2-10 of Army Regulation 200-3, *Natural Resources -- Land, Forest, and Wildlife Management*, states that access by recreational users, *... will be within manageable quotas, subject to safety, military security, threatened or endangered species restrictions, and the capability of the natural resources to*

support such use; and at such times as such access can be granted without bona fide impairment of the military mission, as determined by the installation commander. This regulation further states that withholding public access must be substantiated by a statement in the Integrated Natural Resources Management Plan.

IAAAP's policies toward public access are within both the spirit and letter of Army and Department of Defense policies. Access to the installation for recreational activities is controlled by each type of activity (*e.g*., fishing, hunting). About 15% of game hunters are IAAAP employees. Personnel authorized to hunt, fish, or trap in restricted areas of the installation are categorized to limit access to areas within the installation. Seasonal licenses, which must be renewed annually, may be issued to personnel in several categories in accordance with IAAAP Regulation 420-1. Quotas are based on safety and quality of the experience (*e.g*., prevention of overcrowding), as well as the status of game populations with regard to their capability to sustain harvest. Lottery drawings are conducted by IAAAP to fill hunt quotas.

Individuals who desire to hunt, fish, or trap must obtain IAAAP permits and the required State and/or federal license, permit, or stamp for the activity they wish to pursue. Hunters, anglers, and trappers must attend the mandatory safety briefing annually.

4.14.2 Hunting, Fishing, and Trapping

Military installations usually have complex hunter and angler control systems. These are needed to accommodate recreational activities without interference with the military mission and to ensure safe, high quality recreational experiences.

4.14.2.1 Current Management

Records of permit sales, trips afield, and harvest are maintained by the Natural Resources Manager. Access to the installation for hunting, fishing, and trapping is strictly regulated, and all prospective recreational users must apply for permits using the IAAAP Recreational Use Application.

Interest in hunting and fishing has increased on IAAAP over the last several years. IAAAP annually has about 250 deer hunters, about 7 trappers, and about 225 anglers.

Hunting, Fishing, and Trapping Regulations

The IDNR issues regulations for hunters, trappers, and anglers in Iowa, including those who use IAAAP. Army Regulation 200-3, *Natural Resources - Land Forest and Wildlife Management* and IAAAP Regulation 420-1, *Hunting and Fishing Regulation* are primary means of establishing controls on hunting, trapping, and fishing on IAAAP.

IAAAP fishing seasons are identical to those used outside of the Plant. Regulations specific to fishing on IAAAP include, but are not limited to, the following:

- general public anglers are permitted to fish Mathes Lake #18, Stump Lake #19, and Line 1 Pond #40;
- fishing is not authorized on days scheduled for shotgun deer hunting;
- the use of trot and limb lines is prohibited, but jug lines are allowed;
- unauthorized persons will not stock installation waters;
- anglers must check the Recreational Activities Control Board prior to entering the installation;
- anglers must abide by established entry and exit hours;
- cleaning of fish on the installation is prohibited;

- anglers must attend the IAAAP safety briefing; and
- anglers must abide by the following daily bag and length limits: black bass, striped bass, and walleye (1, 20-inch minimum), crappie (8, 10-inch minimum), and all flathead catfish must be immediately released.

IAAAP hunting seasons mirror those used outside the Plant, but bag limits are different than those used outside the Plant. Bag limits, method of take, and number of permitted hunters are determined annually prior to the start of the season. Species hunted on IAAAP are deer, turkey, and small game, such as quail, squirrel, and rabbit. Authority to hunt is tightly controlled, and permits are obtained through issue of permits on a first-received, first-served system or a lottery drawing (only mailed applications are accepted).

Regulations specific to small game hunting on IAAAP include, but are not limited to, the following:

- dogs may not be used to hunt turkeys, coyotes, squirrels, or crows;
- only shotguns using shot are approved for small game and varmint hunting;
- hunters must observe an 80-yard minimum distance from above-ground magazines, outdoor ammunition storage locations, workshops, and other above-ground faculties; and
- waterfowl hunters must remove all decoys and blinds daily.

IAAAP has specific regulations for turkey hunting, such as the youth season is per state regulation with the following exceptions:

- youth must be 12-15 years old and must have a hunter safety card,
- youth will be escorted by an adult with an IAAAP recreational permit that has spring turkey privilege listed on it,
- to escort a youth requires the adult to be within arms reach of the youth when the youth is handling a weapon and within 30 feet of the youth if the youth is not handling a weapon, and
- youth are not allowed to hunt, scout, or assist during the regular adult seasons.

IAAAP deer regulations vary from the State regulations significantly. A few of the more obvious differences are listed below.

- All resident hunters must obtain two IAAAP antlerless deer tags to hunt deer.
- All deer hunters must harvest an antlerless deer prior to harvesting an antlered deer (youth hunters are the exception).
- All deer hunters must have harvested an antlerless deer in the same season in which they harvest an antlered deer.
- Each year the number of antlered deer allowed to be harvested per hunter per year is announced at the hunter safety briefing in August.
- Doe harvest passes are offered as part of the first-received, first-served system.
- Because installation deer hunting is set up for Iowa residents as the installation is a special hunt area under IDNR regulations, nonresident hunters may use a regular state deer tag obtained through the IDNR drawing. However, they must harvest an antlerless deer prior to harvesting an altered deer, and non residents can only obtain one deer tag per year.

Regulations specific to trapping on IAAAP include, but are not limited to, the following:

- trappers must turn in a daily harvest report to Security personnel;

- only pellet guns are allowed for retrieving game from traps;
- blaze orange must be worn while operating trap lines; and
- leg-hold traps will not be attached to any fence.

Mushroom, nut, and berry harvesting is allowed on IAAAP for all authorized persons with exception of the general public. An IAAAP recreation permit is not required.

IAAAP Permits
Individuals must obtain appropriate Plant permits to participate in hunting, trapping, and fishing on IAAAP. Permits are available through the mail. Permits cost the same for both IAAAP personnel and the general public. Permit fee amounts are announced annually. 2005 permit fees were $10 each for the application fee, small game, and fishing permits and $20 each for deer (single or multiple), turkey (single or multiple), and trapping. IAAAP permit fees are used solely for the protection, conservation, and management of fish and wildlife on the Plant.

IAAAP requires each person who applies for recreational access to read and sign a disclaimer statement. This agreement reduces government and the operating contractor's liability associated with recreation on the Plant and serves as a reminder to participants that there are inherent dangers to recreating on IAAAP.

State Licenses
Persons are responsible for obtaining Iowa hunting or fishing licenses and/or applicable game tags or stamps before obtaining IAAAP permits. These licenses are not available at IAAAP.

Check-in and Check-out Procedures
All recreational users are required to check the Recreational Activities Control Board before entering IAAAP. All participants must process in and out through Gate #4. All individuals entering and exiting are subject to inspection of their person, property, and vehicles as condition of entry. Recreational users must show their IAAAP Recreational Permit and indicate the zone or body of water they will be using. When exiting, each individual must report all fish and game harvested.

IAAAP Regulation 420-1 outlines specific requirements for hunters, trappers, and anglers for check-in and check-out procedures. The above briefly-described process has worked well on IAAAP, and there are no plans to change the system during 2007-2011.

Hunting and Fishing Maps
IAAAP maps are essential for hunter and angler use of the Plant. A recreational use map is in IAAAP Regulation 420-1 (Figure 3.4.2).

Safety Considerations
IAAAP Regulation 420-1 contains references to recreational use safety practices and requirements. All recreational users on IAAAP are required to attend a safety briefing. Certain activities also have minimum requirements for wearing blaze orange clothing and carrying a cell phone and whistle.

All persons eligible for recreational access on IAAAP are subject to a background check, and all personnel and vehicles are subject to search by Security personnel. Items prohibited on IAAAP include matches, illegal drugs, alcoholic beverages, fireworks, flares, trail cameras, camera cell phones, GPS units, and any weapon or ammunition other than what is authorized for the particular hunt being conducted.

The possibility exists for encountering potentially hazardous items or unexploded ordnance on IAAAP. Unexploded ordnance is a major portion of safety briefings. Hunters and anglers are warned to never pick up, move, or otherwise disturb any suspect or unusual items on IAAAP.

4.14.2.2 Proposed Management

Project: Hunting, Trapping, and Fishing Programs
Justification: Stewardship; compliance with Sikes Act (public use and wildlife management)
Project Timing: All objectives - ongoing indefinitely
Regulatory Coordination: None required except for IDNR regulatory support for hunting, trapping, and fishing

Goal. Provide opportunities to the IAAAP community and general public for quality, safe, and equitable hunting, trapping, and fishing, consistent with needs of the IAAAP military mission.

Objective 1. Follow IDNR season, bag limit, and other regulatory instruments for hunting, trapping, and fishing, with exceptions for management or safety purposes.

Objective 2. Continue recreation control systems to ensure safe conditions and equitable treatment of users.

Objective 3. Update recreation rules and regulations as needed.

Objective 4. Continue to provide hunting, trapping, and fishing permits on the Plant.

Objective 5. Periodically evaluate the IAAAP recreational user fee schedule.

Objective 6. Ensure IAAAP recreationists follow state and Plant safety requirements.

5.0 Natural Resources-related Programs

This chapter includes those programs that are directly related to natural resources management but are not being implemented solely for that purpose. Some, such as enforcement and NEPA implementation, are totally or partially within responsibilities of organizations other than the Natural Resources Office.

Programs are described in terms of their status and recent history (**Current Management**) followed by proposed project(s) (**Proposed Management**), if appropriate. These projects may be Environmental Branch submissions or submissions through another organization's budget process on IAAAP to integrate implementation of this INRMP to the budget process.

Projects are described in a goal(s)-objective(s) format to provide concise process descriptions that are compatible with adaptive management analyses and overall INRMP implementation monitoring processes. All goals and objectives are summarized in tabular format in Appendix 7.4.

Each project has a summary description at the beginning of the Proposed Management section. The format is as follows:

Project: Title
Justification: Participation in regional initiatives, Sikes Act, Endangered Species Act, AR 200-3, stewardship, etc.
Project Timing: Dates to be accomplished, by objective (*e.g.*, 2007, 2007-08, indefinitely, uncertain)
Regulatory Coordination: Agencies with whom coordination is required

5.1 Natural Resources Enforcement

Many aspects of natural resources management require effective environmental law enforcement (*e.g.*, protection of rare or unique species, harvest controls, protection of sensitive areas, water pollution prevention, hunting and fishing recreation).

5.1.1 Current Management

History, Authority, and Operations
American Ordnance, LLC Security personnel have historically performed natural resources law enforcement on IAAAP. American Ordnance, LLC Security personnel monitor access to the Plant for recreational purposes.

Jurisdiction
IAAAP has concurrent jurisdiction where state or federal commissioned officers can enforce laws. A cooperative relationship exists between IAAAP and IDNR. IDNR Conservation Officers are available to assist Plant Security personnel if requested.

Federal citations are written for most violations. The Federal Magistrate in Rock Island, Illinois adjudicates these citations. Additionally, the Commander of IAAAP has the authority to revoke IAAAP permits as a result of violations of IAAAP regulations or state or federal laws. The Natural Resources Manager, in consultation with the Head of Security, makes recommendations on revocations to the Commander. These recommendations are based on the seriousness of Army violations, the incident report, and case history.

Enforcement Emphasis
Security regarding hunters and anglers begins at the gate. Hunters are allowed to check in at certain times and must clear the gate by specified times. Information recorded includes recreational badge number, permit number, license number, hunting zone, cell phone number, number and type of weapon, and name.

Patrol activities are specific to hunters only during shotgun deer season. Patrol during other hunting or fishing seasons is generally incidental to other Security activities. Security personnel investigate suspicious activity, but they do not function as game wardens.

Training
The Sikes Act mandates that DoD installations employ adequate numbers of professionally trained natural resources personnel, including law enforcement personnel to implement the INRMP. The Act authorizes DoD to enforce all federal environmental laws, including National Historic Preservation Act, Archeological Resources Protection Act, Migratory Bird Treaty Act, Lacey Act, Clean Water Act, and Endangered Species Act when violations occur on the installation.

Game law enforcement is a fairly minor part of Security activities on IAAAP. American Ordnance, LLC Security personnel do not receive specific natural resources enforcement training.

Hunters, in particular, are used to dealing with game wardens, and tactics employed by Security personnel sometimes lead to complaints. This is generally a mutual lack of understanding. Security personnel are taught to deal more aggressively with armed persons, and hunters fall into this category. The Natural Resources Manager works with Security personnel to lessen contact tensions. In addition, all Security personnel who are scheduled for working hunter assignments should attend the installation safety briefing for hunters to become aware of responsibilities placed upon hunters.

5.1.2 Proposed Management

Project: Natural Resources Enforcement
Justification: Maintaining the capability of military lands to support the military mission (Sikes Act); compliance with Endangered Species, National Historic Preservation, and Archeological Resources Protection acts; stewardship
Project Timing: All objectives - ongoing indefinitely
Regulatory Coordination: None required

Goal. Assure legal compliance of military and civilian activities with regard to natural resources on IAAAP.

Objective 1. Maintain a law enforcement program for military and civilian activities that relates to natural resources protection on IAAAP.

Objective 2. Coordinate enforcement activities with other agencies, particularly IDNR and USFWS.

Objective 3. Work with Security personnel to lessen hunter contact tensions, and ensure Security personnel understand recreational user responsibilities on IAAAP.

5.2 Conservation Awareness
Conservation awareness is instrumental in creating conditions needed to manage natural resources. IAAAP's approach to awareness stresses education. It provides government and contractor personnel and

the public with insights into the Plant's natural environment and conservation challenges. The more people know about the Plant's unique natural resources, the more responsibly they act toward them.

Education also promotes awareness of critical environmental projects and the rationale behind them. Activities, such as erosion control, wildfire suppression, etc., can be accomplished with little conservation awareness effort since Plant personnel, recreationists, and the general public naturally support these easily understood efforts. However, issues such as protection of sensitive areas for little understood plant and wildlife species, restrictions on military operations, prescribed burning, permit fees and their uses, etc., require effective conservation communication to get positive support and, perhaps more importantly, to avoid adverse reactions from various users. A conservation awareness program must be directed to both Plant and external interests if it is to be effective.

5.2.1 Current Management

Use of Media
IAAAP's email kiosk system is the most efficient way for the Natural Resources Manager to access the IAAAP community. Natural resources-related articles target a wide range of readers but may be designed to appeal to specific categories of readers. This system is used within the natural resources program to provide information on seasons and bag limits, provide information on permit sales, and explain important local items, such as avoiding deer-vehicle accidents. The Natural Resources Manager either arranges for these items or writes them.

The Burlington newspaper, *The Hawkeye* has occasional interest in IAAAP events related to natural resources. This paper provided considerable coverage of the Trumpeter Swan transplant onto IAAAP, and it is used for paid announcements of agricultural lease information.

Special Events
Special events are limited on IAAAP due to safety and security considerations. Earth Day was celebrated on IAAAP for the first time in 1995. About 80 people participated in that event, and 30 volunteers assisted. In 1996 IAAAP conducted its second annual Winner's Circle Science Fair in Burlington and held its semi-annual road clean up day of public highways running north of the installation to commemorate Earth Day.

IAAAP has developed a slide show and video of its environmental program. These materials are used as part of a 30 - 45 minute program, usually given by the environmental specialist. The program is given to area groups, such as school classes, health centers, and civic clubs.

Youth Groups
IAAAP is committed to cultivating a conservation ethic in local youth. Boy Scouts, in particular, need support with projects, merit badges, and conservation talks. The Scouts have assisted the natural resources program in many ways (*e.g.*, tree trimming, flora identification, nest boxes, fish habitat, augmentation of rose rosetta disease (grafting to kill multiflora rose)).

5.2.2 Proposed Management

Project: Conservation Awareness
Justification: Stewardship
Project Timing: All objectives - ongoing indefinitely
Regulatory Coordination: None required

Goal. Provide information to IAAAP and external interested communities regarding natural resources and associated management programs at IAAAP.

Objective 1. Improve the general knowledge of all persons associated with the natural resources program, particularly those who come into regular contact with interested persons.

Objective 2. Provide prepared talks, dependent upon personnel and time availability. Whenever possible, use these opportunities to explain contemporary natural resources issues and management.

Objective 3. Investigate participating in and/or holding special events to promote the IAAAP image and/or programs.

Objective 4. Encourage youth to participate in the natural resources program, whenever possible.

5.3 Cultural Resources Protection

Cultural resources management at IAAAP is provided in accordance with Section 106 and Section 110 of the National Historic Preservation Act (16 USC Section 470, as amended), the Archeological Resources Protection Act (16 USC Section 470aa-47011), the American Indian Religious Freedom Act (42 USC), the Native American Graves Protection and Repatriation Act (25 USC Section 3001 *et seq*.), Executive Order 11593 (*Protection and Enhancement of Cultural Environment*), DoD Directive 4710.1 (*Archeological and Historic Resources Management*, 1984), and AR 200-4, *Cultural Resources Management* (Department of the Army 1997b).

5.3.1 Current Management

5.3.1.1 General

Management of IAAAP's cultural resources is a mission of the Natural Resources Manager. The Natural Resources Manager is responsible for all aspects of cultural resources management, including coordination with the Iowa State Historic Preservation Officer, the Advisory Council on Historic Preservation, native American tribal organizations, and the public, as appropriate. IAAAP has a Cultural Resources Management Plan (Earth Tech, Inc. 2002).

5.3.1.2 Cultural Resources Inventory

Section 3.4.1, *Cultural Resources* describes the status of cultural resources on IAAAP.

5.3.1.3 Native American Consultation and Coordination

Various laws and regulations require IAAAP to consult with Native Americans regarding Army activities on sites within the installation. The National Historic Preservation Act requires that federal agencies consult with the Advisory Council on Historic Preservation regarding any proposed action that has the potential to affect a property on or eligible for the NRHP. This includes consultation and coordination with the State Historic Preservation Officer and interested parties, including but not limited to Native Americans.

The ***Archaeological Resources Protection Act*** requires that archaeological resources on public and Indian lands be protected. This includes notifying Indian tribes, in advance, of possible harm to sites with religious or cultural importance.

The ***Native American Graves Protection and Repatriation Act*** protects the ownership and control of native American human remains and related cultural items excavated or discovered on federal lands. If

human remains are discovered during projects, work must stop, and a reasonable effort must be made to protect the discovery. Appropriate Native American groups must be notified, and requirements of Section 106 of National Historic Preservation Act and the Native American Graves Protection and Repatriation Act must be followed for excavation and disposition of the remains. The Native American Graves Protection and Repatriation Act also requires a 30-day delay period after the discovery of human remains before project work in the area of the discovery can resume. Work may resume earlier if consultation and agreement occur.

The ***American Indian Religious Freedom Act*** covers the protection of intangible, ceremonial, or traditional values and concerns not tied to specific cultural properties. IAAAP must establish contact with interested Native American groups during the regular course of the National Historic Preservation Act Section 106 process.

Executive Order 13007 (Indian Sacred Sites) stipulates that if a federal-recognized tribe or representative of an Indian religion identifies a sacred site on IAAAP, the installation commander must enter into consultation with that group or individual to provide access to and ceremonial use of the site and avoid adversely affecting the physical integrity of such sites.

Executive Order 13175 (Consultation and Coordination with Indian Tribal Governments) states Native Americans shall have access to DoD sites and resources that are of religious importance or are important to the continuance of their cultures (*e.g*., areas containing traditionally used plants and traditionally used hunting areas), consistent with the military mission, appropriate laws (42 USC 1996, reference (d)) and regulations, and subject to the same safety, security, and resource considerations as the general public.

Department of Defense American Indian and Alaska Native Policy (Department of Defense 1998) emphasizes that the relationship between military services and Native American tribes is to be on a *government-to-government* basis. Consultation and coordination with federal-recognized tribes is to be initiated with the heads of the tribal governments. Department of the Army guidance places the responsibility for initiating tribal consultation at the installation commander level.

5.3.1.4 Natural Resources Management Implications

Natural resources management on IAAAP has little potential to affect historic architectural properties. However, natural resources management has potential to affect archeological sites on IAAAP, as outlined below.

- **Cultivation**: Agricultural activities (*e.g.*, cropland soil tillage) can adversely impact cultural resources through mechanical soil disturbance. Such activities can also lead to erosion of cultural deposits.
- **Forestry operations**: Forest management, tree planting and cutting, can cause moderate ground disturbance and result in damage to archeological sites.
- **Grazing**: Improper grazing practices can change the landscape, particularly vegetation, and lead to erosion. It can also directly affect sites such as old homesites.
- **Erosion control**: Projects involving excavation, earth moving, and fill deposition can damage or bury archeological sites. Generally, however, effects to archeological sites from reduced erosion are positive.
- **Prescribed burning**: Prescribed fire has some potential to affect archeological sites by denuding areas of vegetation and promoting erosion. Fire has a greater potential to adversely impact historic archeological sites with significant surface features.

- **Outdoor recreation programs**: Public access associated with recreational activities has limited potential to increase the risk of vandalism to archeological sites.

Even with proper review, natural resources projects still have potential to affect archeological sites through accidental discovery. IAAAP will avoid adverse effects to cultural resources from natural resources management through proper review and planning. Proposed projects will be submitted, as part of standard NEPA review, for approval, determinations of effect, and Section 106 consultation, as necessary.

Numerous provisions of this INRMP benefit cultural resources management on IAAAP. These include, *Soils Management* (Section 4.3), *Wetlands Management* (Section 4.6.1.2), *Special Interest Area Protection* (Section 4.9), *Natural Resources Enforcement* (Section 5.1), and *NEPA Implementation* (Section 5.4).

5.3.2 Proposed Management

Project: Cultural Resources Protection
Justification: Compliance with various cultural resources laws and regulations, stewardship
Project Timing: All objectives - ongoing indefinitely
Regulatory Coordination: State Historic Preservation Officer, in some cases

Goal 1. Implement this INRMP in a manner consistent with the protection of cultural resources at IAAAP.

