Final

Integrated Natural Resources Management Plan

Camp Atterbury Joint Maneuver Training Center
Edinburgh, Indiana

(Revision 2007)

July 2007

Submitted to:

Joint Forces Headquarters
Indiana National Guard
Indianapolis, Indiana

Submitted by:

Parsons
St. Louis, Missouri

Integrated Natural Resources Management Plan

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Signature Page

This Revised Integrated Natural Resources Management Plan (INRMP) meets the requirements for INRMPs listed in the Sikes Act (16 U.S.C. § 670a et seq., as amended), National Guard Bureau guidance in All States Log Number P00-0039 "Integrated Natural Resources Management Plans", Department of Defense Instruction 4715.3. It has set appropriate and adequate guidelines for conserving and protecting the natural resources of the Camp Atterbury Joint Maneuver Training Center (CAJMTC).

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Acronyms and Abbreviations

ACHP	Advisory Council on Historic Preservation
AIRFA	American Indian Religious Freedom Act
AIT	Advanced Individual Training
ANG	Air National Guard
AQCRs	Air Quality Control Regions
AR	Army Regulation
ARFTA	Atterbury Reserve Forces Training Area
ARNG	Army National Guard
ARPA	Archaeological Resources Protection Act
ARTEP	Army Training Evaluation Program
AST	above ground storage tank
ATV	all-terrain vehicles
BA	Biological Assessment
BBS	bulletin board system
BCT	Basic Combat Training
BFO	Bloomington Field Office
BMP	Best Management Practice
BOD	biological oxygen demand
B.P.	before the present
C	degrees Celsius
CA	Camp Atterbury
CAJMTC	Camp Atterbury Joint Maneuver Training Center
CATS	Combined Arms Training Strategy
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CRM	Cultural Resources Manager
CSMS	Combined Support Maintenance Shop
dB	decibels
dbh	diameter at breast height
DO	dissolved oxygen
DoD	Department of Defense
DOI	Department of the Interior
POTMS	Directorate of Plans, Operations, Training, Mobilization, and Security
DPW	Directorate of Public Works
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EODU	Explosive Ordnance Disposal Unit (U.S. Army)

EPA	Environmental Protection Agency
EPM	Environmental Program Manager
EPR	Environmental Program Requirements
ESA	Endangered Species Act
ESMC	Endangered Species Management Component
F	degrees Fahrenheit
FIFRA	Federal Insecticide, Fungicide and Rodenticide Act
FNSI	Finding of No Significant Impact
FORSCOM	U.S. Army Forces Command
FPPA	Farmland Protection Policy Act of 1981
FY	fiscal year
GIS	geographic information system
gpd	gallons per day
gpm	gallons per minute
GPS	Global Positioning System
HABS/HAER	Historic American Buildings Survey/Historic American Engineering Record
HE	high explosive
HQDA	Headquarters, Department of the Army
HRBC	Human Resources Business Center
IBMZ	Indiana Bat Management Zone
ICRMP	Integrated Cultural Resources Management Plan
ICUZ	Installation Compatible Use Zone
IDNR	Indiana Department of Natural Resources
INARNG	Indiana Army National Guard
INRMP	Integrated Natural Resources Management Plan
IPM	Integrated Pest Management
ITAM	Integrated Training Area Management
IWFMP	Integrated Wildland Fire Management Plan
kVA	kilovolt-amperes
LFX	live fire exercises
LOD	large organic debris
LOE	level of effort
LRAM	Land Rehabilitation and Maintenance
LZs	landing zones
METL	Mission Essential Task List
MDI	Military Department of Indiana
mgd	million gallons per day
mg/L	milligrams per liter

MBF	abbreviation denoting 1,000 board feet; MBF is a typical unit of trade for dimension lumber and sawtimber stumpage.
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MOUT	Military Operations in Urban Terrain
MUTC	Muscatatuck Urban Training Center
MPs	Military Police
MPTR	Multi-Purpose Training Range
MREs	meals-ready to eat
MSL	Mean Sea Level
MWR	Morale, Welfare, and Recreation
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NATO	North Atlantic Treaty Organization
NCO	Non-Commissioned Officer
NCOES	Non-Commissioned Officer Education System
NEPA	National Environmental Policy Act
NGB	National Guard Bureau
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOE	Nap of the Earth
NPDES	National Pollutant Discharge Elimination System
NRB	Natural Resources Branch
NRHP	National Register of Historic Places
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OAHP	Office of Archaeology and Historic Preservation
OAQPS	Office of Air Quality Planning and Standards
OES	Officer Education System
OMB	Office of Management and Budget
OPFOR	opposing forces
ORB	outdoor recreation branch
ORISE	Oak Ridge Institute for Science and Education
OSUT	One Station Unit Training
PA	Programmatic Agreement
PCBs	polychlorinated biphenyls
PEM	palustrine emergent
PFO	palustrine forested
PGP	Power Generation Platform
PIF	Partners in Flight
PLS	Planning Level Survey
PNA	Protected Natural Area
PMO	Provost Marshal's Office

POLs	petroleum, oil, and lubricants
PPM	potentially polluting material
ppt	parts per thousand
PSI	pollutants standard index
psi	pounds per square inch
PSS	Palustrine Scrub Shrub
PZs	pick up zones
RCRA	Resource Conservation and Recovery Act
RDP	Range Development Plan
RFMSS	Range Facility Management Support System
ROTC	Reserve Officer Training Corps
RPTS	Reimbursable Program Tracking System
RSD	relative stock density
RTLA	Range and Training Land Assessment
SAC	Strategic Air Command
SAIA	Sikes Act Improvement Act
SHPO	State Historic Preservation Officer
SMA	Special Management Area
SOMS	State Operated Mobilization Station
SOP	Standard Operating Procedures
SRA	Sustainable Range Awareness
SRP	Sustainable Range Program
SWMUs	Solid Waste Management Units
SWPPP	Storm Water Pollution Prevention Plan
T&E	threatened and endangered
TA	Training Area
TDS	total dissolved solids
TDY	temporary duty
TNC	The Nature Conservancy
TOC	tactical operations centers
TPA	terephthalic acid
TRI	Training Requirements Integration
TSCA	Toxic Substances and Control Act
TSI	Timber Stand Improvement
TSIRT	Theater Specific Individual Readiness Training
g/m	micrograms per cubic meter
UCMJ	Uniform Code of Military Justice
USACE	United States Army Corps of Engineers
USACERL	United States Army Construction Engineering Research Lab
USAEC	United States Army Environmental Center
USAF	United States Air Force

USAR	United States Army Reserves
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
USLE	Universal Soil Loss Equation
UST	underground storage tank
UTES	Unit Training Equipment Site
VOC	volatile organic compounds

CHAPTER 1 GENERAL INFORMATION

1.1 PURPOSE

The purpose of the Revised Integrated Natural Resources Management Plan (INRMP) is to guide the natural resources management program at the Camp Atterbury Joint Maneuver Training Center (CAJMTC) and to provide a solid foundation on which to build the program in the future. This Revised INRMP will allow CAJMTC to achieve its goal of ensuring sustainability of desired military training area conditions while maintaining ecosystem viability. In addition, the Revised INRMP will ensure that natural resources conservation measures and Army activities on CAJMTC land are integrated and consistent with federal stewardship requirements.

Maintaining optimal environmental conditions on the training lands is essential for the success of the military mission at CAJMTC. Therefore, the focus of this Revised INRMP is on the management of the natural resources in the training areas. The management measures have been developed based on the current conditions of the resources, and the anticipated military mission and activities.

1.2 AUTHORITY

Under the Natural Resource Management on Military Lands Act of 1960 (Title 16 of the *United States Code* [U.S.C.], Section 670a and following), commonly known as the Sikes Act, as amended according to the Sikes Act Improvement Act (SAIA) of 1997,

> 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 in the United States under the jurisdiction of the Secretary. Consistent with the use of military installations to ensure the preparedness of the Armed Forces, the Secretaries of the military departments shall carry out the program to provide for the conservation and rehabilitation of natural resources on military installations; the sustainable multipurpose use of the resources, which shall include hunting, fishing, trapping, and non-consumptive uses; and subject to safety requirements and military security, public access to military installations to facilitate the use.

Per 16 U.S.C. § 670a(b) of the SAIA of 1997, to the extent appropriate and applicable, this Revised INRMP provides for the following:

- Fish and wildlife management, land management, forest management, and fish- and wildlife-oriented recreation.
- Fish and wildlife habitat enhancement or modification.
- Wetland protection, enhancement, and restoration, where necessary for support of fish, wildlife, or plants.

- Integration of, and consistency among, the various activities conducted under the plan.
- Establishment of specific natural resource management goals and objectives and time frames for the proposed action.
- Sustainable use by the public of natural resources to the extent that the use is not inconsistent with the needs of fish and wildlife resources.
- Public access to the natural resources of the military installation that is necessary or appropriate, subject to requirements necessary to ensure safety and military security.
- Enforcement of applicable natural resource laws (including regulations).
- No net loss in the ability of military installation lands to support the military mission of the installation.
- Such other activities as the Secretary of the military department deems appropriate.

This Revised INRMP complies with the DoD Supplemental Guidance for Implementation of the SAIC. The August 19, 2004 guidance addresses the INRMP process as pertains to INRMP reviews, public comments on the reviews, and Endangered Species Act consultation on INRMPs. A review of the accomplishments of the 2002-2006 INRMP over the previous 5 years can be found in Subsection 7.1.3 (Tables 7.1 and 7.2). This 2007 Revised INRMP complies with the supplemental guidance because it is the required 5-year review.

Army Regulation (AR) 200-3 (*Natural Resources—Land, Forest, and Wildlife Management*) "set forth policy, procedures, and responsibilities for the conservation, management, and restoration of land and the natural resources thereon consistent with the military mission and in consonance with national policies. The scope includes the conservation, management, and utilization of the soils, vegetation, water resources, croplands, rangelands, forests, and fish and wildlife species."

In addition, this Revised INRMP provides the guidance necessary for CAJMTC to maintain compliance with the DoD Instruction 4715.3 (*Environmental Conservation Program*), Executive Order 11990 (Protection of Wetlands), the Clean Water Act, and the Endangered Species Act.

1.3 RESPONSIBILITIES

The success of the management of the natural resources at CAJMTC requires a cooperative effort among the parties who are directly responsible for implementation of this Revised INRMP. A brief description of the parties directly responsible for the implementation of this Revised INRMP is provided below.

1.3.1 Camp Atterbury

The following outlines the roles of Post Commander and the organizations at CAJMTC that are either directly responsible for, or are assisting in, the implementation of this Revised INRMP.

Post Commander. The Post Commander is directly responsible for operating and maintaining CAJMTC, and this includes implementing and enforcing this Revised INRMP.

Directorate of Public Works (DPW). When fiscal and manpower resources allow it, DPW provides manpower and equipment to accomplish INRMP projects in-house. DPW also ensures

that all environmental regulations, policies, and laws are integrated into the planning and construction phase of projects, whether for the INRMP or the military mission.

Environmental Office. The Environmental Office ensures that CAJMTC's environmental management philosophy is integrated into planning, projects, and training operations, and that all uses of CAJMTC comply with all environmental acts, laws, policies and regulations. The Environmental Office is responsible for development and revision of the INRMP and ensuring its implementation and integration with the installation Master Plan. The Environmental Office serves as the primary point-of-contact for the installation in matters pertaining to the implementation of, and adherence to, environmental protection programs. These activities include the Endangered Species Management Component (ESMC) for the Indiana bat and other endangered species coordination, pesticide management, cultural resources management, trapping, environmental sampling (stream and other water sampling), the Clean Water Program, spill response, the Clean Air Program, and noise abatement.

In addition, personnel are responsible for the management of natural resources and monitoring natural resources under the Range and Training Lands Assessment Program (RTLA), assisting with Land Rehabilitation and Maintenance (LRAM), and Environmental Awareness/Sustainable Range Awareness (SRA) components of the Integrated Training Area Management (ITAM). The office, through the Conservation Director, coordinates all forestry, LRAM, wildland fire management, and natural resources projects and requirements in the INRMP with DPW, the Directorate of Plans, Operations, Training, Mobilization, and Security (POTMS), and the Military Department of Indiana's Joint Forces Headquarters Environmental Program Manager.

Director of Plans, Operations, Training, Mobilization, and Security (POTMS). The Directorate of Plans, Operations, Training, Mobilization, and Security ensures that users of CAJMTC are aware of, and comply with, the provisions of Camp Atterbury (CA) Regulation 200-1 (Environmental Protection Program – Environmental Quality), that is currently under review. POTMS has the authority to disapprove any user activity or event that the Environmental Office can not validate as planned within acceptable environmental consideration standards. (CAR 200-1) POTMS coordinates and resolves conflicts in training requirements and LRAM projects in the training areas and jointly coordinates and implements the ITAM program with the Conservation Director, the Environmental Program Manager, and DPW. When possible, Environmental, POTMS, and DPW utilizes or coordinates troop labor, Indiana Department of Corrections, and Job Corps to complete various projects (ITAM/INRMP).

Morale, Welfare, and Recreation (MWR) Council. The Morale, Welfare, and Recreation Council develops and administers all military and civilian outdoor recreational activities, including camping on the installation.

Installation Planning Board (IPB). The Installation Planning Board manages the planning of new ranges and associated facilities. It also recommends land management activities to counteract the negative environmental impact that new ranges may cause. The IPB predominantly oversees projects within the cantonment area.

1.3.2 Other Defense Organizations

National Guard Bureau (NGB). The National Guard Bureau provides administrative and financial support and policy guidance to CAJMTC. The NGB also reviews, provides comments, and approves CAJMTC's INRMP and MOU/MOA.

The Military Department of Indiana (MDI). The Military Department of Indiana provides administrative and financial support to CAJMTC. The MDI Environmental Program Manager (EPM) has the overall responsibility for executing the Indiana Army National Guard's environmental programs throughout the state, including at CAJMTC. The EPM reviews and coordinates INRMP projects and requirements with the installation's Conservation Director, POTMS, and DPW. Additional responsibilities include planning and executing the environmental budget, including conservation funds, and coordination with POTMS and the Environmental Office on the ITAM budget, which provides a source of funding for implementation of the INRMP.

1st Army The 1st Army has a major role at CAJMTC during the current mobilization training.

United States Army Corps of Engineers CAJMTC has a Memorandum of Understanding (MOU) with the Corps of Engineers. That MOU is included as Appendix I in this document.

1.4 MANAGEMENT PHILOSOPHY

The primary mission of CAJMTC is to provide adequate facilities, training areas, and ranges to maintain the readiness of the Army National Guard (ARNG) and the Air National Guard (ANG) for their assigned mission of being prepared to protect the United States in the event of mobilization. Such readiness results only from high-quality training that incorporates all mission elements and tasks and provides high-quality, realistic training to the individuals and units that train there. CAJMTC serves as a Power Generation Platform (PGP) for the mobilization of U.S. Army Reserve and ARNG units. It is the responsibility of CAJMTC to coordinate medical and dental screening, soldier readiness processing, theater-specific clothing and equipment issue, weapon familiarization and qualification, theater-specific individual readiness training, and coordinate movement of personnel into the Area of Operation. The second mission of the Indiana ARNG (INARNG) is to be ready, at the Governor's request, to respond to any natural disasters or civil unrest.

The INARNG recognizes that a healthy and viable natural resource base is required to support the military mission. To be effective, the natural conditions of the training areas on CAJMTC must be maintained to provide realism. This Revised INRMP helps to ensure that environmental considerations are an integral part of planning activities at CAJMTC and that natural resources are managed and protected in accordance with INARNG regulations and policies. A goal of this Revised INRMP is no net loss in the ability of military installation lands to support the military and training missions of the installation.

1.5 CONDITIONS FOR IMPLEMENTATION AND REVISION

1.5.1 Implementation

Environmental funding through the forestry and agriculture reimbursable programs and conservation funds as well as POTMS through ITAM funds help fund implementation of the Revised INRMP. The Environmental Office, through the Conservation Director, will ensure that the Revised INRMP is implemented and annual reviews are conducted.

1.5.2 Revisions

The Environmental Office, through the Conservation Director, will annually review this Revised INRMP in light of the preceding year's accomplishments. The schedule of activities as they appear in the Implementation Chapter will be the basis for monitoring the plan's implementation. CAJMTC must review the Revised INRMP for operation and effect every five years in accordance with the SAIA. Changes to goals, objectives, management, legal, or regulatory changes that result in materially significant different biophysical consequences will trigger a revision and possibly require an EA. This Revised INRMP is a result of the five-year review for operation and effect. The NEPA process for this Revised INRMP was carried out during the previous version. There are no substantive changes to this version; thus, the NEPA process is not necessary. However, a record of environmental consideration will be completed for this Revised INRMP. This Revised INRMP also provides discussion of the progress toward goals identified in the previous INRMP (see Chapter 7).

CHAPTER 2 INSTALLATION OVERVIEW

2.1 LOCATION AND AREA

CAJMTC is located in south central Indiana approximately 30 miles south of Indianapolis, as shown in Figure 2-1. There are two nearby communities, Edinburgh, Indiana and Nineveh, Indiana. Nineveh, the smallest, lies adjacent to the northwest corner of the installation while Edinburgh is located one mile east of the installation. The larger city of Columbus, Indiana, lies approximately 10 miles to the southeast. State Road 252 lies to the north of CAJMTC, Interstate 65 and U.S. Route 31 lies to the east, State Route 46 lies to the south, and State Route 135 lies to the west.

CAJMTC consists of approximately 33,194 federally-owned acres controlled by the Department of Defense. Property accountability is vested in the United States Property and Fiscal Officer, Indiana, a National Guard Bureau official.

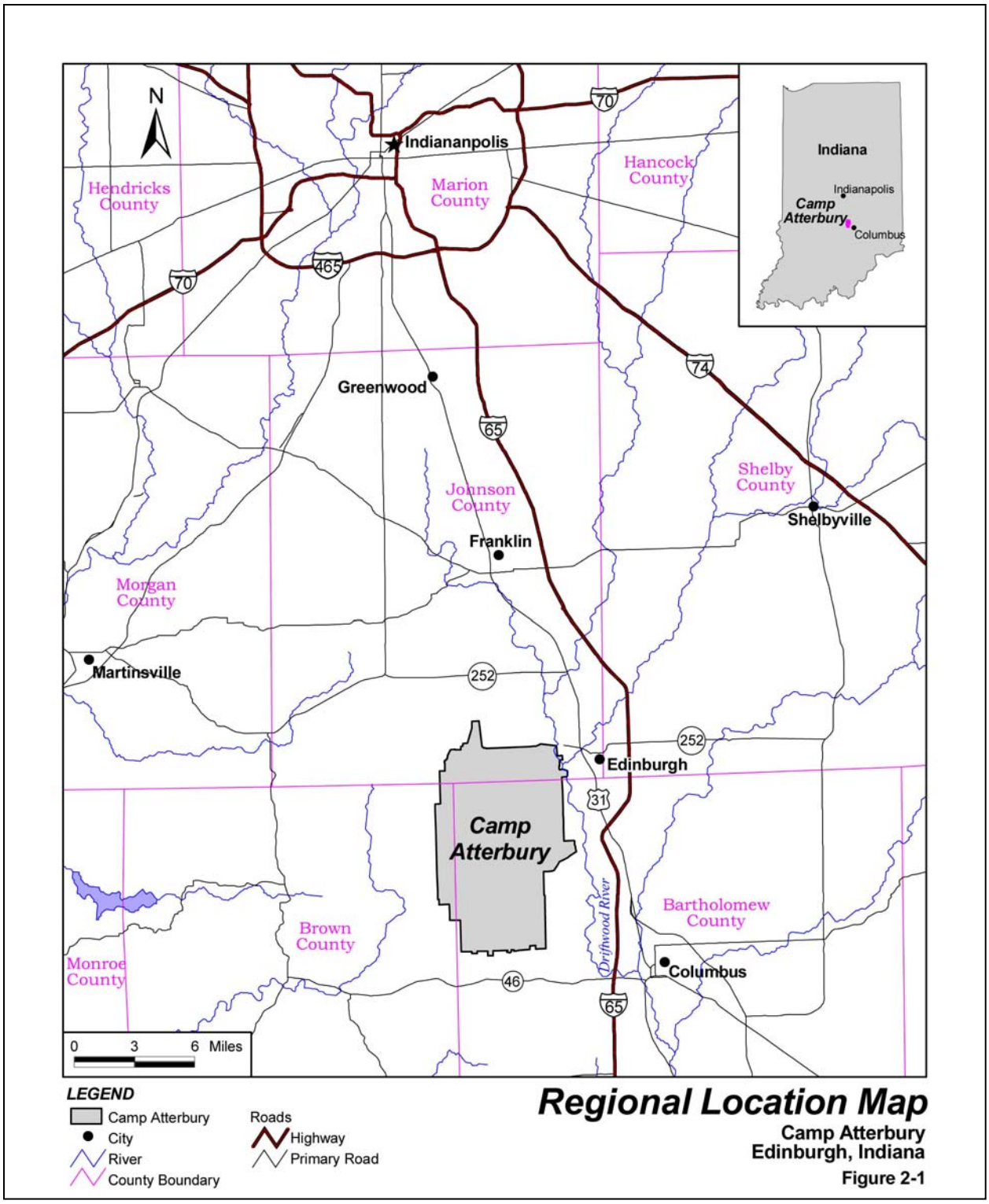
CAJMTC lies in portions of Bartholomew, Brown, and Johnson counties (Figure 2-1). Approximately 78% resides in Bartholomew County; 10% in Brown County; and 12% in Johnson County, Indiana according to the Reimbursable Program Tracking System (RPTS) and the deed agreements under the USACE. Figures 5-1 and 5-2 provide an installation map and a delineation of training areas. The post is broken into six major units as follows:

Area	Approximately
Cantonment Area	655 acres
Impact Areas	5,655 acres
ANG Air to Ground Range	650 acres
ASP	565 acres
Training Area-Light	18,290 acres
Training Area-Heavy	7,379 acres

As shown in Figure 2-2, areas north of Hospital Road are currently deeded by the Corps of Engineers to the U.S. Department of Labor (DOL) Job Corps, the Indiana Department of Natural Resources (Division of Fish and Wildlife) and the Johnson County Parks Department.

2.2 INSTALLATION HISTORY

Less than a month after Japan's attack on Pearl Harbor, the War Department announced its decision to construct a two-division training site in central Indiana and immediately purchased and constructed Camp Atterbury. Named after Brigadier General William Wallace Atterbury, a famed World War I military transportation expert, Camp Atterbury was opened on August 15, 1942, to train the 83rd Infantry. Camp Atterbury was also the site of a prisoner of war internment camp in which over 15,000 German and Italian POWs were interned. Near the end of World War II, the installation was used as a separation center where more than 560,000 veterans were processed. Camp Atterbury was deactivated in 1946.


N
Indianapolis
Hendricks County
Marion County
Hancock County
Indiana
Indianapolis
Camp Atterbury
Columbus
70
465
74
Greenwood
65
Johnson County
Shelby County
Shelbyville
Franklin
Morgan County
Martinsville
252
Edinburgh
31
Camp Atterbury
Driftwood River
Bartholomew County
Brown County
Monroe County
Columbus
46
0 3 6 Miles
LEGEND
Camp Atterbury
City
River
County Boundary
Roads
Highway
Primary Road
Regional Location Map
Camp Atterbury
Edinburgh, Indiana
Figure 2-1

In 1950 Camp Atterbury was reactivated and became the training site of the 28th and the 31st Infantry Divisions. The installation was again deactivated in 1954 but retained a mobilization mission. From 1954 to 1968, Camp Atterbury saw many varied uses by the National Guard and U.S. Army Reserve units, and was used by many Department of Defense contractors as a testing and monitoring site. In July 1958, the Indiana ANG established an air-to-ground gunnery range that is still in operation. The first permanent stationing of Indiana Army National Guard (INARNG) functions at Camp Atterbury occurred in November 1965 with the relocation of the INARNG Officer Candidate School from Ft. Benjamin Harrison. The school is now a part of the INARNG Military Academy.

In 1968, the Department of the Army determined that Camp Atterbury was larger than necessary. Approximately 7,000 acres in the northern part of the installation were disposed of, leaving its current size of approximately 33,194 acres. Department of the Army, General Order 19, dated January 1969, changed the name of Camp Atterbury Military Reservation to Atterbury Reserve Forces Training Area (ARFTA), Camp Atterbury, Edinburgh, Indiana.

On April 1, 1969, the Secretary of the Army issued a License for National Guard Purposes to the INARNG for 33,141.76 acres and all included buildings, renewable every five years until 1982. This license is for the INARNG to use and occupy, for year-round training and support, certain land and improvements comprising a portion of the Atterbury Reserve Forces Training Area. On April 20, 1982, the license was reissued for 25 years.

From 1969 to 1984, utilization of Camp Atterbury was increased by the accession of several new INARNG troop units that became housed permanently at the installation. In the same timeframe, Camp Atterbury, while operated in peacetime by the INARNG, was a mobilization asset for the U.S. Army Training and Doctrine Command (TRADOC) and would become a subpost of Ft. Benjamin Harrison if mobilization was to occur. This arrangement was modified on October 1, 1984, when the mobilization status of Camp Atterbury was changed to a stand-alone installation under the U.S. Army Forces Command (FORSCOM), with the National Guard Bureau remaining the peacetime authority.

In July 1988, the license was amended and made valid for an indefinite period. On August 25, 1988, the Indiana ANG was granted a license for exclusive use of 650 acres of the installation based on USACE lease agreements for operation of an Air-to-Ground Gunnery Range for an indefinite period.

Currently, the official name for Camp Atterbury is the Camp Atterbury Joint Maneuver Training Center.

2.3 MILITARY MISSION AND TRAINING

The primary mission of CAJMTC is to provide adequate facilities, training areas, and ranges to maintain the readiness of the ARNG and the ANG for their assigned mission of being prepared to protect the United States in the event of mobilization. Such readiness results only from high-quality, realistic training that incorporates all mission elements for the individuals and units that train at CAJMTC.

CAJMTC is licensed to the Military Department of Indiana Joint Forces Headquarters as a training site for reserve units of the region. The Post Camp and Station Carrier Unit, which was reorganized and renamed the Installation Support Unit, assume the two-fold mission (pre- and post-mobilization) of CAJMTC.

2.3.1 Peacetime Missions

In peacetime, CAJMTC operates under the National Guard Bureau and the Military Department of Indiana as a Major Training Site for Reserve Component and Active Duty Forces. To support this training operation, CAJMTC provides support facilities, training areas, and ranges for one combat or combat-support brigade conducting battalion-level Army Training Evaluation Programs (ARTEPs). Should the need arise, as it did in 2002, CAJMTC can support training and facilities for up to two brigades.

Currently sized at 4,200 troops according to NGB Pamphlet 570-3, CAJMTC is used an average of 46 weekends and 23 weeks per year by National Guard and Reserve Component units. Several Active Component units and other Department of Defense agencies train intermittently on a daily basis. Area police agencies and other civilian groups use CAJMTC's facilities and ranges during off-season periods after obtaining preauthorization.

Ranges and training areas support Army standard, individual, and crew served weapons qualification and allow collective training through company/team level of combat, combat support, and combat service support tasks for a brigade-sized element. The Indiana National Guard maintains an Field Maintenance Shop (FMS), a Combined Support Maintenance Shop (CSMS), a Unit Training Equipment Site (UTES), a State Military Academy for officer and NCO development, and a Troop Command Armory for 800 troops.

2.3.2 Post-Mobilization Mission

CAJMTC has a stand-alone status under FORSCOM on mobilization. CAJMTC's mobilization mission is to improve installation activities and facilities to receive, support, train, and prepare Active and Reserve Component personnel for deployment to their mobilization assignments (USACE, 1994). The CAJMTC post-mobilization mission is to operate a Mobilization Station as a troop mission subsequent to the initial mobilization mode. CAJMTC is designed as a State Operated Mobilization Station (SOMS) for up to brigade-sized combat element.

2.3.3 Future Force Structure and Unit Changes

It is likely that, over time, CAJMTC will experience an increase in the number of units using its training facilities and in the intensity of training that will occur there. The Multi-Purpose Training Range (MPTR) is utilized for additional mechanized and light armored vehicles use as well as rotary wing aircraft. Other factors that are likely to result in increased use of the facilities at CAJMTC include:

- More training requirements based on combat support (CS) and combat service support (CSS) models;

- Increased demand for training facilities related to potential regional Base Realignment and Closure (BRAC) activities;
- Increased use as CAJMTC training opportunities are identified;
- Greater use of school type courses as the 138th Regiment (Combat Arms) increases the schools it operates;
- More training based on task force and/or strike force operations;
- Greater demand for Military Operations in Urban Terrain (MOUT) training facilities. The Muscatatuck Urban Training Center (MUTC) is a 1,000 acre site that was turned over to the Indiana National Guard in July of 2005 and since has been continually evolving into a full-immersion contemporary urban training environment. MUTC provides a realistic training environment to address urban operational challenges. In its first year of operation the facilities at MUTC have been utilized by over 16,000 people from military, government, and private agencies.
- CAJMTC serves as a PGP for the mobilization of U.S. Army Reserve and ARNG units. It is the responsibility of CAJMTC to coordinate medical and dental screening, soldier readiness processing, theater-specific clothing and equipment issue, weapon familiarization and qualification, theater-specific individual readiness training, and coordinate movement of personnel into the Area of Operation.

2.4 REGIONAL LAND USE AND SURROUNDING COMMUNITIES

Most of the land within Bartholomew, Johnson, and Brown counties is in woodlands and agriculture, with scattered residential areas. A few commercial and industrial land uses exist in the area. Along the eastern boundary, in Bartholomew County, land uses are predominantly agricultural, with the exception of small areas of residential development. The residential area with the greatest population near CAJMTC is Columbus, which lies approximately 10 miles to the southeast. In Johnson County, Princes Lake and Nineveh lie to the west and the northwest, respectively, of the installation boundary. Nineveh lies less than a mile from the west boundary and the City of Edinburgh lies one mile east. In Brown County, west of the installation, the main residential areas are around Cordry and Sweetwater Lakes. Most of the zoning outside these areas is either forested reserve or residential; agriculture exists, but has no zoning designation (Rodgers, 1991).

Several nonresidential land use areas adjacent to the installation include IDNR's Atterbury State Fish and Wildlife Area, Johnson County Park, the IDNR Division of Fish and Wildlife Driftwood Public Fishing Area, the private Double YY Saddle Club (an equestrian club), the Prince's Lakes Utilities' Water Treatment Plant, and the Whippoorwill Woods Nature Preserve (SAIC, 1998). The Atterbury State Fish and Wildlife Area is located on 6,206 acres immediately north of CAJMTC and is used for hunting, fishing, boating, and rifle and archery practice. The Wildlife Area is managed primarily for game fish and wildlife. Johnson County Park is a 600-acre recreation area adjoining the Wildlife Area. The Driftwood Public Fishing Area, located outside the northeast corner of the CAJMTC, is managed primarily for game species for fishing and hunting, but it also serves as waterfowl habitat and provides waterway protection. Adjacent to and east of the installation is a 30-acre parcel used by the Double YY Saddle Club. The Prince's Lakes Utilities' Water Treatment Plant operates 26 acres of emergency water supply reservoirs, which serve as waterfowl nesting and resting lagoons. The Whippoorwill Woods

Nature Preserve is 880 acres located near the western portion of CAJMTC and is managed to develop old growth forest characteristics.