Goal 2. Comply with all laws, regulations, and Army guidance regarding cultural resources on IAAAP.

Objective 1. Implement provisions of the Cultural Resources Management Plan that relate to natural resources management.

Objective 2. Consider natural resources projects when planning cultural resources surveys and use results of cultural resources surveys to plan natural resources projects.

Objective 3. Avoid or mitigate adverse effects to cultural resources from natural resources through proper review and planning; submit proposed projects, as part of NEPA review, for approval, determinations of effect, and Section 106 consultation, as necessary.

Objective 4. Take the following protective measures upon discovery of sites.

- Cease ground disturbing activities immediately and report the discovery of potential cultural deposits.
- Consider alternatives for moving the project to another location.
- If remains are determined to be of no cultural significance, do no further investigation and resume the project. Protect the site until such time that it is determined ineligible for the NRHP if remains are determined to be of cultural significance.

Objective 5. Use natural resources techniques and projects to protect cultural resources sites.

5.4 National Environmental Policy Act Implementation

The National Environmental Policy Act was created to disclose environmental concerns with human activities and resolve them to the best degree possible. The intent of NEPA is to protect, restore, or enhance the environment through well-informed federal decisions. NEPA regulations (32 CFR Part 651, *Environmental Analysis of Army Actions*) require mitigation or full disclosure of damage to the environment. NEPA was not legislated to stop actions. Rather, it was crafted to identify environmental problems, providing an opportunity to resolve them using planning at early stages of project development.

5.4.1 General

Responsibility

The Natural Resources Manager has responsibility for NEPA implementation and compliance related to natural resources on IAAAP. The process of reviewing and preparing NEPA documentation involves direct coordination with the Natural Resources Manager. Coordination may also include other natural resources partners, particularly those listed in Chapter 2 of this INRMP.

NEPA Documentation

The most common NEPA document prepared for projects that impact natural resources is a Categorical Exclusion. This simple documentation generally works well for routine projects where natural sites are not damaged.

Environmental Assessments (EAs) are required when conditions for a categorical exclusion are not met. This can happen when a large construction project is planned, when the action involves a wide geographic area, or when wetlands or other sensitive plant communities may be involved. Examples include major erosion control projects, use of pesticides, or major range construction. EAs require the Commander's approval, publishing a Finding of No Significant Impact (FONSI), and waiting 30 days for public comment.

If an FONSI is not appropriate, the following options are available:

- modify the action to remove significant impacts;
- mitigate significant adverse impacts;
- drop the action; or
- publish a Notice of Intent to prepare an Environmental Impact Statement.

The previous natural resources management plan (IAAAP 2000) included an EA. The EA within this INRMP supersedes the previous version.

Mitigation

Mitigation is an excellent way to either consider less damaging options or provide means to off-set damage to the environment and should be considered throughout the NEPA process. Below are five general mitigation tactics:

Avoidance: Avoid adverse impacts on natural resources by not performing activities that would result in such impact. Confine construction to areas where no significant impact would occur to natural resources.

Limitation of action: Reduce the extent of an impact by limiting the degree or magnitude of the action. Minimize impacts of construction projects by arranging timing, location, and magnitude of actions so that they have the least impact on natural resources.

Restoration of the environment: Restore the environment to its previous condition or better. This could involve reseeding and/or replanting an area with native plants after it has been damaged by construction projects.

Preservation and maintenance operations: Design the action to reduce adverse environmental effects. This could involve actions such as monitoring and controlling pollution, contamination, disturbance, or erosion caused by construction projects that would impact natural resources.

Replacement: Replace the resource or environment that will be impacted by construction projects. Replacement can occur in-kind or otherwise, on-site, or at another location. This could involve creation of the same type or better quality habitat for a particular impacted fish or wildlife species or creation of habitat for another species.

Mitigation that is identified in a FONSI is a Class 1 "must fund" for environmental purposes. This provides a reliable mechanism to fund mitigation included in NEPA documents.

5.4.2 NEPA and Natural Resources Management

5.4.2.1 Current Management

The Environmental Branch uses NEPA to ensure natural resources activities (as described in this INRMP) are properly planned, coordinated, and documented. The Natural Resources program also uses NEPA to identify problems associated with other organization's projects which affect IAAAP's natural resources when afforded the opportunity to review such projects.

Environmental Branch personnel can be very helpful in assisting with the decision as to where and/or when the proposed action will take place. Siting non-cantonment area-related projects is perhaps the most basic decision that requires input from natural resources personnel. If this phase is done within the cooperative spirit of NEPA, most other environmental problems are generally resolved with relative ease. Decisions such as specific siting or mission planning should be cooperatively discussed prior to preparing NEPA draft documents.

An important offshoot of proper NEPA implementation is that projects are often enhanced by the effort. Siting is one of the most common examples of project enhancement. When natural resources managers understand mission/project requirements in terms of land features and requirements, they often not only offer more potential site options to mission or project planners, but also offer alternatives to avoid future environmental conflicts.

5.4.2.2 Proposed Management

Project: Use of NEPA
Justification: Compliance with NEPA and other federal laws affected by individual projects, stewardship
Project Timing: Objective 1 - 2007; other objectives - ongoing indefinitely
Regulatory Coordination: None

Goal 1. Use NEPA to identify projects and activities on IAAAP that might impact natural resources and work with project planners to resolve issues early in the planning process.

Goal 2. Use NEPA to ensure this INRMP is documented according to the spirit and letter of NEPA.

Goal 3. Help IAAAP comply with NEPA.

Objective 1. Document effects of implementation of this INRMP through an incorporated EA.

Objective 2. Reference this INRMP/EA in descriptions of affected environment to reduce verbiage in other NEPA documents.

Objective 3. Classify mitigation as a "must fund" for budgetary purposes.

6.0 UNRESOLVED ISSUES

It is not unusual for some natural resources-related issues to be at a stage where the path to issue resolution is unknown or uncertain. Reasons for this status might be the political environment, a lack of scientific information, conflicting agendas, costs, or other roadblocks. Issue resolution difficulties will not prevent IAAAP from continuing to work on resolutions. Recognition and a willingness to deal with such issues are a part of the process itself.

Ecosystem Restoration
Restoring presettlement (preEuropean) forest and prairie ecosystems on IAAAP is somewhat inconsistent with other objectives of the military mission and natural resources management. Commercial products of the forest (*i.e.*, timber) and prairie (*i.e.*, crops and livestock) are important. The military mission requires protection from wildfires, yet fire is critical to both forest and prairie restoration and maintenance. There is also the virtual impossibility of restoration of any single parcel to conditions prevalent at any point in time prior to arrival of European descendants. Effects of surrounding modern landscapes (*e.g.*, exotic species, human activities, off-site watershed conditions) will detract from original conditions even if plant communities are similar.

Ecosystem management recognizes the importance of providing human-use products as well as restoring and maintaining native ecosystems. IAAAP will continue to work toward a reasonable balance in this area.

Ecosystem Management Partnerships
IAAAP continues to forge more partnerships with neighbors and organizations interested in managing ecosystems that extend beyond installation boundaries. While this ecosystem management approach has the potential to improve natural resources management, it also has the potential to create biopolitical issues.

It is fairly easy for IAAAP to form partnerships with natural resources-based state and federal agencies. These organizations understand the need for such partnerships, and the partnerships are often mutually beneficial. Most neighbors, however, are private landowners, and the matter of private property rights often conflicts with the objectives of managing ecosystems. Other neighbors are urban. Urban priorities are often very different than ecosystem needs. Small towns, in particular, are very concerned about financing compliance with federal environmental (and other) mandates. Ecosystem management partnership activities with towns that cost them money will likely be difficult to implement.

Public Access for Recreational Use
IAAAP has an equitable public access policy. However, this is perhaps the most potentially volatile issue regarding natural resources management on the installation. The installation adds members by a lottery to fill the need for more deer hunters. This policy requires teaching newcomers about IAAAP security and the fairly complex access procedure.

Newcomers must develop a conservation ethic toward IAAAP's natural resources. This has not been a problem in the past since potential loss of hunting privileges (essentially lifelong privileges) is considered such a monumental punishment.

Another issue is the potential loss of volunteer staffing for natural resources projects. Volunteers are essential to a variety of projects. Almost all volunteers are from hunting and angling rosters. It is doubtful that new hunters would be similarly inclined, especially if they live considerable distances from IAAAP.

7.0 IMPLEMENTATION

This INRMP is only as good as IAAAP's capability to implement it. This INRMP was prepared with a goal of 100% implementation. Below are described the organization, personnel, and funding needed to implement programs described in chapters 4-5.

7.1 Organization

The Natural Resources Manager can implement most of this INRMP and fulfill goals and policies established in Chapter 1 and more specific goals and objectives within chapters 4-5. Other responsible organizations identified in Chapter 2 are also capable of implementing their portions of this INRMP with no organizational changes, although they may elect to make changes during 2007-2011 for improved operations efficiency.

7.2 Personnel

7.2.1 INRMP Implementation Staffing and Training

7.2.1.1 Current Management

Staffing required to implement this INRMP at IAAAP is the Natural Resources Manager (full-time federal employee). This does not include personnel within other Plant organizations who have roles in implementation of this INRMP. Volunteers provide an invaluable source of on-site assistance in implementation of this INRMP.

IAAAP has a goal to continuously improve the success of natural resources management activities through professional development and information exchange. This will be accomplished by:

- maintaining staff knowledge of management strategies at the current state of the art through training and participation in workshops, research presentations, and other activities of regional and national professional natural resources research and conservation programs; and
- sharing information with natural resources experts to ensure maximum benefits of adaptive management and research efforts.

IAAAP plans to send one person to the following annual workshops or professional conferences if schedules and budgets allow:

- National Military Fish and Wildlife Association annual workshop (concurrent with the North American Wildlife and Natural Resources Conference),
- North American Wildlife and Natural Resources Conference,
- The Wildlife Society Conference,
- American Society of Agronomy,
- Northwest Region Installation Management Agency training sessions, and
- The Pest Management Quality Assurance Evaluator course and refresher training.

These annual wokshops and professional conferences have some of the best scientific publications in their professions, and literature review is a commitment needed to maintain standards. Meetings of these societies provide excellent ways to communicate with fellow professionals as well as maintain

professional standards. Other conferences/workshops will be evaluated for their usefulness, and decisions will be made based on appropriateness to ongoing projects and funding availability.

The Natural Resources Manager will be encouraged to join professional societies and their state chapters, as well as be active in them. Personnel will be sent to as many meetings as feasible to meet with other professionals, exchange ideas, and work on matters of common interest.

7.2.1.2 Proposed Management

Project: INRMP Implementation Staffing and Training
Justification: Compliance with Sikes Act (implementation of INRMP) and other federal laws affected by this INRMP, support of the military mission, stewardship
Project Timing: All objectives - ongoing indefinitely
Regulatory Coordination: None directly

Goal 1. Provide staffing of natural resource management professionals required to effectively manage natural resources on IAAAP (Department of Army 1995).

Objective 1. Provide staffing for the IAAAP natural resources program to effectively implement this INRMP.

Goal 2. Provide training to natural resources personnel implementing this INRMP.

Objective 2. Encourage natural resources personnel to join professional societies and their state/regional chapters as well as be active in them.

Objective 3. Send at least one person to each of the annual workshops or professional conferences discussed above.

Objective 4. Evaluate other conferences/workshops for their usefulness as training tools, and send personnel to those most justified, based on current training needs and those most related to IAAAP activities.

Objective 5. Ensure that natural resources personnel obtain the one-time or occasional refresher training needed to fulfill job requirements (*e.g.*, pest management, NEPA training, endangered species documentation/consultation training).

Objective 6. Actively participate in training sessions to disseminate knowledge learned at IAAAP.

7.2.2 External Assistance

7.2.2.1 Current Management

Demands of natural resources management have resulted in the need for outside assistance with natural resources programs on IAAAP. The Plant has used its partnerships in a variety of ways, particularly for plant and wildlife research and technical assistance in management. The growth of environmental compliance requirements has increased many of these needs and added considerably to the need for specialized external assistance in other areas, including on-the-ground personnel support.

Volunteers
IAAAP has a core group of qualified volunteers who are dedicated to the success of the natural resources program. They assist with a variety of natural resources duties, and without volunteer assistance, many projects would be seriously hindered. This relationship will continue to be fostered during the next five years.

Other Agency Assistance
IAAAP recognizes the importance of cooperating with federal and state agencies (sections 2.3 and 2.4). Other agency partners have included the Natural Resource Conservation Service, the U.S. Army Environmental Center, the U.S. Environmental Protection Agency, and the U.S. Army Corps of Engineers. The USFWS has been a consistent source of fisheries management assistance. The IDNR has used IAAAP for many projects including stocking Ring-necked Pheasants, Wild Turkeys, Trumpeter Swans, and Ruffed Grouse as well as a variety of other programs, especially involving white-tailed deer and other game species. The Natural Resource Conservation Service has assisted with a variety of land management programs including agricultural leasing and wetlands delineation and permitting. The U.S. Army Corps of Engineers provides contracting support for the installation. IAAAP is a partner with the Des Moines County Roadside Biologist for prairie restoration and weed control. IAAAP hosts the Southwest Iowa County Weed Commissioners Meeting every 3-5 years. During 2007-2011 IAAAP will use state and federal agencies, particularly this INRMP's signatory partners, the USFWS and the IDNR, as well as other partners, to assist with implementation of various aspects of this INRMP.

University Assistance
Universities are an excellent source of research assistance. IAAAP has primarily used the University of Iowa to help with specialized needs. This university and others will be considered as a source of assistance in implementation of this INRMP during 2007-2011.

Other Support
Contractors give IAAAP access to a wide variety of specialties and fields. A variety of projects could use the support of contractors in the next five years. Contractor and other sources of support will be evaluated on a case-by-case basis during the next five years.

7.2.2.2 Proposed Management
There is no requirement for a specific project for external assistance since objectives within this area are included within other projects of this INRMP. However, the below goal and objectives are appropriate to list.

Goal. Provide external specialized skills, personnel, and resources to support the IAAAP natural resources program.

Objective 1. Implement external support projects, which are described in more detail in appropriate sections of this INRMP.

Objective 2. Use volunteers and contractors for personnel assistance.

Objective 3. Use county, state and federal agencies, particularly INRMP signatory partners, the USFWS and IDNR, to assist with implementation of this INRMP.

Objective 4. Use universities and contractors to assist with implementation of this INRMP.

7.3 Data Storage, Retrieval, and Analysis

The capability to store, retrieve, and analyze data is central to professional management of natural resources, and it is essential to implementing the adaptive management aspect of ecosystem management. IAAAP is committed to providing efficient, cost-effective systems for data storage and analysis.

7.3.1 Current Management

Microcomputer System

Microcomputers are essential to the routine operation of efficient natural resources management organizations. The volume of data is too substantial to handle without computers, and routine administrative tasks are accomplished considerably more efficiently with computers.

The Natural Resources office is equipped with a quality personal computer with a peripheral printer; it is used primarily to store data on flora and fauna. There are no major needs with regard to this system beyond normal upgrades and replacement of hardware and software.

Geographic Information System

A geographic information system (GIS) allows users to manipulate spatial data (*e.g.*, maps, aerial photos, satellite images) in a similar fashion as a data management program allows the analyses and presentation of mathematical data. Data can be purchased and converted into most software formats, or it can either be scanned or digitized directly from maps or aerial photographs. A GIS can analyze different map layers to show the relationship of one map layer to another.

The Natural Resources office would be well served by a GIS. Numerous data layers could be developed on the natural resources of IAAAP. However, without additional staffing, use of a GIS for natural resources management at IAAAP is unlikely.

Remote Imagery

IAAAP has many aerial photographs taken by the U.S. Department of Agriculture. There are complete or partial black and white photographs, taken at various altitudes, for 1937, 1941, 1957, 1962, 1963, 1969, 1973, 1976, 1978, 1990, 1994, and 1995. In 1999 color infra-red aerial photographs were taken of IAAAP from an altitude of 2,000 feet. Most recently, in 2003 and 2005 the Natural Resources Conservation Service took county-wide photographs, which are available at the Natural Resources Conservation Service website.

7.3.2 Proposed Management

Project: Data Storage, Retrieval, and Analysis
Justification: Sikes Act (implementation of INRMP) and other federal laws affected by this INRMP, support of the military mission, stewardship
Project Timing: All objectives - ongoing indefinitely
Regulatory Coordination: None

Goal. Store, analyze, and use data in an efficient, cost-effective manner.

Objective 1. Upgrade microcomputer hardware and software as needed during the next five years.

Objective 2. Develop or obtain databases needed to support the IAAAP natural resources program.

Objective 3. Investigate development of a GIS support contract; coordinate GIS needs with others on the Plant or other Plants.

Objective 4. Use remote imagery for improved decision-making for military activities, environmental management, and natural resources management and protection.

7.4 Project/Program Summary

Projects, goals, and objectives within this INRMP can be used to monitor the effectiveness of natural resources management at IAAAP. Appendix 7.4 contains a list of projects, goals, and objectives for this INRMP in the order they appear. Goals and objectives are abbreviated from chapters 4, 5, and 7.

7.5 Implementation Funding Options

Natural resources management relies on a variety of funding mechanisms, some of which are self-generating and all of which have different application rules. Below are general discussions about different sources of funding to implement this INRMP. As noted, not all of these funding options are now used by IAAAP.

7.5.1 Forestry Funds

Forestry funds are generated from sale of forest products. Individual installations can be reimbursed for approved forest management expenses. Forty percent of excess revenue produced by an installation is provided to the State. The remainder is deposited into the DoD Forest Reserve Account, which funds approved natural resources projects. Such projects include timber management, reforestation, timber stand improvement, inventories, fire protection, construction and maintenance of timber area access roads, purchase of forestry equipment, disease and insect control, planning (including compliance with laws), marking, inspections, sales preparations, personnel training, and sales. AR 200-3 (Chapter 5) (Department of the Army 1995) outlines collection and expenditure systems. IAAAP does not generate forestry funds beyond a limited amount ($50 - $100 annually) obtained from the firewood program. Timber removed from the south boundary fence project in 2005 was sold with the project for $5,000.

7.5.2 Sikes Act Funds

Sikes Act funds are collected via sales of licenses to hunt or fish. They are authorized by the Sikes Act and regulated via AR 200-3, Chapter 6 (Department of the Army 1995). These funds may be used only for the protection, conservation, and management of fish and wildlife on the installation where they are collected. They have no year-end (unobligated funds carry over on 1 October).

IAAAP generates $10,000 - $15,000 annually for fish and wildlife management from the sale of permits. Army policy encourages self-sufficiency with regard to managing game populations on military lands. IAAAP will, from time to time, examine options to increase Sikes Act income to maintain its quality hunting and fishing program. Sikes Act funds may be used to support portions of fish and wildlife management during 2007-2011.

7.5.3 Agricultural Funds

Agricultural funds are derived from agricultural leases on installations. They are centrally controlled at Department of Army and Major Command levels with no requirements for spending where they were generated. AR 200-3 (Chapter 2) (Department of the Army 1995) outlines procedures for collection and spending these funds. They are primarily intended to offset costs of maintaining agricultural leases, but they are also available for preparing and implementing INRMPs. These are the broadest use funds available exclusively to natural resources managers.

IAAAP agricultural leases generate about $600,000 annually. With exception of Sikes Act funds, all of the funding to support the natural resources program, including the Natural Resources Manager salary, is anticipated from the Agricultural Reimbursable Account. Projects anticipated to be funded with agricultural funds are listed in Table 7.5.3.

Table 7.5.3 Agricultural Funds Projects

Funding in thousands of dollars.

Project	INRMP Section	FY 07	FY 08	FY 09	FY 10	FY 11	Totals
Ecosystem Management Coordination	4.2.1.2	Funded within INRMP Implementation Staffing/ Training project					
Integrated Natural Resources Management Planning	4.2.2.2	Funded within INRMP Implementation Staffing/ Training project				$25	$25
Soils Management	4.3.2	Funded within INRMP Implementation Staffing/ Training project					
Water Resources Management	4.4.2	Funded within Environmental Office programs					
Habitat Management	4.6.2	Funded within INRMP Implementation Staffing/ Training project					
Fish and Wildlife Management	4.7.2	Funded within INRMP Implementation Staffing/ Training project and Sikes Act funding					
Nonfederal-listed Sensitive Species Management	4.8.2	$0*	$0*	$0*	$0*	$0*	$0*
Agricultural Outlease Management	4.10.2	Funded within INRMP Implementation Staffing/ Training project					
Pest Management Support	4.11.2	Funded within INRMP Implementation Staffing/ Training project					
Fire Management	4.13.2	Funded within INRMP Implementation Staffing/ Training project					
Outdoor Recreation	4.14.2.2	Funded within INRMP Implementation Staffing/ Training project and Sikes Act funding					
Natural Resources Enforcement	5.1.2	Funded within INRMP Implementation Staffing/ Training project and other organizations/agencies					
Conservation Awareness	5.2.2	Funded within INRMP Implementation Staffing/ Training project					
Cultural Resources Protection	5.3.2	Funded within INRMP Implementation Staffing/ Training project					
Use of NEPA	5.4.2.2	Funded within Environmental Office programs					
INRMP Implementation Staffing/ Training	7.2.1.2	$500	$510	$520	$550	$575	$2,655
Data Storage, Retrieval, and Analysis	7.3.2	Funded within INRMP Implementation Staffing/ Training project					
Total		$500	$510	$520	$550	$600	$2,680

* Funding needs would increase if these species were discovered or a known species status changed.

7.5.4 Environmental Funds

Environmental funds are a special subcategory of Operations and Maintenance funds. They are set aside by DoD for environmental purposes but are still subject to restrictions of Operations and Maintenance funds. Compliance with laws is the key to getting environmental funding. Environmental funds are most commonly used for projects that return the installation to compliance with federal or state laws, especially if noncompliance is accompanied by Notices of Violation or other enforcement agency actions.

"Must fund" classifications include mitigation identified within *Findings of No Significant Impact* and items required within Federal Facilities Compliance Agreements. This INRMP is a Federal Facilities Requirement Agreement, and some projects and programs within it are used to mitigate various military activities. In addition, 1997 amendments to the Sikes Act require implementation of INRMPs, which make implementation of this INRMP a priority for funding. Table 7.5.4 lists projects for which environmental funding is anticipated for implementation of this INRMP.

Table 7.5.4 Environmental Funds Projects

Funding in thousands of dollars.

Project	INRMP Section	FY 07	FY 08	FY 09	FY 10	FY 11	Totals
Federal-listed Species Management	4.8.1.2	$6	$6	$61	$6	$8	$87
Total		$6	$6	$61	$6	$8	$87

7.6 INRMP Implementation Costs

Table 7.6 is a summary of funding avenues and dollars required for implementation of this INRMP.

Table 7.6 INRMP Implementation Costs

Funding in thousands of dollars.

Type Funds Anticipated	Section	FY 07	FY 08	FY 09	FY 10	FY 11	Totals
Forestry*	7.5.1	$0	$0	$0	$0	$0	$0
Sikes Act	7.5.2	$0	$0	$0	$0	$0	$0
Agriculture	7.5.3	$500	$510	$520	$550	$575	$2,680
Environmental	7.5.4	$6	$6	$61	$6	$8	$87
Totals		$506	$516	$581	$556	$583	$2,767

* Retained as a funding option during 2007-2011.

Thus, total five-year funding to implement this INRMP will be $2,767,000.

7.7 Command Support

Command support is essential to implementation of this INRMP. Many projects for natural resources management within the next five years require command support. This INRMP has the support of the IAAAP Commander and other personnel in command positions who are needed to implement this INRMP. The Command is dedicated to implementation of this INRMP, as required by the Sikes Act and other federal laws. Just as importantly, the Command is dedicated to maintaining and improving the military mission at IAAAP. Implementation of this INRMP is a means to that goal.

8.0 ENVIRONMENTAL CONSEQUENCES AND CONCLUSIONS

This section of the document assesses known, potential, and reasonably foreseeable environmental consequences related to implementing the INRMP and managing natural resources at IAAAP. Section 8.1, *Impacts Common to Both Alternatives* lists areas where neither the No Action Alternative (***Current Management***) (*i.e.*, this IAAAP INRMP would not be implemented and current natural resource management practices at IAAAP would continue as described in the current INRMP (IAAAP 2000)) nor the Preferred Alternative (***Proposed Management***) (*i.e.*, implementation of this INRMP) would discernibly affect resources. Section 8.2, *Environmental Consequences Analyses* addresses implementation of both alternatives on other environmental resources. This assessment considers implementation of management measures in their entirety (as summarized in Appendix 7.4). Cumulative effects are discussed in Section 8.3, *Cumulative Impacts*. A summary of potential environmental consequences associated with the No Action Alternative and the Preferred Alternative is presented in Section 8.4, *Summary of Potential Environmental Consequences*.

As discussed in Section 1.6.4, *Alternatives*, the EA addresses two alternatives: ***Proposed Management*** (Preferred Alternative) and ***Current Management*** (No Action Alternative). Other management alternatives were considered during the screening process but were eliminated because they were economically infeasible, ecologically unsound, or incompatible with requirements of the military mission.

The IAAAP INRMP is a living document that focuses on a 5-year planning period based on past and present actions. Short-term management practices included in the plan have been developed without compromising long-range goals and objectives. Because the plan will be reviewed annually and will undergo a major review every five years, additional environmental analyses may be required as new management measures are developed over the long-term (*i.e.*, beyond 5 years).

8.1 Impacts Common to Both Alternatives

The Preferred Alternative is the professionally-guided evolution of programs within the No Action Alternative. Both alternatives are similar in their effects with the primary difference being one of improvements in managed resources under the Preferred Alternative with many impacts to resources being similar.

No discernable adverse effects were identified or anticipated for the No Action Alternative or the Preferred Alternative for the following environmentally-related areas: Physiography, Topography, and Geology; Petroleum and Minerals; Climate; Noise Environment; Hazardous and Toxic Materials; Facilities, Public Services and Utilities; Socio-economics; Environmental Justice; and Environmental Health and Safety Risks for Children (Section 1.6.5, *Issues Not Considered to be Potentially Significant*).

8.2 Environmental Consequences Analyses

Expected consequences of the No Action and Preferred alternatives for each resource area are presented in the following paragraphs.

8.2.1 Soils

Under both alternatives, soil integrity is managed and protected through planning via NEPA; implementation of appropriate vegetation management practices, such as restoration of prairie areas, monitoring grazing leases, and protection of riparian areas; and using agricultural practices, such as contour and no-till farming. An example of an action that would create significant impacts to soils on

IAAAP would be construction activities (*e.g*., new production line, improved roads). Neither alternative would create conditions that lead to significant impacts to soils.

No Action Alternative (Current Management)
Beneficial effects would be expected to continue under the No Action Alternative. Implementation of the No Action Alternative would involve more reactive management to problems after their occurrence, rather than managing the resource to prevent impacts or to minimize the extent of unavoidable impacts.

Preferred Alternative (Implementation of this INRMP)
Beneficial effects would be expected under the Preferred Alternative. This Alternative offers a more progressive and integrated program for the planning of land use and maintenance and repair of damaged lands than the No Action Alternative. The Preferred Alternative is the next generation of the soils management program that has evolved over decades of active management on IAAAP. Brief periods of increased erosion would occur during damaged sites' maintenance and rehabilitation activities, but these would be relatively minor compared to erosion control benefits. There may be slight increases in erosion during bare ground aspects of projects that disturb the soil, such as firebreak maintenance, but the plan includes provisions to minimize erosion during and following these actions primarily using vegetation for soil stabilization. The Preferred Alternative offers effective protection and mitigation for damages incurred to soils due to the Army mission.

8.2.2 Water Resources
Under both alternatives, surface water quality requirements are met through implementation of proper vegetation management practices. Groundwater and surface water quality are maintained through pollution prevention programs and treatment and control of discharges.

Since surface waters and wetlands are regulated by executive order and federal and state laws and regulations, significance criteria are determined by compliance with these legal mandates as well as stewardship responsibilities associated with public lands. Examples of actions that would create significant impacts to surface waters and wetlands on IAAAP include:

- unpermitted deposition of dredged or fill material into wetlands or other "Waters of the U.S.", and
- a net loss of wetlands within installation boundaries (unmitigated).

Activities affected by both alternatives have some potential to affect surface waters and wetlands (*e.g*., improper road maintenance) but not to the degree of other activities at IAAAP, such as munitions production and storage operations. Neither alternative is more prone than the other to such impacts. Neither alternative would create conditions that lead to significant impacts to surface waters, wetlands, or water quality.

No Action Alternative (Current Management)
Beneficial effects would be expected to continue. Sedimentation of surface waters would be decreased under this alternative. Under the No Action Alternative, brief periods of increased erosion, and possibly minor sedimentation, would occur during site maintenance and rehabilitation activities, but these potential surface water impacts would be more than compensated through conservation awareness activities, rehabilitation and establishment of vegetation of potentially erodible areas (*e.g*., demolition area, agricultural field waterways), restrictions for vehicle movement and digging operations, and including natural resources implications in military project planning. The No Action Alternative would not affect groundwater.

Preferred Alternative (Implementation of this INRMP)
Beneficial effects would be expected. The Preferred Alternative offers a more progressive program than the No Action Alternative for the control and repair of damaged or erodible areas, which potentially contribute the most sediment to waterways. Consequently, sedimentation of surface waters would be decreased under the Preferred Alternative. Under the Preferred Alternative, brief periods of increased erosion, and possibly minor sedimentation, would occur during site maintenance and rehabilitation activities, but these potential surface water impacts would be more than compensated through increased conservation awareness, rehabilitation and establishment of vegetation of potentially erodible areas (*e.g.*, demolition area, agricultural field waterways), restrictions for vehicle movement and digging operations, and including natural resources implications in military project planning. The Preferred Alternative offers the most effective protection and mitigation for damages incurred to surface water via soil erosion due to the Army mission. The Preferred Alternative would not affect groundwater.

8.2.3 Air Quality
Since air quality is regulated by laws and their implementing regulations, significance criteria are determined by compliance with air quality standards and operating permit criteria. Neither alternative would create conditions that lead to significant impacts to air quality. Potential effects on existing pollutant emissions are precluded by the fact that most current natural resource management actions do not involve activities that would significantly contribute to changes in existing air quality. However, some natural resources-related programs, particularly prescribed burning and to some degree operation of vehicles and heavy equipment, primarily by agricultural lessees, directly affect air quality.

No Action Alternative (Current Management)
Slightly beneficial effects would be expected to continue. Prescribed burning negatively affects air quality; however, prescribed burning is conducted within local and state regulatory constraints. Vegetation management and restoration activities reduce airborne particulates (dust) through revegetation of bare ground areas.

Preferred Alternative (Implementation of this INRMP)
Beneficial effects would be expected. Prescribed burning negatively affects air quality; however, prescribed burning is conducted within local and state regulatory constraints. Vegetation management and restoration activities reduce airborne particulates (dust) through revegetation of bare ground areas. The minimization of dust would be more effective under the Preferred Alternative, compared to the No Action Alternative, since vegetation management and restoration projects would be improved.

8.2.4 Flora
Native plant species and communities are managed and protected through planning via NEPA, vegetation management practices, invasive species management, and other programs described in this INRMP. Protection and management of native plant species and communities at IAAAP are influenced by ecosystem management and biodiversity conservation principles, federal laws and executive orders, and general stewardship requirements associated with public lands, upon which significance criteria are determined. Examples of actions that would create significant impacts to native plant species and communities on IAAAP include:

- fragmentation, loss, or degradation of high quality natural or sensitive sites;
- local extirpation of rare or sensitive plant species; and/or
- the introduction or increased prevalence of undesirable non-native species.

Both alternatives have the same requirements to comply with federal laws (*e.g*., Sikes Act, Endangered Species Act) and regulations, executive orders 11990 (*Protection of Wetlands*) and 13112 (*Invasive Species*), and policy requirements to conserve native species biodiversity to maintain ecosystem functionality. Neither alternative would create conditions that lead to significant impacts to flora.

No Action Alternative (Current Management)

General. Beneficial effects would be expected to continue. Management would achieve compliance with laws, as well as provide benefits to floral resources.

Special Status Flora and Special Interest Areas. Special status flora and special interest areas would be afforded protection under the No Action Alternative, which would result in beneficial effects regarding protection of special status flora and special interest areas.

Wetlands. Beneficial effects would be expected to continue. IAAAP minimizes impacts that could result from mission-related activities on the Plant using the NEPA process and fully complies with wetland protection requirements.

Preferred Alternative (Implementation of this INRMP)

General. Beneficial effects would be expected. The Preferred Alternative would use newer technology and scientific information and rely heavily on adaptive management to improve flora protection and restoration projects. Implementation of the INRMP under this alternative would include responses to current needs to support the military mission as well as site-specific responses to environmental compliance. It would continue to implement natural resources monitoring, as well as long-term programs to improve floral resources in general. Improvements in the use of more native species would improve flora restoration programs.

Special Status Flora and Special Interest Areas. Special status flora and special interest areas would be afforded protection under the Preferred Alternative. Therefore, there would be beneficial effects regarding protection of special status flora and special interest areas as a result of implementing this alternative.

Wetlands. Beneficial effects would be expected. IAAAP would continue to minimize impacts that could result from mission-related activities on the Plant using the NEPA process, fully complying with wetland protection requirements.

8.2.5 Fauna

The management of wildlife and aquatic species at IAAAP is influenced by ecosystem management and biodiversity conservation principles, federal laws and executive orders, state laws, and general stewardship requirements associated with public lands, upon which significance criteria are determined. Examples of actions that would create significant impacts to wildlife and aquatic species on IAAAP include:

- local population-level impacts (*e.g*., potential to reduce local populations below self-sustaining levels or long-term loss or impairment of substantial portions of local habitat);
- direct impacts/disturbance to birds protected by the Migratory Bird Treaty Act; and/or
- direct impacts/disturbance to candidate species for federal or state listing.

Since federal-listed species are regulated by the USFWS, per requirements of the Endangered Species Act, significance criteria are determined by compliance with USFWS mandates. Examples of actions that would create significant impacts to federal-listed plants and animals include:

- a USFWS jeopardy opinion,
- a drastic change in available habitat,
- inhibiting natural expansion of existing populations,
- direct mortality or other unpermitted "take" of federal-listed species, and/or
- the loss of designated Critical Habitat.

Neither alternative would create conditions that lead to significant impacts to fauna.

No Action Alternative (Current Management)

General. Beneficial effects would be expected to continue to both game and nongame species. The health and condition of wildlife populations would be improved, and management measures to increase the abundance and biodiversity of wildlife at IAAAP would be implemented. Management measures to protect and enhance wildlife habitats (*e.g.,* aquatic, riparian, wetlands, terrestrial) would be implemented thereby increasing the quality and complexity of habitats. Above discussions involving soils, water resources, and flora would also apply to native fauna that require good soils, unpolluted waters, and quality habitat.

Special Status Fauna. Beneficial effects would be expected to continue for special status species not federal-listed. There would be few, if any, studies and surveys for these species. Federal-listed species management would be identical under both alternatives due to legally mandated requirements associated with the Endangered Species Act.

Preferred Alternative (Implementation of this INRMP)

General. More beneficial effects would be expected for both game and nongame species. Compared to the No Action Alternative, implementation of the Preferred Alternative would improve the health and condition of wildlife populations to a greater degree, and management measures to increase the abundance and biodiversity of wildlife at IAAAP would be improved. Management measures to protect and enhance wildlife habitats (*e.g.,* aquatic, riparian, wetlands, terrestrial) would be improved, further increasing the quality and complexity of habitats. Above discussions involving soils, water resources, and flora would also apply to native fauna that require good soils, unpolluted waters, and quality habitat.

Special Status Fauna. Beneficial effects would be expected for special status species not federal-listed. Compared to the No Action Alternative, the Preferred Alternative provides more extensive measures for the protection and management of these species. The chances for incidental finds as a part of other surveys would be enhanced. Federal-listed species management would be identical under both alternatives due to legally mandated requirements associated with the Endangered Species Act.

8.2.6 Cultural Resources

Since cultural resources and their protection/management are regulated by federal laws and national policy, significance criteria are determined by compliance with these laws and policies. An example of an action that would create significant impacts to cultural resources on IAAAP is irretrievable or irreversible damage to a prehistoric or historic site that is listed or is eligible for listing on the NRHP. IAAAP must comply with laws and policies related to cultural resources, and in this respect both alternatives would be

similar in their effects. Neither alternative would create conditions that lead to significant impacts to cultural resources.

No Action Alternative (Current Management)
The No Action Alternative would have slightly beneficial effects on cultural resources. The agricultural lease management scheme, which has the potential to affect cultural resources, would be cognizant of the need to protect cultural resources.

Preferred Alternative (Implementation of this INRMP)
The Preferred Alternative would have slightly beneficial effects on cultural resources. However, the agricultural lease program, which has the potential to affect cultural resources, would be cognizant of the need to protect cultural resources.

8.2.7 Outdoor Recreation

IAAAP is required by the Sikes Act to provide sustainable use of natural resources by the public to the extent that use is not inconsistent with needs of fish and wildlife resources or requirements to ensure safety and military security. Significance criteria are determined by compliance with the Sikes Act. An example of an action that would create significant impacts to recreation opportunities on IAAAP is a substantial decrease in the availability of recreational resources relative to historic baselines. Neither alternative would create conditions that lead to significant impacts to outdoor recreation.

No Action Alternative (Current Management)
Beneficial effects would be expected to continue, particularly for game species related to hunting and fishing. Game management programs are well established and, in general, are conducted in close cooperation with IDNR.

Preferred Alternative (Implementation of this INRMP)
Beneficial effects would be expected, particularly regarding game species related to hunting and fishing. Game management programs are well established and, in general, are conducted in close cooperation with IDNR. Minimal changes would occur under the Preferred Alternative. Since the Preferred Alternative provides more benefits to IAAAP ecosystems, in general, the case could be made that outdoor recreation that uses natural environments would be generally improved.

8.2.8 Summary

No Action Alternative (Current Management)
The IAAAP natural resources program, as currently conducted, has no significant negative impacts to environmental and related resources. It is a quality program and is recognized as such. However, there are areas where improvements could be made, and some programs could take advantage of new scientific information and improved technologies. Therefore, implementation of the No Action Alternative is not favored.

Preferred Alternative (Implementation of this INRMP)
The IAAAP natural resources program has areas where improvements could be made, and some programs could take advantage of new scientific information and improved technologies. The Preferred Alternative achieves these improvements. Therefore, implementation of the Preferred Alternative is favored. These findings are consistent with goals of the natural resources management program to maintain ecosystem functionality and ensure the sustainability of desired military lands conditions. The nature of the

management measures recommended by the INRMP, if implemented, would directly and positively affect the health and condition of natural resources at IAAAP.

8.3 Cumulative Impacts

A cumulative effect is defined as an effect on the environment that results from the incremental effect of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative effects can result from individually minor, but collectively significant, actions taking place locally or regionally over a period of time.

Implementation of the INRMP would result in a comprehensive environmental strategy for IAAAP that represents compliance, restoration, prevention, and conservation; improves the existing management approach for natural resources on the Plant; and meets legal and policy requirements consistent with national natural resources management philosophies. Implementation would improve environmental conditions at IAAAP, both in the short- and long-term, as shown by the potential for beneficial effects in Table 8.4. Over time, adoption of the Preferred Alternative would enable IAAAP to achieve its goal of maintaining ecosystem viability and ensuring sustainability of desired military lands conditions. Any cumulative effects of implementing either alternative would be beneficial.

This INRMP, by design, incorporates current Plant planning documents and management plans and is to be reviewed and updated routinely (every five years at a minimum). INRMPs are designed to follow an ecosystem approach, which involves establishing partnerships with federal, state and local groups. These actions further reduce the possibility for cumulative effects arising that are not already considered within the INRMP. By its nature, ecosystem management has cumulative effects. As new, relevant issues or initiatives arise, either on or off-post, or within the state, local, or regional community, they would be incorporated into the INRMP at either the annual review or five-year review periods. In this way, the INRMP is maintained as an active reference document that describes IAAAP's planned natural resources management for the current five-year period.

Outside of the actions included in the INRMP, there exists the possibility of several general actions that may result in cumulative effects. For example, major changes in the IAAAP military mission, major funding and/or personnel reductions, and major changes in local/state planning and development (*e.g.*, change in land use of the surrounding area, major highway construction) could interact with natural resources management initiatives at IAAAP and result in cumulative effects.

The No Action Alternative, which continues natural resources management at the status quo, would be less able to respond effectively to significant changes in military mission, funding cuts, or major changes in off-post planning and development that interact with Plant resources than if the Preferred Alternative were implemented.

The Preferred Alternative takes advantage of lessons learned during implementation of the current INRMP as well as new advances in science and technology of natural resources management. The Preferred Alternative contains sufficient flexibility in its initiatives to allow managers to modify, as necessary, their implementation approaches, schedules, etc. or to accommodate changes outside of their immediate control. Changes in mission, funding and/or personnel reductions, or changes in off-post land use planning and development, would be accommodated and would be incorporated into the subsequent update of the INRMP. The updating of the INRMP could realign management intensities to better correspond to current needs and account for cumulative effects.

8.4 Summary of Potential Environmental Consequences

Table 8.4 Summary of Potential Environmental Consequences

Resource Area	Environmental Consequence*	
	No Action Alternative	**Preferred Alternative**
Physiography, Topography, and Geology	No Effect	No Effect
Petroleum and Minerals	No Effect	No Effect
Noise Environment	No Effect	No Effect
Climate	No Effect	No Effect
Facilities, Public Services, and Utilities	No Effect	No Effect
Hazardous and Toxic Materials	No Effect	No Effect
Socioeconomic Environment	No Effect	No Effect
Environmental Justice	No Effect	No Effect
Protection of Children	No Effect	No Effect
Soils	Beneficial	More Beneficial
Water Resources	Beneficial	More Beneficial
Air Quality	Beneficial	More Beneficial
Flora (General)	Beneficial	More Beneficial
Special Status Flora and Special Interest Areas	Beneficial	More Beneficial
Wetlands	Beneficial	More Beneficial
Fauna (General)	Beneficial	More Beneficial
Special Status Fauna	Beneficial	More Beneficial
Cultural Resources	Slightly Beneficial	Slightly Beneficial
Outdoor Recreation	Beneficial	More Beneficial
Cumulative Impacts	Beneficial	More Beneficial

* No Effect: Actions have no known demonstrated or perceptible impacts
Beneficial: Actions have apparent beneficial effects
(Note: The terms "less" or "more" may be added to the terms "beneficial" or "negative" for comparison purposes between alternatives.)

8.5 Conclusions

8.5.1 INRMP Summary

This document reflects the commitment set forth by the Army to conserve, protect, and enhance the natural resources necessary to sustain the military mission on IAAAP. The primary purpose and objective of this document is to present an implementable INRMP that guides IAAAP in meeting mission requirements, achieving natural resource management goals, and complying with environmental policies and regulations. In addition, the NEPA analysis required for undertaking this major federal action (*i.e.*, implementation of this plan) is embodied within the INRMP. The resultant "planning assessment" includes a comprehensive description, evaluation, and assessment of environmental conditions and natural resources at IAAAP.

This INRMP will direct the natural resources management program at IAAAP from 2007 through 2011. An ecosystem approach was used to develop management projects for each resource area. Implementation

of management projects will maintain, protect, and enhance the ecological integrity of military lands and biological communities inhabiting them. In addition, natural resources management measures described in this plan will protect IAAAP ecosystems and their components from unacceptable damage or degradation and identify and restore previously degraded habitats.