2.5 LOCAL AND REGIONAL NATURAL RESOURCES

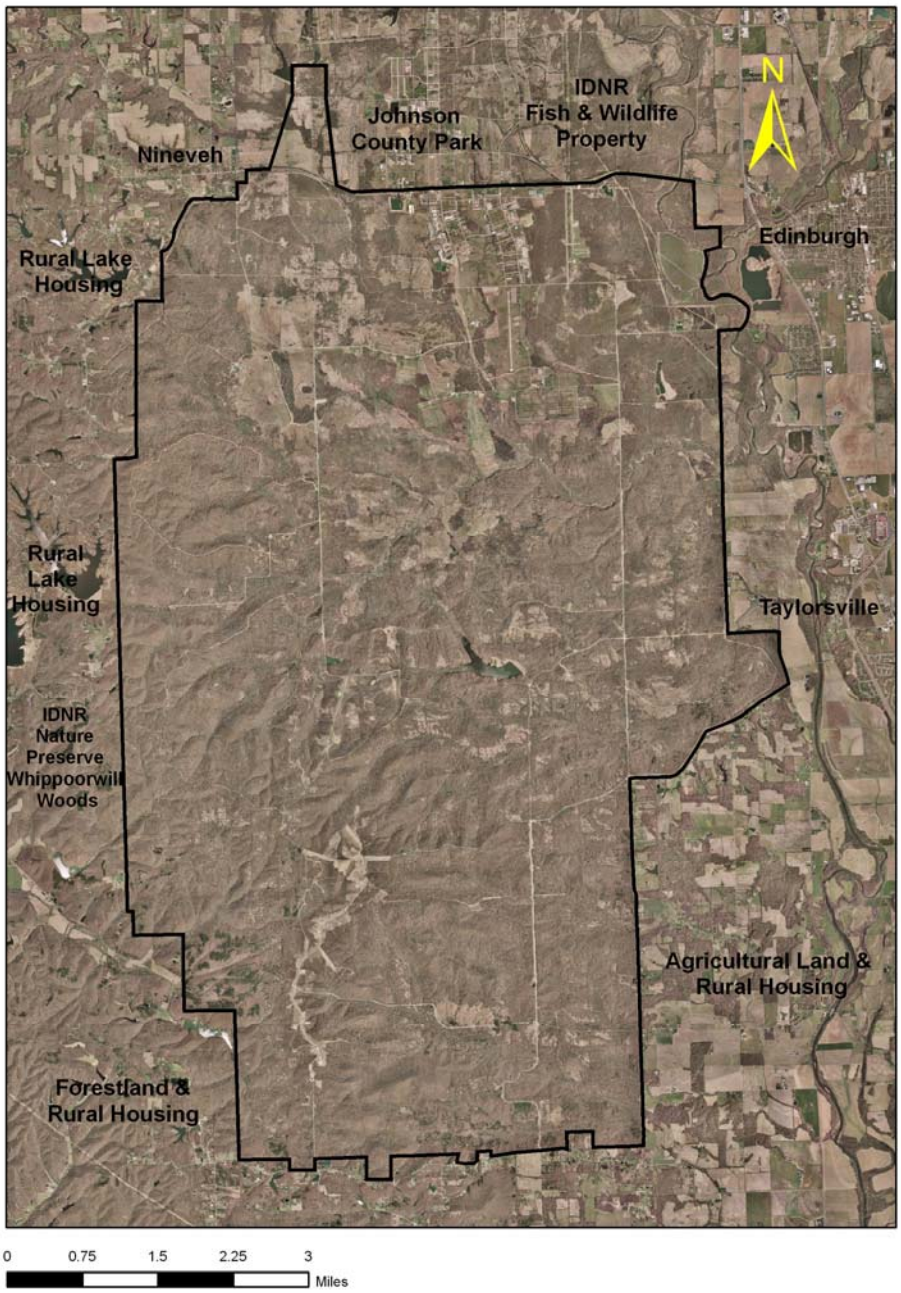
Surrounding CAJMTC are several areas of public and private lands dedicated to various natural resource and conservation uses, as shown in Figure 2-2.

Atterbury State Fish and Wildlife Area. The 6,206-acre Atterbury State Fish and Wildlife Area, located north of the installation, is managed by the Indiana Department of Natural Resources (IDNR) and is dedicated to providing quality hunting and fishing opportunities and to the conservation of natural resources. The property is mostly upland game habitat with marsh and shallow impoundments. This area is managed primarily for game species for fishing and hunting, but it also provides waterway protection. Other outdoor recreational activities, such as boating and canoeing, trail hiking, bird watching, sightseeing, and nature study, are also encouraged. A state-of-the-art shooting range recently opened at the area.

IDNR personnel from the Atterbury State Fish and Wildlife Area also assist CAJMTC in fish and wildlife management on the installation's grounds.

In addition to the Atterbury State Fish and Wildlife Area, the 260-acre Driftwood Public Fishing Area is located to the east of the installation and is managed by the IDNR Division of Fish and Wildlife. This is a satellite property separate from Atterbury State Fish and Wildlife Area.

Johnson County Park. Johnson County Park is a 600-acre tract adjacent to the installation. The park is primarily dedicated to camping (55 class A sites and unlimited primitive), picnicking (10 large shelters with electricity, water, and grills), and other recreational pursuits. A 10,000-person capacity amphitheater is the site of five to six concerts per summer season, and the Hoosier Horse Park plays host to over 65 shows and rodeos per year. A new 7-acre lake for small boat fishing has a swimming beach available for use. The park has volleyball, baseball, and basketball areas and a radio control flying field. The park offers 6 miles of hiking trails, 6 miles of mountain bike trails, and 10 miles of horse trails, as well as a nature observation area. Individuals and families stationed at CAJMTC often use the facilities at Johnson County Park.



Surrounding Land Use Map

Camp Atterbury Joint Maneuver Training Center
Indiana

Source: CAJMTC, 2006

Figure 2-2

Whippoorwill Woods Nature Preserve. Whippoorwill Woods is an 880-acre tract of forest habitat adjacent to the western side of the installation. The preserve is managed by the IDNR Division of Nature Preserves to restore and maintain old growth forest habitat.

Prince's Lakes Utilities. At the northwest corner of the cantonment area is the Prince's Lakes Utilities water treatment plant. The area has a 22.5 acre parcel housing a sewer treatment plant and a 39 acre parcel that houses the wastewater treatment plant. Within the 39 acre parcel, there is also a 26 acre marsh managed as a nesting and resting lagoon for waterfowl.

Heflin Park. This Bartholomew County park has 35.5 acres, on which are a campground, two shelterhouses, a fishing lake, and hiking trails.

CHAPTER 3 PHYSICAL ENVIRONMENT

3.1 CLIMATE

South central Indiana has a temperate climate characterized by warm summers and no dry season. Winters are usually cold due to the occurrence of continental polar air coming from northern latitudes, with mean temperatures at or below 0^0 Celsius. Currents from the Gulf of Mexico bring maritime tropical air to the region during the summer months, along with warm temperatures and moderate humidity levels.

Rainfall averages 41 inches per year, most of it falling in the late winter and early spring months. While the month of May typically incurs the greatest amount of rainfall, thunderstorms and rain showers are common throughout the spring and summer months. Snow averages 22 inches per year and can occur from mid-November through late March. Four complete seasons are evident at CAJMTC, with midsummer temperature averaging in the mid-to-high 80s and winter temperatures averaging in the mid-20s.

Heavy fog is not common in the region, occurring about 20 days per year. The prevailing direction of surface winds is southwesterly, except during late winter months when winds come mostly from the northwest. Wind speed averages under 10 knots, with the strongest winds usually associated with thunderstorms.

3.2 LANDFORMS

CAJMTC lies on the boundary between the Scottsburg Lowland and Norman Upland physiographic regions. The Knobstone Escarpment, located to the east, rises almost 300 feet above the lowlands and forms the boundary between the two provinces (Mumford and Whitaker, 1982). CAJMTC is approximately 6.2 miles wide by 10 miles long on a north-south axis and elevations across the installation range from 636 to 968 feet mean sea level (MSL). A topography map of CAJMTC can be found in Appendix A.

The northern third of the installation lies in the Scottsburg Lowlands, a region glaciated during the Wisconsin Glacial Period. Topography in the Lowlands is relatively flat and gently rolling and consists of nearly level to gently sloping terraces and outwash plains and nearly level river bottomlands. CAJMTC's southern two-thirds lies in the Norman Uplands, an area that was unglaciated during the Wisconsin Period. The area is characterized by rugged terrain that is deeply dissected by ridges and ravines and is underlain by siltstone, shale, and limestone. The Norman Uplands are characterized by flat-topped narrow divides, steep slopes, and deep V-shaped valleys. Bedrock is near the surface, but rarely crops out. There is little level land and the area is very well drained. Streams are characterized by dendritic drainage patterns (ANG, 1993).

Before the area was established as a military property, land use varied. In the northern third of the property, farms, homesites, and woodlands were common. These areas were cleared and graded when the installation was established, and afterwards subjected to livestock grazing. Forests in this area are presently in mixed stages of succession. The topography of the southern

two-thirds of the property made it less suitable for farming. Farming was generally confined to the valley bottoms in this region, and thus overall disturbance to this area was not severe.

3.3 GEOLOGY AND SOILS

3.3.1 Geology

General Geology Bedrock geology at Atterbury consists of interbedded sandstones, siltstones, and shales that were formed from sediments deposited in a marine environment during the Upper Devonian (350 to 400 million years ago) and Mississippian (about 350 million years ago) periods. The sedimentary formations at Atterbury form a broad anticline with the stratigraphic units forming a series of outcrop belts that parallel the strike of the anticline, with the oldest units outcropping to the east. Regional dip of the bedrock strata is to the south-southwest at an average of 25 feet per mile (less than 1 degree) (SAIC, 1998).

Sedimentary formations underlying Atterbury consist of Ordovician and Silurian aged (400 to 500 million years ago) sandstones and shales, Devonian aged limestones and dolomites, the upper Devonian New Albany shale and the lower Mississippian Borden Group (SAIC, 1998).

The New Albany shale is predominantly a dark gray to black carbonaceous shale that contains pyrite. Maximum thickness of the formation is approximately 130 to 140 feet. Where the formation outcrops, the shale weathers rapidly to chips and flakes, and then weathers slowly to clay. The contact between the upper Devonian New Albany shale and the Mississippian Borden Group is not clearly defined. However, the oldest Borden Group member, the New Providence shale, is separated from the New Albany shale by the Rockford limestone (SAIC, 1998).

The Borden Group consists predominantly of gray, argillaceous siltstones, fine grained sandstones, and shales containing interbedded limestones. The rock units of the Borden Group formed from organic and inorganic sediments that were deposited in a marine environment during the Mississippian Period. The Borden Group is approximately 325 feet thick under Atterbury (SAIC, 1998).

Alluvial deposits on Atterbury consist of Holocene aged (10,000 years ago to present) clays, silts, sands, gravels, and organic materials. These deposits occur along streams that are limited to valley areas where they overlie deposits of glacial outwash gravel. The thickness of the alluvium varies, but is generally less than 15 feet. The maximum thickness of the alluvial deposits occurs in stream channels (SAIC, 1998).

Seismicity The region encompassing CAJMTC is considered to be seismically inactive (Rene, 1998). The Mount Carmel fault is located approximately 30 miles west of CAJMTC along the border between Brown and Monroe counties. The fault, which trends north-northwest parallel to the Cincinnati Arch, is not seismically active.

3.3.2 Soils

Soils on CAJMTC developed in several types of parent materials and have characteristics that reflect the variability. Dominant parent materials that occur on CAJMTC include till of Wisconsin and Illinoian Age; glacial outwash of Wisconsin Age; lacustrine material of Wisconsin and Illinoian ages; loess and windblown sands of Wisconsin Age; weathered sandstone, siltstone and shale; and alluvium along streams (USDA, 1992). Glacial till was deposited in place by melting glaciers and underwent little reworking by water. Soils on CAJMTC that developed in the tills typically have a loamy texture. Glacial outwash materials were deposited by running water from melting glaciers. Soils that developed in these materials generally formed in particles of similar size such as sandy loams, sands, and gravels. Lacustrine deposits were laid down in lakes or backwater areas away from faster flowing meltwaters. Soils that formed in lacustrine deposits developed from sands, silts and clays. During drier glacial periods, silt was blown from broad floodplain areas and deposited on uplands as loess. These loess deposits formed many of the silt loams that occur on uplands at CAJMTC.

Soils on CAJMTC that developed from the weathering of interbedded sandstones, siltstones, and shales include the silt loams that occur in uplands on moderate to steep slopes, are well drained and have potential for severe erosion hazards. Alluvial soils on CAJMTC developed in sediments recently deposited by floodwaters along streams. The texture of these soils varies depending on the velocity of flow of the water from which the sediments were deposited. Alluvial soils on CAJMTC primarily include loams and silt loams.

Based on the soil map of CAJMTC compiled by the Natural Resources Conservation Service (NRCS), 58 soil mapping units occur on the installation. The map includes data from the Soil Survey Geographic (SSURGO) dataset for Johnson, Bartholomew, and Brown counties. The map and soil series descriptions provide a good general characterization of soil conditions and are useful as a tool in determining use and management of the soil resources on CAJMTC. However, where proposed activities will directly impact soils, or the viability of a proposed use is dependent on soil conditions, on-site soil characterization should be conducted.

Appendix B lists the soil mapping units and provides general characteristics of the soil series or soil complexes. The table also provides the drainage characteristics, textural characteristics, landscape position, and some potential limitations associated with the mapping units. The soils on CAJMTC have also been rated using the U.S. Department of Agriculture Land Use Classification System. The classification system assesses the constraints of soils on agricultural development. The capability class rates limitations from slight (I) to those which would nearly preclude use for commercial agricultural production (VIII). The capability subclasses are soil groups within one class. The subclasses are designated by the letters e (erosion), w (wet), or s (shallow, droughty, or stony). For example, a soil that is rated IIe shows that the main limitation is risk of erosion unless close-growing plant cover is maintained. The system provides a general indication of potential soil limitations for farming purposes, although, for the most part, CAJMTC is not being used for agriculture.

Mapping units that are designated as hydric, or have inclusions that are hydric, are also indicated in Appendix B. Hydric soils are soils that are saturated, flooded, or ponded for long enough

during the growing season to develop anaerobic (oxygen deficient) conditions in their upper part. Anaerobic soil conditions are conducive to the establishment of vegetation that is adapted for growth under oxygen-deficient conditions and is typically found in wetlands (hydrophytic vegetation). Areas on CAJMTC where hydric soils, or soils with hydric inclusions, have been mapped are typically associated with the general location of wetlands on the installation.

The soil map for CAJMTC indicates that there is a moderate to severe potential for erosion in more than half of the soil mapping units that occur on CAJMTC. Figure 3-1 shows the location of soils on CAJMTC. Because of a high degree of topographic variation within soil mapping units, there is considerable variation in erosion potential among locations within units. Most problems associated with soil erosion on Atterbury result from the removal of vegetation on moderate to severe slopes or on long, gradual slopes.

3.4 Water Resources

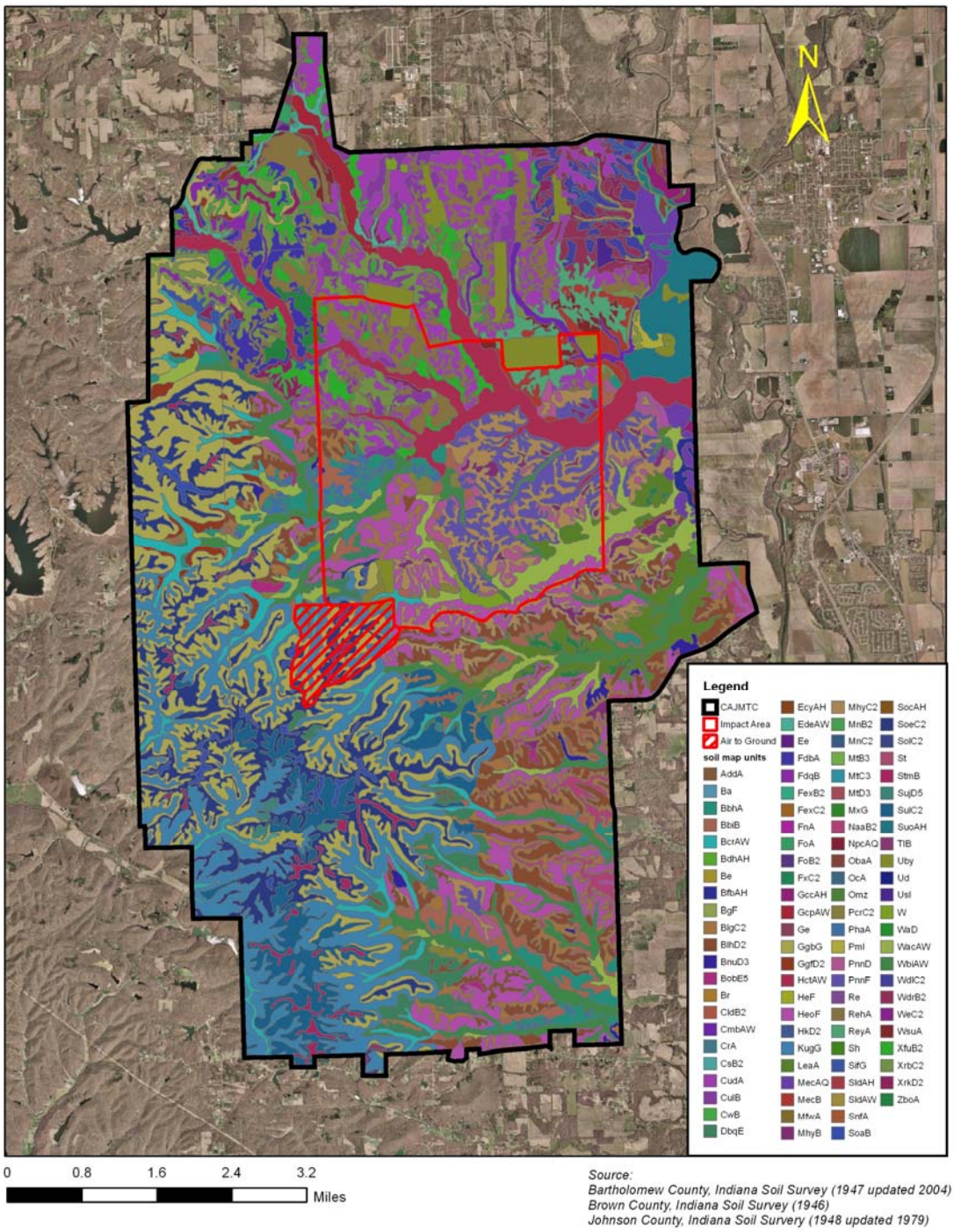
The water resources of CAJMTC can be divided into three main categories: groundwater, surface water, and wetlands.

3.4.1 Groundwater

Aquifers at and in the vicinity of CAJMTC occur primarily in glaciofluvial deposits in lowland areas and in consolidated bedrock of the Borden Group in the Norman Upland area. Groundwater occurring within the Borden Group generally moves slowly and does not occur everywhere as a result of the varying rock unit characteristics. At some locations joints and fractures within the rock units allow for more rapid and continuous movement of groundwater resulting in yield rates suitable for domestic use. Typically groundwater yields range from less than 2 gallons per minute (gpm) to 10 to 15 gpm. Groundwater occurring within the rock units of the Borden Group is highly mineralized with iron, manganese, sulfate, and total hardness occurring (SAIC, 1998). Aquifers occurring in older underlying Devonian limestones generally yield groundwater at higher, more dependable rates.

Aquifers in the glaciofluvial deposits occur in sediments deposited during the Illinoian and Wisconsin stages of Pleistocene glaciation and in recent stream sediments composed of silt, sand, and gravel. Well yields are highly dependent on the thickness and textural characteristics of the unconsolidated deposits. In general, the glaciofluvial aquifers are capable of producing adequate supplies of groundwater for domestic and light industrial use. Wells drilled in glacial valley train deposits about 2 miles east of CAJMTC, along the Driftwood and Big Blue rivers, have yielded groundwater from 100 to over 1,000 gallons per minute (gpm) at depths from 50 to 200 feet (APG, 1987).

The potable water supply for CAJMTC is supplied from the Prince's Lakes well field located along the west side of the Blue River to the northwest of Edinburgh. The well field, which is developed in glaciofluvial deposits, is completed in sands and gravels at depths of from about 65 to 115 feet (SAIC, 1998).



Soils

Camp Atterbury Joint Maneuver Training Center
Indiana

Source: CAJMTC, 2006

Figure 3-1

3.4.2 Surface Water

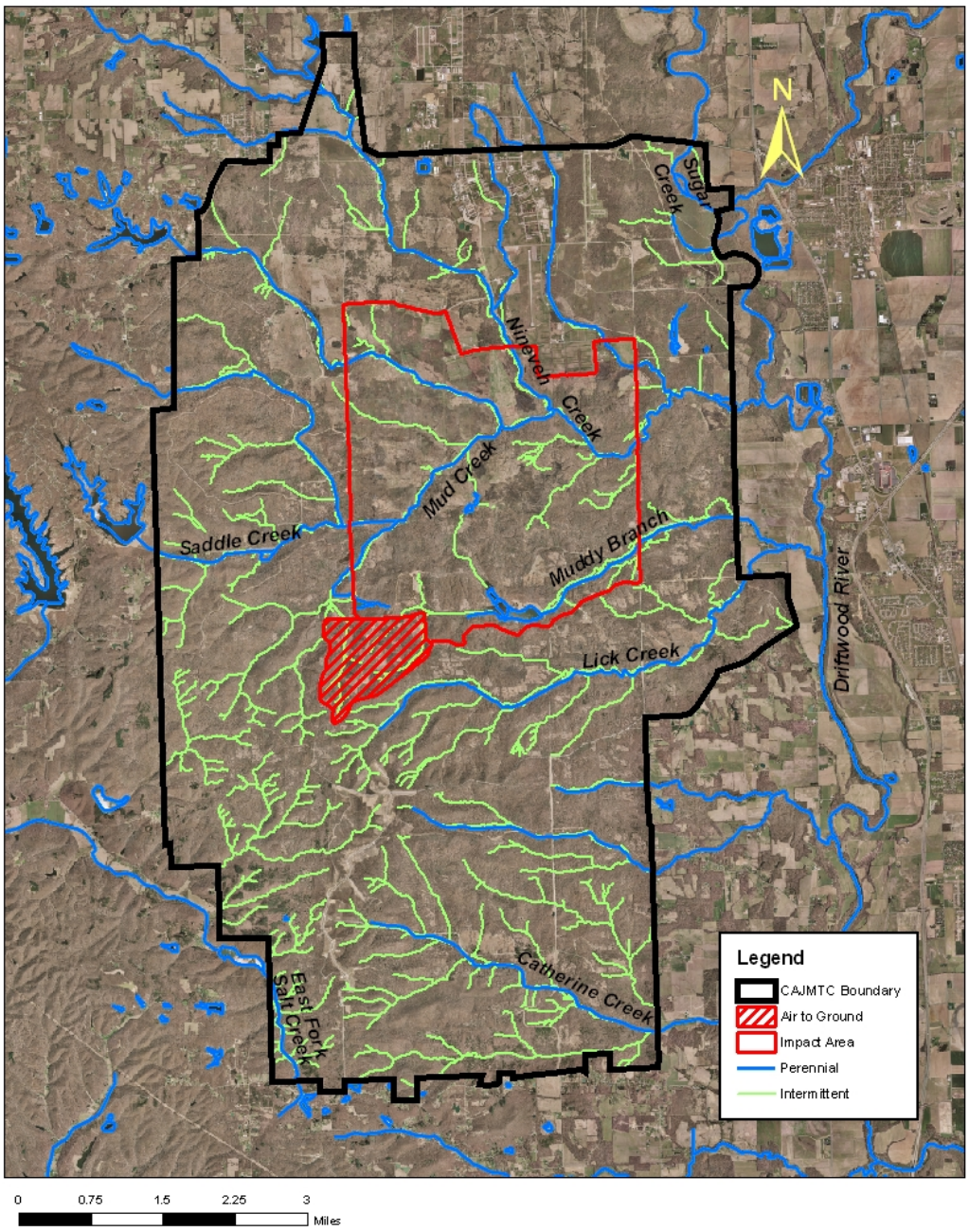
Surface water on CAJMTC consists of numerous streams and small, seasonal ponds located throughout the property. The streams range from intermittent first- and second-order to permanent flowing second-order, and include Sugar, Nineveh, Saddle, Mud, Muddy Branch, Lick, Catherine, and East Fork Salt creeks, as shown on Figure 3-2. There are several small wildlife ponds, Duck Pond and Puff Lake, that contain water year round. The installation lies within the watershed of the East Fork of the White River. Drainage from the installation primarily flows eastward into the Driftwood River, which is a tributary of the White River. Any actions on the installation have the potential to affect both Driftwood and White Rivers.

In the northeastern portion of CAJMTC, Sugar Creek forms the primary drainage channel and generally flows southeast before exiting the site.

Drainage along the western border of the air-to-ground range flows to the north in an intermittent tributary that comprises the headwaters of Mud Creek. Mud Creek, the largest and most central drainage channel on the Post, flows eastward into Nineveh Creek. Further west, Saddle Creek flows easterly, crossing the western boundary of CAJMTC and joining Mud Creek inside the impact area. Duck Lake, located just north of the air-to-ground range boundary, is also a receptacle for surface water flows. Overflow from Duck Lake flows into Mud Creek.

Drainage in the rest of the air-to-ground range flows north within the boundaries of the range, then eastward after reaching the northern boundary (ANG, 1993). This drainage comprises the headwaters of Muddy Branch Creek, which flows to the east approximately 4 miles before joining with Lick Creek. Lick Creek originates in Training Area 6B, approximately 1 mile south of the impact area border. The creek flows east to northeast before exiting CAJMTC and merging into the Driftwood River. Catherine Creek originates in the southeast portion of the installation and flows eastward into the Driftwood River. Puff Lake is a man-made lake of approximately 50 acres in size, and is located on Muddy Branch Creek approximately one mile from the eastern border of the air-to-ground range. Small, steep streams that flow only after a rain storm are common in this area. Intermittent, seasonal pond areas occur in various areas on the range.

The drainage system of Bartholomew County was formed during periods of glaciation. The valleys of the Driftwood River and Flatrock River, to the east of the Post, and the Eastern Fork of the White River, to the south of the Post, were formed by the melt waters of Wisconsonian glaciers. All of the streams and tributaries in the county drain into the East Fork of the White River, except for Salt Creek, which is located to the southwest of the Post; it flows west into Brown County.



Drainage Network

Camp Atterbury Joint Maneuver Training Center
Indiana

Source: CAJMTC, 2006

Figure 3-2

3.4.3 Wetlands

Characterization of wetlands on CAJMTC is based on U.S. Army Corps of Engineers (USACE) data. In January 2000, USACE used aerial photogrammatic techniques to determine approximate wetland boundaries on large-scale aerial photographs. The Cowardin classification system (Cowardin et al., 1979) was used to describe mapping units. Cowardin classifies wetlands into five systems that are based on similar hydrologic, chemical, or biological factors.

Cowardin classifies riverine systems as wetlands and deepwater habitats (depth greater than 2 meters) in or adjacent to stream channels. Riverine systems include both low- and high- energy perennial and intermittent streams. Some of the riverine systems on CAJMTC have been modified by excavation. There are 170.1 stream miles of riverine wetlands on the installation.

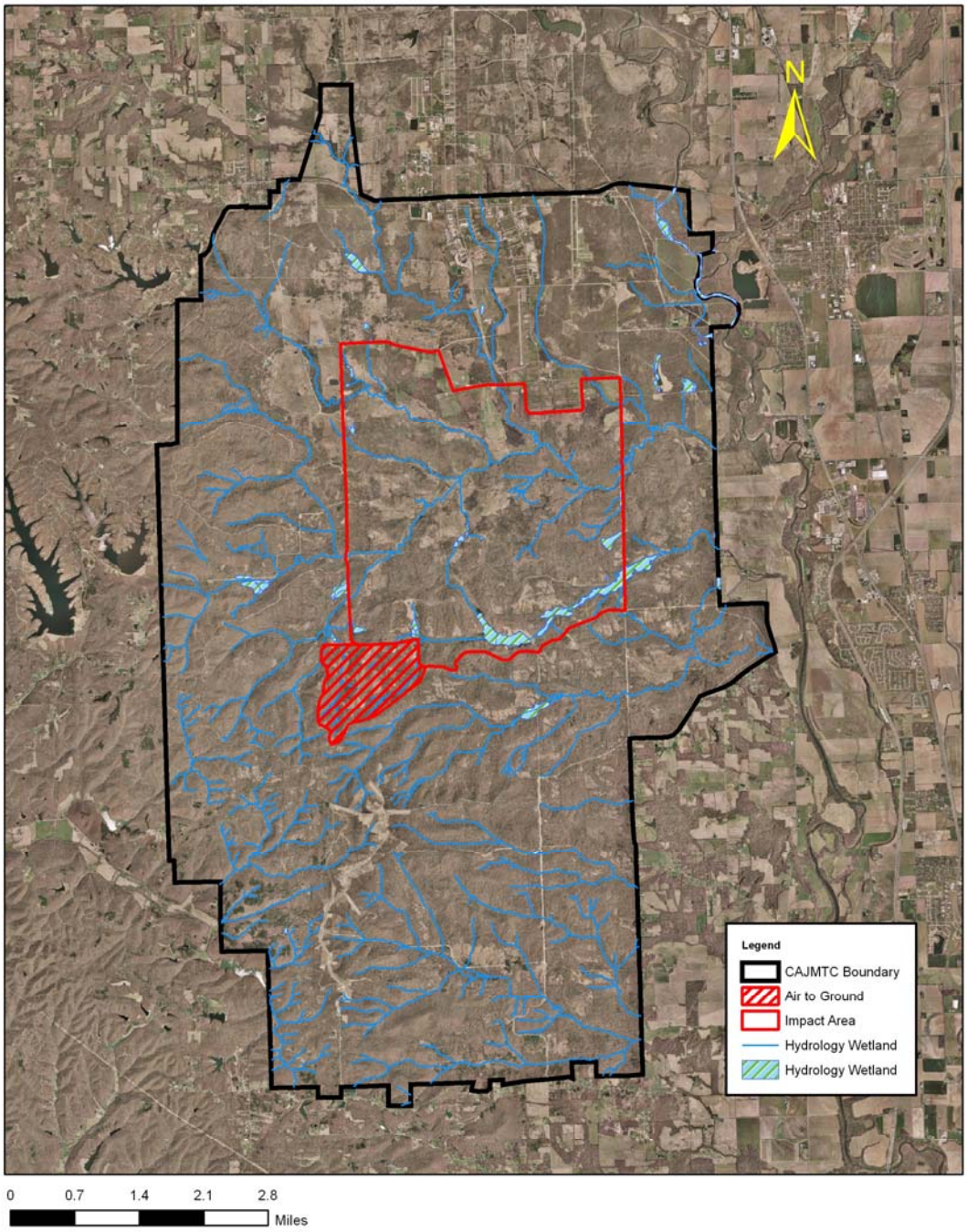
CAJMTC GIS data based on USACE delineation identify 200.4 acres and 170.1 stream miles of wetlands on CAJMTC. Table 3.2 lists wetland habitat types, numbers, and acreage, and Figure 3-3 shows the approximate location of wetlands occurring on CAJMTC. Both Table 3.2 and Figure 3-3 are based on the USACE delineation.

Table 3.1 Wetlands Mapped on Camp Atterbury Based on USACE Delineation

Cowardin Classification System –Wetland Habitat Type	Wetland Designator	Total Acreage/ Stream Miles
Palustrine Emergent	PEM	70.9
Palustrine Forested	PFO	58.4
Palustrine Scrub Shrub	PSS	31.2
Palustrine Open Water	POW	39.9
Riverine Lower Perennial; Unconsolidated Bottom	R2UB	15.7
Riverine Intermittent Streambed	R4SB	154.4
Source: U.S. Army Engineer Research and Development Center, 2000.		

The dominant wetland system occurring on the installation is palustrine, which consists primarily of broad-leaved deciduous trees (forested wetlands), shrubs or scattered small trees (scrub shrub), herbaceous plants, or unvegetated ponds. Many of the wetlands on the installation have been modified by dikes, dams, or excavation. There are 160.5 acres of palustrine wetlands on the installation including 70.9 acres of emergent wetlands, 58.4 acres of forested wetlands, and 31.2 acres of scrub shrub wetlands. There are also 39.9 acres of unvegetated ponds (open water wetlands).

The Sugar Creek seep is located adjacent to Sugar Creek at the point where it intersects the northern boundary of the installation. In addition to supporting a high-quality seep community, this area harbors CAJMTC's only known population of thicket sedge (Carex leptalea), a state watchlist plant species. The seep is also likely the only location on CAJMTC that provides habitat for black ash (Fraxinus nigra).



Wetlands

Camp Atterbury Joint Maneuver Training Center
Indiana

Source: CAJMTC, 2006

Figure 3-3

CHAPTER 4 ECOSYSTEMS AND THE BIOTIC ENVIRONMENT

4.1 TERRESTRIAL ECOSYSTEMS

CAJMTC supports a mixture of wooded and open habitats interspersed with small waterways. Major terrestrial community types include upland hardwood forest, bottomland hardwood forest, grassland, and shrubland.

CAJMTC is situated within three distinct natural regions—the Central Till Plain Natural Region, Highland Rim Natural Region, and the Bluegrass Region. A natural region, as defined by the Indiana Academy of Science (Homoya et al., 1985), is a land area grouped together by similar natural features, including climate, soils, glacial history, topography, exposed bedrock, presettlement vegetation, species composition, and physiography. In Indiana, 11 natural regions are defined, along with 20 sections or subtypes within the regions. Characteristic features of the regions and sections associated with CAJMTC are described below.

Central Till Plain Natural Region (Region 5) This region, the largest in Indiana, is a formerly forested plain of Wisconsin till located in the central portion of the state. In general, the region is topographically homogeneous, although several glacial features such as moraines are common. Within the region, CAJMTC exists in a major divide between communities with strong northern affinities and those with strong southern affinities.