8.5.2 NEPA Findings and Conclusions

The Preferred Alternative to implement the INRMP for IAAAP was analyzed by comparing potential environmental consequences against existing conditions. Findings indicate that, under the Preferred Alternative, potential consequences would result in either no significant adverse effects or beneficial effects on each resource area (see Section 8.2, *Environmental Consequences Analyses*). The affected environment would not be significantly or adversely impacted by proceeding with the Preferred Alternative. Additionally, no significant cumulative effects would be expected.

Based on this environmental assessment, implementation of the Preferred Alternative (full implementation of this INRMP) would have no significant environmental or socioeconomic effects. Because no significant effects would result from implementation of the Preferred Alternative, preparation of an environmental impact statement is not required, and preparation of a Finding of No Significant Impact is appropriate.

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ACRONYMS

AR	Army Regulation
CFR	Code of Federal Regulations
DoD	Department of Defense
EA	Environmental Assessment
ESMP	Endangered Species Management Plan
F	Fahrenheit
FONSI	Finding of No Significant Impact
GIS	Geographic Information System
IAAAP	Iowa Army Ammunition Plant
IDNR	Iowa Department of Natural Resources
INRMP	Integrated Natural Resources Management Plan
MAPS	Measuring Avian Productivity and Survivorship
msl	Mean sea level
NEPA	National Environmental Policy Act
NRHP	National Register of Historic Places
TNT	Trinitrotoluene
U.S.	United States
USC	United States Code
USFWS	U.S. Fish and Wildlife Service

INTEGRATED NATURAL RESOURCES

MANAGEMENT PLAN

IOWA ARMY AMMUNITION PLANT
IOWA

APPENDICES

Appendix 1.4.6 Regulatory Instruments that May Affect Natural Resources Management on Iowa Army Ammunition Plant

Below is a list of the most significant federal and state laws and regulations and other regulatory instruments that may govern implementation of this Integrated Natural Resources Management Plan.

Federal Laws

American Indian Religious Freedom Act (42 United States Code (USC) 1996-1996a)
Americans with Disabilities Act of 1990 (PL 101-336; 42 USC 12101)
Archaeological and Historic Preservation Act of 1974 (PL 93-291; 16 USC 469 *et seq*.)
Archaeological Resources Protection Act of 1979 (PL 96-95:16 USC 470aa-11)
Assimilative Crimes Act (18 USC 13)
Bald and Golden Eagle Protection Act (PL 86-70, as amended)
Clean Air Act (as amended through 1990) (42 USC 7401-7642)
Clean Water Act of 1978 (33 USC 1251-1387)
Conservation and Rehabilitation Program on Military and Public Lands (PL 93-452)
Conservation Programs on Military Reservations (PL 90-465)
Endangered Species Act of 1973 (PL 95-632, as amended)
Erosion Protection Act (33 USC 426e-426h)
Federal Facilities Compliance Act of 1992 (PL 102-386; amending 42 USC 6961)
Federal Insecticide, Fungicide and Rodenticide Act (7 USC 136 *et seq*.)
Federal Water Pollution Control Act Amendments of 1972 (PL 92-522)
Fish and Wildlife Conservation Act of 1980 (PL 96-366; 16 USC 2901)
Fish and Wildlife Coordination Act (PL 85-624)
Fish and Wildlife Conservation and Natural Resource Management Programs on Military Reservation (Amends Public Law 86-797 (Sikes Act) (PL 96-561)
Hunting, Fishing and Trapping on Military Lands (an update to the Military Construction Authorization Act 10 USC 2665)
Migratory Bird Conservation Act (Chapter 257; 45 Stat 1222; 16 USC 715 *et seq*.)
Migratory Bird Treaty Act (PL 65-186; 16 USC 703 *et seq*.)
Mineral Leasing Act of 1920 (30 USC 181 *et seq*.)
Native American Graves Protection and Repatriation Act (25 USC, Section 3001 *et seq*.)
National Environmental Policy Act of 1969 (as amended, PL 91-190; 42 USC 4321 *et seq*.)
National Historic Preservation Act of 1966 (as amended, PL 89-665; 16 USC 470 *et seq*.)
Native American Graves Protection and Repatriation Act (25 USC, Section 3001 *et seq*.)
Non-game Act (PL 93-366)
Noxious Plant Control Act (PL 90-583)
Noxious Weed Control and Eradication Act of 2004
Outdoor Recreation on Federal Lands (16 USC 4601{1})
Plant Protection Act of 2000 (replaces Federal Noxious Weed Act of 1973 (PL 93-629))
Sikes Act (PL 105-85, as amended through 1997; 16 USC 670 *et seq*.)
Timber Sales on Military Lands [An update of the Military Construction Authorization Act] (10 USC 2665)
Watershed Protection and Flood Prevention Act (PL 92419;68 Stat 666, as amended & 86 Stat 667; 16 USC 1001)

Executive Orders and Presidential Memoranda

Executive Order 11593, Protection and Enhancement of the Cultural Environment
Executive Order 11988, Floodplain Management

Executive Order 11989, Off-Road Vehicles on Public Lands
Executive Order 11990, Protection of Wetlands
Executive Order 11991, Protection and Enhancement of Environmental Quality: Amends Executive Order 11514
Executive Order 12898, Environmental Justice
Executive Order 12962, Recreational Fisheries
Executive Order 13007, Indian Sacred Sites
Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks
Executive Order 13148, Greening the Government through Leadership in Environmental Management
Executive Order 13175, Consultation and Coordination with Indian Tribal Governments
Executive Order 13112, Invasive Species, 1999
Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds
Executive Order 13352, Facilitation of Cooperative Conservation
Presidential Memorandum, Environmentally and Economically Beneficial Practices on Federal Landscaped Grounds (April 26, 1994)
Presidential Memorandum, Government-to-Government Relations with Native American Tribal Governments

Department of Defense (DoD) Directives/Instructions
DoD Directive 4150.7, DoD Pest Management Program
DoD Directive 4700.4, Natural Resources Management Program
DoD Directive 4710.1, Archaeological and Historic Resources Management
DoD Instruction 4715.1, Environmental Security
DoD Directive 4715.1E, Environment, Safety, and Occupational Health (ESOH)
DoD Instruction 4715.9, Environmental Planning and Analysis
DoD Instruction 5000.13, Natural Resources
DoD Directive 6050.1, Environmental Effects in the United States of DOD Actions
DoD Directive 6050.2, Use of Off-Road Vehicles on DOD Lands
DoD Directive 7310.5, Accounting for Production and Sale of Forest Products
Department of Defense, American Indian and Alaska Native Policy

Army Regulations (AR)
AR 200-1, Environmental Protection and Enhancement (Department of the Army 1997a)
AR 200-3, Natural Resources, Land, Forest, and Wildlife Management (Department of the Army 1995a)
AR 200-4, Cultural Resources Management (Department of the Army 1997b)
AR 200-5, Pest Management (Department of the Army 1999)
AR 215-1, Morale, Welfare, and Recreation Activities and Nonappropriated Fund Instrumentalities (Department of the Army 1998)
Environmental Analysis of Army Actions (32 CFR Part 651), Federal Register Vol. 67, No. 61, March 29, 2002).

IAAAP Regulations
IAAAP Reg 420-1, Hunting and Fishing Regulation

Iowa (IA) Regulations
Hunting and Trapping Regulations
Fishing Regulations

Appendix 1.6.6 Comments from Agencies that Reviewed the INRMP/EA

Fields of Opportunities

THOMAS J. VILSACK, GOVERNOR
SALLY J. PEDERSON, LT. GOVERNOR

STATE OF IOWA

DEPARTMENT OF NATURAL RESOURCES
JEFFREY R. VONK, DIRECTOR

July 17, 2006

Department of the Army
Jack T Judy
LTC, U.S. Army
Iowa Army Ammunition Plant
17571 Highway 79
Middletown, Iowa 52638-5000

Dear Lieutenant Colonel Jack T. Judy:

Thank you for the opportunity to review the draft copy of the 2007-2011 Integrated Natural Resources Management Plan.

After review by wildlife and forestry personnel, please find attached their comments regarding the plan.

If you have any questions, please let me know.

Sincerely,

Jeffrey R. Vonk
Director

WALLACE STATE OFFICE BUILDING / 502 EAST 9th STREET / DES MOINES, IOWA 50319-0034
515-281-5918 TDD 515-242-5967 FAX 515-281-6794 www.iowadnr.com

Page 41 – Wildlife Habitat – 17,461 acres has to include the agricultural land.

Page 55 – Paragraphs 6 & 7 – Too much emphasis on fish barrier and "loss of quality fish."

Page 58 – Deer counts are not inclusive. Used for index from year to year.

Page 59 – Paragraph 2 – Winter herd goal. Just index

- Paragraph 2 – The previous Integrated Natural Resources Management Plan (2000, page 51) stated an IAAAP goal of 400 to 600 deer in the winter herd and said the State's goal of 600 to 800 deer appears to be above the normal habitat carrying capacity limits. The current draft states an IAAAP goal of 800 to 1,000 deer in the winter herd and says the State's goal of 600 to 800 deer appears to be below habitat carrying capacity limits. Why did the IAAAP nearly double their goal? As far as a state goal for the IAAP, I checked with our deer biologist, Willie Suchy, and we don't have a goal for deer numbers at IAAAP. Habitat carrying capacity means different things to different people – are the deer affecting native plant communities; impacting crop production; forest regeneration? Why was the same goal above the carrying capacity in the 2000 plan and now below it in 2006? Any mention of a state goal should be deleted and explanation provided for nearly doubling their deer goal.

- Paragraph 3 – What is significance of number of tines?
- Paragraph 3 – We do not count turkeys on the winter aerial deer census so "and via the aerial deer census each winter" should be deleted. They may have counted turkeys when the used to do the helicopter survey, but they no longer do that.

- Paragraph 6 – Significant of harvest data?

Page 61 – Paragraph 4 – What is the carrying capacity and how is that determined? Are they performing plan community inventories to determine that they "allow for an upward trend in habitat condition?" What does that mean and how is it measured?

– Paragraph 7 – Fall turkey bow season is October 1 – December 1 and December 18 – January 10, 2007. Fall gun season is October 16 – December 1

Page 62 – Rabbits and squirrels – The season starts on September 1.

Page 76 – Paragraph 5 - Is Avitrol still legal?

Page 80 – Paragraph 1 – Consider fire in woodlands to set back multiflora rose, red cedar and other undesirable woody plants.

Below are the comments from the Forestry Bureau Chief and the local District Forester in regards to Draft 2006-2010 Integrated Natural Resources Management Plan and Environmental Assessment for the Iowa Army Ammunition Plant – Middletown, Iowa.

Section 4.5 Forest Management pages 50-53

Page 50 2nd paragraph 1st sentence should replace "Iowa Conservation Commission" to the Iowa Department of Natural Resources District Forester.

Page 50 3rd paragraphs - 1st through 3rd sentences are incorrect and should read: "Forest resources on IAAAP are composed of a mixed hardwood forest – upland areas being dominated by a mature to over mature oak-hickory over story (white *Quercus alba*, red *Quercus rubra* and black oak *Quercus velutina* – shagbark hickory *Carya ovata*) with a shade tolerant under story of sugar maple *Acer saccarium*-basswood *Tilia americana*-ironwood *Ostrya virginiana*. Mature red and black oak mortality in upland areas is visibly increasing due to the disease oak wilt *Certocystis fagacearum*. Regeneration of the oak resources is compounded by a severe deer browse by the current high white-tailed deer *Odocoileus virginianus* population. Known populations of the invasive plants, garlic mustard *Alliaria petiolata* and multi-flora rose *Rosa multifora* are spreading complicating natural oak-hickory regeneration.

Bottomland or flood plain forests of the IAAAP are dominated by silver maple *Acer saccharinum* - green ash *Fraxinus pennsylvanica*-American elm *Ulmus americana* with minor component of mast bearing pin *Quercus palustris* and swamp white oak *Quercus bicolor*. Periodic and sustained flooding, lack of sunlight along with an active infestation of the invasive plant, Reed canary grass *Phalaris arundinacea* are limiting natural regeneration of the IAAAP bottomland forests. American elm *Ulmus americana* populations are continuing to be lost to Dutch elm disease *Certocystis ulmi* and there is great concern over the potential impact of the invasive insect pest emerald ash borer *Agrilus planipennis* (not yet established in Iowa) to native stands of black, green and white ash on the IAAAP.

Without an active program of timber and wildlife management involving crop tree release and even-aged regeneration harvests (clear cut and shelter wood methods) and controlled deer harvesting the upland oak-hickory forests and the wildlife dependent upon the mast will be replaced by a shade tolerant forest in 100+ years. Timber management efforts to regenerate the oak ecosystem are cost-effective; local standing timber markets are in need of quality oak and sustainable timber sales will than provide enough revenue to expand active timber management through the forested portions of the IAAAP.

Investment is needed at the IAAAP in dealing with invasive plant issues and preparing for possible impacts of emerald ash borer now located in Illinois and Indiana. Encourage locating and inventorying invasive plant issues and developing a management regime of appropriate tools such as increasing prescribed fire, physical removal and chemical control to minimize impacts.

Page 50 4th paragraph 4th sentence is incomplete and should read "The IAAAP forests are within the critical habitat of the federally listed Indiana Bat *Myotis sodalis*. Forest and wildlife management of IAAAP needs to take into consideration timing of active management to avoid nesting season (April 15 through September 15) of the Indiana Bat.

Page 51 Current Management 1st paragraph, replace the 1st sentence with IAAAP's forestlands have commercial value that can be reinvested into expanding ecosystem management efforts.

Page 51 Proposed Management

Objective 1 should be rewritten to say "IAAAP upland forests will be managed according to ecological principles to sustain the diversity rich oak-hickory forest through active forest management involving forest stand improvement (crop tree release) and even aged forest management (clear cutting and shelter wood harvests). Upland areas with savanna-like characteristics should be managed with a combination of uneven-aged management (group selection harvesting) and frequent use of prescribed fire (2 out of every 5 years). Bottomland forests need to utilize even-aged management for natural silver maple regeneration and areas of pin and swamp white oak need to be released to expand mast production. Revenue received from timber sales should be reinvested into expanding forest stand improvement and supplemental regeneration with seedlings as needed.

Page 52
Objective 5 should be rewritten to reducing the white-tailed deer herd to state standards to allow desirable regeneration of wood species.

Suggest adding Objective 6
"Invasive plants populations need to be inventoried for location and severity. Action plans using appropriate management tools of chemical control and prescribed fire should be used.

IAAAP Responses to IDNR Comments on draft INRMP

DEPARTMENT OF THE ARMY
IOWA ARMY AMMUNITION PLANT
17571 HIGHWAY 79
MIDDLETOWN, IOWA 52638-5000

REPLY TO
ATTENTION OF

September 13, 2006

Installation Management Division

Iowa Department of Natural Resources
Wallace State Office Building
Attn: Mr. Jeffery Vonk
900 East Grand
Des Moines, Iowa 50319

Dear Mr. Vonk:

Your personnel's review and comments on the Draft 2007-2011 Integrated Natural Resources Management Plan (INRMP) are greatly appreciated.

We have enclosed our response to those comments. Once changes are completed a final copy of the INRMP will be sent to you for signature.

If you have any questions, please contact Mr. Joe Haffner, E-mail joe.haffner@us.army.mil or Phone (319) 753-7903.

Sincerely,

Jack T. Judy
LTC, U.S. Army
Commanding

Enclosure

Response to wildlife personnel comments.

1. Page 41- Yes, the 17,461 acres includes row crop acres.

2. Page 55- Not a big issue with us. We will delete.

3. Page 58- The spotlight and evening counts are not all inclusive. The results are used as trend data.

4. Page 59- Trend data, 2003 Infrared (FLIR) count and other information pointed out that the 1996 helicopter count was not accurate. The 1996 count showed 600 deer when we most likely had 800-850. We adjusted the goal to what we now believe is in middle ground with regards to biological, social and agricultural carrying capacities.

   The DNR goal came from a handout titled: Take A Doe Let A Buck Grow! I believe Willie was the creator of that handout in the late 80's or early 90's. We will delete the IDNR goals.

   Deer will always affect plant communities, agricultural crops and seedling/sapling trees. Tree plantings were over browsed even in the early 90's when deer herd numbers were low (200-300).

   The number of tines is used to link the written data to the photo taken and it gives the hunters away to size up what class of deer have been taken as they do not have access to the photos.

   The Army counted turkeys not the IDNR. The Army did all the helicopter counts not the State.

   Turkey harvest data is used to track the numbers and quality of birds harvested. Over the last few years spur lengths over 1 ½" have decreased. Is it due to an increase in harvest? If I keep increasing the number of birds harvested will spur length keep decreasing?

5. Page 61- Carrying capacity for this habitat is thought to between 30 – 50 deer per square mile. A midwest standard from the SE Deer Study Group a subcommittee of The Wildlife Society. To me carrying capacity is the number of deer that will not adversely impact the diversity and richness of the habitat. The Plant Communities Survey was done in 2001 and the Invasive Species survey in 2003. They maybe conducted again in 2012 or 2013. Survey plots and transects were record.

   Yes, we will make those season changes.

6. Page 79- Yes, Avitrol is still legal. We seldom use it.

7. Page 80- Landscape wide use of fire in the forest areas is currently not an option. Limited resources, Indiana Bat and conflict with ammunition production are the main issues.

Response to Forestry personnel comments.

1. Page 50, 2nd paragraph: Ok, but I believe in 1978 when that inventory was performed it was the ICC not the IDNR.

2. Page 50, 3rd paragraph: Are 80 -100 year old oaks over mature? We do not agree that oak wilt is increasing. Have not noted any oak wilt (if that is what it truly was) since 1994. Regeneration of oak is a complex issue. Deer are an issue but hard maple and eroded soils are bigger issues. In 1992 deer numbers were at the lowest levels in decades and tree plantings were still over browsed and failed.

3. Even-age management is not an option. Clear cut methods do not meet the requirements set by the US Fish & Wildlife Service for management of Indiana Bat habitat.

4. Thanks to high grading in the 60's and 70's we are left with low (pallet) quality oak. The sale of 850 trees in 1999-2000 was a loss (in the red) and the 2001 sale was canceled by the Army Forester. The sale of timber at Iowa AAP is much more complex and costly than general private owner sales.

5. Fire on a landscape scale is not currently an option. Due to the Indiana Bat burns can not be conducted April through September. The IAAAP conducted inventories in 2003. The invasive plant issues are beyond any practical chemical or mechanical controls. Garlic Mustard, Sugar Maple, Multi-flora Rose, Honey Suckles, Olives, Canary Grass and others are widespread across thousands of acres or the entire installation. The more we look the more we find.

6. Page 50, 4th paragraph: We will reference the Endangered Species Management Plan and the forest management requirements that it contains. The IAAAP is not listed as critical habitat for the Indiana Bat. The Indiana Bat has a maternity roost season not a nesting season. The Migratory Bird Treaty Act also limits tree cutting activities during the spring and summer months.

7. Page 51, 1st paragraph: Due to the additional requirements and restrictions of a federal restricted access area the IAAAP's forested lands have little or no commercial value to be reinvested. The 1999 sale is a good example.

8. Page 51, Proposed Management: See comments 2 – 7 listed above.

9. Page 52, Objective 5: The State does not have any white-tailed deer herd standards.

10. Page 52, Objective 6: See comment 5 listed above.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Rock Island Field Office
4469 48th Avenue Court
Rock Island, Illinois 61201
Phone: (309) 793-5800 Fax: (309) 793-5804

IN REPLY REFER TO:
FWS/RIFO

October 13, 2006

Mr. Joe Haffner
Iowa Army Ammunition Plant
17571 Highway 79
Middletown, Iowa 52638-5000

Dear Mr. Haffner:

This is in response to the request for comments on the draft Integrated Natural Resources Management Plan and Environmental Assessment 2006 - 2010 dated May 18, 2006, for the Iowa Army Ammunition Plant (IAAAP), Middletown, Des Moines County, Iowa. We offer the following comments for your consideration.

Section 3.3.2.3 indicates the eastern prairie fringed orchid *(Platanthera leucophaea)* and western prairie fringed orchid *(Platanthera praeclara)* have the potential to occur statewide in Iowa based on historical records and habitat distribution. According to our records, the eastern prairie fringed orchid is not considered to potentially occur statewide in Iowa, however the western prairie fringed orchid and prairie bush clover *(Lespedeza leptostachya)* are.

Section 4.13 details the IAAAP policy on Fire Management including the Integrated Wildland Fire Management Plan (4.13.1.1) and Prescribed Burning (4.13.1.3). The Service recommends that all prescribed burning within the IAAAP that may affect potential Indiana bat *(Myotis sodalis)* summer habitat be restricted to the period outside the summer maternity dates of April 15 – September 15.

Appendix 5.1.1 outlines the IAAAP Endangered Species Management Plan. It states,

> "Tree cutting will not occur at IAAAP during the Indiana bat maternity roosting season (April 1 through September 30) unless it is necessary to maintain forest health or safety conditions (for example, control of a disease or insect outbreak or removal of storm damage). Any tree cutting activities during the maternity roosting season or determined by IAAAP to have a potential impact on the Indiana bat will be coordinated with the USFWS Region 3 Rock Island Field Office and will undergo necessary ESA Section 7 consultation in order to avoid and minimize impacts on the Indiana bat and on potential maternity roost trees".

Although removal of potential habitat outside of the maternity colony dates would adequately avoid possible direct effects to Indiana bats, in some cases, the removal of this habitat may cause indirect effects to bats returning after their winter hibernation. We recommend the IAAAP consult with this office when any potential Indiana bat habitat is removed, regardless of the time of year.

If you have any questions regarding our comments, please contact Kristen Lundh of my staff at (309) 793-5800 ext. 215.

Sincerely,

Richard C. Nelson
Field Supervisor

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IAAAP Responses to USFWS Comments on draft INRMP

Comment regarding Section 3.3.2.3
Changed Section 3.3.2.3, second paragraph to read:
The western prairie fringed orchid (*Platanthera praeclara*) (federally-listed threatened and state-listed threatened) and the prairie bush clover (*Lespedeza leptostachya*) (federally-listed threatened and state-listed threatened) have a potential to occur statewide based on historical records and habitat distribution. These species are not known to occur on IAAAP.

Comment regarding Section 4.13
Changed Section 4.13.1.3, fifth paragraph to read:
Opportunities to prescribe burn are weather-dependent, and parameters for prescribed burning (wind speed, relative humidity, fuel moisture, and atmospheric conditions) must be followed closely. Prescribed burning is generally accomplished from early January through early April. However, based on location, current conditions, desired results, etc., burning may be performed outside these parameters. Prescribed burning that may affect potential Indiana bat (*Myotis sodalis*) summer habitat is restricted to the period outside the summer maternity dates of April 15 - September 15. The Natural Resources Manager provides the Fire Department a map of areas to be burned each year.

Added the following sentence to Appendix 4.13.1.1, number 8, first paragraph:
Prescribed burning that may affect potential Indiana bat (*Myotis sodalis*) summer habitat is restricted to the period outside the summer maternity dates of April 15 - September 15.

Comment regarding Appendix 5.1.1 of the Endangered Species Management Plan, portions of which are inserted in Appendix 4.8.1.1 of the INRMP
IAAAP will consult with the USFWS Rock Island Field Office when any potential Indiana bat habitat is planned for removal, regardless of the time of year.

Fields of Opportunities

STATE OF IOWA

CHESTER J. CULVER, GOVERNOR
PATTY JUDGE, LT. GOVERNOR

DEPARTMENT OF NATURAL RESOURCES
RICHARD A. LEOPOLD, DIRECTOR

April 10, 2007

Jack T. Judy, LTC., US Army Commanding
Department of Army
Iowa Army Ammunition Plant
Highway 79
Middletown, IA 52638-5000

Dear Lieutenant Colonel Jack T. Judy:

The Iowa Department of Natural Resources appreciates the opportunity to comment on the development of the Integrated Natural Resources Management Plan and Environmental Assessment for the Iowa Army Ammunition Plant lands. We understand the challenges of managing natural resources of this unique facility in Iowa, particularly in light of budget and available staffing.

Our Forestry and Wildlife staffs have been in contact with Mr. Joe Haffner – Natural Resources Manager at IAAP regarding the plan and greatly appreciate his cooperation and understanding with our questions and comments. Our staff believes that the IAAP's forestland has great opportunity for sustainable forest management that could perhaps go beyond the vision of the plan if only budget and staff resources were available.

If our forestry and wildlife staff could further assist Mr. Haffner in collecting updated forestry/invasive species data, improving game and non game species management and assisting in coordinating demonstration efforts to prove sustainable forestry and wildlife management on the IAAP lands please do not hesitate to contact me or have Mr. Haffner seek local staff assistance.

Please consider this letter as endorsement of the partnership between our two agencies and your Integrated Natural Resources Management Plan. I appreciate the long tenure of our relationship of working together towards for the betterment of our natural resources.

If you have further questions or needs, please don't hesitate to contact me.

Sincerely,

Richard A. Leopold
Director

WALLACE STATE OFFICE BUILDING / 502 EAST 9th STREET / DES MOINES, IOWA 50319-0034
515-281-5918 TDD 515-242-5967 FAX 515-281-6794 www.iowadnr.gov

Appendix 2.3.1 Items of Cooperation Among the U.S. Fish and Wildlife Service, Iowa Department of Natural Resources, and Iowa Army Ammunition Plant, Iowa

PURPOSE: The purpose of this document is to specifically list items to be provided by the Iowa Department of Natural Resources (IDNR), U.S. Fish and Wildlife Service (USFWS), and Iowa Army Ammunition Plant (IAAAP) for cooperative implementation of the IAAAP Integrated Natural Resources Management Plan. Items not specifically listed will generally be the responsibility of IAAAP unless the other agencies agree to assist with their implementation.

AUTHORITY: In accordance with the authority contained in Title 10, U.S. Code, Section 2671, and Title 16, U.S. Code, Section 670a, the Department of Defense, Department of Interior, and the State of Iowa, through their duly designated representatives whose signatures appear on the IAAAP Integrated Natural Resources Management Plan, approve the Integrated Natural Resources Management Plan and the below specific items of cooperation among the three agencies.

MUTUAL AGREEMENT:

X Persons hunting, trapping, or fishing the lands or waters of IAAAP shall be required to obtain special IAAAP hunting, trapping, or fishing permits, unless exempt by IAAAP regulations. IAAAP reserves the right to charge for these permits. Any funds derived from the sale of these permits will be used exclusively for the implementation of the IAAAP Integrated Natural Resources Management Plan in accordance with Army regulations and the Sikes Act. Fees charged shall be established by IAAAP in accordance with Army regulations. Persons guilty of violating the requirement for these special permits may be prosecuted under 10 USC 2671(c).

X Persons hunting, trapping, or fishing the lands of IAAAP must purchase state licenses, tags, and stamps as required by IDNR, unless exempt by IDNR regulations.

X All hunting, trapping, and fishing on IAAAP will be in accordance with federal and state fish and game laws.

X Representatives of IDNR and USFWS will be admitted to IAAAP at reasonable times, subject to requirements of military necessity and security.

X IDNR and USFWS shall furnish technical assistance for development and implementation of professionally sound natural resources programs on IAAAP provided funding for such support is available.

X IAAAP shall furnish assistance and facilities to IDNR and/or USFWS for mutually agreed upon natural resources research projects provided funding for such support is available. It shall be the policy of the Commander, IAAAP to encourage and support research conducted by the participating agencies. To this end, suitable land areas, animals, facilities, and personnel may be made available at the Commander's discretion, when requested, providing the proposed studies are compatible with, and in no way limit, accomplishment of the military mission.

X No exotic species of fish or wildlife will be introduced on IAAAP lands without prior written approval of the Army, IDNR, and the USFWS.

X IDNR shall establish season and bag limits for harvest of game species on IAAAP. IAAAP may make special requests for such regulations or impose more stringent seasons or bag limits. Requests for regulations not in accordance with those established statewide will be based on data specific to IAAAP or designed to meet IAAAP's military mission needs.

X Hunting, trapping, and fishing on IAAAP will be authorized and controlled by the Commander in

accordance with locally published IAAAP regulations promulgated in compliance with applicable federal and state laws, Army regulations, military requirements, and the Integrated Natural Resources Management Plan.

X IAAAP will operate biological check stations to collect data on harvested deer and turkey. IDNR may collect additional data on fish or wildlife resources at IAAAP with approval of IAAAP for access to military lands.

X Public access for hunting, trapping, and fishing is approved under a system of controls established by IAAAP in cooperation with IDNR. Quotas are set on the number of hunters permitted on a daily or seasonal basis for reasons of safety or harvest management. Hunting, trapping, and fishing will be allowed only on those areas where there is no conflict with military mission activities and no unreasonable safety hazard to military personnel and dependents, Army civilian employees, or the public. Certain areas will be closed to hunting, trapping, and fishing, including but not limited to production areas.

X IAAAP has concurrent jurisdiction with regard to law enforcement. State or federal commissioned officers can enforce laws on IAAAP. Enforcement will be a joint responsibility of IAAAP, IDNR, and the USFWS. USFWS will assist with enforcement of federal laws as requested by IAAAP and as feasible given funding and personnel limitations.

X IAAAP agrees to cooperate with USFWS and IDNR for management of any threatened or endangered species residing on IAAAP. Such efforts will be in compliance with federal and state laws and applicable Army regulations.

X IDNR and USFWS will provide technical and professional advice on matters concerning wildlife and fish management when necessary. IDNR will provide technical wildlife and fisheries assistance on a non-reimbursable basis, except in specific mutually agreeable instances. Assistance from the USFWS will be provided within funding and personnel limitations.

X IAAAP has the option to directly transfer funds to the IDNR or USFWS for implementation of this Integrated Natural Resources Management Plan.

X It is understood that implementation of this INRMP requires certain latitude with regard to professional decisions. However, IAAAP agrees that any land-use change which significantly impacts natural resources must include modification of this INRMP in addition to any other environmental compliance requirements.

LIMITATIONS:

The military mission of IAAAP supersedes natural resources management and associated recreational activities; and, such activities must in all instances be compatible with the military mission. However, where there is conflict between the military mission and provisions of the Endangered Species Act, the Sikes Act, or any other law associated with natural resources conservation, such conflicts will be resolved according to statutory requirements.

REQUIRED REFERENCES:

- Nothing contained in this agreement shall modify any rights granted by treaty to any Native American tribe or to members thereof.

X The possession of a special permit for hunting migratory game birds will not relieve the permittees of the requirements of the Migratory Bird Stamp Act, as amended.

X This INRMP is a Federal Facilities Compliance Agreement.

X As required by the Sikes Act, the following agreements are made:

(1) This IAAAP Integrated Natural Resources Management Plan is the planning document required by the Sikes Act, as amended. This plan contains those items specifically required by law. In the event the Sikes Act is amended after this INRMP is signed, this plan will be amended to conform with new requirements within the Sikes Act, if needed.

(2) This plan will be reviewed by IDNR, USFWS, and IAAAP on a regular basis, but not less often than every five years.

(3) No land or forest products from land on IAAAP will be sold under Section 2665 (a) or (b) (address the sale of certain interests in land), Title 10 USC and no land will be leased on IAAAP under Section 2667 (addresses the leasing of non-excess property of military departments) of such Title 10 unless effects of such sales or leases are compatible with purposes of the Integrated Natural Resources Management Plan.

(4) With regard to the implementation and enforcement of the IAAAP Integrated Natural Resources Management Plan, neither Office of Management and Budget Circular A-76 nor any successor circular thereto applies to the procurement of services that are necessary for that implementation and enforcement, and priority shall be given to the entering into of contracts for the procurement of such implementation and enforcement services with federal and state agencies having responsibility for the conservation or management of fish or wildlife.

(5) The IAAAP Integrated Natural Resources Management Plan is not, nor will be treated as, a cooperative agreement to which chapter 63 of title 31, United States Code applies.

(6) This Integrated Natural Resources Management Plan will become effective upon the date subscribed by the last signature and shall continue in full force for a period of five years or until terminated by written notice to the other parties by any of the parties signing this agreement. This agreement may be amended or revised by agreement between the parties hereto. Action to amend or revise may originate with any of the other participating agencies.

Appendix 2.6 Reimbursable Agreement Between Des Moines County, Iowa and Iowa Army Ammunition Plant

Reimbursable Agreement
between
Des Moines County, Iowa
and
Iowa Army Ammunition Plant
U.S. Department of the Army

I. AUTHORITY:

This agreement between the County of Des Moines, Iowa (hereinafter referred to as the "County") and the Iowa Army Ammunition Plant, (hereinafter referred to as IAAAP) is hereby entered into under the authority of 16 U.S. Code 670 et. Seq. A Conservation Programs on Military Installations (Sikes Act) as amended, whereby the IAAAP and the County will cooperate in maintaining roadside vegetation, prairie and controlling noxious weeds on the IAAAP and the Economy Act, 31 U.S.C. 15235.

II. PURPOSE:

This agreement is intended to provide for the stewardship, conservation and management of IAAAP natural resources. It provides for the limited interchange of services, personnel, equipment, facilities and funds to obtain this goal.

III. BACKGROUND:

IAAAP and the County have engaged in cooperative efforts over the years to provide sound management of local resources. This agreement provides for the continuation of that relationship.

IV. SCOPE:

The IAAAP and the County shall furnish the necessary personnel, material, services, facilities and otherwise perform all things necessary for or incident to the performance in accordance with the following statement of work.

The County's personnel will provide technical assistance, advice and recommendations to develop, maintain and conserve IAAAP natural resources.

Specifically, within the limits of funding provided the County will:

- Provide trained personnel as needed to carry out the statement of work.

- Provide gear, chemicals and equipment as needed to conduct vegetation control.

- Provide data and recommendations as necessary for the management of roadside vegetation, prairie and noxious weeds on the IAAAP.

- Provide technical assistance for habitat management on IAAAP roadsides and prairie.

- Support recommendations for IAAAP management objectives.

Specifically, IAAAP will:

- Provide access to IAAAP lands as needed to carry out field activities.

-Coordinate with County personnel and provide information on activities, programs, projects or plans which may affect roadside and prairie resources.

- Provide personnel as needed to assist the County in field activities on the IAAAP.

- Provide annual reimbursement to the County in accordance with the schedule described in Section VIII.

V. PERIOD OF PERFORMANCE:

The period of performance of this Agreement is for five fiscal years starting at the date of approval to September 30, 2008. This Agreement will expire at the end of the specified period of performance unless formally modified and extended. If, at the end of five years, the re-evaluation of the relationship between the parties concludes that the efforts should be continued, the Agreement may be extended by mutual agreement of both parties or, preferable, a new Agreement prepared and executed between the parties. Fiscal year will be October 1 through September 30.

VI. AGREEMENT AMOUNT:

A. Total (Not-to-exceed) Amount: $10,000

B. Total Amount of Reimbursement by Fiscal Year:

FY 2004 - $2,000
FY 2005 - 2,000
FY 2006 - 2,000
FY 2007 - 2,000
FY 2008 - 2,000

VII. PAYMENT PROVISIONS:

A. The County will submit a bill to the IAAAP no later than September 1st of each year for work accomplished during that fiscal year.

B. IAAAP will prepare or cause to be prepared through internal financial processes, a MIPR or other similar document for electronic funds transfer and submit for payment within 30 days of billing receipt.

C. Reimbursable funding levels for each fiscal year are defined in Section VI.

VIII. PROJECT OFFICERS:

A. Des Moines County Roadsides
Jeff Chase, Roadside Manager
13522 Washington Road
West Burlington, IA 52655
Phone: 319/753-8720
FAX: 319/753-8740
email: dmcroadsides@mchsi.net

B. Iowa Army Ammunition Plant
Joe Haffner, Natural Resources Manager
17575 Highway 79
Middletown, IA 52638-5000
Phone: 319/753-7903
FAX: 319/753-7601
email: joe.haffner@us.army.mil

IX. REPORTING/DELIVERY REQUIREMENTS:

A. The County will be available for technical advice and consultation on routine conservation and management issues.

B. The execution of this agreement is contingent on the availability of funds and the availability of personnel.

C. The County will furnish the IAAAP with a report of pesticides applied prior to September 1st each year.

X. MODIFICATION:

Modifications or renewals may be proposed at any time during the period of performance by either party and shall become effective upon approval by both parties. This Agreement, unless otherwise modified or renewed, is scheduled for completion on September 30, 2008. It may be terminated at any time prior to that upon thirty days written notice by either party to the agreement or by mutual consent of both parties. Upon any termination the County will be paid for service completed in that fiscal year.

XI. SPECIAL PROVISIONS:

In the event the Project Officer for either party to this agreement should change, the party incurring the change shall notify the other by written memorandum within 60 days. The memorandum will specify the new Project Officer and be included in this Agreement as an addendum.

Nothing contained in this Agreement shall abrogate the statutory responsibility or authority of either signatory agency.

IN WITNESS WHEREOF, the parties hereto have caused this Reimbursable Agreement to be executed as of the date therein written.

Des Moines County Board of Supervisors

_____

David A. Miller, Chair

Date: _____

_____

Timothy E. Hoschek, Vice-Chair

Date: _____

_____

Edgar A. Blow, Member

Date: _____

Des Moines County Roadsides

_____

Jeffrey R. Chase, Roadside Manager

Date: _____

Iowa Army Ammunition Plant

_____

Rory K. Tegtmeier
Lieutenant Colonel, US Army
Commander, Iowa Army Ammunition Plant

Date: _____

Appendix 3.2.4 Soil Series of Iowa Army Ammunition Plant, Iowa

Ambraw Series: The Ambraw series consists of poorly drained, moderately and moderately slowly permeable soils found on floodplains. These soils formed in loamy alluvium. The native vegetation was prairie grasses. The slope ranges from 0 to 2%.

Belinda Series: The Belinda series consists of poorly drained, very slowly permeable soils found on upland ridgetops. These soils formed in loess. The native vegetation was mixed prairie grasses and deciduous trees. The slope ranges from 0 to 2%.

Bolan Series: The Bolan series consists of well drained soils on stream terraces. These soils are moderately permeable in the upper part of the solum and rapidly permeable in the lower part. They formed in loamy and sandy alluvial sediments. The native vegetation was prairie grasses. The slope ranges from 0 to 5%.

Clarinda Series: The Clarinda series consists of poorly drained, very slowly permeable soils. These soils are on short, convex side slopes and in coves at the upper end of drainage ways in uplands. They formed in loess and the underlying clayey, weathered glacial till. The native vegetation was prairie grasses. The slope ranges from 5 to 9%.

Clinton Series: The Clinton Series consists of moderately well-drained, moderately slowly permeable soils on the convex tops and upper sides of ridges in uplands and on stream benches. These soils formed in loess. The native vegetation was deciduous trees and the slope ranges from 2 to 14%.

Colo Series: The Colo Series consists of poorly drained and moderately permeable soils found on floodplains, alluvial fans, and along upland drainage ways. These soils are formed in silty alluvium. The native vegetation was prairie grasses. The slope ranges from 0 to 5%.

Gara Series: The Gara Series consists of moderately well-drained or well-drained, moderately slowly permeable soils located on convex ridgetops and side slopes dissected by drainage ways. These soils formed in glacial till. The native vegetation was mixed prairie grasses and deciduous trees. The slope ranges from 9 to 18%.

Gara-Rinda Complex: The Gara-Rinda complex slopes range from 9 to 14% and are moderately eroded. These strong sloping soils occur on short, convex side slopes and in coves at the head of drainage ways in uplands. The well-drained or moderately well-drained Gara soil is found on lower slopes, and the poorly drained or somewhat poorly drained Rinda soil occurs on upper slopes. These soils are subject to seasonally high water tables. The Gara soil is moderately slowly permeable and the Rinda soil is very slowly permeable. Surface runoff is rapid. Most areas are used for hay and pasture. Some are used for cultivated crops. These soils are poorly suited to corn, soybeans, and small grain. If cultivated crops are grown, further erosion is a severe hazard. A conservation tillage program would be required to maintain crop residue on the surface and the practice of contour farming would be necessary to assist in the prevention of excess soil loss.

Givin Series: The Givin series consists of somewhat poorly drained, moderately slowly permeable soils located on ridgetops and slopes that form the head of drainage ways in uplands. These soils formed in loess. The native vegetation was mixed prairie grasses and deciduous trees. The slope ranges from 1 to 3%.

Hedrick Series: The Hedrick series consists of moderately well-drained and moderately permeable soils located in coves at the head of drainage ways and on short, convex to plane side slopes in uplands. These soils formed in loess. Native vegetation was mixed prairie grasses and deciduous trees. The slope ranges from 2 to 9%.

Keomah Series: The Keomah Series consists of somewhat poorly drained and moderately slowly permeable soil found on ridgetops in uplands. These soils formed in loess. The native vegetation was deciduous trees. The slope ranges from 1 to 3%.

Keswick Series: The Keswick series consists of moderately well-drained and slowly permeable soils. These soils are found on short, convex side slopes and nose slopes in uplands. They formed in loamy weathered glacial till. The native vegetation was deciduous trees. The slope ranges from 9 to 14%.
Klum Series: The Klum series consists of moderately well drained, moderately rapidly permeable soils on floodplains. These soils formed in stratified loamy alluvium. The native vegetation was prairie grasses. The slope ranges from 0 to 2%.
Ladoga Series: The Ladoga Series consists of moderately well-drained, moderately permeable soils located on convex ridgetops and side slopes in uplands. These soils formed in loess. The native vegetation was mixed prairie grasses and deciduous trees. The slope ranges from 2 to 9%.
Lindley Series: The Lindley series consists of well-drained, moderately slowly permeable soils generally found on convex side slopes in uplands. These soils formed in glacial till. The native vegetation was deciduous trees. The slope ranges from 9 to 40%.
Mahaska Series: The Mahaska series consists of somewhat poorly drained and moderately permeable soils found on ridgetops in uplands. These soils formed in loess. The native vegetation was prairie grasses. The slope ranges from 1 to 3%.
Nira Series: The Nira series consists of moderately well-drained and moderately permeable soils found on ridgetops, in coves at the head of drainage ways and on short, convex to plane side slopes surrounding the nearly level areas on upland divides. These soils formed in loess. Native vegetation was prairie grasses. The slope ranges from 2 to 9%.
Nodaway Series: The Nodaway series consists of moderately well drained, moderately permeable soils on floodplains along rivers and major streams. These soils formed in stratified silty and loamy alluvium. The native vegetation was deciduous trees and prairie grasses. The slope ranges from 0 to 5%.
Nordness-Rock Outcrop Complex: The Nordness-Rock outcrop complex occurred as areas of rock outcrop intermingled with areas of a shallow, well-drained Nordness soil. Generally located in convex side slopes and escarpments in uplands, most areas support native hardwoods or are used as permanent pastures.
Orthents Series: This unnamed series consists of loamy soils found on nearly level to moderately steep areas that have been used as borrow sites for construction. The soils range from well drained to somewhat poorly drained, depending on the type of material that they are derived from and the condition of the restored borrow area.
Otley Series: The Otley series consists of moderately well-drained and moderately permeable soils found on convex ridgetops and side slopes in uplands that formed in loess. The native vegetation was prairie grasses. The slope ranges from 2 to 9%.
Pershing Series: The Pershing Series consists of moderately well drained to somewhat poorly drained, slowly permeable soils located on convex ridgetops and side slopes in uplands. The soils formed in loess. The native vegetation was mixed prairie grasses and deciduous trees. The slope ranges from 2 to 9%.
Rinda Series: The Rinda series consists of poorly drained or somewhat poorly drained, very slowly permeable soil located on short, convex to plane side slopes and in coves at the upper end of drainage ways in uplands. These soils formed in clayey, weathered glacial till. The native vegetation was mixed prairie grasses and deciduous trees. The slope ranges from 5 to 14%.
Sperry Series: The Sperry Series consists of very poorly drained or poorly drained, slowly permeable soils in slight depressions on broad upland divides. These soils formed in loess. The native vegetation was prairie grasses. The slope is 0 to 1%.
Taintor Series: The Taintor series consists of poorly drained and moderately slowly permeable soils found on ridgetops in uplands. These soils formed in loess. The native vegetation was prairie grasses. The slope is 0 to 1%.
Tuskeego Series: The Tuskeego series consists of very poorly drained and slowly permeable soil found in nearly level to slightly depressional areas on bottomland and concave foot slopes. These soils formed in

silty and clayey alluvial sediments. Native vegetation was mixed prairie grasses and deciduous trees. The slope ranges from 1 to 3%.