> Tipton Till Plain Section. The northern flatwoods community (beech-maple-oak forest) supported by poorly drained soils was once ubiquitous in the Tipton Till Plains, but is now confined to scattered woodlots.

Highland Rim Natural Region (Region 10) This natural region in part occupies the Highland Rim region of the Interior Low Plateaus that occurs in a discontinuous belt from northern Alabama through Tennessee, Kentucky, and into Indiana. A distinctive feature of the Highland Rim is the large expanse of karst topography. Other major topographic features include cliffs and rugged hills. Much of this area was forested in presettlement times, but large areas of barrens and smaller areas of glade (limestone and siltstone) and gravel wash communities were also present.

> Brown County Hills Section. Characterized by deeply dissected uplands underlain with siltstone, shale, and sandstone, soils in this section are composed of well-drained acid silt loams with minor amounts of loess. Vegetation communities are rather uniform in composition, with uplands dominated by oak-hickory and ravines supporting mesic species such as beech, red oak, sugar maple, and white ash.
>
> Bottomland hardwood forests contain moderately-drained soils that are inundated seasonally. This forest type tends to support a well-developed canopy layer, with a sparser understory.

Bluegrass Natural Region (Region 11) This natural region is identified and named for similarities of the physiography and natural communities to the Bluegrass region of Kentucky.

Historically, this portion of Indiana has not been considered a part of the Interior Low Plateaus Bluegrass Region as outlined by Fenneman. However, several geologists have pointed out similarities in the Kentucky Bluegrass Region and the Indiana Area, with one (Ray) placing them together in the Bluegrass part of the Interior Low Plateaus. Major portions of three regions are included in the Bluegrass Natural Region, one being the Scottsburg Lowland Region. The three sections of this natural region approximate the area of these physiographic units with the Scottsburg Lowland Section falling within the boundary of CAJMTC.

> Scottsburg Lowland Section. The main features of this section are the wide alluvial and lacustrine plains that border the major streams. Major soils are acid to neutral silt loams, particularly of the Stendal, Atkins, Haymond, and Wilbur series. A sizable area of eolian sand occurs just east of the East fork of the White River, but no unique communities or species are known to have been associated with it. Bedrock rarely crops out. Predominant natural communities are floodplain forest and swamp, although areas of upland forest are included. The swamp community is characterized by the occurrence of swamp cottonwood, red maple, pin oak, river birch, green ash, stiff dogwood, and button-bush. The slightly more well-drained floodplain forest adds sweetgum, swamp chestnut oak, swamp white oak, American elm, blackgum, American beech, shellbark hickory, and rarely pecan. Characteristic herbs include Mushingum sedge, Louisiana sedge, Virginia day flower, lizard's tail, and woodreed. The very rare southern pale green orchid is geographically restricted here, as is the northern copperbelly, and the eastern ribbon snake. The northern studfish is known in Indiana only from streams in the far northern portion of this section. State restricted plants include the extinct stipuled scar-pea, and the extirpated Short's goldenrod. Wetland features in this section include swamps, acid seep springs, low-gradient, silty-bottomed streams and rivers and ponds.

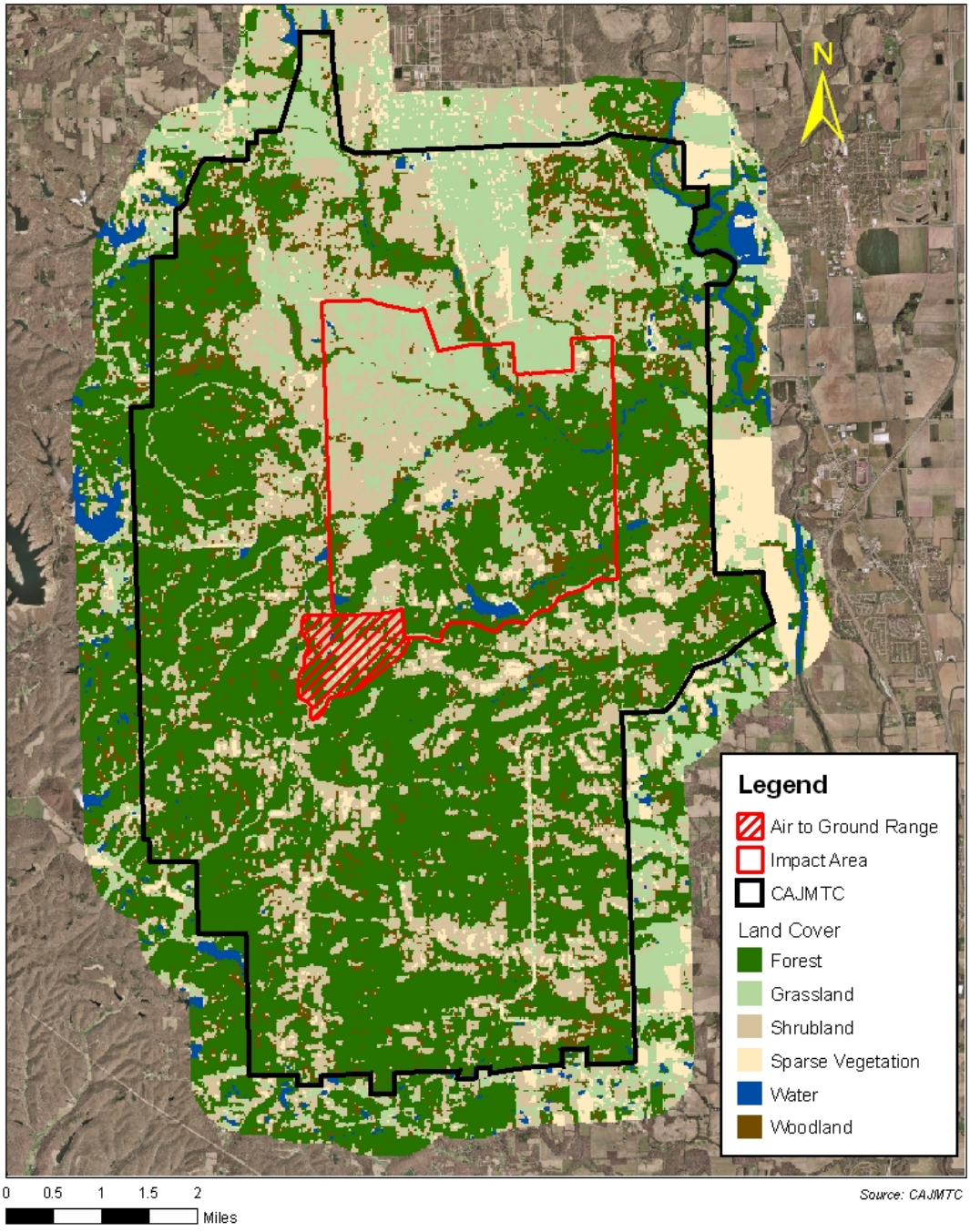
CAJMTC's grasslands, or open-field habitats, are scattered throughout the installation in small patches, typically occurring in areas of periodic burning. Fields containing prairie species such as *Andropogon scoparius* add considerable diversity to CAJMTC and, as such, are of special preservation interest to the state of Indiana.

4.2 VEGETATION

A summary of terrestrial ecosystems and vegetative species is provided in the following subsections. Figure 4-1 shows vegetative land cover on CAJMTC. A complete list of recorded species is provided in Appendix C.

4.2.1 Current Vegetative Cover

Bottomland hardwood forests contain moderately-drained soils that are inundated seasonally. This forest type tends to support a well-developed canopy layer, with a sparser understory, and is composed of the following tree species: red maple (*Acer rubrum)*, river birch *(Betula nigra*), shellbark hickory (*Carya lacinosa*), button bush (*Cephanlanthus occidentalis*), green ash (*Fraxinus pennsylvanica*), sweetgum (*Liquidambar styraciflua*), blackgum (*Nyssa sylvatica*), American sycamore (*Platanus occidentalis*), eastern cottonwood (*Populus deltoids*), swamp



Vegetative Land Cover
Camp Atterbury Joint Maneuver Training Center
Indiana

Source: CAJMTC, 2007

Figure 4-1

white oak (*Quercus bicolor*), swamp chestnut oak (*Q. michauxii*), pin oak (*Q. palustris*), and American elm (*Ulmus americana*).

In the upland forests scattered throughout the installation, vegetation consists of well-developed and moderately diverse overstory and understory layers. On drier sites, oak and hickory predominate, including such species as pignut hickory (*Carya glabra*), red hickory (*C. ovalis*), shagbark hickory (*C. ovata*), white oak (*Quercus alba*), scarlet oak (*Q. coccinea*), chestnut oak (*Q. prinus*), and black oak (*Q. velutina*). Understory vegetation includes Jack-in-the-pulpit (*Arisaema triphyllum*), ebony-spleenwort (*Asplenium platyneuron*), sedge (*Carex abscondita*), flowering dogwood (*Cornus florida*), poverty grass (*Danthonia spicata*), witch hazel (*Hamamelis virginiana*), partridge berry (*Mitchella repens*), wood betony (*Pedicularis canadensis*), and Venus' looking-glass (*Specularia perfoliata*).

More mesic upland sites support overstory populations of sugar maple (*Acer saccharum*), American beech (*Fagus grandifolia*), white ash (*Fraxinus americana*), yellow poplar (*Liriodendron tulipfera*), northern red oak (*Quercus rubra*), and basswood (*Tilia americana*). In the understory, the following species are found: maidenhair fern (*Adiantum pedatum*), cohosh (*Caulophyllum thalictroides*), wild hydrangea (*Hydrangea arborescens*), large-leaved waterleaf (*Hydrophyllum macrophyllum*), lanceleaf loosestrife (*Lysimachia lanceolata*), great yellow woodsorrel (*Oxalis grandis*), mayapple (*Podophyllum peltatum*), broad beech-fern (*Thelypteris hexagonoptera*), and yellow violet (*Viola eriocarpa*).

CAJMTC's grasslands, or open-field habitats, are scattered throughout the installation in small patches, typically occurring in areas of periodic burning. Grasses and forbs found in this community include little bluestem grass (*Andropogon scoparius*), churchmouse threeawn grass (*Aristida dichotoma*), butterfly milkweed (*Asclepias tuberosa*), beach false foxglove (*Gerardia fasciculata*), slender bushclover (*Lespedeza virginica*), woodland flax (*Linum virginianum*), green fringed orchid (*Platanthera lacera*), rosepink (*Sabatia angularis*), yellow nodding ladies'-tresses (*Spiranthes ochroleuca*), and oval ladies'-tresses (S. ovalis). Fields containing prairie species such as *Andropogon scoparius* add considerable diversity to CAJMTC and, as such, are of special preservation interest to the state of Indiana.

4.2.2 Turf and Landscaped Areas

Most developed areas of the base are highly disturbed and are dominated by introduced or non-native grasses such as fescue (*Fescue spp*.), bluegrass (*Poa pratensis*), ryegrass (*Lolium spp*.), and zoysia (*Zoysia spp*.) mixed with various perennial and annual weed species.

4.3 FISH AND WILDLIFE

Numerous faunal surveys have been completed on the installation. University research involves field surveys of mammals, birds, reptiles, amphibians, and fish at CAJMTC, with special emphasis placed on species considered rare in Indiana. Indiana bat surveys were undertaken in 1997, 1998, and 2002 and completed by USACERL (United States Army Construction Engineering Research Lab) in 2005 and 2006. Surveys are completed using a variety of methods

that characterized animal communities in representative habitat types. A complete list of recorded species is provided in Appendix C.

4.3.1 Mammals

The 1990 survey of mammals documented 28 species. Mammals found in the greatest relative abundance were the white-tailed deer, raccoon, eastern cottontail, and Virginia opossum.

Bat surveys were conducted in 1997, 1998, and 2002. Additional research on bat biology was conducted at CAJMTC in 2005 and 2006 by a joint effort of USACERL and Southern Illinois University. A complete list of recorded species is provided in Appendix C. The big brown bat, eastern pipistrelle, red bat, and northern long-eared bat were the most abundant species captured, representing 83 percent of the total bats surveyed in 1997. Also found were the federally-endangered Indiana bat and the state-endangered evening bat.

4.3.2 Birds

A survey of bird species at CAJMTC was conducted in the spring and summer of 1990 (Hengeveld, 1990). Survey results indicate that the breeding bird community at CAJMTC contains species representative of the woodlands and fields of south central Indiana. Woodland birds are represented in relatively high numbers. A complete list of recorded species is provided in Appendix C.

Of the total bird species encountered during the survey, 89 are known or probable breeders on the installation.

4.3.3 Reptiles and Amphibians

Seventeen species of reptiles and 19 amphibian species were recorded on CAJMTC from the 1990 survey of fishes, amphibians, and reptiles (Ewert et al., 1990). A complete list of recorded species is provided in Appendix C.

4.3.4 Fish

The fish population at CAJMTC has been surveyed in 1990, 1992, 1996, and as recently as 2005 (IDNR, 1991; SAIC, 1998). The 1990 survey of fish detected the presence of 38 species. Sampling was conducted at a total of 10 sites within Nineveh, Saddle, Mud, Lick, and Catherine creeks, as well as some unnamed creeks in training areas 1A and 7A. In 1992, surveys were undertaken at Puff Lake and Duck's Pond.

The 1996 survey sampled 13 sites located within East Fork Salt Creek, Nineveh Creek, South Fork Catherine Creek, Catherine Creek, Lick Creek, Muddy Branch, two unnamed tributaries to Nineveh Creek, two unnamed tributaries to Mud Creek, and one unnamed tributary to the Driftwood River. A total of 41 species were collected, nine of which had not been collected during the 1990 survey. The most abundant species included the green sunfish (*Lepomis cyanellus*), central stoneroller, creek chub, bluegill, and bluntnose minnow.

4.3.5 Invertebrates

A 1998 survey of freshwater mussels was conducted on streams of the Sugar Creek and East Fork White River drainages that occur within installation boundaries (Harmon, 1998). Twenty species were collected alive or "freshly dead," and 11 more dead species were found weathered or subfossilized. The mucket (*Actinonaias ligamentina*) was the most abundant species collected.

4.4 THREATENED AND ENDANGERED SPECIES

As described above, numerous wildlife surveys have been conducted at CAJMTC to determine the presence of federal and state listed species. For the last ten years, bird surveys were conducted as part of the previous LCTA program. The program is now called the RTLA program. Mammals, birds, reptiles, amphibians, fish, and a bat survey was conducted in 1997. A survey of freshwater mussels was completed in 1998.

An inventory of rare plant species and natural areas was conducted in 1990 by the IDNR, Division of Nature Preserves (IDNR, 1990). Approximately 80 percent of the total acreage of CAJMTC was surveyed for rare plants; the impact and cantonment areas were excluded from study. In addition to providing information on rare species occurrences, IDNR evaluated areas on the installation proposed for designation as a natural area.

4.4.1 Endangered, Threatened, and Rare Fauna

Results of the vertebrate and invertebrate surveys indicate the presence of 26 sensitive wildlife species on or in the vicinity of the installation (IDNR, 1990). One federally-listed species, the bald eagle (*Haliaeetus leucocephalus*), was included in the results of the bird inventory because it has been seen on CAJMTC. However, no resident birds or nesting sites have been identified.

The Indiana bat, a federally listed endangered species, is the only federally listed species known to occur at CAJMTC. In 1997 mist net sampling was conducted at 22 sites and Indiana bats were captured at nine of those sites (Montgomery Watson, 1997). To gather additional data on Indiana bats at CAJMTC, a mist netting and telemetry study was conducted in the summer of 1998. A copy of the ESMC for the Indiana Bat (*Myotis sodalis*) at CAJMTC is provided in Appendix D.

The cerulean warbler (*Dendroica cerulea*) and the Henslow's sparrow (*Ammodramus henslowii*) have been identified by the U.S. Fish and Wildlife Service as Migratory Nongame Birds of Management Concern (USFWS, 1995a). The rayed bean clam (*Villosa fabalis*) is a candidate species for Federal listing as threatened or endangered.

Three species of fauna listed as endangered by the state of Indiana have been observed on the installation: evening bat, Henslow's sparrow, and the sedge wren (*Cistothorus platensis*). The cerulean warbler has also been identified as an Indiana Special Concern species.

The numerous other state species of special concern, state rare species, and species on the Indiana Watch List that have been found on the installation, along with those previously mentioned, are listed in Table 4.1.

Table 4.1 Endangered, Threatened, and Rare Fauna on and in the vicinity of Camp Atterbury

Species	Preferred Habitat	State Status	Comments
Mammals			
Indiana bat, *Myotis sodalist*	Caves and small streams with riparian forest.	FE, SE	
Least weasel, *Mustela nivalis*	Meadows, fields, brushy areas, and open woods.	SSC	
Evening bat, *Nycticeius humeralis*	In summer, roost in tree cavities and buildings, including occupied homes.	SE	Have not located roosts
Birds			
Bald eagle, *Haliaeetus leucocephalus*	Forests along the coasts, rivers, or large lakes. Nest in tall trees or cliffs.	FT, SE	Flies over post
Barn owl, *Tyto alba*	Open and partly open habitat, such as grassland or farmland. Typically nest in cliff crevices or man-made structures such as a nest box.	SE	Not found on post, but near post
Black-and-white warbler, *Mniotilta varia*	Deciduous and deciduous-coniferous forests. Nest on hillsides and in ravines, concealed under dead leaves or branches.	SSC	
Broad-winged hawk, *Buteo platypterus*	Dense deciduous and mixed forest, often near water. Nests in deciduous trees.	SSC	
Cerulean warbler, *Pendraica cerulea*	Mature woodlands with little understory, near streams and rivers. Nest in deciduous trees.	SSC, FMC	
Golden-winged warbler, *Vermivora chrysoptera*	Early successional habitats of old fields. Nests on the ground in grass clumps or against trees.	SE	
Great blue heron, *Ardea herodias*	Freshwater and brackish marshes, swamps, lakes, rivers, and mangroves. Nest in deciduous trees and occasionally in shrubs.		Bird not listed but rookery habitat is.
Great egret, *Ardea alba*	Marshes, swamps, irrigation ditches, tidal estuaries, fresh- and brackish-water margins	SSC	
Henslow's sparrow, *Ammodramus henslowii*	Moist or dry grasslands, scattered weeds, small shrubs.	SE, FMC	
Hooded warbler, *Wilsonia citrina*	Moist, mature deciduous forest. Nest in shrubs, especially in ravines.	SSC	
Mississippi kite,	Forest, open woodland, semi-arid	SSC	

Table 4.1 Endangered, Threatened, and Rare Fauna on and in the vicinity of Camp Atterbury			
Species	**Preferred Habitat**	**State Status**	**Comments**
Ictinia mississippiensi	rangeland, usually near a waterway.		
Northern harrier, *Circus cyaneus*	Prairie, savanna, slough, wet meadow, marsh. Nests on slightly elevated ground or in thick vegetation.	SE	
Osprey, *Pandion haliaetus*	Along rivers, lakes, and coasts. Nests near or over water in deciduous or coniferous trees or man-made structures such as poles, docks, sheds, and platforms.	SE	Has been noticed feeding on post
Red-shouldered hawk, *Buteo lineatus*	Riparian forest and wooded swamps. Nest and forage in large tracks of mature bottomland forest.	SSC	
Sandhill crane, *Grus canadensis*	Shallow wetlands, freshwater margins, prairies, fields. Nests on the ground.	SE	In migratory path; stops to rest
Sedge wren, *Cistothorus platensis*	Grassy freshwater marshes and sedges, brackish marshes, wet meadows.	SE	
Sharp-shinned hawk, *Accipiter striatus*	Northern woodland and mountainous coniferous/deciduous forest. Nests in trees near the trunk.	SSC	
Worm-eating warbler, *Helmitheros vermivorus*	Ravines and hillsides in thick deciduous forests. Nests on hillsides, tucked beneath low shrubs, occasionally concealed by drifts of dead leaves.	SSC	
Reptiles			
Rough green snake, *Opheodrys aestivus*		SSC	
Note: All species listed on this table, with the exception of the barn owl, have been found on CAJMTC.			

4.4.2 Endangered, Threatened, and Rare Flora

As a result of floristic surveys conducted in 1990, seven state listed plant species are known to occur on CAJMTC, but no federal species are known to be present. State endangered plant species include Northern dewberry (*Rubus flagellaris*), Smith's bulrush (*Schoenoplectus smithii*), Goosefoot cornsalad (*Valerianella chenopodiifolia*), and Withe-rod (*Viburnum nudum*). State threatened plant species include Missouri river willow (*Salix eriocephala*), Branched bur-reed (*Sparganium androcladum*), and Yellow nodding lady's tresses (*Spiranthes ochroleuca*).

CHAPTER 5 MISSION IMPACTS ON NATURAL RESOURCES

5.1 INSTALLATION LAND USE

Prior to being established as a military property, the northern portion of CAJMTC was primarily farms, homesites, and woodlands. When the installation was constructed, the northern section was cleared and graded, and portions were made available for livestock grazing. The forests in this section are in mixed stages of succession. The topography of the southern portion was unsuitable for farming, which was confined to the valley bottoms in this region and, therefore, was left relatively undisturbed (IDNR, 1990).

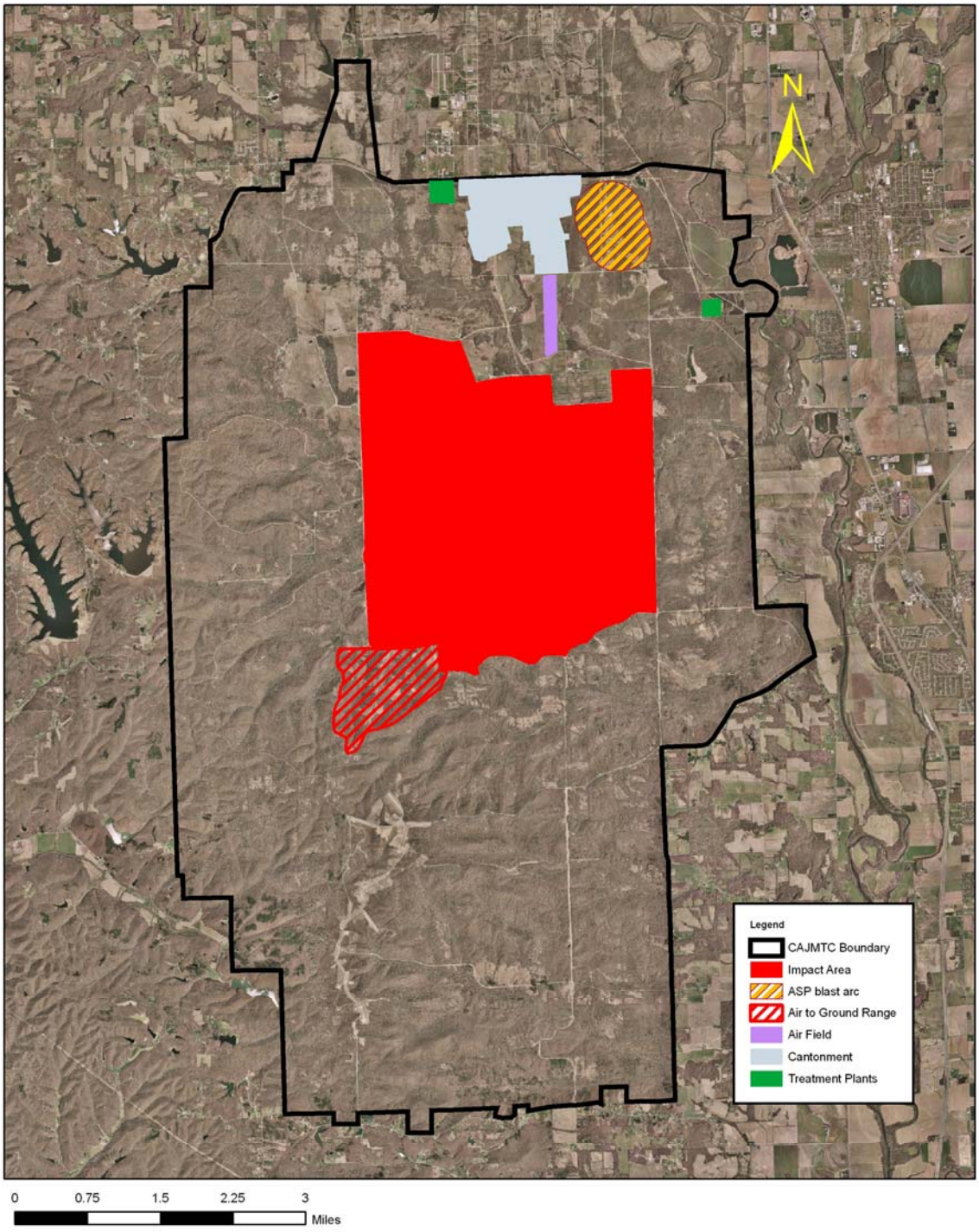
There are four major land uses on the installation as shown on Figure 5-1: the cantonment area; the common impact area; the air-to-ground range; and the training areas. Training areas are shown on Figure 5-2.

Cantonment Area The cantonment area consists of approximately 655 acres and is located in the northern portion of the installation. The area contains various support facilities for CAJMTC, including administration, dispensary, transportation, storage, communication, utilities, and housing facilities. The housing facilities consist of barracks. The ANG Headquarters is located on 4.5 acres in the cantonment area. There is also a minimum security detention facility, operated by the Indiana Department of Corrections, located in the cantonment area (ANG, 1993; SAIC, 1998).

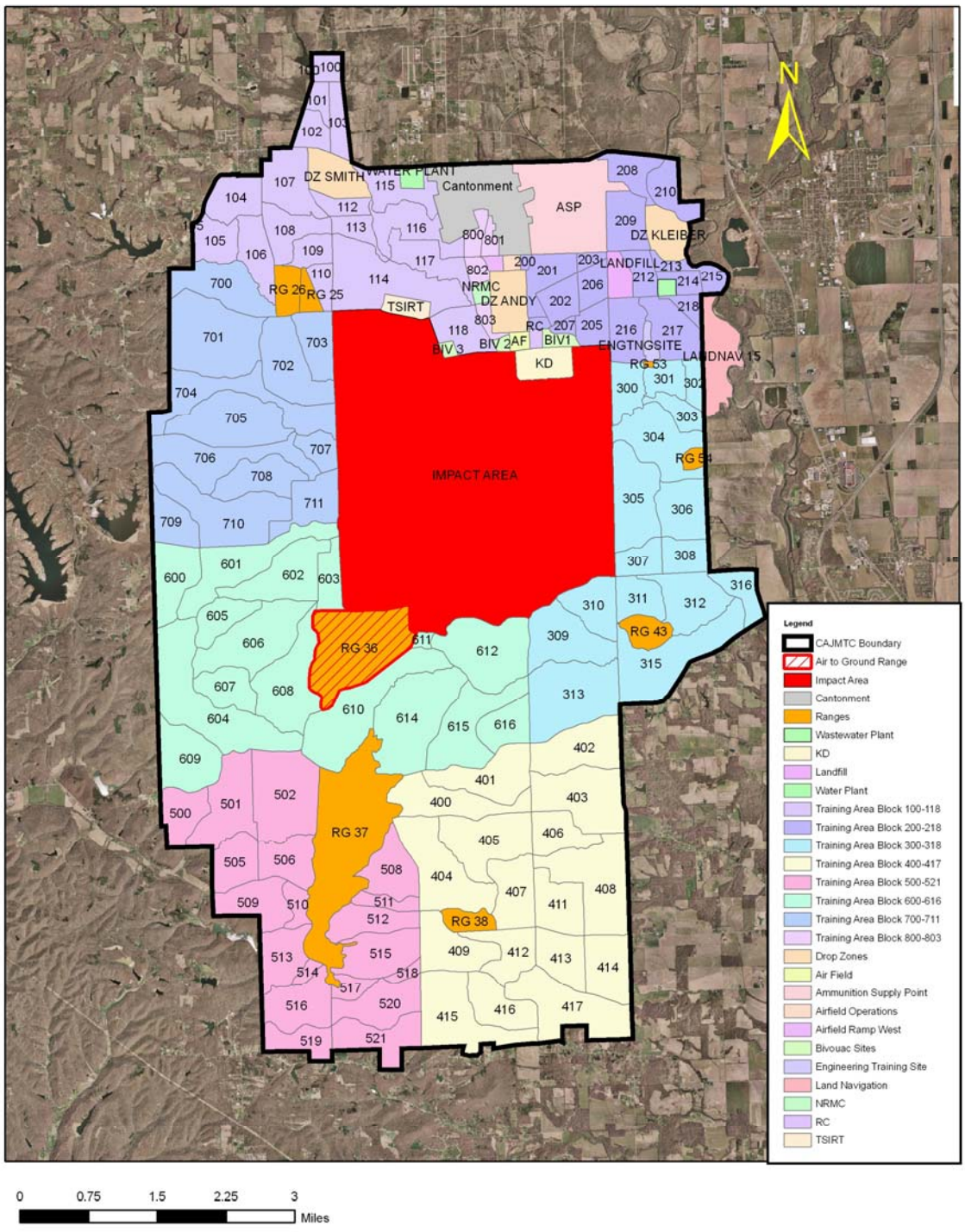
Impact Area The 5,655-acre centrally located common impact area is bounded on the north by Hendricks Ford and Wilder Roads; on the east by Mauxferry Road; on the south by Morton and Short Roads; and on the west by Lincoln Road. There are 59 range locations within the perimeter. Most of the ranges lie along the perimeter of the impact area. There are approximately 14 mortar locations, 14 numbered ranges and approximately 76 artillery firing points. Most of the mortar firing points run along the eastern, southern, and western boundaries. The only training that occurs within the impact area consists of direct range firing and/or all live fire mortar and artillery impacts (CA, 1993). The impact area is used mainly by the Army; however, the ANG occasionally uses the area to drop inert bombs (SAIC, 1998).

Air-to-Ground Range The air-to-ground range, which consists of approximately 650 acres and is located in the southwestern portion of the impact area, is used by the ANG for aircraft training. Aircraft approach the area from the north or south and perform bombing and strafing passes on a bombing circle or scored targets. The range, which permits low- and high-angle bombing, contains 14 tactical and strafe targets and is compatible with all high-speed jet aircraft (SAIC, 1998).

Under a MOU/MOA between ANG and ARNG, ANG has exclusive-use and joint-use properties located within the boundaries of the installation. The exclusive-use property includes a storage yard, and the joint-use land consists of the air-to-ground range.



Installation Map
Camp Atterbury Joint Maneuver Training Center
Indiana
Source: CAJMTC, 2006
Figure 5-1



Training Areas

Camp Atterbury Joint Maneuver Training Center
Indiana

Source: CAJMTC, 2006

Figure 5-2

The Environmental Manager's Office under the Support Group Commander located in Terre Haute, Indiana provides technical and professional assistance and ensures all state and federal laws, regulations, and policies are followed by the ANG concerning natural resource issues. To ensure CAJMTC's conservation mission is met, consideration of all potential impacts to natural resources resulting from projects is coordinated through the Conservation Director. The range receives on-the-ground support and advice from the CAJMTC Environmental Office, POTMS and the Department of Public Works (Post Engineer).

ANG provides the funding as well as the majority of manpower and machinery for operation of the air-to ground range, and CAJMTC provides recommendations and some services. CAJMTC is reimbursed by ANG for all services and materials.

The primary natural resource issues affecting the air-to-ground range include:

- Firebreak maintenance — Firebreak maintenance is overseen by the CAJMTC Conservation Director and the actual work is accomplished by CAJMTC ANG personnel and equipment.
- Erosion control — Erosion control is the responsibility of the CAJMTC Conservation Director, with the required on-the-ground work accomplished by ANG. All costs incurred by INARNG are to be reimbursed by ANG.
- Prescribed burning — Routine prescribed burning is accomplished by qualified ANG personnel and adherence to all requirements under the CAJMTC's annual burn variance, DoD Fire Policy, and CAJMTC's IWFMP. All burns will be coordinated with the Conservation Director.
- Forestry — The ANG grounds have no merchantable forestland; however, the CAJMTC forestry personnel will continue to offer advice and services for salvage tree removal, endangered species issues, and tree removal projects. All activities that involve the manipulation of trees, disturbance of riparian areas, and streams will require coordination with the Environmental Office to ensure ESA compliance as well as compliance with other state and federal laws, regulations, orders, and policies. Any ESA Section 7 consultations will be conducted by the Conservation Director.
- Cultural resources — Use of ANG-leased land will follow all applicable state and federal laws that pertain to INARNG lands. The CRM, and Integrated Cultural Resource Management Plan and its standard operating procedures (SOP) will be consulted when appropriate. All management actions that would require soil disturbance would be done in coordination with the CRM to ensure National Historic Preservation Act (NHPA) compliance.

All state and federal acts, laws and regulations are applicable on ANG grounds under the authority of the INARNG, and this Revised INRMP.