Weller Series: The Weller Series consists of moderately well-drained, slowly permeable soils located on narrow tops and upper sides of ridges on upland divides. These soils formed in loess. The native vegetation was deciduous trees. The slope ranges from 2 to 9%.

Urban Land: Areas of urban land include paved areas and buildings, and/or may be permanently disturbed and show no soil series characteristics. These areas are associated with the industrial facilities, administrative buildings and support areas.

Soil Series and Erodibility

Soil Series	Family or Higher Taxonomic Class	Erosion Factor (T)†	Prime Farmland
Ambraw	Fine-loamy, mixed, mesic Fluvaquentic Haplaquolls	5	—
Belinda	Fine, montmorillonitic, mesic Mollic Albaqualfs	4	silt loam, 0 to 2% slopes (where drained)
Bolan	Coarse-loamy, mixed, mesic Typic Hapludolls	4	loam, 0 to 2% slopes
Clarinda	Fine, montmorillonitic, mesic, sloping Typic Argiaquolls	3	—
Clinton	Fine, montmorillonitic, mesic Typic Hapludalfs	5	silt loam, 2 to 5% slopes
Colo	Fine-silty, mixed, mesic Cumulic Haplaquolls	5	silty clay loam, 0 to 2% slopes (where drained)
Gara	Fine-loamy, mixed, mesic Mollic Hapludalfs	5	—
Givin	Fine, montmorillonitic, mesic Udollic Ochraqualfs	5	silt loam, 1 to 3% slopes
Hedrick	Fine-silty, mixed, mesic Mollic Hapludalfs	5	silt loam, 2 to 5% slopes
Keomah	Fine, montmorillonitic, mesic Aeric Ochraqualfs	5	silt loam, 1 to 3% slopes
Keswick	Fine, montmorillonitic, mesic Aquic Hapludalfs	3	—
Klum	Coarse-loamy, mixed, nonacid, mesic Mollic Udifluvents	5	—
Ladoga	Fine, montmorillonitic, mesic Mollic Hapludalfs	5	silt loam, 2 to 5% slopes
Lindley	Fine-loamy, mixed, mesic Typic Hapludalfs	5	—
Mahaska	Fine, montmorillonitic, mesic Aquic Argiudolls	5	silty clay loam, 1 to 3% slopes
Nira	Fine-silty, mixed, mesic Typic Hapludolls	5	silty clay loam, 2 to 5% slopes
Nodaway	Fine-silty, mixed, nonacid, mesic Mollic Udifluvents	5	silt loam, 0 to 2% slopes

Soil Series	Family or Higher Taxonomic Class	Erosion Factor (T)†	Prime Farmland
Nordness	Loamy, mixed, mesic Lithic Hapludalfs	2	—
Orthents	Mixed, mesic Udorthents	—	—
Otley	Fine, montmorillonitic, mesic Typic Argiudolls	5	silty clay loam, 2 to 5% slopes
Pershing	Fine, montmorillonitic, mesic Udollic Ochraqualfs	3	silt loam, 2 to 5% slopes (where drained)
Rinda	Fine, montmorillonitic, mesic, sloping Mollic Ochraqualfs	3	—
Sperry	Fine, montmorillonitic, mesic Typic Argialbolls	5	silt loam, 0 to 1% slopes (where drained)
Taintor	Fine, montmorillonitic, mesic Typic Argiaquolls	5	silty clay loam, 0 to 1% slopes
Tuskeego	Fine, montmorillonitic, mesic Mollic Ochraqualfs	3	silt loam, 1 to 3% slopes (where drained)
Weller	Fine, montmorillonitic, mesic Aquic Hapludalfs	3	silt loam, 2 to 5% slopes

Source: Soil Conservation Service 1983

†Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year. T factor is used here to show the relative erosivity of IAAAP soils.

Appendix 4.8.1.1 Management Prescriptions and Implementation Portions of the Endangered Species Management Plan, Iowa Army Ammunition Plant, Iowa

Update/Revision Supplement to the Endangered Species Management Plan

Total Estimated Cost of Conservation Actions

The total estimated cost of conservation actions over the period 2007-2011 for the Endangered Species Management Plan is shown in Table 1. Table 2 provides a more detailed description of the time, costs, and personnel needed to implement each management prescription.

Table 1: Total Estimated Cost of Conservation Actions

Fiscal Year	Estimated Annual Cost
2007	$6,000
2008	$6,000
2009	$61,000
2010	$6,000
2011	$8,000
Total	$87,000

Table 2: Estimated Level of Effort and Cost by Management Prescription

Prescription Category	Annual Level of Effort Required	Cost	Frequency
Forest management	Part of the existing forest management program	N/A	N/A
Agricultural management	Part of the existing agricultural management program	N/A	N/A
Construction, demolition, and environmental remediation	Conduct Endangered Species Act Section 7 consultation for proposed construction, demolition, and environmental remediation activities. It is assumed that such consultation will be required once annually.	$1,000	Annual average (as required)
Training exercises	Prescriptions associated with training exercises are not expected to require additional level of effort.	N/A	N/A
Hunting and other outdoor recreation	Hunting and other outdoor recreation prescriptions are not expected to require additional level of effort beyond that associated with routine natural resources management activities.	N/A	N/A
Operating contractor activities	Additional level of effort will likely be required to conduct Endangered Species Act Section 7 consultation for tree removals by the operating contractor. It is assumed that such consultation will be required three times per year.	$2,000	Annual average (as required)
Test firing	Prescriptions associated with test firing are not expected to require additional level of effort.	N/A	N/A
Monitoring of Indiana bat and habitat	Conducting a biological survey once every 5 years will require additional level of effort and contractor costs. Long-term monitoring of summer habitat conditions is part of the habitat management program and is not expected to require additional level of effort.	$55,000 N/A	Once every 5 years. N/A
Implementation of awareness program	Additional level of effort will be required for activities associated with awareness, including reproducing and distributing a fact sheet, training supervisors and Plant managers, and participating in mandatory safety briefings.	$1,500	Annual
Communication with USFWS	Additional level of effort will be required for activities associated with the conduct of Endangered Species Act Section 7 consultation. It is assumed consultation will take place once annually.	$500	Annual

ESMP compliance and ESMP/EA review	Additional level of effort will be required for IAAAP's natural resources manager to complete the ESMP annual compliance checklist and minor updates to the ESMP/EA. Additional level of effort will be required to complete major revisions to the ESMP/EA.	$1,000 $2,000	Annual Once every 5 years (or as required)

5.0 MANAGEMENT PRESCRIPTIONS

This section discusses management prescriptions that will be implemented by IAAAP to meet the conservation goals set forth in Section 4.0. To facilitate implementation of these prescriptions, they are categorized according to general types of ongoing and future IAAAP activities that are most likely to impact the Indiana bat. If a new installation activity is initiated that may impact the Indiana bat, IAAAP will review and update the ESMP as necessary and will engage in ESA Section 7 consultation with the USFWS Region 3 Rock Island Field Office. In addition, other management prescriptions that are not directly related to an ongoing or future IAAAP activity will be implemented by IAAAP to meet the conservation goals set forth in Section 4.0.

5.1 MANAGEMENT PRESCRIPTIONS FOR IAAAP ACTIVITIES

In the interest of conserving existing Indiana bat summer foraging and roosting habitat, this section presents prescriptions for activities that take place at IAAAP that might impact the Indiana bat. These activities include forest management; agricultural management; construction, demolition, and environmental remediation; training exercises; hunting and other outdoor recreation; operating contractor activities; and test firing. For activities that IAAAP is considering undertaking, funding, permitting, or authorizing that are outside the scope of the prescriptions and have a potential impact on the Indiana bat at the installation, IAAAP will engage in necessary ESA Section 7 consultation with the USFWS Region 3 Rock Island Field Office.

5.1.1 Forest Management

Forest management practices will reflect USFWS Indiana bat guidelines for forest management and, if applicable, ESA Section 7 consultation. Based on the fact that the Indiana bat forages and the possibility that it roosts at IAAAP, forest management prescriptions and actions that will be implemented by the IAAAP natural resources manager to preserve summer habitat for the Indiana bat are described below.

1. Tree cutting will not occur at IAAAP during the Indiana bat maternity roosting season (April 1 through September 30) unless it is necessary to maintain forest health or safety conditions (for example, control of a disease or insect outbreak or removal of storm damage). Any tree cutting activities during the maternity roosting season or determined by IAAAP to have a potential impact on the Indiana bat will be coordinated with the USFWS Region 3 Rock Island Field Office and will undergo any necessary ESA Section 7 consultation in order to avoid and minimize impacts on the Indiana bat and on potential maternity roost trees. As part of ESA Section 7 consultation, a detailed

description of any trees to be removed (including the species, dbh, overall condition, bark condition, presence of cavities or crevices, and presence of dead limbs) along with an explanation of the need to remove the trees will be provided to the USFWS Region 3 Rock Island Field Office by the IAAAP natural resources manager. Based on this information, a determination will be made of whether the trees provide potential Indiana bat roosting habitat.

If it is determined that a tree provides potential bat roosting habitat, the tree will be monitored for the presence of bats prior to its removal. Tree removal will take place immediately after two consecutive nights of dusk counts in which no bats are observed. If tree removal is not practical immediately after the second dusk count, IAAAP will conduct a pre-dawn count using a bat detector on the next day to verify that bats are not roosting in the tree, and the tree will be removed on that day. If bats are present, the need for an incidental take permit will be evaluated.

2. Forest management will promote diversity of age and size classes with emphasis on retention of adequate stocks of large, mature and overmature trees in each stand. The range of acreage of stands at IAAAP is presented in the forest management section of the INRMP. As individual trees in the overmature age class die and become snags (trees with less than 10 percent live canopy), they will provide a continuing supply of potential maternity roost trees (defined as those listed in Table 1) for Indiana bats. Reforestation efforts will favor planting tree species native to regional ecological communities and Indiana bat roost tree species where practical.

   The following forest management prescriptions will be implemented to maintain a suitable component of habitat for the Indiana bat at IAAAP. Because of heterogeneity both within and between stands, not all the conditions noted are necessarily evenly distributed across the landscape or currently present in each stand. Therefore, attainment of habitat management goals will be evaluated on an average (per acre), standwide basis, and these goals will be attained through the life-cycle of forest management activities in each stand.

   - An average of at least one live, potential maternity roost tree per 5 acres with a dbh greater than 20 inches will be maintained in the stand.
   - An average of at least six live, potential maternity roost trees per 5 acres with a dbh greater than 9 inches will be maintained in the stand.
   - If the stand does not contain trees with a dbh larger than 20 inches, the two largest live, potential maternity roost trees per 5 acres with a dbh greater than 14 inches will be maintained in the stand.

3. Hickory trees, particularly shagbark hickory (*Carya ovata*) and shellbark hickory (*Carya laciniosa*), are recognized for their high value as potential maternity roost trees. Harvesting of these species may be allowed (1) to address density thresholds that would otherwise inhibit their reproduction and (2) in compliance with other forest management prescriptions described in the ESMP.

4. Canopy cover will equal or exceed 60 percent in each forest stand after forest management activities. The percentage of canopy cover will be evaluated on an average stand basis, not as continuous cover.

5. Snags will not be removed except where they pose a threat to safety or forest health (for example, a threat of disease or insect outbreak). In the event that snag removal is necessary during the Indiana bat maternity roosting season (April 1 through September 30), the removal will take place immediately after two consecutive nights of dusk counts in which no bats are observed. If snag removal is not practical immediately after the second dusk count, a pre-dawn count using a bat detector will be performed on the next day to verify that bats are not roosting in the snag, and the snag will be removed on that day. If bats are present, IAAAP will engage in ESA Section 7 consultation with the USFWS Region 3 Rock Island Field Office to evaluate the need for an incidental take permit. Where practical, snags will be retained in groups with live trees to prevent wind-throw.

6. Tree cutting within 100 feet on both sides of perennial streams and within 50 feet on both sides of intermittent streams will be limited to activities that maintain or improve the quality of Indiana bat habitat and that are in accordance with other forest management prescriptions described in the ESMP.

7. If active maternity roost trees are identified at IAAAP, they will be protected until they no longer serve as maternity roosts (for example, because of loss of exfoliating bark or cavities, blow-down, or decay).

8. Only U.S. Environmental Protection Agency (EPA)-approved pesticides will be used, and their application will be avoided in forested areas during the maternity roosting season (April 1 through September 30). IAAAP will engage in ESA Section 7 consultation with the USFWS Region 3 Rock Island Field Office if pesticide application in forested areas is determined to be necessary during this period and will have a potential impact on the Indiana bat.

9. Prescribed burning of woodlands will not occur during the Indiana bat maternity roosting season (April 1 through September 30).

5.1.2 Agricultural Management

Agriculture is the major commercial land use at IAAAP. The area used for explosive buffers is leased for cattle grazing, hay baling, and row cropping. IAAAP issues agricultural leases on 5-year terms. It currently has 11 cattle grazing or hay production leases and 47 row crop leases under which lessees have the option to use the area for either grazing or hay cutting and baling. The primary Indiana bat management concern related to agricultural management is the potential impact of pesticides on the bat's prey resources at IAAAP.

To minimize the impact of pesticides on the Indiana bat's prey resources, IAAAP will continue legally acceptable and scientifically based pesticide applications in support of agricultural operations on the installation. However, to enhance integrated pest management and reduce the need for pesticide use, all agricultural crop leases will institute rotation periods, which diminish the opportunity for pest populations to become established. Other agricultural management practices that offer the opportunity to reduce insect and weed pests will be continually reviewed. The IAAAP natural resources manager and the USACE Omaha District will inspect lessee activities for compliance with lease agreements on an annual basis.

Only pesticides approved by EPA will be used at the installation, and the method and rate of each such chemical's application will be consistent with provisions presented on the container label. In addition to the leasing protocols discussed above, the management prescriptions presented below will be implemented to minimize the impact of pesticides on the Indiana bat.

1. Pesticides will be applied only after use of other integrated pest management techniques has been considered and only when the potential for economic loss from crop damage is evident. This management prescription does not preclude use of pre-emergent pesticides.

2. Consideration will be given to rotation of pesticide classes from application to application in order to reduce pest resistance.

3. Precision farming using variable-rate technology will be employed whenever possible to adjust the percentage of active pesticide ingredient used based on the soil type or the location of pests in a field.

4. Pesticides will be applied in accordance with container label provisions as required by federal law.

5. Pesticide application will be limited to the period between 30 minutes after sunrise and 30 minutes before sunset.

6. Pesticide application in gusty winds or when the wind speed exceeds 10 miles per hour will be avoided.

These agricultural management prescriptions will be included in agricultural lease agreements, tract management plans, and land use regulations. Compliance with these prescriptions will be monitored by the USACE Omaha District during its annual inspections.

Aerial application of pesticides currently does not occur at IAAAP. In accordance with the pest management plan for the installation, the pest management coordinator at IAAAP will prepare an aerial validation plan if aerial pesticide application is deemed necessary (IAAAP 1998). Any aerial validation plan will be developed in cooperation with the USFWS Region 3 Rock Island Field Office as part of ESA Section 7 consultation.

5.1.3 Construction, Demolition, and Environmental Remediation

IAAAP will engage in ESA Section 7 consultation with the USFWS Region 3 Rock Island Field Office for all major construction, demolition, and environmental remediation activities that may impact the Indiana bat, especially those planned for forested areas that are suitable Indiana bat foraging or roosting habitat. Such activities include but are not limited to construction and demolition of dams, buildings, pipelines, and roads; water resource development; and remediation of areas that may pose risk to the environment or human health. Regarding environmental remediation, IAAAP is currently evaluating potential impacts on the Indiana bat associated with installation contamination as part of an ongoing ecological risk assessment. The USFWS Region 3 Rock Island Field Office has been and will continue to be an active participant in the development and review of the risk assessment. IAAAP will determine the need for ESA Section 7 consultation with regard to construction, demolition, and environmental remediation activities.

5.1.4 Training Exercises

IAAAP is not used intensively for training exercises. Routine training exercises conducted at IAAAP include internal 38-caliber revolver and shotgun refresher training at the small arms range (see Figure 1) for about 30 security guards employed by the installation. The refresher training is conducted twice per year. IAAAP security guards also conduct various emergency response training exercises, primarily in nonforested areas along patrol roads. These exercises are not likely to impact the Indiana bat.

The installation also permits local National Guard and U.S. Army Reserve units to periodically conduct land navigation, vehicle maneuvering, and road maintenance exercises outside the quantity distance arcs in the southeastern corner of the installation. U.S. Army Reserve training exercises also include 22-caliber rifle refresher training at the small arms range once per year. These exercises are not likely to impact the Indiana bat.

The IAAAP natural resources manager will determine whether training exercises are becoming more intensive at IAAAP and will engage in necessary ESA Section 7 consultation with the USFWS Region 3 Rock Island Field Office regarding any training exercises that are likely to impact the Indiana bat.

5.1.5 Hunting and Other Outdoor Recreation

Hunting of upland game birds, turkey, deer, rabbits, squirrels, crow, pigeon, raccoon, opossum, fox, and coyote is allowed on IAAAP property. The approximate hunting seasons at the installation are presented in Figure 5. As shown in this figure, the hunting seasons for turkey (spring season), squirrel, rabbit, and youth and disabled deer overlap with the maternity roosting season (April 1 through September 30) for the Indiana bat. The hunting season for each of these animals is provided below.

- Spring turkey hunting season begins on the Monday closest to April 13 and ends in mid-May.
- Youth and disabled deer hunting season begins the third Saturday in September and runs through the first Sunday in October.
- Rabbit hunting season occurs from the first Saturday in September through the end of February.
- Squirrel hunting season begins on the first Saturday in September and runs through the end of January.
- Coyote hunting season is continuous year round.

Hunting activities at the installation will be conducted in accordance with state law. The IAAAP natural resources manager will strictly enforce the hunting seasons at the installation. Therefore, hunting activities at IAAAP are not likely to impact the Indiana bat.

Other outdoor recreation activities at IAAAP include trapping, fishing, and boating, which should not have an impact on the Indiana bat. However, under the awareness program described in Section 5.2.2, individuals who engage in these activities or in hunting will be advised to minimize disturbances to woodlots that comprise Indiana bat summer foraging and maternity roosting habitat at IAAAP.

FIGURE 5

IAAAP HUNTING SEASONS IN RELATION TO THE MATERNITY ROOSTING SEASON OF THE INDIANA BAT

Note:
[a] This represents the Indiana bat maternity roosting season as defined by USFWS (Tetra Tech 1999d).

5.1.6 Operating Contractor Activities

Operating contractor activities at IAAAP include loading, assembly, and packing of a full range of munitions and high-explosive components; demilitarization services such as explosive projectile disassembly and decontamination; ammunition research and development; and operation of the 500-acre test firing site that supports development of warheads and ammunition (see Section 5.1.7). Daily production activities take place inside buildings located within large, unforested, fenced production yards (see Figure 1). Air and water emissions associated with daily production activities are monitored in accordance with EPA permit requirements. The operating contractor is also responsible for maintenance of utility corridors, roadways, walkways, buildings, and railways on the installation; these areas are not considered to be parts of the forested areas that are managed under the prescriptions discussed in Section 5.1.1. Operating contractor maintenance activities typically include control and removal of brush and trees with a dbh of less than 9 inches and trimming or pruning of larger trees. These activities are not likely to impact the Indiana bat.

Maintenance activities performed by the operating contractor also include removal of trees with a dbh greater than 9 inches during the maternity roosting season (April 1 through September 30). These activities may have an impact on the Indiana bat. In the rare instance when such a tree poses an immediate safety risk because of its condition, location, and potential impact on property and human life, the tree will undergo emergency removal upon its discovery. If emergency removal of a tree with a dbh greater than 9 inches is necessary during the maternity roosting season, the operating contractor will notify the USFWS Region 3 Rock Island Field Office within 5 working days of the tree's removal and will engage in necessary ESA Section 7 consultation.

A tree that has a dbh greater than 9 inches provides potential roosting habitat, and does not pose an immediate safety risk will be monitored for the presence of bats prior to its removal during the Indiana bat maternity roosting season. Tree removal will take place immediately after two consecutive nights of dusk counts in which no Indiana bats are observed. If tree removal is not practical immediately after the second dusk count, IAAAP will conduct a pre-dawn count using a bat detector on the next day to verify that bats are not roosting in the tree, and the tree will be removed on that day. If bats are present, the need for an incidental take permit will be evaluated.

For activities performed by the operating contractor that may impact the Indiana bat, the operating contractor will engage in necessary ESA Section 7 consultation with the USFWS Region 3 Rock Island Field Office. All such consultation will be documented and coordinated with the IAAAP natural resources manager, who will receive a copy of any ESA Section 7 consultation correspondence between the operating contractor and the USFWS Region 3 Rock Island Field Office.

5.1.7 Test Firing

As stated in Section 2.1, IAAAP's military mission includes development of warheads and large-caliber blank ammunition rounds. To support this mission, IAAAP uses a 500-acre test fire area to perform static testing of warheads and to test fire blank ammunition rounds at fixed targets. As discussed below, these activities are not likely to impact the echolocation and auditory functions of the Indiana bat.

Regarding bat echolocation, all test firing activities are performed within the test fire area (see Figure 1) during daylight hours. Because the Indiana bat forages at night, test firing activities will not likely impact the bat's echolocation functions.

Biological assessments (BA) conducted at Fort Leonard Wood in Missouri (3D/International, Inc. 1996) and at Camp Atterbury in Indiana (Montgomery Watson and 3D/International, Inc., Environmental Group 1998) support the conclusion that test firing activities at IAAAP will not likely impact the auditory functions of the Indiana bat. The BAs were conducted at Fort Leonard Wood and Camp Atterbury to determine the impact on the Indiana bat of sounds and vibrations generated from military mission activities, which included firing of munitions similar to those test fired at IAAAP. The findings of the BAs indicated that mission activities at the two installations were not likely to generate sound frequencies within the peak auditory sensitivity range of the Indiana bat. Thus, there was a low probability that Indiana bats at the two installations would be exposed to sounds that could cause auditory damage. Also, it was determined that the intensity and duration of sounds generated by mission activities would not cause Indiana bats to permanently abandon suitable roosting or foraging habitat at the two installations.

The sound produced by detonation of the 40-pound (lb) explosive evaluated in the Camp Atterbury BA measured 193.3 decibels (dB) 100 feet from the source, whereas IAAAP's predicted sound level for a 40-lb explosive was 123.8 to 141.4 dB 3,250 feet from the source (American Ordinance 1998). The initial test firing of the 40-lb explosive was performed at IAAAP in 1993, and it was test fired in the

following years at the monthly rates indicated: 1994 (10 rounds), 1995 (10 rounds), 1996 (10 rounds), 1997 (3 rounds), and 1998 (3 rounds). Production of the 40-lb explosive stopped in 1998, and no additional test firings of this explosive have been performed since. The largest explosive currently produced and tested at IAAAP is the Hellfire II. The Hellfire II weighs significantly less (13.6 lb) than the 40-lb explosive and is test fired at a rate of 8 rounds per month. Collectively, annual test firings of all munitions planned for the test fire area at IAAAP in 2000 and beyond will be fewer than any year since 1995 (American Ordnance 1998).

The USFWS biological opinion (BO) for the Camp Atterbury BA concluded that the installation's mission activities did not appear to startle or frighten Indiana bats or cause them to flee the area and that Indiana bats were still active and roosting on the installation. For these reasons, USFWS concluded that mission activities were not likely to adversely affect the Indiana bat (USFWS 1998b).

Although the Indiana bat has not been shown to roost at IAAAP, the Indiana bat and other bats are active on the installation. As discussed in Section 3.7, Tetra Tech conducted a biological survey for Indiana bats at the installation in June 1998. As part of this survey, Tetra Tech mist netted the three major watersheds that drain IAAAP (Spring Creek, Brush Creek, and Long Creek) and the unnamed creek in the southwestern portion of the installation. Of the 16 bats captured during the survey, which included 2 Indiana bats, 7 red bats (*Lasiurus borealis*), 4 big brown bats (*Eptesicus fuscus*), 1 northern Myotis bat (*Myotis septentrionalis*), 1 little brown bat (*Myotis lucifugus*), and 1 hoary bat (*Lasiurus cineveus*), at least 2 bats were captured in the area of each major watershed and the unnamed creek. These 16 bats included seven of the nine bat species with seasonal ranges that extend into Iowa (Tetra Tech 1998)

In summary, test firing activities likely do not impact the Indiana bat at IAAAP because (1) the test firing activities occur during daylight hours, (2) the largest munition currently being test fired at IAAAP (Hellfire II) is smaller than those at other installations whose test firings are not believed to adversely affect Indiana bats, and (3) a wide variety of bats, including the Indiana bat, are active at IAAAP.

IAAAP will determine whether test firing activities are becoming more intensive at the installation and will engage in necessary ESA Section 7 consultation with the USFWS Region 3 Rock Island Field Office regarding any test firing activities that are likely to impact the Indiana bat.

5.2 OTHER MANAGEMENT PRESCRIPTIONS

This section describes other management prescriptions that will be implemented by IAAAP to protect the Indiana bat. These prescriptions, which are not directly related to ongoing or future IAAAP activities, include monitoring the Indiana bat and its habitat, implementing an awareness program, and communicating with USFWS.

5.2.1 Monitoring of Indiana Bat and Habitat

The Indiana bat and its summer habitat will be monitored at IAAAP. Monitoring activities will include biological surveys to identify Indiana bat maternity roosts at IAAAP and long-term monitoring of potential maternity roost trees.

A biological survey that includes mist netting will be conducted at least once every 5 years to monitor Indiana bat activity at IAAAP. At a minimum, the following information will be consistently recorded for each bat captured:

- Species
- Capture location
- Time of capture
- Gender
- Age class
- Reproductive condition (lactating or pregnant)
- Weight
- Flight direction
- Location of maternity roost site (if known)

Each biological survey will be conducted in accordance with USFWS mist-netting guidelines and may include use of radiotelemetry.

Long-term monitoring of summer habitat conditions for the Indiana bat at IAAAP will be accomplished through collection of information on stocking levels of potential maternity roost trees and snag density in relation to the forest management prescriptions specified in Section 5.1.1. Such an inventory will be conducted at least once every 10 years as part of scheduled forest surveys.

As part of forest surveys at IAAAP, information will be collected on snags with a dbh that is characteristic of primary and alternate maternity roost trees as discussed in Section 3.3 (9 inches dbh or greater, depending on the size class used during the surveys). The number of snags per acre will also be recorded. When analyzed in conjunction with data from biological surveys, long-term monitoring information will permit IAAAP to evaluate the effectiveness of the ESMP in meeting Indiana bat recovery goals. Although compliance with the ESMP will contribute to the success of the Indiana bat population at IAAAP as well as the overall recovery of the species, certain negative impacts may occur that are beyond the control of the installation. For example, harm to the bat population may occur at the hibernacula, during spring or fall migration, or at the installation as a result of activities on surrounding properties.

5.2.2 Implementation of Awareness Program

IAAAP will provide a fact sheet (see Appendix E) to promote awareness of the presence and status of the Indiana bat at the installation as well as the regulatory requirements driving its protection. The IAAAP natural resources manager will be responsible for distributing the fact sheet to IAAAP employees, agricultural lessees, hunters, and other individuals whose activities may impact Indiana bat foraging areas or potential maternity roost sites at the installation. The IAAAP natural resources manager will meet with installation supervisors and plant managers to discuss the fact sheet and to request that they disseminate information on the Indiana bat to their staff as appropriate. The IAAAP natural resources manager will also disseminate information on the Indiana bat through (1) mandatory safety briefings attended by installation employees at least once per year and (2) a safety video viewed by hunters at IAAAP before each hunting season.

5.2.3 Communication with USFWS

The IAAAP natural resources manager will update USFWS on the status of the Indiana bat at the installation by reporting the findings of species and habitat monitoring activities to the USFWS Region 3 Rock Island Field Office. As discussed in Section 5.1, IAAAP will also engage in ESA Section 7 consultation with the USFWS Region 3 Rock Island Field Office when necessary. IAAAP personnel will also continue to coordinate with USFWS the development and review of the installation's ecological risk assessment as discussed in Section 5.1.3.

6.0 ESMP IMPLEMENTATION

This section describes how IAAAP will implement the ESMP. Specifically, this section describes the process of complying with the ESMP; discusses the time, costs, and personnel needed to implement the ESMP; and describes the review process for the ESMP/EA.

6.1 ESMP COMPLIANCE

To evaluate IAAAP compliance with the ESMP and the effectiveness of the ESMP itself, the IAAAP natural resources manager will complete an annual compliance checklist. This checklist addresses the management prescriptions presented in Section 5.0. The checklist, which is presented in Appendix C, is the primary tool used in assessing installation compliance with the ESMP.

The IAAAP natural resources manager will be responsible for completing the checklist during the fourth quarter of each calendar year. The IAAAP commanding officer will then approve and sign the ESMP compliance checklist and forward it to the AMC Installations and Services Activity by December 31.

If the completed ESMP compliance checklist shows that IAAAP is not in full compliance with the ESMP or that the ESMP is not effective in meeting installation conservation goals, IAAAP will identify the deficiencies and develop recommendations for resolving them.

6.2 ESMP/EA REVIEW

The IAAAP natural resources manager will review the ESMP/EA annually and will update and revise it as necessary to meet conservation goals. This review will be conducted concurrently with preparation of the ESMP compliance checklist (see Appendix C).

The ESMP/EA will be subject to major revision every 5 years in conjunction with major revision of the INRMP. If significant information becomes available during the 5-year period, the ESMP/EA will be rewritten; otherwise, it will be revised as part of the annual updating process. As discussed in Section 3.6, USFWS is currently revising its recovery plan for the Indiana bat. The ESMP/EA will also be revised as appropriate upon issuance of the new Indiana bat recovery plan.

6.3 TIME, COSTS, AND PERSONNEL

Table 2 provides estimates of the time, costs, and personnel needed to implement the management prescriptions described in Section 5.0. The IAAAP commanding officer is responsible for ensuring that adequate professional personnel and funds are provided to implement the management prescriptions. The estimated overall cost of conservation actions over the first 5 years of the ESMP is presented in Table 3.

Appendix 4.10.1 Land Use Regulations and Example Grazing Lease and Row Crop Lease, Iowa Army Ammunition Plant, Iowa

2006 AGRICULTURAL LAND USE REGULATIONS AND SPECIAL CONDITIONS
IOWA ARMY AMMUNITION PLANT (IAAAP), MIDDLETOWN, IOWA

1. The lessee agrees to conduct all farming and grazing operations in accordance with the Land Use Regulations and Special Conditions set forth herein, and in accordance with the General Land Use Directives and the Tract Management Plan, made a part hereof. However, the crop rotation plan may be modified by the IAAAP Management Agronomist, upon written application from the lessee, in the event of crop failure, unseasonable crop years, or other unusual circumstances warranting such modifications.

2. A Tract Management Plan has been prepared for each tract. The plan is to be followed and is made a part of the lease contract.

3. **VERBAL AGREEMENTS WILL NOT BE HONORED.** Any change in the Tract Management Plan, i.e., crop changes, maintenance requirements, etc., must be approved in writing by the Omaha District, Corps of Engineers, Real Estate Division, 106 South 15th Street, Omaha, Nebraska 68102. Any such agreement will be reduced to writing in the form of a "supplemental agreement" to the lease or a letter from the Contracting Officer.

4. Lease operations are to be carried on within the limits of the Army Ammunition Plant area. The use and occupation of the premises leased shall be subject to the general supervision and approval of the officer having immediate jurisdiction over the property and such rules and regulations regarding ingress, egress, safety, sanitation, and security as may be prescribed by the officer.

5. The government will maintain any existing utilities or facilities that are on or adjacent to the tract and necessary for its use. The lessee will permit entry and performance of inspection or maintenance as required.

6. The lessee will plant a **crop rotation** as specified in the tract management Plan. To change the crop rotation the lessee will submit a written request for approval to the IAAAP Management Agronomist. The IAAAP Agronomist may grant changes due to adverse environmental factors that prevent planting the scheduled crop or to reduce the impact of a major pest infestation. All leased land will be planted prior to July 1st each year. For all row crop leases with less than a five year term the existing crop rotation must be adhered to.

7. On grazing leases the lessee is responsible for **maintaining all fences** in the tract cattle tight except for the chain link fence. An annual inspection by the lessee of grazing tracts is required, prior to the turning in of livestock. The lessee

before turning in the livestock will repair all required fences not in sufficient condition to contain or repel cattle. Any chain link fencing found not in sufficient condition to contain or repel cattle shall be reported to Guard headquarters upon discovery.

8. The lessee will request permission to place structures on any tract. The **location of structures** will not interfere with plant operations or be within thirty (30) feet of a chain link fence.

The lessee will supply all equipment needed **to water the cattle.** The Government does not guarantee the quality or quantity of water. The **grazing season** is from the first Saturday in May to the first Sunday in November each year. Gates will not be opened to give cattle access to ponds that are fenced. The lessee at the request of the installation Management Agronomist will gather all the cattle on the lease for counting. Should the number of animal units on the lease be more than allowed in the lease tract management plan the lessee will remove the **extra units** within two days and the grazing period on the lease shortened for that year using the following formula. The number of extra units times 2 equals the number of days to shorten the grazing period.

An **animal unit** is one bull or a cow/calf. Feeder calves and bred heifers are three quarters of an animal unit.

9. The lessee will remove or lime **dead cattle** as soon as discovered. Cattle will not be buried on the installation. The lessee may be notified of livestock problems via collect telephone call.

10. Only Environmental Protection Agency approved pesticides will be allowed. EPA approved **pesticides** may be banned from use on Government property during the lease period. Should the EPA ban the production of a pesticide but not its use. The use of that pesticide on the installation will be prohibited. The lessee shall report, in writing by the 15th of September all chemicals applied during the year. The lessee shall assume full responsibility for applications of pesticides. Damage resulting from the use of pesticides by the lessee, either to the leased premises, adjacent property, and/or life shall be a lessee responsibility. Care will constantly be exercised in the mixing and usage of agricultural chemicals. Empty containers and excess material will be removed daily from the Installation.

Pesticides with a high potential of carryover will not be used the last year of the lease.

Pesticides will only be applied from a half-hour after sunrise to a half-hour prior to sunset.

Pesticides will not be applied when wind the speed exceeds 10 miles per hour.

The aerial application of any pesticide is prohibited.

11. In the case of any **chemical spill,** call Guard Headquarters immediately at (319) 753-7414 or 7912. The lessee will incur the cost of cleaning up the spill and any regulatory fines associated with the spill.

12. The leased tracts are subject to concurrent use for **recreational purposes,** including hunting, trapping and fishing, by such persons accorded the privilege by appropriate regulations established by the Installation Commander.

13. Lessee and employees, visitors, or other personnel will comply with all Installation **safety and security regulations** and will be required to clear through the Installation security office prior to being permitted access to the Installation.

14. The lessee will not be allowed to enter any hazardous or explosive plant areas with vehicles equipped with catalytic converters. **Converter equipped vehicles** shall not be driven over or parked on a surface of easily combustible material such as straw, stalks, or dry grass.

15. It is understood and agreed that the Government is not responsible for and will not reimburse the lessee for any **crop damage** sustained due to wildlife or maintenance activities.

16. **REDUCED TILLAGE:** After planting no less than 15% of the ground will be covered by residue, except for the following reasons with Management Agronomist approval: planting small grains or hay, grass waterway work, erosion repair, field tile and terrace work, testing of archeological sites and/or crop failure.

17. **CONSERVATION TILLAGE:** After planting no less than 25% of the ground will be covered by residue, except for the following reasons with Management Agronomist approval: planting small grains or hay, grass waterway work, erosion repair, field tile and terrace work, testing of archeological sites and/or crop failure.

18. **MINIUMUM TILLAGE:** After planting no less than 35% of the ground will be covered by residue, except for the following reasons with Management Agronomist approval: planting small grains, grass waterway work, erosion repair, field tile and terrace work, testing of archeological sites and/or crop failure.

19. **No fall tillage of soybean stubble** or any tillage deeper than 8" will be allowed without the written approval from the Management Agronomist.

20. If the lessee fails to **control noxious weeds** within the lease area, the Government at it's option, may have the noxious weeds controlled and the lessee shall immediately reimburse the Government for it's incurred costs to control said noxious weeds.

21. The Lessee will be responsible for **roadside mowing** within a fenced Storage (Igloo) Yard. The Lessee will be responsible for **roadside mowing** once (1) each year as follows: along the roadside from the edge of the roadway back fifteen (15) feet into the ditch on all roads that are inside the fenced area before the 15th of July each season. The lessee will be responsible for costs to repair **damaged signs and posts** caused by lessee activities. All tractors actively involved in mowing activities will be equipped with rollover protection.

Grazing leases will be mowed every third year of the lease period.

22. The application of **Anhydrous Ammonia** is only permitted during the months of March, April and May. The lessee will not apply more than 150 units of N per acre.

23. Idle fields will be mowed prior to the 15th of June each season.

24. The Government will mow for the lessee if the lessee does not accomplish the **mowing requirements** in the lease. The present charge for mowing is about $50.00 per acre. This is not a fixed price and the price can change at anytime without notify the lessee prior to mowing. The lessee shall immediately reimburse the Government for its incurred costs.

25. The Government plans to take soil tests, apply **lime and fertilizer** as needed starting in the fall of 2005 with the exception of nitrogen. The lessee will apply nitrogen per the recommendations in the soil test results. The lessee will not apply more than 150 units of N per acre. Soil test and fertilizer data is public information.

26. The lessee will control **noxious weeds**.

27. **Tile systems** with broken or missing tile intakes will be replaced and protected with two 6-8" diameter 7' long wooden (hedge) posts placed on opposing sides of the intake.

28. All new and/or existing **grass waterways** will not be sprayed with pesticides that could damage or kill the grass. All grass waterways will be left in sod if fields are cultivated. At the request of the Management Agronomist, waterways will be created, removed, reseeded, mowed or changed as deemed necessary. Grass waterways will be maintained at least five (5) yards wide at the inlet and ten (10) yards wide at the outlet.

29. The Lessee will not **destroy native prairie or shelterbelt plantings.** If these plantings are damaged or destroyed the Lessee will be required to reestablish the planting at no cost to the Government. The lessee will control noxious weeds in the shelterbelt plantings that may border this tract.

30. No crops will be grown or tillage done within 3 (three) feet of the top of a back slope of any ditch.

31. All **hay bales** will be removed from the installation annually.

32. All crops will be mechanically harvested.

33. Reference is made to Sketch NO. 067061-16, **"Road Intersection - R.R. Grade Crossing Sight Requirements"**, which is included as part of this regulation. The lessee will take whatever measures are necessary to maintain acceptable sight distance requirements at intersections.

34. **Grazing** is prohibited on tracts numbered under 100.

TRACT 136

336 ACRES 324 GRAZING/HAY ACRES

CROPPING PLAN AND SCHEDULE OF PRACTICES

TERM

10 Years - 1 March 2005 to 28 February 2015

MILITARY USE

The government will maintain any existing utilities or facilities that are on or adjacent to the tract and necessary for its use. The lessee will permit entry and performance of inspection or maintenance as required.

ARCHEOLOGICAL SURVEY

No cultural resources sites are known to be within this agricultural tract.

TILLAGE SYSTEM OPTIONS

This tract will not be tilled at any time during the lease period, without permission from the installation Management Agronomist.

CROP ROTATION

All crops will be permanent hay.

TYPE OF LIVESTOCK

Cattle only.

CARRYING CAPACITY

The carrying capacity of this tract is the number of cattle that will be allowed to graze. The carrying capacity of this tract is 80 animal units.

WATER SUPPLY

Two fenced ponds are located on this tract. Cattle will not have access to the ponds. Lessee must supply all watering equipment.

LAND CAPABILITY CLASSIFICATION

Class I: soils have slight limitations that restrict their use.

Class II: soils have moderate limitations that reduce planting options or require soil conservation practices.

Class III: soils have severe limitations that reduce planting options or require soil conservation practices, or both.

Class IV: soils have very severe limitations that reduce planting options or require a high amount of management, or both.

Class VI: soils have very severe limitations that maker them generally unsuitable for cultivation.

Subclasses are small letters added to the Class numbers to show the soils main limitation. The Subclass designations are e for erosion and w for wetness.

CLASSES	ACRES
I	39
IIe	77
IIw	164
IIIe	34
IIIw	7
IVe	3
VIe	0

TRACT 30

131 TOTAL ACRES: 126 ROW CROP, 5 HAY & 0 PRAIRIE

CROPPING PLAN AND PROJECTS

TERM

5 Years - 1 March 2006 to 28 February 2011

LAND USE REGULATION

The Land Use Regulation contains requirements that the lessee must comply with. Please read and understand this regulation prior to bidding on this tract.

ARCHEOLOGICAL SITES

Two cultural resource sites 13DM541 and 13DM393 are within the tillable portion of this agricultural tract.

TILLAGE SYSTEM

1. All fields will be planted to meet the requirements of Conservation Tillage (25% residue after planting) in the Land Use Regulation.

CROPS

1. Crop rotation will be corn-soybean-corn-soybean-corn.

2. All fields will be continuously cropped.

3. 5 acres of the North and East edges of field A will be continuously hayed. The hay will be mixed grasses and legumes or alfalfa. Oats may be used as a nurse crop.

4. All fields may be planted to hay.

5. Small grains may be planted in the place of corn in the rotation.

PROJECTS

The lessee will repair/replace the tile systems of this tract by March 1, 2007. This project will be a rental abatement project. The cost will not exceed the amount one year's rental payment.

LAND CAPABILITY CLASSIFICATION

Class I: soils have slight limitations that restrict their use.

Class II: soils have moderate limitations that reduce planting options or require soil conservation practices.

Class III: soils have severe limitations that reduce planting options or require soil conservation practices, or both.

Class IV: soils have very severe limitations that reduce planting options or require a high amount of management, or both.

Subclasses are small letters added to the Class numbers to show the soils main limitation. The Subclass designations are e for erosion and w for wetness.

CLASSES	ACRES
I	59
IIe	6
IIw	61
IIIe	5
IIIw	0
IVe	0
IVw	0

Appendix 4.13.1.1 Integrated Wildland Fire Management Plan, Iowa Army Ammunition Plant, Iowa

This Iowa Army Ammunition Plant (IAAAP) Integrated Wildland Fire Management Plan uses guidance and format presented in the Army Integrated Wildland Fire Management Plan Template, with exceptions as needed for IAAAP conditions. It is intended to be an integral part of the Integrated Natural Resources Management Plan. This Integrated Wildland Fire Management Plan has been integrated with other environmental plans, particularly the Integrated Cultural Resources Management Plan.