Training Areas CAJMTC has approximately 26,330 acres (PRIDE, 2006) of maneuver training land divided into eight training and maneuver areas. Each training area is further subdivided into sub-areas, which are identified by an numeric designator. The terrain of the training areas varies, ranging from fairly flat in the north to steep hills in the southern portion of the post. Boundaries are formed by improved roads and natural barriers such as rivers and streams. Descriptions of the training areas are summarized below.

- Training Area 100 Block has 18 subdivisions, 1 Drop Zone, 1 Theater Specific Individual Readiness Training (TSIRT) area, and 2 ranges;
- Training Area 200 Block has 18 subdivisions, 1 Land Navigation Course, 5 Drop Zones, 1 Engineering training site, an ASP, and a cantonment area;
- Training Area 300 Block has 17 subdivisions and 1 range;
- Training Area 400 Block has 18 subdivisions;
- Training Area 500 Block has 19 subdivisions and 1 range;
- Training Area 600 Block has 16 subdivisions;
- Training Area 700 Block has 12 subdivisions;
- Training Area 800 Block has 4 subdivisions, 1 Drop Zone/Landing Strip, a Natural Resources Compound, 1 staging area and 1 bivouacking area.

Ranges CAJMTC currently has 59 direct fire ranges, 29 of which are adjacent to and fire directly into the 5,655-acre centrally located common impact area. The remaining ranges are located throughout the seven major training areas. These ranges provide training and qualification firing for individual and crew-served weapon systems as well as anti-tank weapons, demolitions, helicopter gunnery, tank firing, and hand grenades. CAJMTC also supports indirect mortar and artillery live-fire training and service practice. There are 51 surveyed artillery firing points with the ability to support indirect fire from 105 mm through 203 mm (8-inch) cannons. Twenty mortar firing points support mounted and dismounted mortar training from 60 mm through 120mm mortars, including three for 81 mm Short Range Training Round (SRTR) training. There are five observation points that provide varying views of the common impact area. The 203 mm howitzer is being dropped from the Army weapons inventory and firing of the 203 mm no longer occurs at CAJMTC.

Few, if any, lead projectiles are used during weapon live-firing training. While most larger weapons fire training/practice (TP) rounds, some potential dud-producing high explosive (HE) rounds are fired. All major weapons systems fire into the common impact area. Small arms TP rounds are normally steel core with a copper jacket; mortar and artillery high explosive/smoke/illumination rounds are steel and brass. A limited number of small arms using .22 caliber and 9 mm rounds may contain lead projectiles (SAIC, 1998).

Non-firing training facilities located on the installation include a medical litter course; rappelling tower; physical conditioning course; nuclear, biological, chemical (NBC) chamber; still water bridge and rafting site; Mobile Conduct of Fire Trainer (M-COFT) site; training site, fire observation (TSFO) trainer; sling load trainers; land navigation courses; three Air Force-certified drop zones; and a 4,250-feet tactical landing strip capable of supporting C-130 aircraft operations.

5.2 CURRENT MAJOR IMPACTS

The Army recognizes that a healthy and viable natural resource base is required to support the military mission. To be effective, the natural conditions of the training areas on CAJMTC must be maintained to provide realism. Areas that are obviously degraded by previous training activity detract from the realism of the current training activity. Vegetation is necessary for cover and concealment; therefore, areas that are stripped of their vegetation are no longer

representative of the undisturbed lands that might be encountered during real conflicts. The relationship between soils and vegetation is very important in supporting the mission. In addition to providing cover and concealment, vegetation protects soils from erosion. Eroded soils cannot support the vegetation, which results in a loss of realism, and eroded areas also represent a safety hazard to the soldiers. This Revised INRMP helps to ensure that environmental considerations are integral part of planning activities at CAJMTC and that natural resources are protected in accordance with Army regulations and policies.

Ongoing military operations performed in support of the mission at CAJMTC may alter the environmental setting and condition of the natural resources. For example, the construction of ditches, foxholes, and roads results in vegetation loss and disturbance, compaction, and erosion of the soil. While short-term changes in the environmental setting may still provide for relatively realistic training opportunities, the absence of long-term management measures to properly conserve and restore natural resources may impede CAJMTC's ability to continue to adequately train soldiers. In addition to the impacts mentioned above, environmental damage can also place other artificial constraints on training, such as:

- Loss of training acreage;
- Decreased tactical maneuverability;
- Increased land and natural resource maintenance costs; and
- Increased safety hazards.

Training leaders and soldiers are required to follow the practices described in CAJMTC's Leader's Handbook to limit environmental degradation during training activities. Implementing appropriate management measures and considering alternatives to these measures as they are developed limit the potential for serious alterations to natural resources that are critical to providing a realistic training environment. In addition, such measures likely result in a more effective, long-term approach to natural resource protection and conservation.

Existing natural resources on CAJMTC lands may influence the manner in which CAJMTC's mission is executed. While natural resources provide a realistic training environment for meeting mission requirements, their existence may also limit certain military plans and activities. For example, topographic features of the land or the presence of wetlands or threatened and endangered species may preclude military activities, such as construction, because of potential adverse impacts to those legally protected resources. In addition, any permanent degradation of natural resources as a result of continuing military use would, in turn, ultimately lead to further mission impairment, should realistic training conditions no longer be available. Therefore, the proper management of natural resources and their use by the military is a sound environmental practice; it also directly supports the CAJMTC mission to provide realistic training. This Revised INRMP considers the effects of such natural resources on the mission.

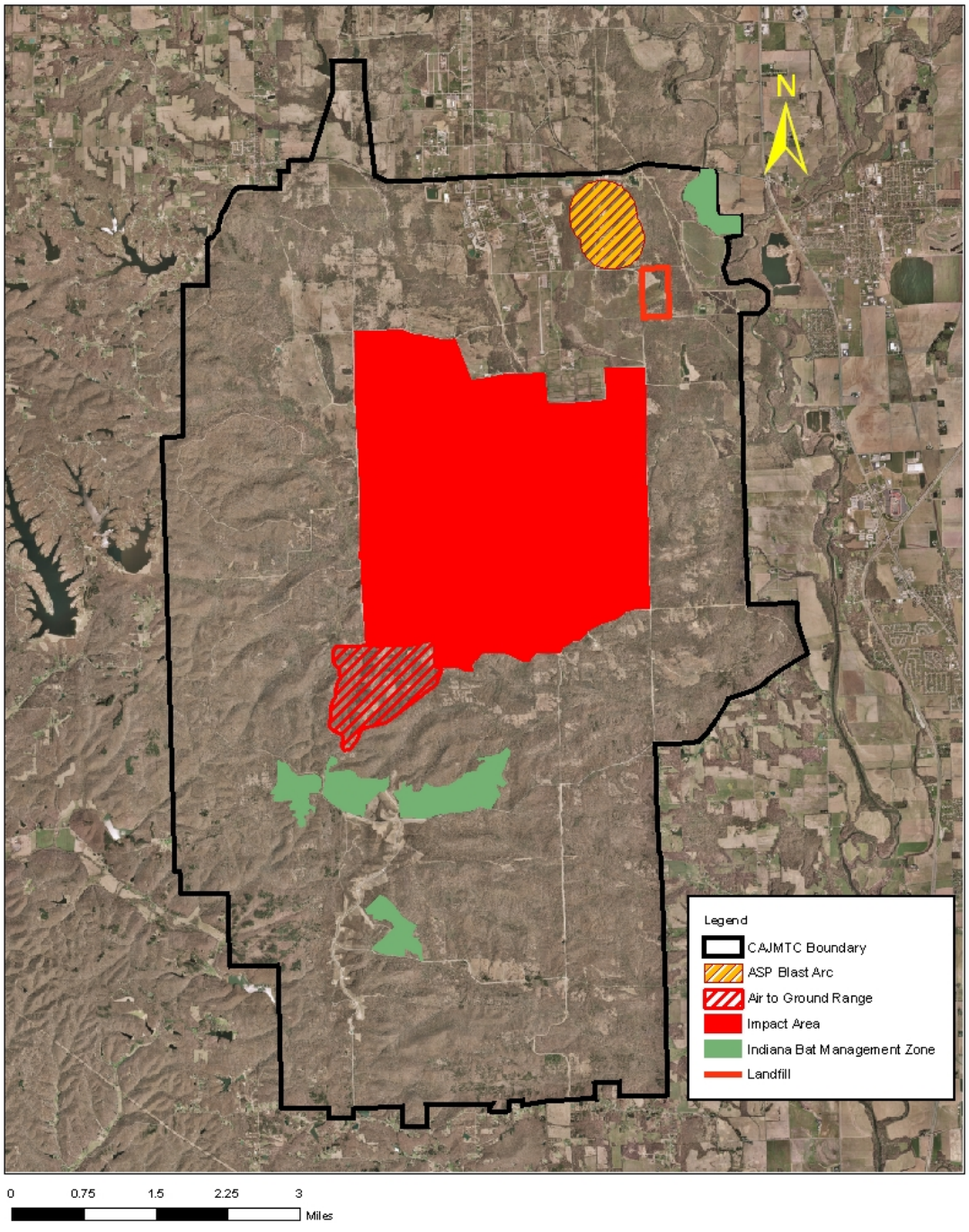
5.3 NATURAL RESOURCES CONSTRAINTS TO MISSIONS AND MISSION PLANNING

Increased use and intensity of use of the training lands on CAJMTC can be expected to place further demands on the natural resources. The Environmental Office will continue to diligently monitor the environmental conditions and implement an adaptive ecosystem management

approach to ensure that the training lands continue to support the mission and provide realistic training conditions.

Figure 5-3 provides a map of training limitations at CAJMTC.

Because the primary mission of CAJMTC is to provide adequate facilities, training areas, and ranges to maintain the readiness of the ARNG and the ANG, any environmental initiatives or plans are considered secondary and should be managed so as not to inhibit meeting military requirements. It is important to consider limitations due to the presence of naturally occurring resources that can not be altered, as well as those limitations resulting from natural resources that have already been impacted. However, certain restraints and conditions limit the types and locations of training and range activities.



Training Limitations
Camp Atterbury Joint Maneuver Training Center
Indiana
Source: CAJMTC, 2006
Figure 5-3

CHAPTER 6 NATURAL RESOURCES PROGRAM MANAGEMENT GOALS, OBJECTIVES, AND ACTIONS

6.1 INTRODUCTION

The INRMP is considered a "living" document that is based on several short-, medium-, and long-range planning goals. Short-range goals include activities that are planned to occur within five years, while medium-range goals include activities in a 6- to 10-year period. Long-range goals are usually scheduled beyond 10 years. Because an INRMP is a living document, goals may be revised over time to reflect evolving environmental conditions. In addition, medium- and long-range planning goals eventually become short-range activities that also require implementation.

The primary long-range planning goal at CAJMTC is to continue to provide training facilities while supporting environmental strategies and goals that are consistent with Army regulations and policies and federal and state laws and regulations. No net loss in the ability of military installation lands to support the military and training missions of the installation is desired. With long-range planning goals in mind, CAJMTC has developed several short-range goals for the installation to support the current mission and meet future needs. To that end, this INRMP includes management recommendations that meet three short-range planning goals: (1) to implement a comprehensive environmental protection strategy that incorporates compliance, restoration, prevention, and conservation; (2) to improve the existing management approach to protecting natural resources on the installation; and (3) to meet legal and policy requirements consistent with national natural resources management philosophies.

6.2 INTEGRATED TRAINING AREA MANAGEMENT PROGRAM

Program Overview and Management Goal
Headquarters, Department of the Army (HQDA), Office of the Deputy Chief of Staff for Operations and Plans (ODCSOPS) is the primary proponent for the Integrated Training Area Management (ITAM) Program. Within the NGB, the Training Division (NGB-ART) has overall program responsibility and technical support is provided by the Environmental Programs Division (NGB-ARE). AR 350-19 defines responsibilities and prescribes policies for implementing the Sustainable Range Program (SRP) on Army controlled training ranges and training lands. The ITAM Procedural Manual (HQDA, 1999) provides more detailed information on the executive management of the ITAM Program for the HQDA.

Integrated Training Area Management (ITAM) is the Army's way of bridging the gap between training and the environment. The primary mission of today's Army is to provide soldier readiness. But, the potential effects of this mission on the environment are a primary consideration as well. Heavier and faster equipment, increased range of weapons systems, and the testing of technologically advanced weapons and materials have presented new challenges – specifically to minimize the Army's impact on the land used for these activities.

The ITAM program is a management and decision making process to integrate the Army's training and other mission requirements for land use with the sound natural resource

management of land. The implementation of sound programs will ensure that the Army has lands available to train on in the future.

The ITAM program belongs to the Installation Commander. The ITAM core capability funding is integrated with other available funding sources, such as range operations, environmental compliance and real property maintenance funds, to support the total land management requirement of the installation.

The ITAM program was instituted at CAJMTC during FY 93. The Environmental Office and POTMS are primarily responsible for coordinating and conducting the specific activities that are detailed in the comprehensive ITAM Annual Work Plan. In addition, much of the workplan is executed by range personnel working under the direction of the ITAM Manager. The work plan is prepared by POTMS with assistance from the Environmental Office, and it covers the current year and several years beyond. Much of the information from the work plan has been incorporated into this Revised INRMP as part of the integration of the overall natural resources management program at CAJMTC. All ITAM management actions that would require soil disturbance would be done in coordination with the CRM and the Conservation Director to ensure NHPA and ESA compliance, as well as other compliance issues.

The ITAM program consists of five components:

- Range and Training Land Assessment (RTLA), formerly called Land Condition Trend Analysis (LCTA). This component provides for collecting data, inventories, monitoring, and analysis of data to determine the condition of training land as it relates to the training mission.
- Training Requirements Integration (TRI). This component is a decision support procedure that integrates training requirements with land management.
- Land Rehabilitation and Maintenance (LRAM). This component is the preventative and corrective land rehabilitation and maintenance process that reduces the long-term impacts of training and testing on the installation. LRAM projects are based on requirements and priorities identified in the TRI component.
- Sustainable Range Awareness formerly called Environmental Awareness. This component is a means to develop and distribute educational materials to land users. This material includes information on sound environmental stewardship of the natural and cultural resources and reduces the potential of inflicting avoidable impacts.
- Geographic Information System (GIS) is the newest component of the ITAM program. GIS allows the integration of spatial information and planning at a high level of detail.

A synopsis of each component and their corresponding objectives and management actions are provided below.

ITAM Objective 1. ***Maintain a routine, long-term RTLA program to monitor land and vegetation condition trends at Camp Atterbury.***

Effective management of CAJMTC lands requires continually updated information regarding resource conditions and knowledge of impacts from various types of military training. Maintenance of the RTLA program at CAJMTC would continue to provide a systematic, routine

monitoring program to identify potential impacts before they have a significant impact on training and the environment. RTLA is intended to monitor the land's ability to meet training needs, but RTLA data is often useful for environmental management activities. Documenting and understanding training-related impacts with RTLA can minimize excessive or irreversible damage and associated land rehabilitation costs.

Range and Training Land Assessment is a methodology for inventorying and monitoring physical and biological resources on Army training lands in an effort to relate land conditions to training activities. The primary objectives of RTLA are as follows:

- To evaluate land capability to meet multiple use demands on a sustained basis.
- To inventory conditions and monitor changes of natural resources.
- To provide information for land management decisions.
- To implement a standardized data collection, analysis, and reporting method for data compilation at the installation level.

Management Action: When staffing and funding are available, conduct routine annual RTLA monitoring using a systematic, qualitative approach that focuses on general site parameters such as the relative percentage of vegetative cover and bare ground, presence and severity of soil erosion, potential for soil erosion to impact nearby aquatic resources, and specific evidence of training related impacts on birds and small mammals. Using this information, try to identify possible sources of observed changes and trends. ITAM funds do not support bird and mammal studies. The Environmental Office uses environmental funds when available for contract services or in-house staff.

Management Action: Enter data from annual collections into RTLA database, conduct analyses on these data, and write summary reports of these data and the analyses conducted. Include potential LRAM project sites in the summary reports.

Management Action: Identify and map heavily used training areas. These areas will include heavy equipment training area, open areas, bivouac sites, command post sites, off-road driving course maneuver trails and roads. Define training area uses and frequency and intensity of use, document existing natural resources and current impacts, and incorporate all pertinent data in the GIS using GPS and aerial and ground photography.

ITAM Objective 2. ***Maintain the LRAM program to mitigate the long-term impacts of training and testing at Camp Atterbury by using preventive and corrective land rehabilitation and maintenance procedures.***

LRAM is a preventive or corrective land rehabilitation and maintenance procedure that reduces the long-term impacts of training and testing on an installation. Maintaining LRAM procedures at CAJMTC will help sustain the overall condition of the installation lands to ensure long-term military viability on the site.

The LRAM component mitigates the impacts that result from training and the mission (HQDA, 1995c). Based on the training requirements and priorities, LRAM develops land management projects. To successfully rehabilitate, repair, and maintain the natural resources, LRAM makes

use of best management practices, training area redesign and reconfiguration, and long-term maintenance planning. LRAM provides the following functions:

- Establishes long-term, sustainable land maintenance programs.
- Provides for planning and design of rehabilitation and maintenance projects.
- Provides for execution of projects.
- Provides for redesign, reclamation, and modification of training areas.

Management Action: Rate all areas of the installation to determine the level of damage that has occurred and to prioritize rehabilitation efforts, resources, and projects.

Management Action: When possible, close and rehabilitate only that portion of land which has been targeted for rehabilitation for up to two years. This will allow the trainers and soldiers continuous use of the remaining portion of the training area.

Management Action: Identify and design specific projects to enhance the natural resources necessary to support mission-related activities.

Management Action: Identify specific ecosystem-based management measures that could be done in conjunction with or in support of LRAM projects to improve or maintain ecological integrity, restore degraded areas, and achieve natural resources management goals and objectives.

Management Action: Conduct projects such as the hardening of firing point entrances, bivouac repair, and erosion control measures that are necessary to restore, repair or protect heavily degraded sites prior to closing the targeted site.

Management Action: When possible, initiate revegetation projects prior to closing the site to allow sufficient time for revegetated areas to become firmly established before training activities begin.

Management Action: Develop timber harvesting and ecosystem management activities that support or enhance LRAM effort to coincide with the rehabilitation period, where practicable.

ITAM Objective 3. ***Maintain the TRI process at Camp Atterbury to ensure that training requirements and training land management are effectively integrated.***

TRI integrates the installation's land use requirements for military mission requirements with the natural resource conditions of the installation's lands. Training land and range requirements are derived from the Range and Training Land Assessment (RTLA), using the installation's assigned units' Mission Essential Task List (METL) and Combined Arms Training Strategy (CATS). Procedures for the day-to-day management of range and training lands are also outlined by the RTLA. TRI uses RTLA information to integrate training requirements with the ability of the natural resources to support those requirements. The TRI process involoves:

- Identifying existing and projected training resources (a training facilities baseline inventory),
- Identifying existing and projected training requirements,

- Determining capability of training lands to sustain the required training,
- Allocating current and future land use for training and training-related projects (i.e. range construction).

Management Action: Upgrade and fully utilize Range Facility Management Support System (RFMSS) at CAJMTC. Obtain current RFMSS software and conduct software training for staff.

Management Action: Identify existing and projected training land resources and prioritized land use requirements.

Management Action: Integrate training requirements with training land management into a prioritized work plan and execute requirements subject to availability of manpower and fiscal resources.

Management Action: Optimize training land management decisions by coordinating mission requirements and land maintenance activities with training land carrying capacity.

Management Action: Generate prioritized requirements for land rehabilitation, repair, and/or reconfiguration.

Management Action: Cooperatively plan and implement Range Development Plan (RDP) initiatives.

Management Action: Integrate training requirements identified in RDP and RFMSS into RTLA.

Management Action: Review and analyze RTLA data and make recommendations in a prioritized LRAM work plan.

ITAM Objective 4. ***Maintain the SRA program to educate Camp Atterbury land users in order to ensure concurrent protection for both them and the environment they use for training.***

The Sustainable Range Awareness program at CAJMTC seeks to minimize training impacts by improving the land users' understanding of the effects the mission, mission training, and other activities have on the environment. The SRA component of ITAM applies to commanders, unit leaders, soldiers, and others who make use of an installation's training areas. Sustainable Range Awareness is promoted by providing training and educational materials, and having the command emphasize the importance of environmental stewardship. The Sustainable Range Awareness program:

- Provides information to units, leaders, civilian employees, and other installation users to improve their understanding of the impacts of their activities on the environment,
- Includes both general and installation-specific multi-media materials,
- Is being integrated into BCT/AIT/OSUT and all NCOES and OES.

Management Action: Continue producing and distributing helpful information in the form of handbooks, field cards, and pamphlets to the appropriate personnel. Examples of such materials

include: *Preserving Camp Atterbury's: Leader's Handbook*; *Leader's Field Card*; *Soldier's Field Card*; *Vehicle Logbook Card, CampAtterbury Safety Handbook*; and *Indiana Bat Awareness Information*.

Management Action: Require all elements of the INARNG, other Reserve and Active Components, and all personnel, military and civilian, who use CAJMTC to adhere to CA Regulation 200-1, Environmental Quality - Environmental Protection Program. This regulation establishes environmental policy, guidance, and requirements for the conduct of training at CAJMTC (CA, 1997). This regulation provides the procedures required to assess the environmental impact that may result from planned training, to minimize any possible adverse effects, and to compensate for damage caused by training activities.

6.3 TERRESTRIAL COMMUNITY MANAGEMENT

Program Overview and Management Goal
The plan will be based on ecosystem management principles. This means that terrestrial community management at CAJMTC will consider the following factors:

- Military land use needs at CAJMTC;
- Available forest resources as described in inventories;
- Patterns of natural disturbances such as fire, tornadoes, lightning, and windstorms;
- Habitat needs of state and federal listed species and other species of concern;
- Effects on adjacent land uses; and
- Effects on other resources and concerns such as soil and water quality.

The Environmental Office, through the Conservation Director, will determine goals and objectives by integrating RTLA findings and recommendations, Indiana Natural Heritage Data, federal and state threatened and endangered species information, and forest inventory data with military land use requirements. POTMS will ensure that training site objectives are supported by the plan. Terrestrial community management will be integrated with other resource management at CAJMTC to support training and ecosystem management. All management actions that would require soil disturbance would be done in coordination with the CRM to ensure NHPA compliance

Consistent with the military mission at CAJMTC and sound ecosystem management principles, the terrestrial community management goal is to manage and maintain diverse natural terrestrial communities. In addition to supporting the military mission, these communities will promote native flora and fauna and provide recreational opportunities. The following section describes terrestrial habitat management practices to be implemented at CAJMTC.

Terrestrial Community Objective 1. ***Maintain and protect the Camp Atterbury forest community in order to maintain the natural diversity of the forest, to preserve the biodiversity of the region and to ensure the long-term use of this habitat for training.***

Management Action: Restore Degraded Training Areas CAJMTC rehabilitates portions of training areas so that degraded ground cover can be replanted. While past planting efforts have focused more on erosion control than on habitat enhancement, it has become the Army's

intention to accomplish both tasks at once. Instead of continuing past practices of planting nonnative species such as fescue, rye, and bluegrass, native grasses and forbs will be used.

CAJMTC maintains many of their open areas for drop zones, landing zones, and open field exercises for training purposes. The idea is to maintain the areas to benefit both training and wildlife by providing an array of habitat across the landscape. Some training areas have had restoration of hardwoods and softwoods to repair areas where native hardwoods have been choked out by invasive or noxious plants. In other cases, hardwoods and softwoods are planted to create concealment islands and corridors within training areas that are open. Tree plantings also contribute to watershed protection. In localized, severely eroded areas white pine and Virginia pine will be planted for immediate erosion control. While establishing a cover of native grasses is usually the favored approach to rehabilitating these lands, prairie grasses and other forbs typically require a few years to become established as above-ground biomass. Where planting native grasses is not an option due to severe erosion, trees will be used instead, until the problem is at least controlled.

Management Action: Maintain and Improve Unique Trees and Forest Stands The scattered stands of aspen on CAJMTC provide summer and winter habitat for both nongame and game species. In flowering stands, catkins provide a food source for many passerines, and dense stands have been shown to provide winter food resources and cover for game species such as ruffed grouse. To improve sprouting and overall stand conditions, aspen root sucker growth can be increased by burning the stands or cutting small clearings within or beside them. From root suckers, new sprouts grow and, under optimal conditions, have the potential to reach stem densities of up to 70,000 per acre.

Terrestrial Community Objective 2. ***Maintain and protect the Camp Atterbury terrestrial community in order to manage for the survival of and maintain habitat for rare, threatened and endangered species, to preserve the biodiversity of the region and to ensure the long-term use of this area for training.***

Management Action: Minimize the Harvest of Shagbark and Shellbark Hickory Given its value as bat habitat, shagbark and shellbark hickory trees will not be harvested or manipulated during forest management activities unless the density of trees of these two species combined exceeds 16 trees per acre. If present, at least 16 live shagbark and shellbark hickory trees (combined) with a diameter at breast height (dbh) of greater than 11 inches must be maintained per acre. If the number of shagbark and shellbark trees doesn't exceed 16 per acre, no manipulation will take place and they remain standing.

Other hickory species are harvested based on current conditions of the tree, adjacent trees and area around it. Sometimes other hickories are girdled during timber stand improvement projects. Hickory management is conducted in accordance with the forest management guidelines issued by the USFWS–BFO.

Management Action: Manage for Forest Interior Rare and Watch List Bird Species A 4,329-acre tract of forest has been noted as "special management or limited use areas" on CAJMTC in the southern portion of the installation, shown on Figure 6-2, to enhance habitat diversity and

benefit forest-interior bird species. Activities such as salvage timber harvests and military projects are not restricted in this area. However, this area is not included in the regular management schedule due to its location and proximity to several ranges and their Safety Danger Zones (SDZ).

On CAJMTC, there are four forest-interior species that are either listed as rare in Indiana or listed on the state watch list—the black-and-white warbler, hooded warbler, worm-eating warbler, and cerulean warbler. The worm-eating warbler and cerulean warbler are also classified as USFWS Migratory Nongame Birds of Management Concern. Forest-interior birds, in general, are known to be area-sensitive and highly susceptible to forest fragmentation.

To maintain suitable habitat for Indiana bats, as well as area-sensitive species, no timber harvest will occur within this tract in the next 5 years. If needed the area may still undergo salvage activities from natural disasters or construction activities that my take place. If these activities do occur, they would require special environmental documentation and consultation with the USFWS.

Management Action: Maintain Edge and Open Areas Edge occurs where two different plant communities or successional stages within plant communities meet. In these transitional zones, species common to either of the major plant communities may be found, as well as other species that are a product of the ecotone itself. Wildlife richness in edges is typically higher than in surrounding areas, probably as a result of the increased plant and habitat diversity. The richness of edge habitat for wildlife, though, is determined partially by the degree of contrast between communities forming the edge, as well as by ecotone discreteness. The greater the contrast and broader the transition area, the more likely the edge habitat will have higher structural and plant species diversity and therefore provide habitat for a wider variety of wildlife species. Many bird species are attracted to edge habitat because of the greater structural diversity found there, while the preference of some large game have for edge habitat may be due to the close association of cover and foraging areas.

On the installation, small (less than 1 acre) and larger (3-5 acre) forest openings are created through the practice of group selection—a method of regenerating uneven-aged stands in which trees are removed and new age classes are established in small groups. Open areas of regenerating trees and the edge habitat surrounding it typically attract deer and other browsers, often resulting in population growth beyond a desired level. When management activities such as hunting are not utilized to keep the population within carrying-capacity, excessive deer populations can, in turn, inhibit forest regeneration and limit the cover necessary to support military training. Thus far, on CAJMTC, deer browsing has remained mostly under control and has not significantly inhibited native forest regeneration.

Forest regeneration openings are instrumental in the survival and recovery of the ruffed grouse in this region. They provide a habitat type that is dwindling in Indiana and needed for many forest dwelling species such as the indigo bunting, yellow-billed cuckoo, eastern towhee and worm-eating warbler.

Management Action: Preserve Snags and Trees with Natural Cavities Standing dead and dying trees, called snags, and live trees with natural cavities are important habitat components for many wildlife species. Snags, with or without cavities, provide foraging, nesting, roosting, and perching sites, while natural cavities provide den and roosting sites. It is often the case that the abundance of woodpeckers, raptors, passerines, and bats is directly related to the availability of snags and tree cavities in an area. A 1998 radio telemetry study of Indiana bats noted that 18 of the 20 Indiana bat roost trees characterized at CAJMTC were snags. Given the high likelihood that snags are also being used by various species of birds and small mammals for feeding and den sites, snag usage will be carried out through general forest inventories or site specific snag inventories.

In addition to monitoring, the following management measures will be preserved or created where practical on the installation:

- After a harvest event, an average of at least four cull trees per acre will be left standing, surrounded by healthy trees for wind-throw protection. Where possible, groups will be left rather than individuals. Selection criteria include hollow-butt trees and trees with holes in the bole for habitat, small crown to allow for regeneration beneath, dead snags for predatory bird perches, dead trees for woodpeckers, and slipped bark trees for bat habitat.
- All snags within 100 yards of lakes and ponds will be retained consistent with personal safety and the protection of facilities.
- Snags and dead trees will be removed if they interfere with landscape objectives or if their presence endangers personnel, roadways, power lines, buildings, training structures, or high-use areas such as bivouac areas. When removing trees, CAJMTC will continue to consult with the USFWS, to the extent practical, regarding potential impacts to the Indiana bat.

Management Action: Manage Dead and Downed Logs Dead woody debris on the ground, especially large logs, nourishes trees and is an important habitat component for many forest-dwelling species. Woodpeckers eat insects that inhabit logs, and numerous species of mammals (e.g., flying squirrel, deer mouse, short-tailed shrew, eastern chipmunk) use logs as sites for reproduction, foraging, and cover. Several species of amphibians are also found in association with decaying logs on the forest floor. In many cases, downed logs protect developing seedlings from deer browsing.

Management measures for fallen logs include retaining fallen logs on the forest floor in areas where the excess volume does not pose a significant fire hazard or obstacle to military training.

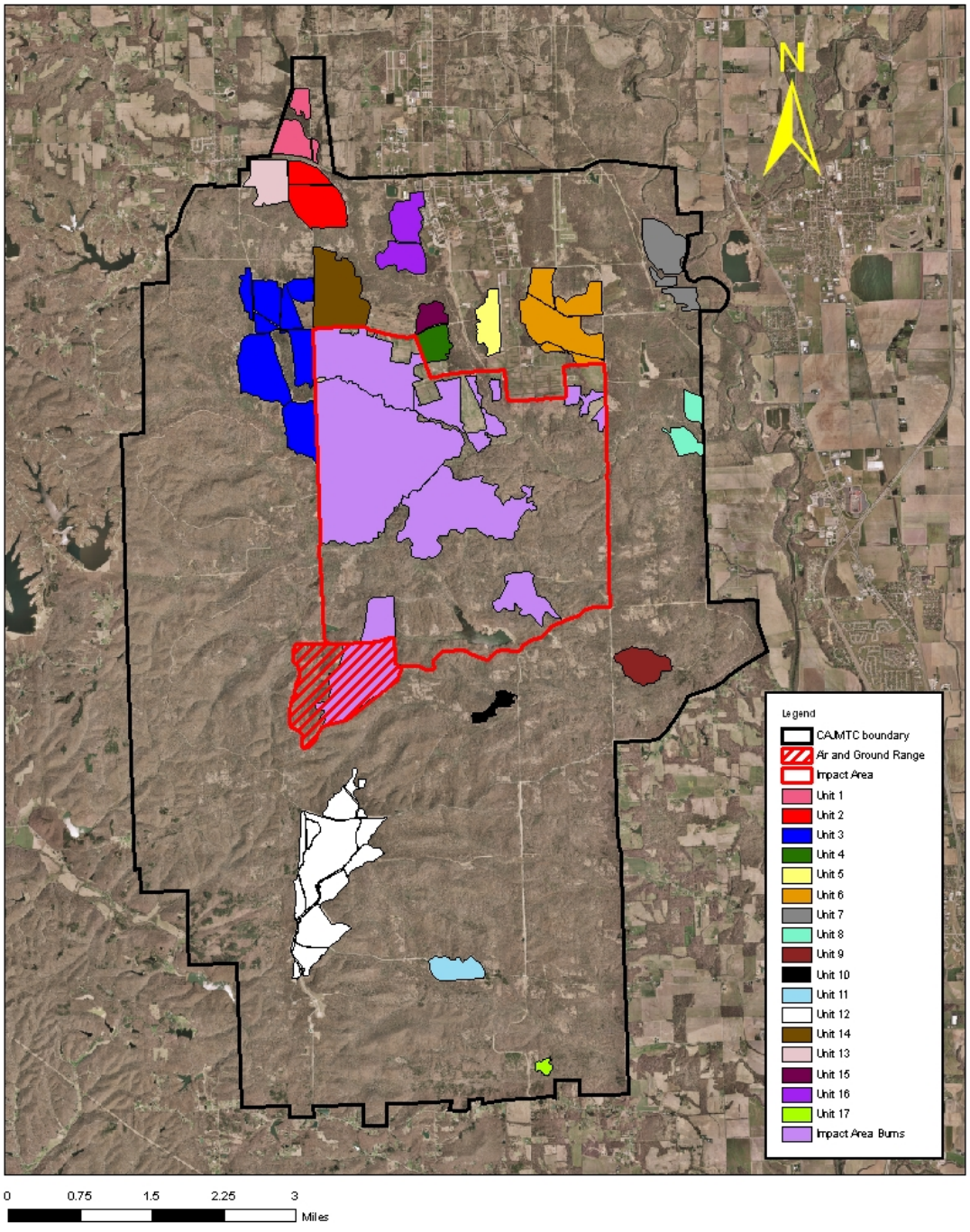
Terrestrial Community Objective 3. ***Maintain and protect the Camp Atterbury grasslands to sustain the quality of prairie vegetation, to preserve the biodiversity of the region and to ensure the long-term use of this habitat for training.***

Management Action: Grassland Restoration Two important components of grassland restoration include prescribed burning and the planting of native species. The intent of CAJMTC's prescribed burning program is to combine military need, preventing accidental and potentially more damaging burns from tracer firing, with natural resources objectives for increased native

grass cover and wildlife habitat improvement. Several grassland areas have been set aside on the installation for wildlife use, and these areas are to be burned based on military mission requirements, but no less than every 3 years. Pyrotechnics and illumination devices cause a large percentage of unplanned fires. Prescribed fires allows CAJMTC to minimize the number and intensity of unplanned fires that do occur. Figure 6-1 shows prescribed fire units. The units have various rotation schedules ranging from annually to three years, and they receive prescribed burn for reasons such as reduction of fuel load, prevention of woody stem encroachment, wildlife management, and invasive species management.