1. Goals and Objectives

Goal. Provide wildland fire suppression support that prevents wildland fires from escaping IAAAP, minimizes damage to the environment, and ensures no threat to human life.

Objective 1. Provide a system that ensures timely notification of wildfires. Educating military personnel and civilians on prompt notification and proper information of wildfires is critical.

Objective 2. Use fire regulations to prevent wildfires from occurring.

Objective 3. Maintain fuel loads at levels appropriate for the prevention of major wildfires. Prescribed burns are conducted on some areas of IAAAP, primarily prairies areas. Regular burning promotes the native ecosystem, enhances prairies, and controls fuels in heavily vegetated areas resulting in lower intensity wildfires.

Objective 4. Comply with smoke management and air quality requirements regarding wildland fires.

Objective 5. Cooperate with IAAAP and other agencies for wildland fire management.

Objective 6. Provide for firefighter and public safety with regard to wildland fire management.

Objective 7. Use wildland fire management to support the military mission on IAAAP.

Objective 8. Ensure wildland fire management is consistent with objectives of natural and cultural resources management and their compliance requirements on IAAAP.

Objective 9. Identify funding requirements for implementation of this Integrated Wildland Fire Management Plan.

2. Organizational Structure and Responsibilities

The IAAAP Fire Department is responsible for fire protection and suppression on the Plant. The Natural Resources Manager is responsible for planning prescribed burns and supports the Fire Department as necessary with regard to annual prescribed burns and wildfires on IAAAP.

Ammunition production and storage facilities on IAAAP provide additional challenges to wildfire suppression and prescribed burning. Fire Department personnel respond to wildfires; if assistance is required, the Natural Resources Manager may be contacted.

If the Natural Resources Manager happens to be the first to arrive on the scene of a wildfire, he will serve as Incident Commander on that fire until superseded by a more qualified individual. The Incident

Commander communicates to the appropriate organization the precise location and intensity of the fire and whether additional equipment and personnel are needed. Decisions on suppression techniques will be made by the Incident Commander.

3. Interagency Cooperation and Mutual Aid Agreements
IAAAP has established mutual aid agreements with Burlington, West Burlington, and Danville Fire Departments.

4. Smoke Management and Air Quality
Smoke management and air quality are integral parts of each prescribed burn and the annual Prescribed Burn Plan prepared by IAAAP. The Prescribed Burn Plan includes site specific characteristics to be considered for prescribed burning.

5. Safety and Emergency Operations
The on-site Incident Commander will ensure all safety precautions are taken. Except in the event of a threat to human life, no wildfire situation will require placing a firefighter or equipment in extreme danger. All efforts are to be made that military and civilian personnel are not in any danger from the wildfire. Firefighters must wear all necessary protective equipment.

Prescribed burning will not be done in ammunition storage areas (igloo areas) unless igloos are empty, or experimental burns on igloos indicate the potential danger of such action is minimal, and the appropriate authorization is acquired. Creeks, firebreaks, and roads will be used to contain wildfires and prescribed burns. Backfires will also be used to prevent wildfires from escaping and for prescribed burns.

6. Risk Assessment Decision Analysis Processes
The Fire Chief will review the Fire Weather issued by the National Weather Service. Prescribed burning normally will not be conducted under any one of these circumstances:

- a wind speed outside of the 5-10 miles per hour range,
- a relative humidity outside of the 25-45% range,
- a fuel moisture outside of the 8-12% range,
- an atmosphere with eminent storm fronts, and
- inadequate personnel or equipment available to manage the prescribed burn.

However, the Fire Chief may decide to perform prescribed burning operations outside of the above stated parameters based on the location of the planned burn, conditions of the area to be burned, conditions of the surrounding areas, desired results, etc. Natural Resources concurrence must be obtained regarding such decisions.

7. Wildland Fire History
The IAAAP Natural Resources Manager maintains a file of wildland fire incidents and prescribed fires on the Plant.

8. Natural and Cultural Resource Considerations
Areas with potential cultural resources and natural resources sensitive areas are known and protected. Personnel will avoid these areas when maintaining and constructing firebreaks or any other soil-disturbing activities. Prescribed burning that may affect potential Indiana bat (*Myotis sodalis*) summer habitat is restricted to the period outside the summer maternity dates of April 15 - September 15.

Regular prescribed burning benefits the prairie ecosystem by removing midstory, allowing native vegetation to proliferate. It also controls invasive species, such as eastern red cedar.

9. Mission Considerations
IAAAP provides facilities for the production and storage of ammunition and a range of military training opportunities. Downtime for production, storage operations, or training from wildfires is not desirable. This plan provides for timely wildfire response with minimal impact to these activities. The prescribed burn program allows for good vegetation management, invasive species control, and less intense wildfires.

10. Wildland Fuel Factors
IAAAP's prescribed burn cycle minimizes the excessive build-up of fuel loads. Areas with high fuel loadings should be burned on a regular cycle, perhaps even annually, depending on such factors as location of the burn, conditions of the area to be burned, conditions of areas surrounding the planned burn, desired results, etc. About 50 acres are prescribe burned annually.

11. Monitoring Requirements
Each wildfire and prescribed burn produces a different set of monitoring requirements. Several factors affect monitoring required, such as size, location, weather, mission operations, safety, fire behavior, and resources available. Fires are evaluated by the Natural Resources Manager. Evaluations are used to determine the extent of damage to resources in the case of wildfire. Prescribed burns are evaluated to determine if objectives were attained and to ensure desired results in future burns.

12. Public Relations
Interaction with the public is performed by the Public Affairs Officer or the Fire Chief. If a wildfire situation requires public notification, the information will be forwarded to the Commander. The Commander will be informed of all wildfires. Information will be made available for persons working on the Plant through *The Eye*, an installation-based newspaper.

13. Funding Requirements
Funding for wildfire suppression and for prescribed burns will be directly supported by the Plant through the operating contractor and through Agricultural Reimbursable Account funds for vegetation management-related prescribed burns.

14. Personnel Training and Certification Standards and Records
Records of training and experience for IAAAP Natural Resources personnel will be maintained by the Natural Resources Manager. Records of training and experience for IAAAP Fire Department personnel will be maintained by the Fire Department. Records will be periodically reviewed to ensure personnel are current in all aspects of training requirements.

15. Physical Fitness Standards
The physical fitness standards for prescribed burning and wildfire suppression performed by the Fire Department are met through regular training, which includes meeting a standard of physical fitness.

Staffing Requirements
Required staffing necessary for wildland fire management is the current Fire Department staff plus the Natural Resources Manager for prescribed burning. These positions are necessary to provide adequate protection to military and civilian personnel and natural resources on IAAAP.

Training Requirements

IAAAP will provide a means for each employee to maintain training levels and encourage use of new technology through Internet access and personal contacts. The Natural Resources Manager and the Fire Chief will explore new equipment ideas and remain open-minded regarding their procurement and use.

Appendix 7.4 List of INRMP Goals and Objectives

The below list of **projects** with their ***goals*** and objectives is presented in the order they appear in this INRMP. Goals and objectives are summarized; their full terminology is within Chapters 4-7.

Section	Projects/Goals/Objectives*	Implementation Year					
		Ongoing/ As Needed**	07	08	09	10	11
4.2.1.2	**Ecosystem Management Coordination**						
	1. Use coordinated planning to manage natural resources to sustain military mission capability						
	Coordinate natural resources planning with planning for the sustainment of the military mission	X					
	2. Promote and participate in regional planning for natural resources conservation at scales larger than IAAAP						
	1. Coordinate with and support regional planning and programs	X					
	2. Coordinate with and support military regional planning and programs	X					
4.2.2.2	**Integrated Natural Resources Management Planning**						
	Use coordinated planning to fully integrate the natural resources program at IAAAP						
	1. Internally review this INRMP annually using project goals and objectives to guide reviews; revise projects and budgets as required; review changes annually with the USFWS and IDNR	X					
	2. Update the INRMP at least every five years or when major changes are made to the natural resources program; coordinate this update with the USFWS and IDNR						X
4.3.2	**Soils Management**						
	Repair damaged soils and use soil parameters to manage military activities, protect soil stability, restore installation lands, and conserve wildlife habitat						
	1. Use improvement of vegetative cover and contour farming to prevent soil erosion	X					
	2. Ensure that roads are maintained and upgraded	X					
	3. Consider soils management in implementation of the agricultural grazing program	X					
	4. Use soil inventory data to make decisions regarding land use, rehabilitation options, and wildlife habitat management options	X					
4.4.2	**Water Resources Management**						
	Protect surface water quality at IAAAP						
	1. Use site-specific water testing for natural resources programs	X					
	2. Use water quality data to make decisions regarding land use, restoration options, and fish and wildlife habitat management	X					
	3. Control or eliminate runoff and erosion that could affect surface waters	X					

Section	Projects/Goals/Objectives*	Implementation Year					
		Ongoing/ As Needed**	07	08	09	10	11
	4. Consider nonpoint source pollution abatement in construction, operations, and land management plans and activities	X					
4.5.2	**Forest Management**						
	Manage the forest ecosystem to support the military mission and maintain ecosystem integrity						
	1. Use ecosystem-focused management with emphasis on the military mission, enhancement of ecosystem integrity, protection of watersheds, management of wildlife habitat, provisions for outdoor recreation, and possibly production of commercial forest products	X					
	2. Implement forest management prescriptions (Tetra Tech EM Inc. 2001) to preserve summer habitat for the Indiana bat	X					
	3. Ensure that natural resources personnel are as free as possible of commercial influence to accomplish landscape management, compliance, and stewardship	X					
	4. Plant trees as necessary for the purpose of mitigation for projects that damage or remove wildlife habitat and to enhance existing wildlife habitat	X					
	5. Consider the issue of deer damage when using tree planting as a forestry technique	X					
4.6.2	**Habitat Management**						
	1. Monitor vegetative communities that are indicators of ecosystem integrity, capability of lands to support military missions, status of sensitive species or communities, and other special interests						
	1. Update the flora inventory as new species are found	X					
	2. If plants that are federal-listed are found, develop an inventory/monitoring program	X					
	3. Periodically update the vegetation map	X					
	2. Manage wetlands to ensure "no net loss" per Executive Order 11990						
	4. Maintain a database on wetland resources	X					
	5. Develop a wetland at the Inert Disposal Area when the area is no longer used as a soil repository	X					
	6. Use site-specific surveys to evaluate wetland resources if potential wetland impacts are proposed	X					
	7. Use the environmental review process to protect wetlands	X					
	8. Provide certified jurisdictional wetland delineations (and permit application, if necessary) if a project is planned in a suspected wetland	X					
	9. Maintain wetlands quality through active management	X					
	3. Manage wildlife species habitats based on conservation needs, distribution and threats, population trends, importance of areas to species, potential for population and/or habitat management, and human						

Section	Projects/Goals/Objectives*	Implementation Year					
		Ongoing/ As Needed**	07	08	09	10	11
	interests						
	10. Maintain terrestrial habitats, primarily through the agricultural outlease program	X					
	11. Expand native prairie areas to 50 total acres through appropriate grazing management, reintroduction efforts, and prescribed burning		X	X	X	X	X
	12. Control invasive species, such as eastern red cedar and mulitflora rose using integrated pest management techniques	X					
	13. Continue the artificial nest box program as a significant habitat program	X					
	14. Remove goose platforms as necessary to minimize goose nuisance problems	X					
	15. Consider applying nest box management to the Pileated Woodpecker	X					
	16. Expand the Bluebird nest box program to 100 boxes, if volunteers are available to construct and maintain the boxes	X					
	4. Maintain and enhance the natural diversity of aquatic communities						
	17. Manage Lake Mathes to support a greater variety of fish and the five other primary impoundments for bluegill, redear, bass, white crappie, and catfish	X					
	18. Manage the small, shallow ponds for amphibian habitat	X					
	19. Repair washed out pond dams as troop-training projects for military engineering units	X					
	20. Construct silt retention dams in the Mathes Lake watershed and add rip-rap to the Mathes Lake spillway to form a fish barrier			X			
	21. Improve the boat ramp area at Mathes Lake, possibly installing a shelterhouse and providing portapotties		X				
	22. Install fish structure on an opportunistic basis using volunteer labor	X					
4.7.2	**Fish and Wildlife Management**						
	1. Regularly monitor species that are indicators of ecosystem integrity and other special interests						
	1. Perform white-tailed deer census and monitoring, collect harvest data at check stations, and conduct supplemental census	X					
	2. Monitor Wild Turkey populations in conjunction with deer census and collection of harvest data	X					
	3. Perform small game and fish population data collection through reporting requirements at installation gates	X					
	4. Monitor other species through incidental observations for abundance and general health	X					
	2. Maintain fish and wildlife populations at optimal levels in accordance with species priorities, population ecology, population health considerations, and habitat						

Section	Projects/Goals/Objectives*	Implementation Year					
		Ongoing/ As Needed**	07	08	09	10	11
	capacities						
	5. Use established hunting seasons, procedures, methods, etc. to maintain white-tailed deer and Turkey populations	X					
	6. Maintain small game and furbearers within habitat carrying capacities	X					
	7. Manage fisheries resources to maintain a harvestable surplus and use recreational harvest to manage game fish populations	X					
	8. Stock fish to support recreational fishing	X					
	9. Investigate options and/or regional facilities (commercial operations) to procure fish	X					
	10. Consider neotropical migrants and nearctic grassland and forest dwelling birds in grassland and forest habitat management	X					
	11. Protect small and shallow water areas as reptile and amphibian habitats, ensure ample cover and resources exist for snakes, lizards, and land turtles to satisfy food and cover requirements, and educate installation personnel on the benefits of reptiles, especially snakes	X					
	12. Investigate the feasibility of additional surveying of nongame birds and reptiles and amphibians	X					
4.8.1.2	**Federal-listed Species Management**						
	Sustain residential or migratory populations of endangered, threatened, or special status species and their habitats at current levels, with the long-term goal of conserving listed species and their habitats in accord with specific Recovery Plans and the Endangered Species Act						
	1. Implement requirements of the Endangered Species Act, as stated by AR 200-3	X					
	2. Implement Indiana bat management prescriptions specified in the Endangered Species Management Plan (Tetra Tech EM Inc. 2001)	X					
	3. Update the Endangered Species Management Plan				X		
	4. Survey for federal-listed species other than the Indiana bat, if any such species are likely to occur on the Plant	X					
	5. If species other than the Indiana bat that are federal-listed are discovered on IAAAP or if species already known on the Plant become federal-listed, consult with the USFWS and develop an inventory/monitoring program and management plan for these species	X					
4.8.2.2	***Nonfederal-listed Species Management***						
	Monitor and manage nonfederal-listed, special status plant and animal species to the degree possible with available funding						
	1. Consider state-protected species in all IAAAP actions	X					
	2. Whenever possible, use actions designed for non-listed species to protect or manage other sensitive species	X					

Section	Projects/Goals/Objectives*	Implementation Year					
		Ongoing/ As Needed**	07	08	09	10	11
4.10.2	**Agricultural Outlease Management**						
	Provide opportunities for agricultural use when consistent with the military mission and native ecosystem functionality						
	1. Update the General Land Use Regulation and individual tract management plans to manage grazing, hay, and crop production activities	X					
	2. Ensure that requirements of the General Land Use Regulation and individual tract management plans are followed	X					
	3. Continue to apply fertilizer and lime to agricultural crop areas through a contract	X					
	4. Replace clay tile	X					
	5. Continue grazing-related research to enhance efforts to restore native prairie areas and reduce the amount of area dominated by fescue	X					
	6. Manage and protect land resources while maximizing land use and providing an economic resource to the natural resources program through agricultural outleases	X					
	7. Include planning and NEPA analysis in agricultural outlease decisions	X					
4.11.2	**Pest Management Support**						
	Control plant and animal species that affect natural resources management or directly affect the military mission						
	1. Maintain an updated Installation Pest Management Plan	X					
	2. Emphasize integrated pest management techniques to reduce the use of pesticides	X					
	3. Ensure pesticide applicators are fully certified including sending the Natural Resources manager to the Pest Management Quality Assurance Evaluator course	X					
	4. Maintain the achieved reduction in annual pesticide use	X					
	5. Control nuisance wildlife to protect facilities, infrastructure, and to maintain the military mission	X					
	6. Prevent the introduction of and control invasive species, per Executive Order 13112	X					
4.13.2	**Fire Management**						
	Prevent and suppress wildfires; utilize prescribed burning to sustain or enhance mission capabilities and maintain ecosystem biodiversity and functionality						
	1. Provide natural resources management-related recommendations relative to fire suppression activities and provide support to the Fire Department	X					
	2. Annually update and refine the *Integrated Wildland Fire Management Plan* and perform revisions every five years. Incorporate the annual Prescribed Burn Plan into the *Integrated Wildland Fire Management Plan*	X					
	3. Ensure that the IAAAP community and the general public are aware of fire prevention requirements and	X					

Section	Projects/Goals/Objectives*	Implementation Year					
		Ongoing/ As Needed**	07	08	09	10	11
	educate them on the benefits of prescribed burning						
	4. Use prescribed burning to maintain the military mission and enhance IAAAP ecosystems with a goal of burning about 50 acres annually	X					
	5. Provide the Fire Department a map of areas to be burned each year	X					
	6. Maintain firebreaks and roads to provide for quick access for fire management and facilitate an effective prescribed burning program	X					
4.14.2.2	**Hunting and Fishing Programs**						
	Provide opportunities to the IAAAP community and general public for quality, safe, and equitable hunting and fishing, consistent with needs of the military mission						
	1. Follow IDNR season, bag limit, and other regulatory instruments with exceptions for management or safety purposes	X					
	2. Continue recreation control systems to ensure safe conditions and equitable treatment of users	X					
	3. Update recreation rules and regulations	X					
	4. Continue to provide recreational permits on the Plant	X					
	5. Periodically evaluate the recreational fee schedule	X					
	6. Ensure recreationists follow state and Plant safety requirements	X					
5.1.2	**Natural Resources Enforcement**						
	Assure legal compliance of military and civilian activities with regard to natural resources						
	1. Maintain a law enforcement program for military and civilian activities that relates to natural resources protection	X					
	2. Coordinate enforcement activities with other agencies, particularly IDNR and USFWS	X					
	3. Work with Security personnel to lessen hunter contact tensions, and ensure Security personnel understand recreational user responsibilities	X					
5.2.2	**Conservation Awareness**						
	Provide information to IAAAP and external interested communities regarding natural resources and associated management programs						
	1. Improve the general knowledge of all persons associated with the natural resources program, particularly those who come into regular contact with interested persons	X					
	2. Provide prepared talks and whenever possible use these opportunities to explain contemporary natural resources issues and management	X					
	3. Investigate participating in and/or holding special events to promote the IAAAP image and/or programs	X					

Section	Projects/Goals/Objectives*	Implementation Year					
		Ongoing/ As Needed**	07	08	09	10	11
	4. Encourage youth to participate in the natural resources program	X					
5.3.2	**Cultural Resources Protection**						
	1. Implement this INRMP in a manner consistent with the protection of cultural resources						
	2. Comply with all laws, regulations, and Army guidance regarding cultural resources						
	1. Implement provisions of the Cultural Resources Management Plan that relate to natural resources management						X
	2. Consider natural resources projects when planning cultural resources surveys and use results of cultural resources surveys to plan natural resources projects	X					
	3. Avoid or mitigate adverse effects to cultural resources from natural resources through proper review and planning	X					
	4. Take appropriate protective measures upon discovery of sites	X					
	5. Use natural resources techniques and projects to protect cultural resources sites	X					
5.4.2.2	**Use of NEPA**						
	1. Use NEPA to identify projects and activities that might impact natural resources and work with project planners to resolve issues early in the planning process						
	2. Use NEPA to ensure this INRMP is documented according to the spirit and letter of NEPA						
	3. Help IAAAP comply with NEPA						
	1. Document effects of implementation of this INRMP through an incorporated EA		X				
	2. Reference this INRMP/EA in descriptions of affected environment to reduce verbiage in other NEPA documents	X					
	3. Classify mitigation as a “must fund” for budgetary purposes	X					
7.2.1.2	**INRMP Implementation Staffing and Training**						
	1. Provide staffing of natural resource management professionals required to effectively manage natural resources						
	1. Provide staffing for the natural resources program to effectively implement this INRMP	X					
	2. Provide training to natural resources personnel implementing this INRMP						
	2. Encourage natural resources personnel to join professional societies and their state/regional chapters as well as be active in them	X					
	3. Send at least one person to appropriate annual workshops or professional conferences	X					
	4. Evaluate other conferences/workshops for their usefulness as training tools, and send personnel to those	X					

Section	Projects/Goals/Objectives*	Implementation Year					
		Ongoing/ As Needed**	07	08	09	10	11
	most justified, based on current training needs and those most related to IAAAP activities						
	5. Ensure that natural resources personnel obtain the one-time or occasional refresher training needed to fulfill job requirements	X					
	6. Actively participate in training sessions to disseminate knowledge learned at IAAAP	X					
7.2.2.2	**External Assistance**						
	Provide external specialized skills, personnel, and resources to support the IAAAP natural resources program						
	1. Implement external support projects	X					
	2. Use volunteers and contractors for personnel assistance	X					
	3. Use county, state and federal agencies, particularly INRMP signatory partners, to assist with implementation of this INRMP	X					
	4. Use universities and contractors to assist with implementation of this INRMP	X					
7.3.2	**Date Storage, Retrieval, and Analysis**						
	Store, analyze, and use data in an efficient, cost-effective manner						
	1. Upgrade microcomputer hardware and software	X					
	2. Develop or obtain databases needed to support the natural resources program	X					
	3. Investigate development of a GIS support contract; coordinate GIS needs with others on the Plant or other Plants	X					
	4. Use remote imagery for improved decision-making for military activities, environmental management, and natural resources management and protection	X					

* Project title (in **bold**) follows section number; goal(s) appear in ***bold/italics***; objectives are numbered consecutively following goals. Both goals and objectives are condensed from chapters 4-7.
** In some cases designates uncertain.