Burns in the grasslands reserved will be conducted in the early spring (late February to mid April) or late fall (October to November). The grasslands are multi-use fields; however, wildlife needs are taken into consideration to avoid adverse impacts to nestlings and fledglings. For this reason, the burns are scheduled to create varying roation ages. Spring burns will be completed prior to April 15 due to Indiana bat prescribed fire guidlines. Early spring burns also allow more time for regrowth of grasses and seed production, which will then enhance winter habitat for numerous species. These burns will also be conducted on an annual rotation where only a portion of a given area is burned each year. Currently, there are 17 burn units that are subdivided into 51 sections ranging from 1 to 242 acres. When burning occurs, the entire section is burned. Should it become necessary to conduct a burn during the Indiana bat maternity roosting season, CAJMTC will consult with the USFWS-BFO regarding the potential impacts on Indiana bats. New burn units would be added in coordination with the CRM to ensure NHPA compliance.

Permanent firebreaks will be constructed and maintained for annual prescribed burning. Before conducting the controlled burn, it is necessary to consider certain weather conditions, such as wind speed, relative humidity, temperature, and fuel moisture, so that no unexpected results occur. Much research has been conducted in this area to determine optimal levels of each variable (O'Keefe, 1994).



Prescribed Burn Units
Camp Atterbury Joint Maneuver Training Center
Indiana
Source: CAJMTC, 2006
Figure 6-1

For native species plantings, much can be learned from the success and failures of prairie restoration projects that have been, or are being, conducted within the state of Indiana (Delphey and Ruwaldt, 1994). Some of the forb and grass species used with promising results that could also be planted in CAJMTC's prairies include big bluestem grass (*Andropogon gerardi*), butterfly-weed (*Asclepias tuberosa*), New England aster (*Aster novae-angliae*), tall coreopsis (*Coreopsis tripteris*), love grass (*Eragrostis spp*.), rattlesnake master (*Eryngium yuccifolium*), round-headed bushclover (*Lespedeza capitata*), rough blazingstar (*Liastris aspera*), dense blazingstar (*L. spicata*), wild bergamot (*Monarda fistulosa*), switchgrass (*Panicum virgatum*), wild quinine (*Parthenium integrifolium*), yellow coneflower (*Ratibida pinnata*), black-eyed susan (*Rudbeckia hirta*), little bluestem grass (*Schizachyrium scoparium*), prairie dock (*Silphium terebinthinaceum*), rigid goldenrod (*Solidago rigida*), Indian grass (*Sorghastrum nutans*), prairie dropseed (*Sporobolus heterolepis*), Ohio spiderwort (*Tradescantia ohiensis*), golden alexander (*Zizea aurea*).In planning grassland restoration projects on CAJMTC, the following elements will be incorporated:

- Design plantings for area-sensitive bird species by minimizing the amount of edge. An area with the greatest ratio of surface area to edge is preferred.
- Site plantings at least 100 yards from forest areas and centers of human activity. If possible, immediately adjacent land uses will be structurally open. The planting should not be bordered by tall fence lines or groves of trees because woody vegetation is known to attract nest predators and nest parasites (non-grassland species).
- Woody vegetation that exceeds the normal grass height will be removed and controlled for the reason given above.
- Plant mixtures of tall and short grasses to provide a mosaic of vegetative heights and attract a large variety of bird species.
- Native warm-season grasses will be preferred over cold-season grasses (e.g., Kentucky 31 tall fescue, bluegrass, timothy). The advantage of native warm-season grasses, which grow during the summer rather than during the cooler spring and fall months, is that they grow in clumps, with each clump surrounded by relatively open areas that provide a network of travel lanes for birds. Tall fescue and other cold-season grasses, on the other hand, form more uniformly dense stands, leaving little room for bird movement on the ground.
- Include forbs in the planting design to provide vital habitat components for grassland birds such as song perches and above-ground nesting substrates. Forbs attract insects, which are an important source of protein for nestlings.
- Implement a rotational burn schedule to accommodate a wider assemblage of grassland bird species.
- In addition, or as an alternative, to prescribed burning, grassland areas will be mowed for woody vegetation control. Mowing should be avoided between mid-April to July 1 to allow for breeding of grassland birds. Early spring (March-early April) should be favored to avoid peak nesting periods and provide time for regrowth and seed production for adequate winter habitat. Mowing will also be avoided very late in the growing season to minimize the potential for invasion of non-grassland species such as Kentucky bluegrass. As with burning, grasslands will be mowed on a rotational system with some subunits left idle in each year. It should be pointed out that periodic mowing to prevent encroachment of woody vegetation does not reduce fuel loading.

Management Action: Control of Invasive and Noxious Plants Invasive and noxious plant species known to occur and impact the installation include Canada thistle (*Cirsium arvense*), multiflora rose (*Rosa multiflora*), fescue (*Festuca spp.*), garlic mustard (*Alliaria petiolata*), bush honeysuckle (*Lonicera* sp.), tree of heaven (*Ailanthus altissima*), chicory (*Cichorium intybus*), autumn olive (*Elaeagnus umbellata*), honey locust (*Gleditsia triacenthos*), Osage-orange *(Maclura pomifera),* Japanese honeysuckle (*Lonicera japanica),* and Japanese stilt grass (*Microstegium vimineum*). Invasive and noxious plant species may have a negative impact on training and the military mission. The populations will be monitored and controlled by physical, chemical, or mechanical methods if needed. Proper management of natural areas on CAJMTC entails long-term monitoring and control of invasive species. CAJMTC will have a policy of ongoing identification of occurrences of invasive species. In addition, CAJMTC will develop a budget and project to write an Invasive Species Management Plan by 2011, contingent upon funding, for their control.

6.4 GEOGRAPHIC INFORMATION SYSTEMS (GIS)

Program Overview and Management Goal
Geographic Information System Management focuses on the maintenance, development, and utilization of the CAJMTC Geographic Information System (GIS), particularly for natural resources and military training information. The CAJMTC GIS is designed to manage, manipulate, and present spatial data related to the physical infrastructure and natural resources of the installation.

The training site resource information goal is to manage training site data to facilitate decision-making that integrates military training requirements with natural resources information.

GIS Objective 1. ***Maintain a staff of GIS-capable personnel in various positions that use the CAJMTC GIS in their day-to-day resource management tasks.***

Management Action: Update and modify CAJMTC GIS layers as needed.

6.5 FISH AND WILDLIFE, OUTDOOR RECREATION MANAGEMENT

Program Overview and Management Goal
Consistent with the military mission at CAJMTC and sound ecosystem management principles, the fish and wildlife resources goal is to manage and maintain year-round fish and wildlife habitat that contributes to the sustained populations of resident species and provides seasonal habitats for migratory species. In addition, fish and wildlife resources will be utilized to the extent possible to enhance the recreational opportunities for the military and public communities.

The goals of game species management at CAJMTC are twofold—to maintain and control game species populations compatible with the areas they occupy, land management objectives, and the military mission of the installation, and to provide quality recreational opportunities.

Management of game species on CAJMTC is accomplished with coordination between CAJMTC and the IDNR Division of Fish and Wildlife. Nongame management is being developed, and is accomplished through CAJMTC.

Game species on CAJMTC include the white-tailed deer, eastern wild turkey, gray squirrel, fox squirrel, rabbit, ruffed grouse, quail, and woodcock. All game species are managed through a regulated hunting program administered cooperatively by IDNR Division of Fish and Wildlife and CAJMTC. Furbearer trapping is also allowed on post and is conducted under the applicable state laws. Trapping is administered by the Environmental Office with strict coordination and communication with Range control.

Most outdoor recreation activities, other than general hunting, are functions of the MWR council at CAJMTC. Camping for military and guests is administered by MWR, as is organized public horseback riding. The MWR council has provided campground improvements, an outdoor theater, nature trail, two volleyball courts, a baseball diamond, and a golf driving range.

Outdoor recreation activities occur throughout CAJMTC, with the exception of ranges and impact areas. Because the primary mission of CAJMTC is military training, outdoor recreation on military lands is secondary. Outdoor recreation in designated training areas is prohibited during times of actual training use, and ranges and impact areas are always off-limits. When not in training use, the training areas are available for outdoor recreation activities under the access systems established by the Command and Staff and the MWR council. All outdoor recreation activities that occur on the installation must be scheduled so as not to interfere with the military mission.

Few public outdoor recreation facilities or activities occur on-post. The most notable public outdoor recreational use of CAJMTC is game hunting. CAJMTC shares a boundary with Atterbury Fish and Wildlife Area, administered by the IDNR, Division of Fish and Wildlife. Through the INRMP with signatures from the IDNR and USFWS, CAJMTC administers deer and small game hunts for military personnel as well as the general public. The general public is allowed access as long as safety and the military mission are not compromised according to the Sikes Law. IDNR assists Command with all draw hunts conducted on the installation. IDNR administers public hunting for archery (deer) and small game when allowed by Command. IDNR is informed of which training areas are open for hunting, and IDNR handles the check in and out process. Range Control handles all employee hunting. General public access for hunting is provided as available within the limits of the military training and resource management requirements of CAJMTC

Deer hunter information and harvest records for hunts that are not administered by IDNR will be provided to IDNR, Division of Fish and Wildlife. This sharing of information is to be coordinated through the CAJMTC Environmental Office.

CAJMTC has two fishing lakes, Puff lake and Duck Pond, within the impact area. Lakes within the Air to Ground Range are restricted to installation personnel. CAJMTC has other small wildlife ponds scattered throughout the installation, but they have never been stocked.

Fish and Wildlife, Outdoor Recreation Objective 1. ***Maintain, protect, and enhance the Camp Atterbury fish and wildlife habitat in order to promote the biodiversity of the region, provide a sustained yield of fish and game species, and to ensure the long-term use of these habitats for training.***

Management Action: Manage for White-tailed Deer Deer are managed on CAJMTC through a hunting program administered by Command, IDNR, and the Environmental Office. Each year a harvest quota is set, usually based on previous years' harvest statistics and trends in the deer population size and structure. The regular season archery hunts are typically held from October through late November and again from early December through early January. Public archery hunts are administered by the IDNR and CAJMTC and coordinated through POTMS/Range Control based on availability of training areas. Areas available for hunting are determined by DPTM. An annual draw firearm hunt is held. A one-day special draw hunt is also typically held.

All hunters must sign in and out to accurately account for all hunting activities on base, and employees must also check with Range Control prior to entering the training areas. Markers designate the common impact area and are designed to protect against accidental trespass and unauthorized hunting.
All Indiana fish and game guidelines and regulations are followed.

Management Action: Manage for Turkey Annual draw turkey hunts are conducted typically in April and May, as determined by IDNR and Command. Interest in turkey hunting on CAJMTC has increased considerably.

A daily hunt map of the training areas will be provided to hunters. The map will specify acceptable hunter behavior and discuss CAJMTC's cooperative effort to provide hunting opportunities within its training areas and will indicate to hunters which training areas are open for hunting.

Management Action: Manage for Small Game The management of and harvest limits for small game are administered jointly by Range Control, Environmental Office and IDNR. The harvest of small game has dwindled in the past, though CAJMTC's ability to directly affect the recreational hunting opportunities is limited to habitat enhancement and conservation.

Management Action: Manage for Furbearers The goals of furbearer management at CAJMTC are to reduce or eliminate nuisance populations in a manner consistent with land use and training objectives and to ensure that healthy populations continue to exist so that they are appreciated for the aesthetic and ecological values. Public furbearer trapping is also allowed on post and is conducted under the applicable state laws. The Environmental Office and Range Control administer this program.

Furbearer trapping within the training areas is conducted during legal trapping seasons to allow opportunities for utilization of the animal. Legal trapping includes a variety of species such as fox, coyote, mink, beaver, muskrat, raccoon, opossum, and skunk. Some furbearers are

considered nuisance and occasionally may be trapped to curtail their nuisance activity. Generally, the practice is unnecessary due to high demand for furbearer trapping in the legal season. Furbearing trapping encourages public opportunities for furbearer trapping as well as overall population control.

Management Action: Manage for Nuisance Species

A nuisance individual or species is generally defined as one that causes unacceptable damage to a natural or man-made element, such as disruption of a hydrologic regime, destruction of vegetation, or flooding of a road, range, or training area. Nuisance trapping relates mostly to species in the cantonment area where current problems exist. During the legal season, trapping is encouraged in the cantonment area to utilize the fur. This form of trapping is covered under the Pest Management Program.

Prevalent nuisance species on CAJMTC are groundhogs, beaver, muskrat, raccoons, skunks, and opossums. Beaver and muskrat create water flow/flooding damage and structural damage to streams, ponds, and lakes. Skunks, opossums, raccoons, and groundhogs have been a nuisance within the cantonment area around buildings and dumpsters. White-tailed deer browse damage has recently been noticed within the cantonment area, tree planting areas, and forested areas. Deer overpopulation was addressed by increasing the number of firearm hunters for seasonal draw hunts.

The most abundant furbearing species on CAJMTC is the raccoon, which has become prevalent enough to be considered a nuisance. The raccoons have become accustomed to human activity in the installation's woodlands and do not hesitate to associate with humans when foraging (Lee, 1991). This lack of fear could put people at risk if they come in contact with a diseased raccoon.

Should a reduction in the raccoon population become necessary, trapping of this species will be allowed. To do so, a permit system will be instituted to control the number of trappers allowed on the installation and the number of animals harvested. Since most trapping occurs in mid-winter, there should be little interference with military training objectives.

Damage caused by beavers has become significant in many of the bottomland timber stands, as well as in bottomlands that are regenerating to forest on CAJMTC. This damage occurs as trunk girdling, tree felling, and flooding, all of which result in limited access to areas and the mortality of species intolerant to flooding. Temporary control of nuisance beavers had been achieved in the past through trapping, and it has been an effective tool for controlling forbearers on the installation. It is the best method for controlling the overall population, and if trapping occurs during legal trapping season, it can keep costs down.

An alternative method to control the high water levels and flooding that can be caused by a beaver dam is the use of the Clemson Beaver Pond Leveler. In addition to reducing the incidence of flooding, this device allows for some of the benefits derived from beaver-created wetlands. The pond leveler device is designed to reduce dam construction by minimizing the probability that current flow can be detected by the beaver.

It should be noted that this particular design is limited to situations in which the water input to a pond is from a small stream or spring and that problems may develop during periods of unusually high rainfall. In fish ponds, where the leveler is used in combination with a standpipe and culvert water control structure, prolonged flow of water over the standpipe riser boards may cause beavers to fill the standpipe. To reduce this possibility, riser boards should extend about one foot above the normal water level so that storm water can be stored and drained slowly through the leveler. Some indications suggest that where a pond is drained and the intake device is above water and near the dam, the beaver may be stimulated to construct a new dam on the upside of the device. It is important that the intake device be installed so that it is totally or mostly submerged at all times.

Beaver activity levels are often highly correlated with seasonal temperatures, and most dam building and repair occurs during the autumn months. Therefore, if the leveler is to be installed at an active dam site, installation should occur in the fall. The dam can be dug out and the device laid in place. Beavers will rebuild over the outflow pipe, which will not deter water flow through the pipe. To easily dig out a dam, a pulaski—a tool with an ax bit on one side and a mattock on the other—is recommended for use. Dams should be broken first on the downstream side so that water pressure can be used to push out dam materials.

Management Action: Manage for Nongame Species The primary goal of nongame species management is to maintain nongame populations at levels compatible with land use objectives while promoting a diverse landscape that promotes a high species richness.

The basis of managing a rich assemblage of nongame wildlife is to provide a mosaic of habitats that are structurally and biologically diverse. These habitat types on CAJMTC include wetlands, riparian areas, open water systems, grasslands, shrublands, woodlands, and both early and late (mature) sucessional forest habitat types, including upland and bottomland. In managing for a diversity of habitats and a diversity of species within those habitats, the potential exists for numerous nongame species to be found on CAJMTC. Wildlife plots have been established on CAJMTC. The presence of small mammal and bird species has been recorded on these plots for the past 10 years.

As part of the forest management program, implementing uneven-aged management, retaining and creating snags and active den trees, and conducting prescribed burns will increase habitat complexity and biodiversity. Aquatic and riparian habitat management measures to improve habitat conditions for aquatic and amphibious communities include protection of habitats of exceptional biological value, establishing protective buffers, and maintaining healthy and diverse riparian zones. Managing, protecting and enhancing wetlands on CAJMTC will further benefit nongame species by ensuring the existence of these high-habitat-potential ecosystems.

Terrestrial habitat management measures that will benefit nongame species (as well as game species in many instances) include restoring degraded training areas with native species and eradication and control of invasive species, maintaining and improving unique tree stands, creating edge and open areas, preserving and creating snags and trees with natural cavities, creating loose-bark trees, erecting and maintaining nest boxes, leaving dead woody material on the forest floor, and restoring native grasslands. In addition, roadside mowing will be minimized

to improve habitat conditions for ground-nesting birds and other wildlife. Grass in these areas will be mowed to a height of six inches or higher, if possible, where safety concerns do not take precedence.

To further benefit nongame species on CAJMTC, the timber management program will administer a variety of silvercultural methods, cut sizes, and rotation lengths to ensure adequate regeneration and provide continued forested cover throughout the property. Also, mast-producing trees will be favored where applicable for mast production serving as a seed source for natural regeneration and food for wildlife. Timber harvest in riparian areas will be limited or restricted and Indiana State BMPs will be incorporated into timber harvest contracts. The retention of woody or brushy corridors connecting ponds will be encouraged to allow for seasonal movement and exchange between amphibian populations.

Management Action: Protect Migratory Bird Species. The Migratory Bird Treaty Act implements various treaties and conventions between the U.S. and Canada, Japan, Mexico and the former Soviet Union for the protection of migratory birds. Under the Act, taking, killing or possessing migratory birds is unlawful. In addition, on January 10, 2001, EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, was signed. It requires that all federal departments and agencies incorporate migratory bird conservation measures into their activities. A "migratory bird" is defined as any of the species covered by the four bilateral treaties on the conservation of migratory birds. This includes all native birds in the United States, except those non-migratory species such as Northern bobwhite and wild turkey that are managed by the states. However, the military would not be penalized for "inadvertent take" of migratory birds during training activities, only those intentionally taken during or outside of training activities on the installation.

To benefit migratory bird species, the timber management program will limit timber harvesting to those months outside of the late spring/early summer breeding seasons of migratory birds.

Management Action: Manage for Sustained Yield of Sport Fish in Puff Lake. Fishing on CAJMTC is permitted per AR 215-5 (Morale, Welfare and Recreation) for active and retired military personnel and their dependents, employees of CAJMTC tenant activities and their dependents, and selected guests. All anglers are required to obtain a valid Indiana fishing license (resident or out-of-state) and a current CAJMTC Fishing Permit, which is issued by Range Control. Anglers must abide by the bag and size restrictions established by IDNR

In 1992, IDNR conducted a fisheries survey of Puff Lake. The survey collected eight species, as well as naturally hybridized sunfish (Lehman, 1993a). The total weight of the collection was approximately 81 pounds. Largemouth bass, bullhead, bluegills, and other sunfish offer excellent fishing opportunities. Bullhead fishing opportunities will probably decline as largemouth bass become established in Puff Lake.

Following the survey, IDNR proposed the following recommendations for Puff Lake:

- Open Puff Lake to fishing.
- Protect largemouth bass with a minimum catch size limit of 14 inches.
- Continue to control soil erosion in the watershed.

Management Action: Manage for Sustained Yield of Sport Fish in Duck Pond. As with Puff Lake, IDNR conducted a fisheries survey in 1992. Bluegills were the most abundant panfish collected in this survey. Along with hybrid sunfish and redear sunfish, they are providing anglers at Duck Pond with good opportunities to catch panfish.

It is recommended that some bass be harvested before they become so abundant that bluegill and redear populations decline as a result of too much predation. According to present pond management guidelines, up to 120 to 150 largemouth bass of any size could be harvested annually.

The following fisheries management strategy recommendations for the lakes and ponds at CAJMTC are designed to enhance the fishing opportunities for anglers while promoting sustainable populations of the species most suitable for each water body. A primary component of the fisheries management program is monitoring. The monitoring methods used will be consistent among water body types (i.e., lakes/ponds and streams) and from year to year. This consistency allows the comparison of data among surface waters of a similar type, as well as the evaluation of temporal status and trends occurring for each water body. The inventorying and monitoring data will be evaluated frequently to ensure continued success of the program. Management measures that are not leading to the desired objective will be reevaluated to determine what corrective action is needed. Management measures that produce the desired results will be continued for as long as they are successful at meeting their objectives.

Management Action: Develop angler reporting forms and maintain angler reporting boxes at all waters. The collection and compilation of angler data will provide fishing pressure and harvest data for each waterbody, providing a foundation for more informed fisheries management decisions. Information on the form should include:

- Date and location;
- Length of time fishing (hours);
- Target species;
- Species caught, including size, number kept, number released;

Management Action: Conduct habitat assessments to monitor the ecological integrity of riparian and instream habitats. The results of these assessments can be used to: detect improvements or degradation in the quality of the stream habitat; monitor the success of habitat enhancement and restoration projects. Early detection of ineffective management strategies, restoration projects, or impacts on the watershed provides the opportunity to develop solutions early and adapt the management strategies necessary to mitigate further impacts; and identify the need for stream restoration projects and prioritize the allocation of resources.

Management Action: Conduct annual macroinvertebrate assessments to evaluate the biological integrity of the stream. The integrity of the macroinvertebrate community also provides valuable information regarding water quality. Evaluating the condition of the habitat and macroinvertebrate communities might also indicate whether other watershed conditions are inhibiting the potential of the stream to sustain viable populations of fish.

Management Action: Survey the fish populations to monitor the size, structure, and biological integrity of the fish communities.

Management Action: Conduct annual screening-level watershed assessments to evaluate the potential for adverse impacts on surface waters.

Management Action: Conduct creel surveys and collect harvest data to evaluate the fishing pressure, catch rates, number of anglers using each water body, and success of the stocking program.

Fish and Wildlife, Outdoor Recreation Objective 2. ***Maintain, protect, and enhance the Camp Atterbury habitat in order to promote the biodiversity of the region, provide outdoor recreational opportunities, and to ensure the long-term use of these habitats for training.***

Management Action: Implement Nonconsumptive Recreation Programs. MWR oversees portions of the installation's outdoor recreation program as well. A campground with Class A sites and primitive sites is administered by MWR, and proceeds from the MWR fund continually upgrade the campground. All Class A sites have clean out stations, water and electric. A bathhouse and playground have been added as upgrades to the campground, and a 2.5 mile nature trail is adjacent to the campground. A program for the rental of fishing boats is available.

6.6 THREATENED, ENDANGERED AND RARE SPECIES MANAGEMENT

Program Overview and Management Goal

The Endangered Species Act (ESA) was passed by Congress in 1973 to protect endangered species and their habitats. This act, along with Army regulations (AR 200-3) and DOD directives (4700.4), requires installations to be in compliance and all military land uses are subject to these regulations. Under section 7(a)(1) all federal agencies are required to carry out programs for the conservation of T&E species listed in pursuant Section 4 of the act.

The ESA requires all federal agencies to conserve listed species. Conservation, as defined by the ESA, means the use of all methods and procedures necessary to bring any listed species to the point where protections pursuant to the ESA are no longer necessary. The act specifically requires agencies not to "take" or "jeopardize" the continued existence of any endangered or threatened species, or to destroy or adversely modify habitat critical to any endangered or threatened species. Under Section 9 of the act, "take" means to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect"; under Section 7, "jeopardize" means to engage in any action that would be expected to "reduce appreciably the likelihood of the survival and recovery of a listed species by reducing its reproduction, numbers, or distribution."

Army policy on listed species includes the following elements: balancing mission requirements with endangered species protection, cooperating with regulatory agencies, and conserving biological diversity within the context of the military mission. As required by AR 200-3, the Army must ensure that it carries out mission requirements in harmony with the requirements of the ESA. All Army land uses, including military training, testing, timber harvesting, recreation, and grazing, are subject to ESA requirements for the protection of listed species and critical

habitat. In fulfilling its conservation responsibilities of Section 7(a)(2), the Army is required to work closely and cooperatively with the U.S. Fish and Wildlife Service (USFWS), the federal agency responsible for enforcing the act. Installations are encouraged to engage in informal consultation with the USFWS during the planning of projects or activities to ensure ESA compliance. In conserving biological diversity, installation commanders and Army natural resource managers are required to develop and implement policies and strategies to maintain viable populations of native plants and animals, maintain natural genetic variability within and among populations, maintain functioning representations of the full spectrum of ecosystems and biological communities, and integrate human activities with the conservation of biological diversity.

AR 200-3 requires installations to prepare ESMCs for each listed and proposed species and critical habitat present on the installation, including areas used by tenant organizations. Installations requiring more that one ESMC (i.e., more than one listed or proposed species present) are permitted to prepare a combined ESMC provided the combined plans satisfy the substantive requirements detailed in AR 200-3, Chapter 11-5(b) (3 and 4). Installation ESMCs must prescribe area-specific measures necessary to meet the installation's conservation goals for the subject species and critical habitats (HQDA, 1995b). In March, 1995, the U.S. Army Environmental Center published the *Manual for the Preparation of Installation Endangered Species Management Plans* to provide a standard and comprehensive format for preparing ESMCs.

Species that are candidates for federal listing or are state-listed as threatened, endangered, or of special concern are not protected under the ESA. Because candidate species may be listed in the future, installations are required to avoid taking actions that result in the need to list candidates as threatened or endangered and are encouraged to participate in conservation agreements with the USFWS. Although not required, installations are encouraged to develop ESMCs for candidate species (HQDA, 1995b). At a minimum, installations are required to document the distribution of candidate species on the installation and monitor their status. For state-listed species, installations are encouraged to cooperate with state authorities in efforts to conserve these species.

Rarity designations for plants have been determined by IDNR based on the number of individuals and the number of distinct population locations of a particular species that are estimated to occur inside the state. On CAJMTC, since the state rarity rank itself does not mandate protection and the legal protection under Indiana state law does not prohibit rare plant disturbance by property owners, the protection and management of these species is treated by the Army as a matter of responsible stewardship.

Threatened, Endangered, and Rare Species Objective 1. ***Maintain and protect the Camp Atterbury Indiana bat habitat in order to promote the biodiversity of the region and to ensure the long-term use of Camp Atterbury lands for training***

Indiana bats (*Myotis sodalis*) were listed as endangered on March 11, 1967 by the USFWS. In 1983, a recovery plan was developed for this species; it called for the protection of hibernacula; maintenance, protection, and restoration of summer nursery habitat; winter surveying to monitor

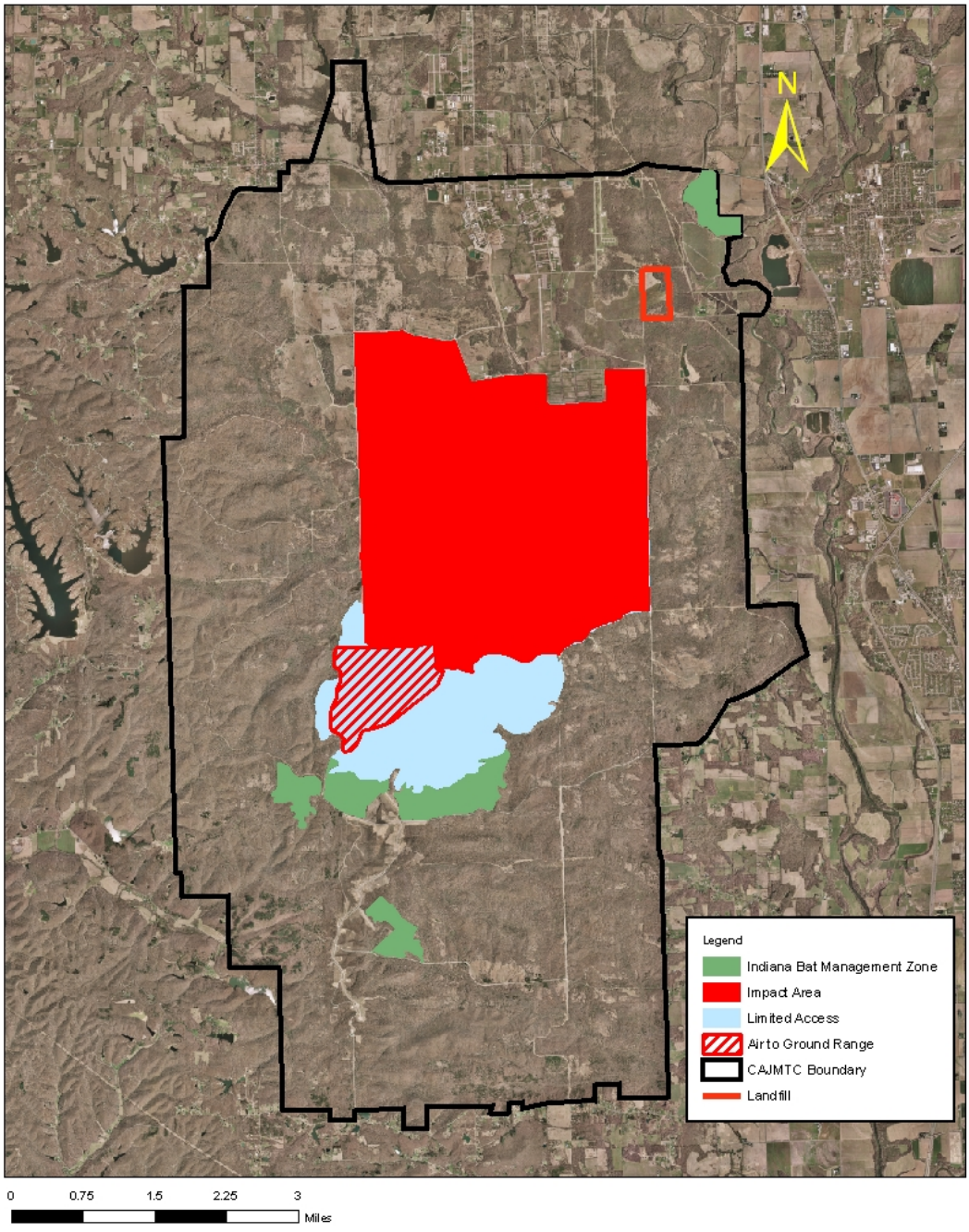
population trends; public education; and continuing research (USFWS, 1983). This recovery plan is in the process of being updated (USFWS, 2006).

CAJMTC falls within the summer range of Indiana bats and is believed to support a minimum of five maternity colonies, widely distributed across the installation. Typically, females locate their maternity colonies beneath the exfoliating bark of dead or dying trees in upland and riparian woodlands. The colonies may consist of more than of 100 adult females, and in one season, the bats may use a number of different roost trees. Studies at CAJMTC have shown a maternity colony to utilize two primary roosts (used by more than 30 bats on more than one occasion) and nine alternative roosts (used less frequently and by fewer bats). In general, Indiana bats require a large number of roost trees which provide a variety of roosting conditions. Some of the most important characteristics influencing roost tree selection are believed to be more structure-related than species-related, as females have been known to use the same roosts in successive years if the trees remain standing and retain exfoliating bark. Indiana bats leave their summer ranges beginning in August and move to regions containing caves or mines where they spend the winter in hibernation.

Management Action: Implement USFWS - BFO Timber Management Guidelines for Indiana bats. The USFWS Bloomington Field Office (BFO) developed timber management guidelines for Indiana bats to protect existing and potential bat habitat by protecting summer maternity and foraging habitat. These guidelines will be implemented and are provided in Appendix E.

Management Action: Maintain Indiana Bat Management Zones (IBMZs) The IBMZs, as shown in Figure 6-2, will be managed to provide the following habitat characteristics suitable for summering Indiana bats (Romme et al., 1995):

- Closed canopy (at least 60 percent)
- Open understory
- Presence of large diameter overstory trees, and
- Presence of potential roost trees



Special Management Areas
Camp Atterbury Joint Maneuver Training Center
Indiana
Source: CAJMTC, 2006
Figure 6-2

CAJMTC will implement the following management measures for these stands:

- Timber management activities will be restricted to meeting the management goals of the IBMZ.
- Silvicultural activities within the IBMZs will be limited to two activities designed to promote growth of a mature forest with an open understory:
  - thinning trees with a dbh of less than 7 inches, and
  - removing understory vegetation (shrubs, seedlings, exotic species, and vines growing from the base of overstory canopy down to two meters above ground) in stands where the cover of understory vegetation exceeds 40 percent.
- None of these activities are to occur between 1 April and 30 September.
- No silvicultural activities will be conducted on trees with a dbh of more than seven inches.
- Snags (trees with less than 10 percent live growth) will not be removed unless they pose a safety hazard to the soldiers.
- The IBMZs will be incorporated into the Indiana bat monitoring program (described below). The results of the monitoring program should provide valuable information for evaluating the benefits of the silvicultural activities in the IBMZs to Indiana bats at CAJMTC.
- Military activities within the IBMZs will remain at current levels and will primarily consist of foot travel, bivouac activities, and surface danger zones associated with existing ranges and the MPTR.

Tracked vehicles are restricted to existing trails and roads; off-road maneuvers with other vehicles will be minimized in the IBMZs.

Management Action: Implement the Endangered Species Management Component In accordance with AR 200-3, CAJMTC has prepared an ESMC for the Indiana bat. The ESMC prescribes specific management measures for the effective management of the bat's summer foraging and roosting habitat. A copy of the ESMC is provided in Appendix D.

Management Action: Restrict Use of Training Materials Toxic to Indiana Bats The 1998 ecological risk assessment indicated that some of the currently used training materials have toxic effects on Indiana bats (Montgomery Watson and 3D/I, 1998a). As a result of those findings, CAJMTC will implement the following restrictions:

- Items containing hexochlorethane (HC) smoke, such as AN-M8 grenades, will not be used.
- The release of M18 colored smoke grenades within 36 meters of trees will be avoided to the maximum extent practicable between 1 April and 30 September.

CAJMTC will submit an annual report to the USFWS BFO detailing the use of M18 grenades, including the number and location of M18 grenades deployed during the year and during the period between 1 April and 30 September.

Management Action: Develop Educational Materials Under the Sustainable Range Awareness component of CAJMTC's ITAM program, educational materials and training for the military trainers will be developed. These materials will focus on improving awareness of the Indiana bat

and its habitat, overall protection of CAJMTC's natural resources, and environmental compliance, particularly with respect to the ESA.

Management Action: Implement Guidelines and Restrictions for Pesticide Use To avoid toxicological effects, CAJMTC will implement the following guidelines:

- The use of pesticides will be in accordance with the manufacturer's directions. This includes, but is not limited to, mixing instructions, application guidelines, storage requirements, and disposal guidelines.
- Pesticides will not be applied directly into surface waters, or be applied in a manner that might result in runoff (within 24 hours of rainfall) or drift into surface waters, unless indicated as appropriate on the pesticide's label or in its instructions.

An annual report characterizing pesticide applications, including types, amounts, locations and dates of applications, and habitats affected by applications (e.g., standing water, grasses) will be submitted to the USFWS BFO.

Management Action: Implement Sediment Erosion Control Measures Erosion control measures will be implemented during all construction activities to minimize sediment displacement within drainages, streams, ponds, and lakes. The erosion control measures are designed to protect water and aquatic habitat quality by minimizing sediment loadings to the streams. Indiana bats forage on emergent aquatic insects, therefore degradation of water quality or aquatic habitat could adversely affect the bat's food supply. Standard erosion control measures that will be implemented during construction activities include the following:

- Vegetative and structural erosion controls will be used according to standards and specifications described in the Indiana Handbook for Erosion Control in Developing Areas (IDNR) and EPA's Stormwater Management for Construction Activities.
- Construction will follow Indiana Clean Water Law requirements for construction activities.
- All erosion and sediment control measures will be established prior to construction or as the first step in construction (e.g., silt fences, straw bales, water bars, etc.).
- The USFWS will be notified of erosion control measures implemented in the MPTR as addressed in the EIS for the construction of the range and may inspect these measures. The MPTR Environmental Impact Statement stipulates erosion control measures for the MPTR that are different than those on the rest of the installation.
- Erosion and sediment control measures will be monitored at least once a week to verify proper use.
- All areas disturbed by construction activities will be seeded and mulched or sodded and fertilized, unless the area is to be paved or built upon.
- The Conservation Director will head planning and coordination of activities pertaining to seeding, mulch specification, and budgeting.

Management Action: Conduct ESA Section 7 Consultation with the USFWS for all Training and Mission-Related Activities A number of training-related activities that occur on CAJMTC could affect Indiana bats. Examples of these activities include the use of troop labor to clear roadsides, firebreaks and fence lines that have become overgrown with woody brush and small trees, and the use of a smoke grenade that is new to CAJMTC. Currently, CAJMTC must review each proposed activity's potential impact on Indiana bats on a case-by-case basis. Consultation with

USFWS would mostly eliminate the need for continued consultation each time one of these activities is to take place.

Management Action: Implement Monitoring of Indiana Bats In addition to these guidelines, CAJMTC has developed an Indiana bat monitoring program in consultation with the USFWS. The purpose of the monitoring program is to check the status of known roost trees. Mist netting will occur periodically. Current and future bat survey results will be mapped and maintained on a GIS database of bat colony sites. When identified, these sites will be avoided, or enhanced, to encourage roosting of maternity colonies. The results of all monitoring activities will be reported to the USFWS.

If bat capture methods are determined to be necessary to monitor the presence of bats, mist netting will be conducted during late spring and summer months. Guidelines for netting Indiana bats have been developed by the USFWS Indiana Bat Recovery Team to standardize the procedure and maximize the potential for capture of bats at a minimum level of effort. Refer to the ESMC in Appendix D for netting guidelines.

Management Action: Monitoring of Evening Bats Based on survey results in which 24 evening bats were captured, a maternity colony is believed to exist within or near CAJMTC's northeast boundary. Evening bats have been documented to roost in trees on and off the installation. No buildings exist near the capture sites.

To get a clearer understanding of the evening bat's presence on CAJMTC, evening bats are observed within the overall bat monitoring program at CAJMTC. Efforts that locate and characterize the roost and foraging habitat of the species may be conducted. In addition, searches may also be conducted prior to the demolition of any buildings on the installation. Data collected on the presence and preferred habitat would be maintained in a GIS database system and updated on a biannual basis.

Management Action: Maintain Suitable Habitat for Grassland Species of Birds Episodic disturbances are necessary to maintain high-quality grasslands that support viable populations of certain grassland birds. Prescribed burning will be used at CAJMTC to maintain grassland areas suitable for these species.

It is generally accepted that rotational burning of at least 50-75 acres per year can maintain suitable habitat conditions for grassland species. Other recommendations include burning larger grasslands (>600 acres) on a 20-30 percent annual rotation (Herkert, 1994) and maintaining a minimum of 75 hectare tracts burned on a 3-4 year cycle (Zimmerman, 1988).

Currently, most management burns at CAJMTC are conducted in late winter to early spring so that training sites have vegetative cover throughout the winter. This vegetative cover helps reduce erosion and provides cover for wildlife. Burning at any time other than during the winter would conflict with military training schedules and safety standards. For these reasons, burning will continue to be conducted during the winter.

Management Action: Develop a Grassland Management Plan A grassland management plan will be developed to improve habitat conditions for the Henslow's sparrow and other grassland bird species on CAJMTC. Rotational burning, as well as specific characteristics of CAJMTC's grasslands (e.g., total area, habitat quality), will be incorporated into the plan.

Management Action: Improve Habitat Conditions for Other Grassland Birds Numerous grassland bird species found at CAJMTC are Migratory Nongame Birds of Management Concern (USFWS 1995b) that are in a regional decline (e.g., sedge wren [state endangered], northern harrier [state endangered], field sparrow, grasshopper sparrow, bobolink, and eastern meadowlark). To improve habitat conditions for these species, the following management measures will be implemented:

- Maintain grassland areas large enough to support the long-term persistence of area-sensitive species (i.e., avoid fragmentation).
- Administer a practice of periodic burning to increase diversity of native prairie plants and eliminate woody encroachment that attracts nest predators and nest parasites.
- Plant various native grasses and forbs to further enhance habitat diversity. Wherever possible, establish native warm-season grasses as the dominant cover type.
- Control invasive, nonwoody plant species.
- Minimize human disturbance in grassland areas during the breeding season and other sensitive periods.

Management Action: Implement Monitoring of Other Grassland Birds Population size and structure of grassland birds and resource use will be monitored and maintained as environmental funds and manpower allow. These data will then be periodically analyzed to detect any long-term changes.

Management Action: Manage for Rare Plants at the Community or Guild Level Old fields containing rare plants will be maintained as such by prescribed burning or mowing, and the planting of non-native species in and around these fields will be avoided to minimize any adverse impacts on the rare plants resulting from competition. Rare species in these areas will be monitored periodically for changes in number, density, and ground coverage and for changes in ecological conditions. Monitoring and survey work will be conducted as fiscal and manpower resources permit. Data on plant locations will be maintained in a GIS database, which will be frequently updated to incorporate the latest monitoring information. Management of a particular species will be altered at any time in response to changes in its population status.

Additional management measures to be implemented where needed include checking proposed installation activities against rare plant locales, protecting vulnerable plants from fire, constructing passive barriers, maintaining habitat conditions, and transplanting and seed banking.

6.7 SURFACE WATER AND WETLAND MANAGEMENT

Program Overview and Management Goal

Consistent with the military mission at CAJMTC and sound ecosystem management principles, the surface water and wetlands goal is to manage and maintain diverse natural aquatic communities and to protect their associated watersheds. In addition to supporting the military

mission, these communities will promote native flora and fauna and provide recreational opportunities while ensuring compliance with Section 404 of the Clean Water Act and state wetland/water quality regulations.

Surface Waters and Wetlands Objective 1. ***Maintain and protect Camp Atterbury surface waters in order to promote the biodiversity of the region, protect water quality and aquatic species, and to ensure the long-term use of Camp Atterbury lands for training.***

The management measures that will be implemented to protect water quality are as follows:

Management Action: Maintain 100-foot vegetative buffers around all sides of surface waters, including lakes and ponds, where possible. (It may not be possible to establish a buffer area with a sufficient number of canopy species around man-made lakes due to federal and state regulations regarding dams, but native grasses and other native non-woody species can intercept overland water flow containing suspended sediments, nutrients, and pollutants.)

Management Action: Establish 100-foot vegetated riparian buffers around streams on CAJMTC where possible. The goal of riparian management at CAJMTC is to protect water quality and fisheries resources. Riparian areas are critical for dissipating stream energy associated with high water flows, filtering sediment and pollutants, improving floodwater retention and groundwater recharge, stabilizing stream banks and shorelines, providing habitat for instream and upland species, and supporting biodiversity (USEPA, 1993). Riparian buffers will be 100 feet on each side of a perennial stream and at least 50 feet on each side of an intermittent stream.

Management Action: Limit the impact on surface waters and riparian areas in the impact areas caused by training exercises. The direct input of pollutants (e.g., lead, petroleum products) as well as the increased erosion of stream banks and shorelines and disturbance of soils in the nearby riparian areas of the impact areas can lead to inputs of nutrients and pollutants and transport to downstream water bodies such as Puff Lake.

Management Action: Use salt for deicing roadways only when necessary. When possible, sand should be used in place of salts. Care should also be taken in stockpiling salts for future use. Storage locations with minimal runoff into CAJMTC aquatic systems are preferred.

Management Action: Apply minimal amounts of pesticides and fertilizers. Pesticides and fertilizers should be applied minimally and in conformity with appropriate standards, and should not be applied in riparian buffer areas. These applications should also be done in accordance with any established integrated pest management practices as specific problems are identified.

Management Action: Limit vehicle use within 100 feet of the water bodies. This action will reduce the potential for the introduction of POLs and sediment into aquatic systems.

Management Action: Control nuisance species to the extent possible.

Surface Waters and Wetlands Objective 2. ***Maintain and protect Camp Atterbury aquatic habitat in order to promote the biodiversity of the region, protect water quality and aquatic species, and to ensure the long-term use of Camp Atterbury lands for training.***

General aquatic habitat management measures have been developed based on the goals and objectives for maintaining healthy aquatic ecosystems. These general management measures are primarily aimed at protecting aquatic habitats. Specific management measures will be developed based upon findings of an aquatic habitat assessment or evaluation. General management measures are listed below.

Biological potential is limited by the quality of the physical habitat; therefore, conducting comprehensive aquatic habitat assessments provides a very effective management approach for evaluating the quality of the water resources at CAJMTC. Little information exists on the condition of the aquatic habitats of CAJMTC. Implementation of the management actions listed below will provide the information necessary to implement adaptive management strategies for the continued protection of the aquatic habitat.

Management Action: Conduct physical habitat assessments. These assessments should evaluate the integrity and condition of stream reaches, instream habitat, and riparian areas. Screening level assessments can be used to evaluate overall conditions, prioritize restoration projects, and allocate resources.

Management Action: Direct stream crossings to bridges and hardened stream crossings. Stream crossings should be located, designed, constructed, and maintained to provide maximum erosion protection; to have the least adverse effects on wildlife, aquatic life, and their habitats; and to maintain hydrologic processes and water quality.

Management Action: Evaluate the potential for stormwater runoff to enter surface waters and measure the corresponding water quality at sites where stormwater currently discharges to surface waters.

Surface Waters and Wetlands Objective 3. ***Maintain and protect Camp Atterbury riparian areas in order to promote the biodiversity of the region, protect water quality and aquatic species, and to ensure the long-term use of Camp Atterbury lands for training.***
The goal of riparian management at CAJMTC is to protect water quality and fisheries resources. Riparian areas are critical for dissipating stream energy associated with high water flows, filtering sediment and pollutants, improving floodwater retention and groundwater recharge, stabilizing stream banks and shorelines, providing habitat for instream and upland species, and supporting biodiversity (USEPA, 1993). The primary objective of riparian management at CAJMTC is to maintain adequate riparian areas.

Management Action: Conduct riparian habitat assessments to document conditions, assess status and trends, and monitor future conditions.

Management Action: Using results from habitat assessments identify and prioritize reaches requiring stabilization of streambanks.

Management Action: Establish and maintain 100-foot vegetated buffers around surface waters. This action will serve to maintain streambank and shoreline vegetation, reduce adverse impacts on water quality, and protect aquatic habitat. Restrict harvesting of timber within 100 feet of streams and lakes. Limit activities within buffer zones to those which would cause little or no impact on water quality and aquatic habitats.

Management Action: Maintain tree canopy over streams. This action serves to reduce summer stream temperatures and to provide a source of organic matter for aquatic biota.

Management Action: Plan training exercises to minimize shoreline and streambank erosion. Unavoidable impacts on aquatic habitats should be mitigated in a timely manner.

Management Action: Plant native vegetation for riparian stabilization. Native hardwood species and native grasses may be used to provide streambank stabilization.

Management Action: Restore degraded riparian habitat or mitigate impacts on the habitat when requirements are identified and resources are available.

Management Action: Restrict or redirect vehicle traffic on roads that traverse riparian areas. Riparian crossings that cannot be avoided should be designed to minimize effects to the riparian areas as well as the surface waters within riparian areas.

Management Action: Locate bivouac sites at least 300 feet from surface waters. If bivouac sites are located in areas adjacent to surface water or its drainage way, implement BMPs for sediment and erosion control.

Management Action: Encourage diverse species composition in the riparian areas, particularly with respect to canopy species. This can be accomplished by controlling riparian disturbances and associated erosion and sedimentation, and by restricting timber harvest activities in the riparian areas. Large organic debris from the woody species also encourages instream species diversity by providing habitat. Naturally-occurring large organic debris will be allowed to remain in stream channels to provide necessary instream aquatic habitat characteristics. This excludes the tops of trees from a timber harvest. All large organic debris resulting from timber harvests must be removed.

Management Action: Monitor for the presence of exotic and invasive species.

Management Action: Limit activities within the riparian buffer zones to those which would cause little or no impact.

Management Action: Plan recreational development and training exercises to minimize shoreline and stream bank erosion and mitigate for unavoidable impacts.

Management Action: Limit pesticide and fertilizer use in riparian buffers.

Management Action: Avoid constructing recreational structures (e.g., beaches, docks) in riparian areas with vital aquatic habitat. Structures should not disturb river or lake beds or restrict water movement near the shoreline. Alternatives such as cantilever, floating, or post-supported structures; dry beaches (built above the high water mark); and swimming platforms will be considered. Also to be considered are beaches with coarse or pea-sized gravel instead of sand (USEPA, 1993).

Surface Waters and Wetlands Objective 4. ***Maintain and protect Camp Atterbury wetlands in order to promote the biodiversity of the region, protect water quality and aquatic species, and to ensure the long-term use of Camp Atterbury lands for training.***

Wetlands are of critical importance to the protection and maintenance of living resources, since they provide essential breeding, spawning, nesting, and wintering habitats for many fish and wildlife species. Wetlands also enhance the quality of surface waters by impeding the erosive forces of moving water and trapping waterborne sediment and associated pollutants, maintaining baseflow to surface waters through the gradual release of stored flood waters and groundwater, and providing a natural means of flood control and storm damage protection through the absorption and storage of water during high-runoff periods.

Management Action: Develop Wetland Inventory Database. Continue to develop the wetland inventory, mapping, and assessment database created for CAJMTC by the United States Army Engineer Research and Development Center (2000). Additional information on wetland characteristics should be added to this database as it is collected. The database will also be used to track wetland conditions on CAJMTC and to assist in the identification of potential problem areas.

Management Action: Maintain 100-foot Buffers Around Wetlands. Where it is determined that a wetland has, or could have, significant habitat value, or where current activities adjacent to a wetland are causing noticeable adverse impacts on the habitat, buffers of greater than 100 feet should be considered. Activities within buffer zones are limited to those which would cause little or no impact on, or disturbance to, the wetland. In cases where established activities already occur within buffers and cannot be reasonably changed, monitor wetland conditions to ensure minimization of potential impacts.

Management Action: Wetland Restoration/Mitigation. Restore degraded wetlands or mitigate impacts on the habitats when requirements are identified and resources are available.

Management Action: Water Quality Management Procedures. Pursue water quality management procedures that protect wetlands from excessive nonpoint source runoff.

Management Action: Plan Maintenance, Development and Training to Avoid Wetland Areas. Plan development and training to avoid wetland impacts to the maximum extent possible and mitigate unavoidable impacts on wetland functions. Encourage project managers to coordinate early with the Natural Resources Branch to determine potential adverse impacts to wetlands. Review operations and maintenance programs that potentially affect wetlands, and develop procedures and guidelines to avoid the loss of wetland functions.

Management Action: Control Invasive Species. Evaluate general vegetative characteristics of wetlands to determine where potential future control of invasive species could measurably enhance habitat value.

6.8 FOREST MANAGEMENT

Program Overview and Management Goal

Forest management involves exercising influence over the ecological processes of a forest in an effort to provide specific sustainable products and amenities from the forest while maintaining its long-term health and vigor. The Army forest management program is required to support and enhance the immediate and long-term military mission and to meet natural resource stewardship requirements set forth in federal laws such as AR 200-3. Army policy further stipulates that forest resources must be managed for multiple uses, using an ecosystem management approach to optimize the benefits to the installation's natural resources. Ecosystem management provides a framework for holistic management of the resource rather than focusing emphasis on a single aspect or activity such as timber production or game species management.

The goal of the forestry program at CAJMTC is to maintain the forest cover required for military training, while complying with the Endangered Species Act by protecting and enhancing habitat for the federally listed Indiana bat, maintaining ecosystem viability, and providing for the production of commercial forest products. Using an ecosystem management approach, the natural resources program can provide for the production of timber while at the same time providing for the following:

- Biodiversity of species and habitat and habitat structure.
- Natural beauty.
- Outdoor recreation opportunities.
- Wildlife habitat, including habitat to support threatened and endangered species.
- Soil conservation, erosion control, and watershed protection.
- Air and water quality.
- Sustained viability and diversity of military training lands.
- Training needs.

Forest management enhances the CAJMTC military mission by providing a healthy training area over the long term. Practices such as forest product sales, timber stand improvement activities, managing forest access roads, encouraging and protecting regeneration, providing forestry support for natural resource surveys and protecting against fire, insects, and disease sustain the forested environment. Conflict of forest management activities with the military mission is avoided by providing for review of management plans and activity schedules by the trainers. Coordination with DPTM/POTMS is conducted regularly to discuss fire and forest management issues.

The forest management program at CAJMTC must also fully comply with all applicable federal laws, policies, and regulations pertaining to forest management. Federal laws, policies, and regulations that may impact forest management at CAJMTC include AR 200-3, PL 86-797, Sikes Act, as amended (16 U.S.C. § 670 a through o), 10 U.S.C. § 2665 (*Sale of Certain Interest*

in Land: Logs), DoD Inst 7310.5 (*Accounting for Production and Sale of Lumber and Timber Products*), Executive Order 11990 (*Protection of Wetlands*), Endangered Species Act of 1973, as amended (16 U.S.C. §§ 1531 et seq.), and the National Forest Management Act of 1976 (16 U.S.C. §§ 1601 et seq.). All management actions that would require soil disturbance would be done in coordination with the CRM to ensure NHPA compliance.

Timber management compartments are shown in Figure 6-3.

Forest Management Objective 1. ***Maintain and protect the Camp Atterbury forest community in order to maintain the natural diversity of the forest, to preserve the biodiversity of the region and to ensure the long-term use of this habitat for training.***

Management Action: Timber Inventory. Forest inventories are the foundation for the development of management and regulation plans. AR 200-3 requires forest stand inventories be conducted and kept current (at least every ten years) to provide for sustained production of forest products. The estimated allowable harvest based on the inventory's 10-year time span, and the statistical summary and other data summaries from the timber inventory are provided in Appendix F. The information provided in Appendix F is from a 1996 forest inventory and new information should be available by the end of 2007.

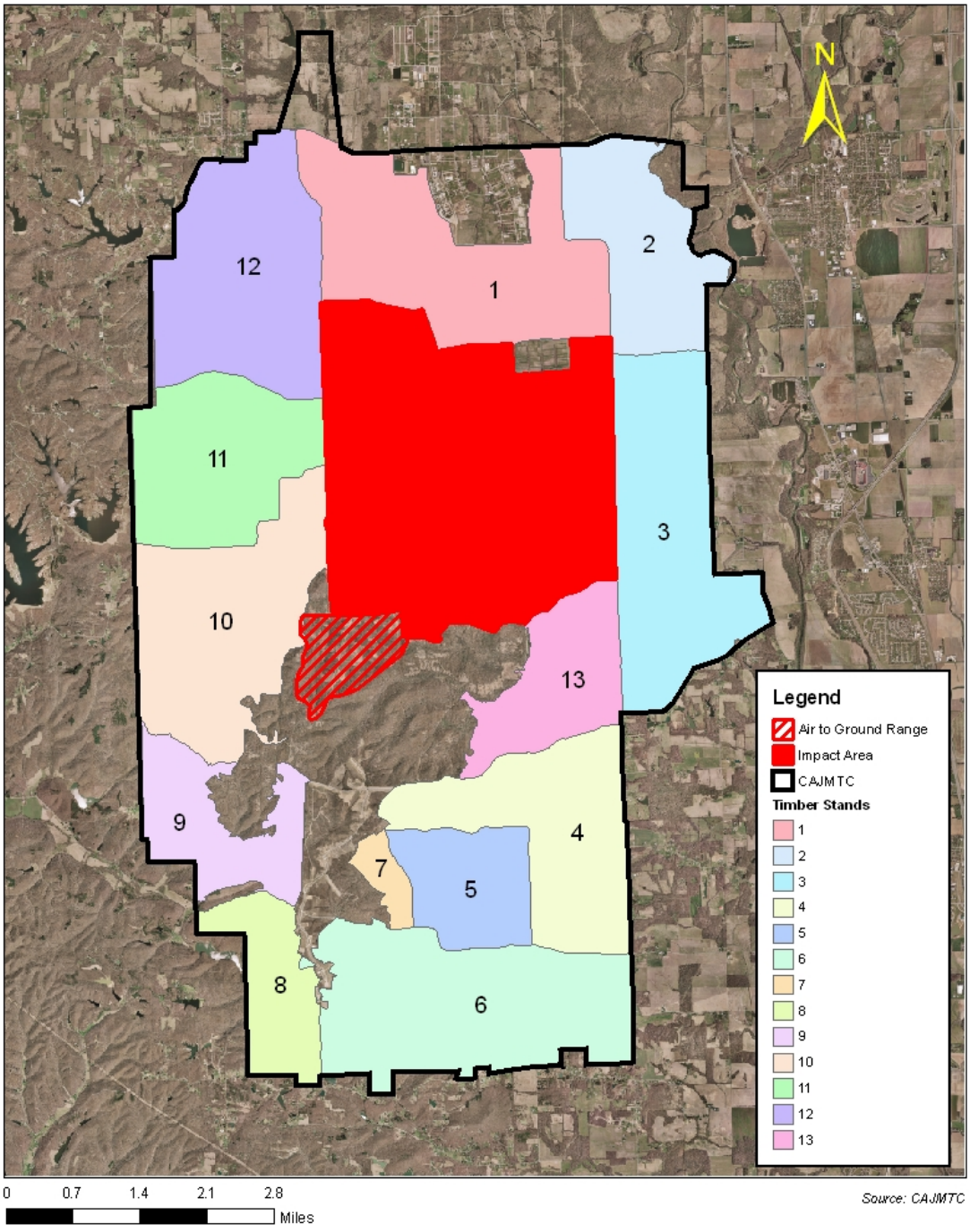
In addition to gathering timber data, information on ground cover, shrub layers, seedling regeneration, general stand environment, stand location relative to various habitats and specific wildlife parameters (e.g., snags and den trees) should be collected. This information will provide a view not only of the timber resource, but also of the composition and structure of the stands as they relate to habitats of other plants and wildlife.

To identify how conditions change in response to management practices, information from forest stand activities will continue to be collected and integrated with other efforts. A GIS database consisting of these data layers will be maintained and updated with each new inventory. Maps built from these data can be used to track temporal and spatial status and trends of the forest resources relative to other ecologically or geologically sensitive resources.

Management Action: Manage for Commercial Forest Production. CAJMTC's commercial forest management objective is to manage primarily for high-quality hardwood sawtimber and veneer on a sustained yield, multiple-use basis with possible minor sales of firewood and fence posts.

The primary markets for the forest products harvested at CAJMTC include the following:

- **Pine Sawtimber**. The majority of pine found on the installation consists of small, widely scattered areas of white, red, Virginia, and Scotch pine originally planted for erosion control or aesthetics. Pine is not a commercially desirable species in this area. Norway spruce is another softwood tree species that is commonly found on the installation, and it is also not a commercially desirable species. Timber stand improvement objectives (thinning) are far overdue and could be accomplished through commercial harvesting.



Timber Management Compartments
Camp Atterbury Joint Maneuver Training Center
Indiana
Source: CAJMTC, 2007
Figure 6-3

- **Pine Pulpwood**. Pine pulpwood would be a by-product of pine thinning operations. CAJMTC does not have sufficient quantities of pine pulpwood to be commercially feasible as a stand-alone harvest.

- **Hardwood Sawtimber**. Hardwood is CAJMTC's most commercially valuable forest product. With proper silvicultural practices, primarily through selective cutting of commercially mature and overmature trees of varied quality, a viable income can be realized while improving the commercial quality of the residual stand and maintaining and enhancing the biological diversity of the installation as well. Single tree and group selection up to 1.5 acres in size are the primary silvicultural methods used. There is also the option of small scale clear-cuts to stimulate oak regeneration and provide ruffed grouse habitat. This would occur on a limited basis and only on appropriate sites. Section 7 consultation would be required for the use of such methods. Clear-cuts are also an option for salvage harvests after a damaging storm or disease/insect outbreak.

- **Hardwood Veneer**. The installation produces very high-quality white oak and black walnut veneer logs. Management has been, and will continue to be, geared toward harvesting commercially mature veneer trees while improving stand conditions for younger, commercially productive, veneer-quality trees through release techniques. In addition, timber harvests are planned in a manner that will enhance the reproduction of highly desirable species, where silviculturally feasible.

- **Hardwood Pulpwood**. A limited market exists for hardwood pulpwood. Under the uneven-age management concept generally employed in the eastern U.S., pulpwood is, in effect, a by-product of sawtimber production. It is not economically feasible, nor silviculturally desirable, to manage for pulpwood production in the majority of stands on the installation.

- **Miscellaneous Forest Products**. On CAJMTC, miscellaneous forest products include firewood and fence posts (red cedar and black locust). The sale of these products is not considered a commercial venture as it is a timber stand improvement tool or a service to the installation by the clearing of project areas, bivouac site improvement, blow-downs, public relations, etc. Firewood is sold to the general public by the cut-and-split rick. The firewood program on CAJMTC utilizes only "butt-offs" from logging activities, standing hazard trees in bivouac and other "safety requirement" areas, and construction and road maintenance removed trees. These supply more than enough for the existing firewood program of approximately 100 ricks sold annually.

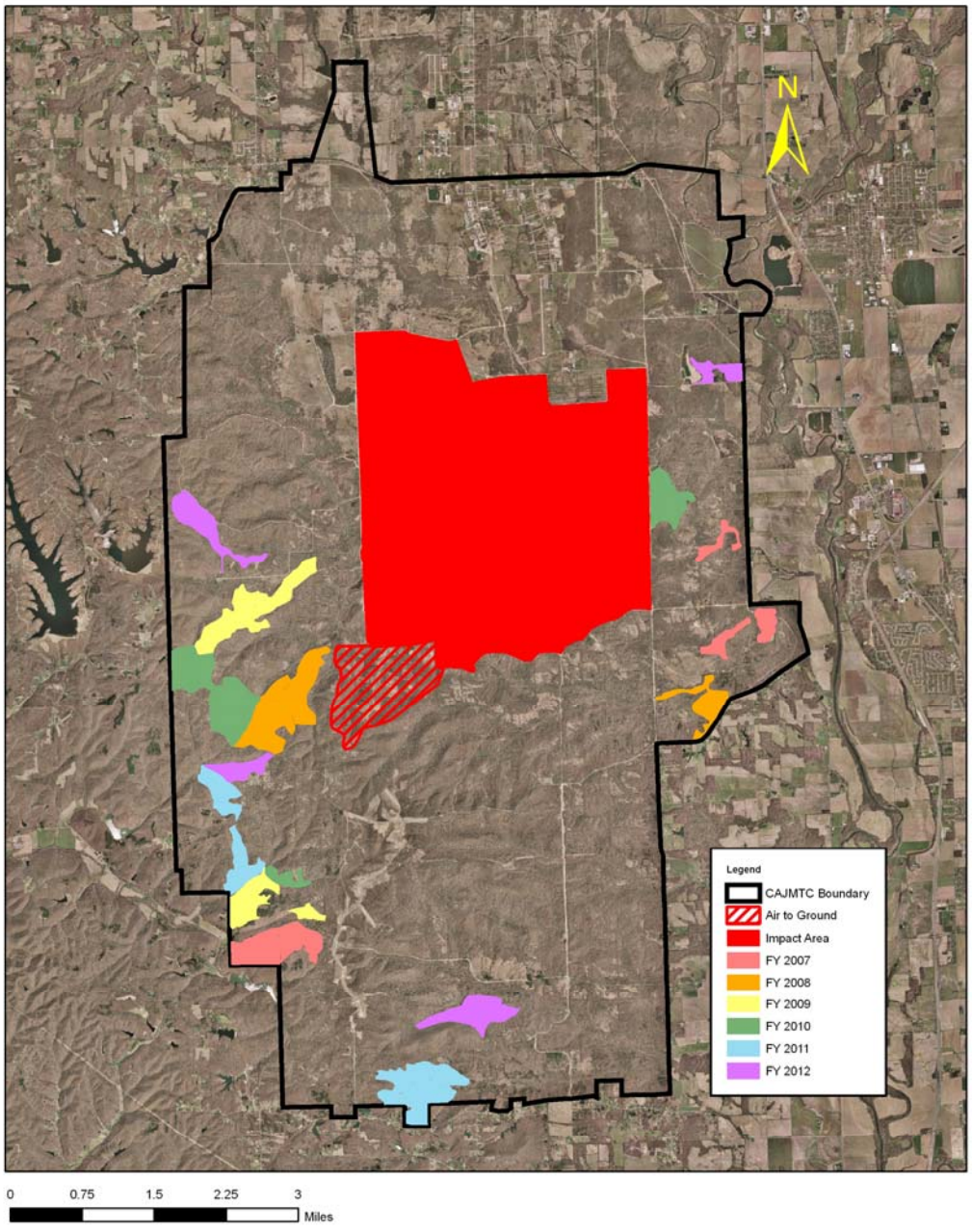
  Trees with less than 10 percent live crown are considered snags. CAJMTC policy does not allow most snags that could potentially serve as Indiana bat roost trees to be cut for firewood. Snags that present safety hazards (e.g., in bivouac sites) may be removed. Anywhere snags are to be removed or cleared CAJMTC will follow the guidance of USFWS-BFO.

A few cut-your-own permits are sold to CAJMTC personnel only, are preselected for location, and marked by the Conservation Director. As new developments in the spread of emerald ash borers emerge, restrictions in the movement of firewood off-post may be implemented.

Management Action: Timber harvest activities. Timber harvest will be conducted within guidelines agreed to under ESA Section 7 Consultation with the U.S. Fish and Wildlife Service to ensure Indiana bat habitat will be enhanced within the timber harvest area. Projected timber harvest areas are shown in Figure 6-4. Timber management activities within the Indiana Bat Management Zones will be limited to activities designed to promote growth of a mature forest with an open understory. No timber harvesting may be conducted between 1 April and 30 September. Timber skidding between 1 April and 30 September will be approved on a case by case basis through an informal consultation with USFWS-BFO.

Management Action: Utilize Uneven-aged Management. This approach will continue as the primary silvicultural system employed at CAJMTC. Throughout Indiana and in most midwestern states central hardwoods are managed using uneven-aged management techniques such as single tree and group selection followed by timber stand improvement (TSI) or fire. In most cases they are used in combination to meet a desired stand objective. Shelterwoods and larger regeneration openings, which are large group selections, are starting to re-emerge for management of oak-hickory and early successional forest habitat that has declined drastically in recent years. Clear cutting and shelterwoods are more frequently used for even-aged management due to the amount of overstory that is removed at the time of the initial harvest. All trees begin at a defined time and are harvested at a defined time. That is not the case using single tree and group selection across a management unit/tract/stand. The reasons for implementing uneven-aged management are as follows:

- to maintain the proper basal area in the stands to promote full stocking and optimum growth of commercially desirable species;
- to provide continuous regeneration containing three or more distinct age classes, either intimately mixed or in small groups, within the stand; and
- uneven-aged management has less impact on the training site and, in most cases, enhances the areas for military training purposes by opening up the area for bivouacking landing zones and open field exercises.



Projected Timber Harvest
Camp Atterbury Joint Maneuver Training Center
Indiana
Source: CAJMTC, 2006
Figure 6-4

Management Action: Utilize single-tree and group tree selection as the preferred harvesting method. The single-tree and group tree selection method creates new age classes in which individual trees of all size classes are removed more or less uniformly throughout the stand to achieve desired stand structural characteristics. The focus will be on the removal of individual trees that are commercially mature or overmature, and deformed or damaged. Undesirable species and cull trees will be removed as well.

Group selection may be employed under specific circumstances. Group selection is a method of regenerating uneven-aged stands in which trees are removed, and new age classes are established in small groups. The maximum width of groups is approximately twice the height of the mature trees. Small openings are created to provide micro-environments suitable for the regeneration of shade-tolerant species, and larger openings (3 to 5 acres) provide conditions suitable for the regeneration of more shade-intolerant species. The Group Selection System will be employed as needed for the following reasons:

- to enhance regeneration of specific shade-intolerant species (e.g., to improve oak regeneration where oak understory is present);
- to enhance wildlife habitat and improve biodiversity.

Management Action: Retain snags and cull trees as wildlife trees. Where applicable, groups rather than individuals will be left. Selection criteria include hollow-butt trees and trees with holes in the bole for habitat, small crown to allow for regeneration beneath, dead snags for predatory bird perches, dead trees for woodpeckers, and slipped bark trees for bat habitat. Where an insufficient number of culls and snags exist, selected trees will be double girdled and left standing to create snags and loose-barked trees. A snag has less than 10% crown.

Management Action: TSI will be achieved concurrently with timber harvesting where practical. TSI is an intermediate stand treatment that generally does not involve the harvest of commercially valuable material at CAJMTC. TSI is employed when conditions of developing stands do not meet forest management objectives and is used primarily to improve the timber quality of selected trees by removing other trees or vegetation that compete for light, nutrients, and moisture. TSI work will be contracted out annually to forestry consultants as funding allows. Selective cutting should be emphasized in bivouac areas. Adequate regeneration does not take place in an old growth habitat and dead trees pose a hazard for personnel. Hazardous trees will be removed from heavily used bivouac sites. Individual, commercially overmature trees should be removed periodically to eliminate hazards and provide openings for regeneration. Portions of stands adjacent to roadways will be less intensively managed, leaving more mature trees for aesthetic purposes.

TSI projects have been undertaken at CAJMTC in the form of cull tree removal in conjunction with scheduled management timber harvests. Other aspects of TSI, such as grapevine control and crop tree release in younger stands, are accomplished through in-house or contract labor. Vine control is best accomplished by using installation personnel or contractors at least 3 years prior to harvesting. Post-harvest TSI is sometimes necessary to complete regeneration openings and complete cull tree removal. Based on inventory recommendations, TSI activities will be increased.

Specific management guidelines for the TSI program include:

- Conduct TSI concurrently with timber harvesting where practical.
- The highest priority for TSI should be given to areas that have recently been harvested. TSI is usually most effective when completed within one year following logging. Current policy completes some of the necessary TSI work through timber sale marking. While this work is beneficial, post-harvest TSI is needed to complete regeneration openings, coppice damaged trees, and treat vines and defective trees.
- Use growing stock crown release, cull tree removal, site preparation for regeneration, and vine removal to improve future forest productivity.
- Generally, favor oaks for their wildlife and timber value, but give consideration to species diversity.
- Generally, use nonchemical methods. Chemical (herbicide) methods may at times be necessary to minimize the structural damage to trees that are desired to be left standing dead for extended periods of time.

All stands projected for harvest as listed in Appendix G will undergo TSI once the harvest operation is complete.

To minimize the potential for adverse effects to Indiana bats and other fish and wildlife species, the use of herbicides should be limited where possible. CAJMTC staff has been approved to use certain chemicals for forestry and road-side maintenance applications (Appendix H). The use of pesticides will be in accordance with the manufacturer's directions for forestry use and will be administered by licensed personnel using hand held or ATV spray applicators. Any pesticide application by fixed or rotary wing aircraft will be under direction of NGB with Section 7 consultation with USFWS-BFO. Consultation for TSI activities under ESA Section 7 is accomplished by way of USFWS concurrence with this Revised INRMP. All TSI operations follow the same USFWS guidance as timber harvests.

Management Action: Salvage sales will be conducted, as dictated by the military mission, to minimize expense to the installation and to recover the monetary value of the resource.
It is noted that salvage sales require separate Section 7 consultation with USFWS-BFO.

Management Action: Utilize Appropriate Timber Harvest Procedures. Timber harvest guidelines have been developed for timber harvest planning, timber stand marking, timber harvest activities, tree planting, the fuelwood program, bivouac areas, and metal contamination areas.

Planning The results of the 1996 forest inventory determined that the annual removal of 2,030 MBF is the theoretical balance between the annual net growth minus estimated mortality. Therefore, under sustained yield principles, a maximum of 2,030 MBF of timber could be harvested annually at CAJMTC. Historically, less than one-quarter of the allowable cut has been harvested in any one year, which has allowed growth to outpace the level of harvest. In addition, special management or limited access areas have reduced the total land base available for commercial forestry operations, thereby reducing the annual harvest to approximately 500 to 1,000 MBF. Increased use of the installation during mobilizations has had and will continue to have an effect on board feet sold annually and revenue.

Timber harvests will be conducted annually and the harvest priorities among the stands will be determined based on each stand's variation from the "average" for factors such as harvest volume per acre and stocking percentage. During the planning process, stands exceeding the averages will be given highest priority for harvest.

Areas to be harvested during the scope of this Revised INRMP are based on recommendations made in the Forest Inventory and Timber Management Report conducted by Grossman Forestry Consulting (1996). However, modifications may occur based on the results of the current inventory being conducted, modified access to areas that are experiencing increased use due to mobilization, limitations imposed by weather, and seasonal harvesting restrictions. Selection from this list will be made on a yearly basis to avoid conflicts with the military mission, construction contracts, access difficulties, or other unforeseen conflicts. Harvest units not selected in one FY may be selected in subsequent years. Historically, the installation has only harvested about 25 to 30 percent of the allowable cut.

Appendix G contains a projected schedule of Compartments and Stands to receive planned timber harvests during this Revised INRMP period. The list also includes one known salvage sale. Selection will be made from these during the plan period. However, various problems may preclude that any particular stand is cut during its scheduled time, or at all. It must be kept in mind that the "Harvest Volume" figures are estimates from 1996. Significant growth has occurred since that time. Therefore actual figures may be significantly higher. Harvests are scheduled in "at risk" stands in an attempt to salvage merchantable timber from these stands. Regular harvest requirements will remain in marking these stands for harvest.

To ensure that timber harvesting operations are compatible with training and mission requirements, CAJMTC maintains a flexible long-range plan for timber harvests. Although the variability in training schedules can make it difficult to plan activities to the exact year in which a stand will be managed, this flexibility ensures that the goals will be achieved during the life of the plan. The projected timber harvest schedule is shown in Appendix G.

Marking Timber marking, performed by the Environmental Office with assistance from the Forestry Section, USACE (Louisville District) when needed, involves marking the individual trees on the bole and on the stump at ground level within the stand designated for harvest. Trees are 100 percent tallied using Doyle Log Rule. All timber marking will adhere to the USFWS-BFO timber management guidelines.

Trees are marked individually based on the growth and regeneration requirements and commercial value for the species. For example, a dominant, commercially mature red oak will be marked if it has reached its growth peak and will likely be in a declining state by the next cutting cycle. Its removal reduces competition for co-dominant white oaks and allows them to grow at an optimum rate. Considerations prior to marking include the health and condition of the surrounding trees, both overstory and understory, and the cutting cycle.

Timber Harvesting Timber harvest activities involve coordination and consultation with a number of state and federal agencies to ensure CAJMTC's compliance with all state and federal

regulations. The primary driving force influencing the timber harvest program at CAJMTC are the restrictions related to maintaining adequate summer maternity and roosting habitat for the federally endangered Indiana bat. The environmental staff will incorporate new information and/or developments regarding the Indiana bats as it becomes available.

The management measures that CAJMTC follows for each timber harvest are provided below: All pertinent environmental documentation will be prepared prior to the Invitation for Bids. This process involves: a Report of Availability (ROA) and a Record of Environmental Consideration that are processed through DPTM, the Environmental Office, and Command. The documentation is then forwarded to Indiana Joint Forces National Guard Headquarters for signature before being sent to NGB for final review and approval. Once the documentation is approved, a memo is issued by the Chief of Environmental Programs Division. Coordination with the State Historic Preservation Office is also completed before each harvest operation and management actions would be done in coordination with the CRM to ensure NHPA compliance.

Consultation under ESA Section 7 is accomplished by way of USFWS concurrence with this Revised INRMP and the management schedule outlined in Appendix G. The Environmental Office will provide the USFWS-BFO with harvest data in preparation for sales. All other forms of harvesting not addressed by specific location in the Revised INRMP will require separate consultation. Separate Section 7 consultations are required for all other non-management actions not listed in Appendix G. These actions include salvage sales and construction projects.

After an ROA is offered by the installation, USACE, Louisville District, assumes responsibility for the disposal of the forest products from the bid opening through the administration of the sale. The procedure to be followed is established by the District's Standard Operating Plan. The District and CAJMTC have developed a MOU for assistance with the Forestry Reimbursable Program. A copy of this MOU is provided in Appendix I.

The forestry program will adhere to the USFWS-BFO Indiana Bat Management Guidelines as presented in Appendix E.

No timber harvesting may be conducted between 1 April and 30 September. Timber skidding between 15 April and 15 September is approved on a case by case basis through an informal consultation with USFWS-BFO. A skidder is a type of heavy vehicle used in a logging operation for pulling cut trees out of a forest.

Precautions will be taken to avoid or minimize operations during wet weather to minimize damage to the timber stands. Enforcement of current contract provisions should minimize negative impacts.

Planned timber harvests in proximity to or in protected natural areas will be coordinated with IDNR Division of Nature Preserves for review and comment.

To comply with the Migratory Bird Treaty Act, the timber management program will limit timber harvesting to those months outside of the late spring/early summer breeding seasons of migratory birds.

Riparian buffers will be 100 feet on each side of a perennial stream and at least 50 feet on each side of an intermittent stream. The Indiana Logging and Forestry Best Management Practices, BMP Field Guide (1999) will continue to be implemented.

All timber operations will be coordinated with the CRM, as stipulated in the Integrated Cultural Resources Management Plan (ICRMP). This will ensure compliance with Section 106 of the NHPA.

CAJMTC will continue to maintain protective buffers around archaeological and historic sites, and do not conduct operations in locations where significant sites are discovered. If a site is discovered during a timber operation, activity will cease and the SHPO will be notified.

CAJMTC will continue evaluating timber stands for possible metal contamination. This will be done by examining the forest floor with a metal detector in each cutting unit suspected of containing metal. If metal is detected on the ground, it will be presumed that the trees contain metal as well and the stands will be sold as such. The purpose of this action is to remove metal-containing trees and to allow future stands to develop free from metal.

Tree Planting The main purposes of tree planting are to create tactical concealment islands, visual breaks, beautification of training and cantonment areas, restoration of riparian areas, restoration of areas affected by invasive species and to stop erosion. Secondary purposes include controlling species composition, providing wildlife food and cover, and increasing land value.

Plantings will focus on species that meet most of the following criteria:

- native species,
- potential value for timber,
- ample food and cover for wildlife,
- ready availability,
- low ability for natural regeneration, and
- ability to thrive at its selected planting location.

Scattered plantings of white and Virginia pine, planted primarily for erosion control, exist throughout the installation. Small plantings of Virginia and/or white pine will be planted primarily for erosion control, as well as to improve habitat diversity. Native hardwood species, possibly interplanted with white pine, will be favored on noneroded areas.

The CAJMTC tree planting program, which is based on recommendations from the 1996 timber inventory (Grossman Forestry Consulting, 1996), will continue to play an integral role in the installation's land management program. The decision to plant native grasses or trees, and when possible, the planting itself, will occur before the selected training area is actually closed. This provides some extra time for the plantings to establish themselves before training recommences.

Plans are also being developed to restore riparian areas that have become choked with bush honeysuckle, honeylocust, and osage orange. These restorations should provide habitat more suitable for wildlife, as well as providing increased buffers along streams to decrease erosion.

Fuelwood Program A fuelwood program has been established on CAJMTC and is planned to expand within the scope of the management plan. At present, the general public is allowed on the installation to procure processed (cut-and-split) firewood on a charge permit, per rick (4 feet by 8 feet with vertical cross sections and sticks less than 4 feet) basis. In addition, military personnel and employees are allowed to remove downed logs for firewood from designated areas on a charge permit per-load basis. In addition, private firewood contractors may remove firewood for resale under a forest products contract. This facilitates post-timber sale and bivouac cleanup, improves roadside aesthetics, and allows for hazard tree removal, thereby enhancing the military mission while decreasing costs. Firewood is only allowed to be retrieved from maintained roads, bivouac sites, or well developed trails. Potential firewood within a stand not easily retrievable (e.g., forested areas or past closed skid trails) will be left to decompose naturally to enhance the habitat and improve biological diversity.

Bivouac Areas Bivouac areas are located in a number of the timber stands and the damage that is incurred from bivouacing is often severe. This damage ranges from basal wounds on trees caused by equipment or fires, bullets shot into trees, soil erosion, nails put in trees, soil compaction and root damage due to rutting by military equipment, and trash left on the site. An educational program for users of CAJMTC should be implemented along with a monitoring and enforcement program to minimize damage to these areas.

Historically, when a bivouac area becomes overused to the point of environmental degradation, the military simply abandons it and moves to another site. The heavy use causes soil compaction and the slow decline of the overstory as well as the virtual removal of the understory. Dying trees become a safety hazard. Forestry operations include removal of hazard trees as firewood or inclusion in an adjacent scheduled timber harvest. Assigning defined bivouac areas and maintaining them would benefit forest resources and the military. Entrance roads and tent pads should be hardened for permanent use, but a lack of funding and a low military desirability for permanent bivouac areas may prevent that from happening. The RTLA program is developing specific protocol guidance for long-term monitoring of CAJMTC bivouac sites.

Metal Contamination Military firing may have contaminated much of the installation. The impact area in the central portion of the installation consists of open fields and metal- containing forestlands of little commercial value. For safety reasons, the impact area and the ANG air-to-ground range are not actively managed. The only activities carried out in these areas are salvage timber harvest associated with projects conducted to meet the military mission. Metal surveys are conducted for management harvests outside the impact area and the ANG air-to-ground range to determine the degree of metal contamination prior to timber sales. The forestry philosophy has been, in recent years, to harvest metal-contaminated timber so that the residual stands will mature uncontaminated. A large area of contiguous forestland within the southern reaches of the impact area and surrounding the air-to-ground range are presently contaminated with metal and has been inaccessible. This area was removed from commercial timber management activities and will remain excluded under this plan.

Management Action: Utilize Urban Forestry On the CAJMTC property, there has been an increased demand and interest in establishing urban forestry areas. Planting trees in the

urbanized areas of the installation would provide for shade to benefit troops, provide energy usage relief, and aesthetics.

In 2003, USACERL created a planting plan for the cantonment area and in 2006 over 100 trees were planted. The locations were decided utilizing the USACERL plan. Many obstacles interfere with urban forestry action. There is a limited availability of funding, the ground can have poor, compacted soils in areas, and multiple under ground utilities can make planting difficult.

6.9 FIRE MANAGEMENT PROGRAM

Program Overview and Management Goal

Wildfires can be started from weapons firing and ammunition striking in the impact area or adjacent ranges. Training area fires can ignite from the use of pyrotechnics such as smoke grenades, star clusters, or flares. While wildfires are a possibility at CAJMTC, the abundant precipitation and habitat management procedures used by the installation tend to mitigate the risk. CAJMTC carries out prescribed burns on selected areas (e.g. burn units/sub-units) to reduce fuel loads and prevent woody encroachment that can impede the training mission. CAJMTC contains 17 prescribed fire burn units and impact area. Some of these units are further divided into sub-units due to roads or trails established for training. There is adequate water supply at CAJMTC to replenish water used during a fire (USACE, 1994).

Increased awareness by Environmental and Range Control staff has minimized the occurrence of wildland fires. Fires that occur in the training areas are generally from pyrotechnics. Live ammunition, tracers, and other forms of firing devices or ordnance spark fire within the impact area. With increased awareness, training, and establishment and maintenance of fire breaks, most wildland fires should be held to small acreages.

Wildfire prevention and suppression is a matter of concern for military training and is a goal for natural resources management at CAJMTC. Wildfires have several undesirable aspects: they interfere with ongoing training activities, they can make training areas unsuitable for training over the short term, and they have direct and indirect impacts on habitats and species. There are positive aspects to wildfires from an ecological standpoint, but the current guidance (i.e., AR 200-3) is to suppress wildfires when they occur. Wildfire prevention and suppression involves minimizing fire occurrence by educating personnel on fire prevention techniques, reducing natural fire fuels, and restricting the types of ammunition and pyrotechnics that can be used based on the level of fire danger they pose, being well prepared for fires, and when necessary, rapidly responding and suppressing the spread of wildfires that do occur. CAJMTC is currently developing an Integrated Wildland Fire Management Plan (IWFMP) to further improve the coordination of existing wildfire prevention and suppression efforts. It is anticipated that the IWFMP will be completed in 2007.

Wildfire danger becomes high in the spring and autumn and is a serious threat to valuable timber resources. Measures that are typically implemented for the detection and control of wildfire include:

- Monitor weather conditions at the permanent fire weather monitoring site.

- Determine fire danger ratings and inform military trainers of potential fire danger for prescribed modifications of training activity.
- Conduct training for fire prevention and reporting for the military trainers.
- Suppress wildfires as they occur.
- Use existing fire hazard conditions to determine the quantity of slash allowed to remain on the forest floor after timber harvests.

Fire Management Objective 1. ***Prevention and suppression of wild fires in order to promote the biodiversity of the region, protect native species and ecosystems, and ensure the long-term use of the lands for training.***

Management Action: Conduct Prescribed Burning. The use of prescribed fire is used as a management tool to reduce the fuel load (making fires less likely to occur and reducing their intensity and rate of speed when they do occur), control undesirable species, prevent woody encroachment, maintain areas suitable for troop training, improve wildlife habitat, and improve habitat diversity across the installation. Reducing the fuel load helps to prevent fires from starting, decreases the intensity of fires that do start, and lowers the rate of spread of wildfires. Prescribed fire is also used as a management tool in grassland habitats to enhance their value for a variety of wildlife species.

The installation Wildland Fire Manager will determine areas particularly susceptible to summer wildfires (including areas adjacent to where pyrotechnics are used) and evaluate the need for prescribed fire. Prescribed burns conducted to reduce woody growth and improve wildlife habitat will be carefully controlled to prevent their spreading. Regular prescribed burns to aid wildlife will be conducted as long as they do not interfere with the training requirements for the military mission. New burn units would be selected in coordination with the CRM to ensure NHPA compliance. Due to current military mission requirements, the impact area is burned annually for safety reasons and to reduce fire hazard. These burns occur both through prescribed burns and as a result of training, and always under supervision.

Prior to conducting prescribed burns, CAJMTC must obtain an annual variance from the Indiana Department of Environmental Management (IDEM). The conditions for burning set forth in the variance are as follows:

- Only natural vegetation shall be burned.
- Fire(s) shall not be ignited or fueled with tires or smoke-producing petroleum products.
- Minimal amounts of clean burning petroleum products may be used for starting fires.
- Fire(s) shall be attended at all times while burning and until completely extinguished.
- If at any time the fire(s) create(s) an air pollution problem, a nuisance, or a fire hazard, the fire(s) shall be extinguished.
- Prescribed burns shall be conducted only during daylight hours.
- All burning must comply with other state and local regulations, such as local health department regulations.
- Adequate fire protection shall be maintained for extinguishing purposes at all times during the burning.

- No burning shall be conducted during adverse weather conditions such as high winds blowing toward populated areas or temperature inversions; and when a pollution alert or ozone action day has been declared.
- The Bartholemew, Brown, and Johnson County Health Departments and emergency dispatch centers must be notified prior to date(s) of burning.
- The variance approval and prescribed burn unit plan must be made available at each burn unit or subunit at time of burn.
- The issuance of one variance does not mean that future variances will be issued. If additional burning is contemplated, CAJMTC may be required to investigate alternative methods of disposal and submit those findings with the next variance request.
- No prescribed burns will be conducted between 15 April and 15 September unless Section 7 consultation has been conducted on the site specific burn and concurrence received.

Management Action: Maintain and Improve Firebreaks. The unimproved roads on the installation currently serve as firebreaks and will be maintained annually to preserve their effectiveness. In addition, CAJMTC is in the process of establishing a network of permanent firebreaks around those areas where prescribed burns are conducted. Large areas without firebreaks, and areas particularly prone to wildfires, will be evaluated to determine the need for establishing additional firebreaks. New firebreaks would be selected in coordination with the CRM to ensure NHPA compliance. The establishment of roads and/or trails to remote areas to provide key access for fire suppression in the event of wildfire will be investigated.

Management Action: Conduct Wildfire Suppression. Nearly all of the fires at CAJMTC result from the use of pyrotechnics during training. Weather conditions will be monitored continuously during the fire season (March through early November), and Range Control will be notified when the fire danger is high so that the necessary training restrictions can be imposed. Woodland fires that threaten life or property will be suppressed as quickly as possible. Range Control and the Conservation Director will be notified immediately of all fires. Personnel out on the training areas will be adequately trained in fire prevention and reporting procedures.

All fires are to be reported to Range Control (812-526-1351), with date, time, location, and cause of fire being recorded. This information will be used for tracking and monitoring purposes, as well as for planning future funding. The Environmental Office should be notified of all fires. The IWFMP provides policy, procedures, and protocols for wildland fire suppression and prescribed burns.

6.10 AGRICULTURAL OUTLEASING PROGRAM

Program Overview and Management Goal

The primary goal of the agricultural outlease program is to assist in maintaining a sufficient acreage of open areas in a condition suitable for specific (e.g. air to ground cargo drops, personnel drops, etc.) military training. Agricultural hay lease activities provide CAJMTC with a low-cost means of preventing encroachment of woody vegetation and maintaining certain areas with specific grassy conditions conducive to military exercises. This in turn provides low-cost outleasing opportunities for local farmers to produce crops.

Training Areas 101, 102, and 103 are used as a troop bivouac areas and contain multiple firing points. Training Areas 211, 213, and 214 are a drop zone. Haying of these areas keeps unwanted vegetation from overrunning the areas and provides income, rather than expense, to the installation. Additional leases could further reduce government maintenance costs, but the local market lacks suitable leases. Additionally, it would reduce grassland diversity and training opportunities. Military/leasee interference occurs in both lease areas, but more in Training Areas 101, 102, and 103 given the type of military use. Troop usage flattens the standing hay, rendering it useless for the leasee.

Agricultural Outleasing Objective 1. ***Provide the military with a low-cost means to reduce woody growth throughout the open areas of the installation.***

Management Action: Continue Current Outleases and Pursue New Ones. The ability for CAJMTC to expand the agricultural lease program is limited by the lack of interest expressed by the local farmers. CAJMTC will continue to lease the tracts in Training Areas 101, 102, and 103 and 211, 213, and 214 based on military training needs and interest by the local farmers. In addition, CAJMTC will investigate the potential for and interest in options for expanding the agricultural lease program. All management actions that would require soil disturbance would be done in coordination with the CRM to ensure NHPA compliance

6.11 PEST MANAGEMENT PROGRAM

Program Overview and Management Goal

The Integrated Pest Management Plan for Camp Atterbury (November 1996) describes the pest management requirements, outlines the resources necessary for surveillance and control, and describes the administrative, safety, and environmental requirements of the program. It is intended to reduce reliance on pesticides, to enhance environmental protection, and to maximize the use of Integrated Pest Management (IPM) techniques. Pest management priorities at Camp Atterbury include control of disease vectors, protection of stored food products, protection of real estate, control of nuisance pests, control of undesirable vegetation, protection of beneficial plants, and control of miscellaneous animal pests (e.g., rodents, birds, bats).

The Camp Atterbury pest management program emphasizes the principles of integrated pest management (IPM). This method of pest management involves four primary control strategies—mechanical and physical control (physical removal or exclusion of pests), cultural control (altering the environment to make it less suitable or attractive to the pest), biological control (use of other organisms to control a pest), and chemical control (use of pesticides). The integrated pest management goal is to judiciously use both non-chemical and chemical controls to suppress or prevent pests from exceeding acceptable populations or damage thresholds. Pest species will be controlled using mechanical, physical, cultural, and chemical controls with an overall goal of minimizing the use of pesticides. All use of pesticides will be in compliance with Army regulations.

Pest Management Objective 1. ***Maintain and protect the Camp Atterbury native wildlife and vegetation communities in order to promote the biodiversity of the region, protect native species and ecosystems, and ensure the long-term use of the lands for training.***

Management Action: Protect Beneficial Plants. Trees on the installation are an asset because of both their aesthetic and natural resource value. Compaction of the soil near trees, neglect during drought, digging too close to trees so that roots are cut, and improper pruning, can lead to disease or pest infection or their death. Measures to minimize stress and damage to beneficial plants include:

- Inspect trees seasonally for signs of stress and insect problems and take proper control measures to reduce the stress and infestation potential.
- Inspect trees in heavily used areas regularly to identify any problems that could damage or lead to the death of trees and to recommend actions to prevent such damage or death.
- Prune damaged or infested parts of trees.
- Remove trees that cannot be pruned to prevent further infestations and replace them with native species of trees that are adapted to the conditions under which the trees will grow.

Pest Management Objective 2. ***Maintain and protect the Camp Atterbury timber communities in order to promote commercial timber sales and ensure the long-term use of the lands for training.***

Management Action: Implement Forest Protection It is necessary to maintain forest protection measures to prevent unacceptable damage and degradation of the resource resulting from insects and disease, animal damage, invasive species, wildfire, and mission related-activities. Recommended forest protection measures for CAJMTC are listed below.

Insects and Disease

- Conduct at least one annual aerial survey of CAJMTC's woodlands during the growing season, followed by ground reconnaissance of any potential problem areas. Although gypsy moth, emerald ash borer, and Asian long-horned beetle are currently major pests of concern, monitoring for all insect infestations and outbreaks is conducted. USDA-APHIS regularly conducts surveys at CAJMTC that target exotic and introduced pest species.
- Conduct annual observations to identify timber stands infested with insects, such as gypsy moths. IDNR Division of Forestry regularly places gypsy moth traps throughout the state, including on CAJMTC, as part of a national "slow the spread" campaign against gypsy moth. Any chemical control of gypsy moths requires consultation with USFWS to evaluate the potential for impacts on Indiana bats.
- Use silvicultural treatments to promote stand and individual tree vigor and reduce susceptibility, and to promote species diversity.
- Continue the annual surveys conducted in cooperation with the USFS for gypsy moth control, including population monitoring, defoliation surveys, biological evaluations, trends, and projected damage. Cooperate with the USFS through the DoD Forest Pest Suppression Project when it appears a suppression project may be warranted. Any aerial suppression projects require specific biological evaluation and environmental

documentation. (No such projects have been required in the past, and there is no current indication of any immediate future need.)

- Annually monitor for the occurrence of dogwood anthracnose and sycamore anthracnose to prevent the occurrence of significant impacts.
- Harvest trees symptomatic of ash decline and oak wilt. Control the spread of these diseases by monitoring the residual trees.
- Minimize the impact of canker of sassafras, a disease that has been common on regenerating ridge tops where sassafras was predominant, by properly timing thinnings to remove weak and damaged trees from sassafras groves.
- Monitor research journals for recommendations on monitoring and control strategies.

Wildlife Damage Damage caused by beavers has become significant in many of the bottomland timber stands, as well as in bottomlands that are regenerating to a forest condition. This damage occurs as trunk girdling, tree felling, and flooding, which results in limited access and mortality to species intolerant of flooding. Damage caused by deer to the woodlands is not significant, but damage to tree plantations is expected. Wildlife damage control can be accomplished by various forms of population control and by discouraging wildlife use of sensitive areas.

- Monitor the location and size of beaver colonies. When necessary and feasible, remove nuisance beavers through trapping.
- Monitor the impact of deer browsing on forest regeneration using regeneration surveys, as well as casual observations.
- Evaluate the efficacy of using tree shelters, deer fencing, and repellents to protect seedlings.
- Fubearer trapping in training areas to keep local populations in check (Refer to Subsection 6.4 Fish and Wildlife, Outdoor Recreation Management).

Management Action: Continue to coordinate recreational hunting with INDR to control deer populations. This action will serve to reduce the impact on forest regeneration from excessive browsing.

6.12 INVASIVE SPECIES MANAGEMENT PROGRAM

Program Overview and Management Goal
Invasive species will be controlled using mechanical, physical, cultural, and chemical controls with an overall goal of minimizing the use of pesticides. All use of pesticides will be in compliance with AR 200-5.

Management of invasive plants is specifically addressed under an invasive species management program. The term invasive species may refer to any alien species whose introduction is likely to cause economic or environmental harm or threaten human health. The primary focus of the Invasive Species Management Program is to reduce or eliminate invasive plant populations, in order to protect biodiversity and ecosystem stability. Invasive species management is closely linked with pest management programs, and produces benefits for fish and wildlife, rare species, wetlands, and forest management programs, as well as military training.

Invasive Species Objective 1. ***Maintain and protect the Camp Atterbury native wildlife and vegetation communities in order to promote the biodiversity of the region, protect native species and ecosystems, and ensure the long-term use of the lands for training.***

Management Action: Control Undesirable Vegetation. Undesirable vegetation can have a negative impact on training. Such vegetation can be hazardous to troops, restrict troop movements, and render training areas unusable. The control of vegetation is also sometimes necessary to reduce the likelihood of fire, to allow for proper operation and maintenance work, and to remove potential interference with daily operations. Vegetation along fence lines, right-of-ways, road shoulders, and ammunition igloos can be a fire hazard. Vegetation along roadways, runways, and rail lines can interfere with daily operations.
Measures to control undesirable vegetation include:

- Maintain a regular schedule of mowing in areas where vegetation growth can interfere with operations or create a fire hazard. Mechanical removal utilizing a flail is also used where appropriate.
- Perform prescribed burns in areas where the fire can be adequately controlled; where the controlled fire does not pose a risk to humans, structures, or equipment; and under favorable weather conditions.
- Apply approved herbicides when other control measures are unfeasible.

Management Action: Evaluate the efficacy of using nonchemical means to control invasive species. The action is intended to minimize herbicide use, but remote locations and species characteristics often make mechanical methods ineffective or impractical.

6.13 CULTURAL RESOURCES MANAGEMENT PROGRAM

Program Overview and Management Goal
The primary cultural resources goal is to implement this Revised INRMP in compliance with laws and regulations governing cultural resources at CAJMTC.

Cultural and Historic Resources Program
Cultural Resources at CAJMTC are managed by the Cultural Resources Manager (CRM). Prior to any groundbreaking activities, the CRM should be notified. If needed, the CRM will contact the Indiana State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation, as appropriate, in order to ensure NHPA compliance.

An ICRMP has been prepared for CAJMTC and includes descriptions of existing historic structures and archaeological sites with general recommendations for preservation and maintenance according to the Secretary of the Interior's standards and guidelines.

The ICRMP provides Standard Operating Procedures for:

1. Capital Construction, Maintenance, and Care for Historic Buildings and Structures;
2. Disposal or Demolition of Excess Property;
3. Mission Training of Military Personnel;
4. Emergency Actions;
5. Inadvertent Discovery; and

6. Major Construction and Land Acquisition.

The Conservation Director consults with the CRM when an activity or project that might have the potential to impact historic or cultural resources is planned. For example, if structures are to be modified or soils disturbed, the CRM determines the appropriate course of action to maintain compliance with federal and state cultural resource laws, such as the NHPA.

Natural Resources Management Implications
Management measures that could affect cultural resources include those proposed for most resource areas. Particular measures include construction of new ditches, culverts, or turnouts, or proposed soil exposure or soil disturbance; tree or grasslands restoration plantings in which soil is disturbed; timber harvesting, and erosion control measures that could involve soil disturbance; and agricultural tasks such as plowing, discing, and some no-till measures that could involve soil disturbance. In these cases, or others where soils or existing historic structures could be affected, natural resource managers should consult the CRM early in the planning process to identify any significant cultural resources.

Consultation with Native American Nations has developed rapidly in recent years due to an aggressive consultation program that was implemented in 2005. As the Native consultation program grows and develops in the near future, INARNG and Native groups may identify species or other natural resources that are of particular interest to the Tribes. If so, INARNG will consult with the Tribes to attempt to develop natural resource management practices that meet both INARNG's objectives and tribal concerns. Until INARNG develops MOUs with the Tribes that specifically address how INARNG and the Tribes will communicate, the INARNG CRM will consult with the Tribes on individual projects in accordance with all applicable federal laws and regulations and DoD policies.

Cultural Resources Objective 1. ***Maintain and protect the Camp Atterbury native wildlife and vegetation communities, in accordance with cultural resources management goals, to promote the biodiversity of the region, protect native species and ecosystems, and ensure the long-term use of the lands for training.***

Management Action: Consult the CRM as an early step in the natural resources management planning process. Identify the area of potential effect with detailed project plans and coordinate plans with the CRM. The CRM has responsibility to fulfill compliance with the NHPA (Section 106), the Archaeological Resources Protection Act, the Native American Graves Protection and Repatriation Act (NAGPRA) and the American Indian Religious Freedom Act (AIRFA).

6.14 NATURAL RESOURCES LAW ENFORCEMENT

The natural resources law enforcement program at CAJMTC has been established under the provisions of a cooperative agreement by the Department of Defense, the Department of the Interior, and the State of Indiana for the conservation and development of fish and wildlife on CAJMTC. As set forth in Public Law 91-511, approved on 26 October, 1970 (84 STAT. 1226, 10 U.S. Code 2683) concurrent legislative jurisdiction between the federal government and the State of Indiana over the property permitted to the Indiana National Guard by license DACA-

223-69-134 was effected on 12 June, 1972. That concept of concurrent jurisdiction is in effect and is recognized by the Post Commander. Three separate county law enforcement agencies (Johnson, Brown, and Bartholomew), the Indiana State Police, IDNR conservation officers, and federal law enforcement agencies currently exercise law enforcement jurisdiction on CAJMTC. Officers of USFWS and the State of Indiana coordinate all law enforcement operations on CAJMTC with the Post Commander. Use the following telephone number to contact law enforcement authorities: 812-526-1109.

Natural Resources Law Enforcement Objective 1. ***Maintain and protect the Camp Atterbury native wildlife and vegetation communities in order to promote the biodiversity of the region, protect native species and ecosystems, and ensure the long-term use of the lands for training.***

Management Action: Call upon law enforcement services as needed when requested or approved by the Post Commander, or his duly authorized representative, to investigate accidents and various criminal investigations.

6.15 PUBLIC OUTREACH

CAJMTC has a commitment to involve those around it in its natural resources management considerations. As good stewards of the land, it is the installation's responsibility to involve the local community as well as other state and federal agencies when deemed necessary and appropriate, for technical advice, funding assistance, project design, manpower, training, etc.

Public Outreach Objective 1. ***Maintain and protect the Camp Atterbury native wildlife and vegetation communities, in accordance with the public and other agencies, to promote the biodiversity of the region, protect native species and ecosystems, and ensure the long-term use of the lands for training.***

Management Action: Develop informational and educational pamphlets for natural resources species and programs on CAJMTC.

CHAPTER 7 IMPLEMENTATION

7.1 WORK PLANS

7.1.1 Organization, Roles, and Responsibilities

The ecosystem approach described in this Revised INRMP to manage the natural resources of CAJMTC can be implemented by the existing Environmental Office, which reports directly to Command. The Environmental Office, through the Conservation Director, has the primary role and responsibility for the preparation and implementation of this Revised INRMP, which is in effect from FY 2007.

7.1.2 Project/Program Priorities

The Office of the Secretary of Defense (OSD) considers funding for the preparation and implementation of this Revised INRMP, as required by the Sikes Act, and the associated NEPA analysis and documentation to be a high priority. However, annual congressional priorities and funding fluctuate and not all of the projects and programs identified in this Revised INRMP will receive immediate funding. As such, these programs and projects have been placed into two priority-based categories: (1) high-priority programs and projects and (2) important projects. The priority of the project is based on need, and need is based on the importance of a project in moving the conservation program closer towards achieving its goals. The time frame during which these projects are to occur is given in parentheses following the project description.

CAJMTC, INARNG, USFWS, and IDNR recognize that year-to-year congressional appropriations for the implementation of CAJMTC's mission or changes in CAJMTC's mission resulting from Base Realignment and Closure (BRAC) or Force Drawdown may reflect different priorities. If these priorities required deferral, redirection, or cancellation of planned projects or plans, CAJMTC will determine which projects or plans should be implemented first. The projects that require funding will proceed only once funding is obtained. Nothing in the plan can be interpreted to violate the Anti-Deficiency Act. In every case, CAJMTC will ensure that constraints on the military mission are minimized and avoided wherever possible.

It is understood that congressional budget constraints will result in increased effort by current in-house staff. Current government wide goals of staff reduction indicate that the hiring of additional permanent full-time natural resources professionals and paraprofessionals will be severely limited during the life of this plan. It is therefore assumed that some of the professional work required by this plan will be accomplished by contract; through partnerships; with universities and other public research institutions; or by limited-term or temporary employees.

Many of the actions that were listed in the 2002-2006 INRMP are continuous processes or activities that are not stand-alone projects. They are part of an ongoing maintenance and awareness effort with the goal of managing, protecting, and sustaining. Funding is made possible for these actions from various sources, including ITAM, Forestry and Agricultural, Conservation, and Compliance.

7.1.3 High-Priority Programs and Projects

Table 7.1 shows high priority programs and projects that are accomplished for reasons of legal and/or regulatory compliance. Many of these projects will continue with the 2007 Revised INRMP as noted in the table.

Table 7.1 High priority programs accomplished from 2002-2006 for reasons of legal and/or regulatory compliance at Camp Atterbury Joint Maneuver Training Center.

Program	Accomplishments
Continue to implement the Environmental Awareness program, including updating outreach and training materials on the Indiana bat.	This has been carried out during 2002-2006. Changes have been made with unit briefings to better identify the awareness piece, an environmental video is being developed, and periodic awareness training has taken place for equipment operators and various directors. Awareness pamphlets about the Indiana bat are being developed. This will be an ongoing mission of the Environmental Office during the life of the 2007 INRMP Revision.
Update GIS coverage for all natural resource areas as new data becomes available.	This has been increasingly developed more in the last several years. Funding has allowed the purchase of upgraded computers, GPS units, and GIS software to accomplish these tasks. Flora and fauna monitoring and project management have begun utilizing GIS at greater levels than in the past. Invasive species are being tracked using GIS. Fire management has increased its use of GIS. T&E species are tracked using GIS. Fish surveys conducted on the installation are tracked using GIS. As funding and manpower allow, Camp Atterbury staff will continue to exploit GIS in the areas of natural resource management.
Develop and provide users of training areas with detailed maps indicating sensitive areas.	Changes have taken place with this program/project in recent years. Maps continue to be developed to support the mission and incoming training forces, but responsibility has shifted from the Environmental Office to DPTM for production. Maps provided to units, trainers, etc. do not identify all environmentally sensitive areas. For example, cultural and archaeological sites, T&E species, rare plants, etc. are not identified for various reasons.

Table 7.1 High priority programs accomplished from 2002-2006 for reasons of legal and/or regulatory compliance at Camp Atterbury Joint Maneuver Training Center.	
Program	**Accomplishments**
	Maps provide the locations of areas with limited or restricted access (e.g., landfill, impact area, grenade range, IBMZ, etc.). This will continue to be a tasking for the installation with coordinated efforts from DPTM and the Environmental Office.
Implement soil resources management measures.	This has been accomplished through forestry and ITAM/LRAM/RTLP, etc. Rehabilitation of eroded sites through hydro-seeding or tree plantings has been carried out during 2002-2006. Monitoring of training areas through the RTLP program has assisted with soil management. General rehabilitation of neglected sites has taken place with road and trail improvements. This will continue to be a viable part of the 2007 INRMP Revision. The RTLA program is also valuable to soil management since it is designed to monitor training area for things such as erosion, providing feedback problems and assisting with solutions.
Continue to use the LRAM program to repair degraded areas.	LRAM has been conducted throughout 2002- and will continue after 2007. Improvements to bivouac sites, roads, trails, and general training areas and ranges have been accomplished during the life of the 2002-2006 plan and additional areas are scheduled for 2007 and beyond.
Implement water resource management measures.	This has been accomplished and will continue with the use of Best Management Practices during forest management and construction activities. USGS conducted a Chemical and Biological Quality of Surface Water at CAJMTC (September 2000 - July 2001). The conservation section of CAJMTC will continue awareness on maintaining buffers around streams, creeks, rivers, lakes, and ponds. Other water resource management measures that take place and will continue to take place are awareness of training on steep slopes, training

Table 7.1 High priority programs accomplished from 2002-2006 for reasons of legal and/or regulatory compliance at Camp Atterbury Joint Maneuver Training Center.	
Program	**Accomplishments**
	around wetlands, and watershed management.
Establish and maintain protective vegetative buffer zones around streams, lake, ponds, and wetlands.	This is addressed during unit briefings as part of water resource management/protection. It's also addressed during project planning. Forest management practices have protective measures written into contracts to maintain buffers around these water features.
Conduct habitat assessments for all surface waters at Camp Atterbury.	During 2002-2006 no lakes or ponds were surveyed for habitat or fish. Several streams were surveyed for fish, but habitat assessments were limited. Little has been done in 5 years regarding habitat assessment. Visual monitoring takes place but is not consistent or measurable from year to year. A project is being considered for the 2007 Revised INRMP to conduct a habitat assessment of wetland, steams, and ponds, to be conducted as funding permits.
Implement aquatic habitat management measures.	USACERL and USGS have conducted surveys in recent years. USGS conducted an inventory of aquatic macroinvertebrates and Calculation of Selected Biotic Indices for CAJMTC and USACERL did an Evaluation and Monitoring of Terrestrial and Aquatic Insect Biodiversity in Forested and Cleared Watersheds at CAJMTC. No additional aquatic surveys, other than fish surveys, are scheduled under the 2007 Revised INRMP.
Implement riparian management measures.	See comments on protective buffers above. Additionally, plans are being developed to restore or improve various riparian areas throughout the installation.
Implement stream and river rehabilitation and stabilization projects for areas identified in surveys.	Restoration of four corners of the Mauxferry Road and Nineveh Creek Bridge was completed during 2002-2006. Another is scheduled under the 2007 Revised INRMP as is rehab work to the Mauxferry and Nineveh Bridge that was breached by back-to-back flooding and debris dams.
Implement wetlands management measures.	Nothing has been implemented aside from

Table 7.1 High priority programs accomplished from 2002-2006 for reasons of legal and/or regulatory compliance at Camp Atterbury Joint Maneuver Training Center.	
Program	**Accomplishments**
	general awareness on maintaining buffers.
Develop a wetlands inventory and assessment database by compiling information on wetland characteristics.	Nothing has been implemented.
Implement terrestrial habitat management measures.	This has been accomplished primarily through forest management activities (e.g., timber harvesting, timber stand improvement, and tree plantings) and prescribed fire management.
Conduct prescribed burns to maintain and enhance grassland habitat.	This has been done throughout the installation to maintain and enhance habitat for both wildlife and training purposes. Areas have been divided into prescribed fire burn units and placed in rotations of 1-3 years depending on training needs for a particular area.
Conduct vegetative communities planning level survey.	This project was not conducted.
Implement forest management measures.	This has been accomplished through scheduled timber harvests, periodic timber stand improvement, periodic tree plantings, insect and disease inspections or surveys, and 10-year forest inventories. Although no standalone forest management plan has been developed, many of the components that one would consist of are carried out through the INRMP. A goal of the 2007 Revised INRMP is to develop a forest management plan that addresses these activities in greater depth and lays out a more detailed schedule of management events.
Adhere to the Indiana bat Guidelines for Timber Management.	Timber Management Guidelines issued by the USFWS-BFO were and will continue to be followed for all forest management activities throughout the installation.
Implement special natural areas management measures.	Historically, these areas have been excluded from forest inventories and forest management activities. In 2005 CAJMTC staff determined that the natural areas have no legal protection or designation. The species identified within these areas during the 1990 survey have since been downgraded in status. Staff identified that the seep PNA in the north section of the

Table 7.1 High priority programs accomplished from 2002-2006 for reasons of legal and/or regulatory compliance at Camp Atterbury Joint Maneuver Training Center.	
Program	**Accomplishments**
	installation is unique and protection measures should be taken to maintain its condition. Staff has determined that these are not "no" management areas. Management measure will need to be developed and implemented to maintain their condition. The goal during the life of the 2007 Revised INRMP is to develop management strategies for each and continue the monitoring process.
Implement wildlife management measures, including the enforcement of protective quotas for the number of hunters.	Wildlife management on the installation is carried out with the assistance of the Indiana Department of Natural Resources Division of Fish and Wildlife, more specifically the Atterbury Fish and Wildlife Property staff. They assist with annual deer and turkey hunts and manage small game hunting when training permits. Trapping is handled through the Environmental Office by permit only, as training allows. Fishing is handled through Range Control and is limited to military personal and staff, as training allows. IDNR Law Enforcement Section assists the installation with ensuring all state and federal fishing and hunting laws and regulations are followed. Non-game management is strictly carried out by monitoring state and federal species. If federally protected species occur on the installation, a plan is developed, if required. State listed species are considered during the planning stage of management activities to ensure diversity is present.
Implement fisheries management measures.	Fisheries management has been limited to shocking surveys in streams. Lakes/ponds were not monitored during 2002-2006. Due to the location and restrictions imposed on CAJMTC waters for recreation (i.e. limited public use) and that there are currently no funds available to carry out fish and wildlife projects, fisheries management has been limited.
Implement endangered, threatened, and rare species management measures.	Management has been carried out for the Indiana bat and to a lesser degree the bald

Table 7.1 High priority programs accomplished from 2002-2006 for reasons of legal and/or regulatory compliance at Camp Atterbury Joint Maneuver Training Center.	
Program	**Accomplishments**
	eagle. A plan for the Indiana bat has been developed and the plan's guidance is used throughout the installation. There is no specific plan in place for the bald eagle.
Establish and maintain Indiana Bat Management Zones.	The establishment of IBMZs is complete. An exception for the establishment of new IBMZs would be where new construction projects result in required mitigation measures (e.g., set aside 2 acres for every 1 acre of suitable habitat removed). These measures would be determined during formal consultation between CAJMTC and USFWS-BFO.
Prepare education materials and training for the military trainers that focus on improving awareness of the Indiana bat and its habitat, overall protection of natural resources, and environmental compliance, particularly with respect to the Endangered Species Act.	Small scale training sessions and informational emails have been performed periodically to inform and update CAJMTC users and staff about the Indiana bat and the specific guidance to protect the Indiana bat and its habitat on the installation. Educational materials such as pamphlets are in the early stage of development. These will cover Indiana bat and general natural resource protection.
Conduct a Biological Assessment on the effects that military training activities at CAJMTC have on the Indiana bat.	This is currently in the contracting stage. A BA will be prepared on the ongoing military training and its effects on the Indiana bat at CAJMTC. It is also anticipated that the BA will cover MUTC.
Establish and maintain an Indiana bat monitoring program.	CAJMTC has not developed a standalone document or plan for monitoring Indiana bats. That tasking has been issued and a rough draft has been developed, but will require additional information and organization. CAJMTC currently conducts various activities such as monitoring known roost trees, contracting mist net surveys, and habitat monitoring that will be part of the official monitoring protocol.
Implement pest management measures.	Pest management on the installation is an ongoing process ranging from insects to mammals to plants. Forest pests (insects) are monitored with assistance from the IDNR – Division of Forestry and USDA-APHIS. During 2002-2006, IDNR included CAJMTC in their statewide grid for monitoring gypsy

Table 7.1 High priority programs accomplished from 2002-2006 for reasons of legal and/or regulatory compliance at Camp Atterbury Joint Maneuver Training Center.	
Program	**Accomplishments**
	moth. USDA-APHIS has conducted trapping for exotic/invasive insects on various sections of the installation as part of a nationwide survey. CAJMTC forestry staff monitor for signs of insect and disease annually from the ground and air, when possible. Recently firewood restrictions were placed on the installation to prevent the introduction of pest species, such as the Emerald Ash Borer or Asian Longhorn Beetle. Sound forest management activities, such as scheduled harvests and TSI, help keep the forest healthy. Healthy vigorous forestland reduces the risk of insect and disease outbreaks. Other forest pests, such as deer, are monitored by installation natural resource professionals and IDNR staff to ensure carry capacity doesn't occur to the point of visible ecosystem damage. To date, no major infestations or damages have been identified. Nuisance animal trapping is conducted throughout the cantonment area annually, primarily to control small rodents, skunks, raccoons, and opossums. The Pest Management Plan has been revised, but has not been approved.
Restrict the use of pesticides.	CAJMTC doesn't restrict the use of pesticides, but monitors their use. All pesticide use is recorded by when, where, and how much used. All users are licensed as applicators or technicians. All pesticides must be approved by the USFWS-BFO prior to use on the installation to ensure no harmful effects on the Indiana bat. CAJMTC does make all possible efforts to reduce the use of pesticides where possible and use alternative methods.
Establish and maintain a permanent firebreak system.	During 2002-2006 several existing firebreaks were rehabilitated and improved by adding gravel. A few new firebreaks were established, but mostly maintenance and improvement work took place. Additional work is scheduled

Table 7.1 High priority programs accomplished from 2002-2006 for reasons of legal and/or regulatory compliance at Camp Atterbury Joint Maneuver Training Center.	
Program	**Accomplishments**
	in the 2007 Revised INRMP.
Protect cultural resources while implementing this Revised INRMP.	This is accomplished through early coordination with the CRM on natural resource and construction projects. For example, forest management activities (i.e., timber harvesting, tree plantings, etc.) are identified by project boundaries using GIS. Project information and reviews of previous archeological surveys are used to generate a report submitted to the Indiana SHPO through the CRM requesting concurrence on the activity. If there is an inadvertent discovery of archaeological deposits or human remains during an activity, according to SOP 5 in the ICRMP, all activity in that area will stop and the CRM would be notified so that he/she could ensure compliance with all state and federal laws regarding inadvertent discoveries.
Increase natural and cultural resource law enforcement activities, including training.	All law enforcement activities are carried out by the Military Police and/or IDNR Conservation Officers. The environmental office only notifies, informs, or advises on the policies, laws, and regulations that pertain to CAJMTC. Informational training during 2002-2006 has taken place involving both directors and equipment operators.
Source: CAJMTC, 2006	

7.1.4 Important Projects

Table 7.2 shows important projects that are conducted as fiscal and manpower resources allow. Many of these projects will continue with the 2007 Revised INRMP as noted in the table.

Table 7.2 Important projects accomplished from 2002-2006 as fiscal and manpower resources allowed.

Project	Accomplishments
Create small (< 1 acre) and larger (2-5 acre) forest openings to improve and enhance edge and open areas for wildlife species.	This was carried out during the marking of various management timber harvests scheduled during 2002-2006. Efforts were made during each timber sale to create interior forest openings of various sizes. These openings are primarily dictated by the condition of the management stand. Not every stand marked for harvest needs or requires openings.
Increase the number of wood duck nest boxes in all suitable wooded pond settings and maintain them on an annual basis.	This has not been accomplished. This project has not been determined to be necessary or important as a standalone project within CAJMTC's INRMP.
Develop a grassland management plan that is compatible with military use to improve habitat conditions for grassland bird species.	No specific plan has been developed, but various management measures are being implemented. Recently grassland areas were divided into burn units and placed on a prescribed fire burn rotation based on military training and/or wildlife habitat needs. Rotations vary from 1-3 years with efforts made to spread burns out across the installation each year so that various age classes are not lumped together. Farmers under CAJMTC's agricultural hay lease program are requested to refrain from cutting until after July 1. The landfill, which must remain free of trees and shrubs and can not be burned, is periodically mowed after July 1.
Investigate the potential for and interest in converting the new drop zone in TA2B to an agricultural lease.	This has been addressed and at this time the TA 2B area is not part of the agricultural hay lease program. The main concern with converting this area into an agricultural lease area is the required down time for planting and establishment of suitable vegetation. This will continue to be an option in the 2007 Revised INRMP.

Source: CAJMTC, 2006

7.1.5 Natural Resources Projects Anticipated for 2007 and Beyond

Table 7.3 shows a list of projects anticipated to be conducted under the 2007 Revised INRMP. The projected year(s) of the start of the project, estimated cost over five years or the life of the particular project, and potential funding source are provided.

Table 7.3 Camp Atterbury Joint Maneuver Training Center Natural Resources Projects Anticipated for 2007 and Beyond				
Integrated Training Area Management Program **GOAL:** The ITAM program is a management and decision making process to integrate the Army's training and other mission requirements for land use with the sound natural resource management of land.				
Anticipated Project	Start Year	Estimated Cost	Potential Funding Source	Associated Management Actions
ITAM Program – Management and Implementation	2007-2011	$2,000,000	ITAM	All ITAM management actions apply
ITAM Objective 1. ***Maintain a routine, long-term RTLA program to monitor land and vegetation condition trends at Camp Atterbury.***				
Anticipated Project	Start Year	Estimated Cost	Potential Funding Source	Associated Management Actions
Range and Training Land Assessment (RTLA) Program – Management and Implementation	2007-2011	$200,000	ITAM	• Conduct routine annual RTLA monitoring using a systematic, qualitative approach that focuses on general site parameters. • Enter data from annual collections into RTLA database, conduct analyses on these data, and write summary reports of these data and the analyses conducted. • Identify and map heavily used training areas
ITAM Objective 2. ***Maintain the LRAM program to mitigate the long-term impacts of training and testing at Camp Atterbury by using preventive and corrective land rehabilitation and maintenance procedures.***				
Anticipated Project	Start Year	Estimated Cost	Potential Funding Source	Associated Management Actions
				• Rate all areas of the installation to determine the level of damage that has occurred and to prioritize rehabilitation efforts, resources, and projects. • When possible, close and rehabilitate only that portion of land which has been targeted for rehabilitation for up to two years.

Table 7.3 Camp Atterbury Joint Maneuver Training Center Natural Resources Projects Anticipated for 2007 and Beyond				
				• Identify and design specific projects to enhance the natural resources necessary to support mission-related activities. • Identify specific ecosystem-based management measures that could be done in conjunction with or in support of LRAM projects to improve or maintain ecological integrity, restore degraded areas, and achieve natural resources management goals and objectives. • Conduct projects such as the hardening of firing point entrances, bivouac repair, and erosion control measures that are necessary to restore, repair or protect heavily degraded sites prior to closing the targeted site. • When possible, initiate revegetation projects prior to closing the site to allow sufficient time for revegetated areas to become firmly established before training activities begin. • Develop timber harvesting and ecosystem management activities that support or enhance LRAM effort to coincide with the rehabilitation period, where practicable.
ITAM Objective 3. ***Maintain the TRI process at Camp Atterbury to ensure that training requirements and training land management are effectively integrated.***				
Anticipated Project	Start Year	Estimated Cost	Potential Funding Source	Associated Management Actions
				• Upgrade and fully utilize RFMSS at CAJMTC. • Identify existing and projected training land resources and prioritized land use requirements. • Integrate training requirements with training land management into a prioritized work plan and

Table 7.3 Camp Atterbury Joint Maneuver Training Center Natural Resources Projects Anticipated for 2007 and Beyond				
				execute requirements subject to availability of manpower and fiscal resources. • Optimize training land management decisions by coordinating mission requirements and land maintenance activities with training land carrying capacity. • Generate prioritized requirements for land rehabilitation, repair, and/or reconfiguration. • Cooperatively plan and implement Range Development Plan (RDP) initiatives. • Integrate training requirements identified in RDP and RFMSS into RTLA. • Review and analyze RTLA data and make recommendations in a prioritized LRAM work plan.
ITAM Objective 4. ***Maintain the SRA program to educate Camp Atterbury land users in order to ensure concurrent protection for both them and the environment they use for training.***				
Anticipated Project	Start Year	Estimated Cost	Potential Funding Source	Associated Management Actions
				• Continue producing and distributing helpful information in the form of handbooks, field cards, and pamphlets to the appropriate personnel. • Require all elements of the INARNG, other Reserve and Active Components, and all personnel, military and civilian, who use CAJMTC to adhere to CA Regulation 200-1, Environmental Quality - Environmental Protection Program.

Table 7.3 Camp Atterbury Joint Maneuver Training Center Natural Resources Projects Anticipated for 2007 and Beyond				
Terrestrial Community Management Program **GOAL:** Manage and maintain diverse natural terrestrial communities. In addition to supporting the military mission, these communities will promote native flora and fauna and provide recreational opportunities				
Anticipated Project	Start Year	Estimated Cost	Potential Funding Source	Associated Management Actions
Conservation Program Management	2007-2011	$300,000	Environmental	All terrestrial community management actions apply
Terrestrial Community Objective 1. ***Maintain and protect the Camp Atterbury forest community in order to maintain the natural diversity of the forest, to preserve the biodiversity of the region and to ensure the long-term use of this habitat for training.***				
Anticipated Project	Start Year	Estimated Cost	Potential Funding Source	Associated Management Actions
				• Restore Degraded Training Areas • Maintain and Improve Unique Trees and Forest Stands
Terrestrial Community Objective 2. ***Maintain and protect the Camp Atterbury terrestrial community in order to manage for the survival of and maintain habitat for rare, threatened and endangered species, to preserve the biodiversity of the region and to ensure the long-term use of this area for training.***				
Anticipated Project	Start Year	Estimated Cost	Potential Funding Source	Associated Management Actions
				• Minimize the Harvest of Shagbark and Shellbark Hickory • Manage for Forest Interior Rare and Watch List Bird Species • Maintain Edge and Open Areas • Preserve Snags and Trees with Natural Cavities • Manage Dead and Downed Logs

Table 7.3 Camp Atterbury Joint Maneuver Training Center Natural Resources Projects Anticipated for 2007 and Beyond				
Terrestrial Community Objective 3. ***Maintain and protect the Camp Atterbury grasslands to sustain the quality of prairie vegetation, to preserve the biodiversity of the region and to ensure the long-term use of this habitat for training.***				
Anticipated Project	Start Year	Estimated Cost	Potential Funding Source	Associated Management Actions
				• Grassland Restoration • Control of Invasive and Noxious Plants
Geographic Information Systems (GIS) Program **GOAL:** Maintenance, development, and utilization of the CAJMTC GIS, particularly for natural resources and military training information.				
GIS Objective 1. Maintain a staff of GIS-capable personnel in various positions that use the CAJMTC GIS in their day-to-day resource management tasks.				
Anticipated Project	Start Year	Estimated Cost	Potential Funding Source	Associated Management Actions
Update and modify GIS layer for timber management compartment and stands.	2008	$3,500	Forestry, ITAM, Fire and Emergency	• Update and modify GIS layers as needed
Fish and Wildlife, Outdoor Recreation Management Program **GOAL:** Manage and maintain year-round fish and wildlife habitat that contributes to the sustained populations of resident species and provides seasonal habitats for migratory species. In addition, fish and wildlife resources will be utilized to the extent possible to enhance the recreational opportunities for the military and public communities.				
Anticipated Project	Start Year	Estimated Cost	Potential Funding Source	Associated Management Actions
Conservation Program Management	2007-2011	$300,000	Environmental	All fish and wildlife, outdoor recreation management actions apply
Fish and Wildlife, Outdoor Recreation Objective 1. ***Maintain, protect, and enhance the Camp Atterbury fish and wildlife habitat in order to promote the biodiversity of the region, provide a sustained yield of fish and game species, and to ensure the long-term use of these habitats for training.***				
Anticipated Project	Start Year	Estimated Cost	Potential Funding	Associated Management Actions

Table 7.3 Camp Atterbury Joint Maneuver Training Center Natural Resources Projects Anticipated for 2007 and Beyond				
			Source	
				• Manage for White-tailed Deer • Manage for Turkey • Manage for Small Game • Manage for Furbearers • Manage for Nuisance Species • Manage for Nongame Species • Protect Migratory Bird Species
Fish and aquatic habitat survey for various ponds on the installation - Puff Lake and Duck Pond, basically a fish shocking survey and possibly an aquatic vegetation survey.	2010-2011	$30,000	Unknown	• Manage for Sustained Yield of Sport Fish in Puff Lake • Manage for Sustained Yield of Sport Fish in Duck Pond • Survey the fish populations to monitor the size, structure, and biological integrity of the fish communities • Conduct habitat assessments to monitor the ecological integrity of riparian and instream habitats
				• Develop angler reporting forms and maintain angler reporting boxes at all waters • Conduct annual macroinvertebrate assessments to evaluate the biological integrity of the stream • Conduct annual screening-level watershed assessments to evaluate the potential for adverse impacts on surface waters • Conduct creel surveys and collect harvest data to evaluate the fishing pressure, catch rates, number of anglers using each water body, and success of the stocking program

Table 7.3 Camp Atterbury Joint Maneuver Training Center Natural Resources Projects Anticipated for 2007 and Beyond				
Fish and Wildlife, Outdoor Recreation Objective 2. ***Maintain, protect, and enhance the Camp Atterbury habitat in order to promote the biodiversity of the region, provide outdoor recreational opportunities, and to ensure the long-term use of these habitats for training.***				
Anticipated Project	Start Year	Estimated Cost	Potential Funding Source	Associated Management Actions
				• Implement Nonconsumptive Recreation Programs
Threatened, Endangered, and Rare Species Management Program **GOAL:** While complying with the Endangered Species Act, balance mission requirements with endangered species protection, cooperate with regulatory agencies, and conserve biological diversity within the context of the military mission				
Threatened, Endangered, and Rare Species Objective 1. ***Maintain and protect the Camp Atterbury Indiana bat habitat in order to promote the biodiversity of the region and to ensure the long-term use of Camp Atterbury lands for training***				
Anticipated Project	Start Year	Estimated Cost	Potential Funding Source	Associated Management Actions
Endangered Species Management	2007-2011	$150,000	Environmental, Forestry, ITAM	• Implement USFWS-BFO timber management guidelines for Indiana bats • Maintain IBMZs • Implement the Endangered Species Management Component • Restrict use of training materials toxic to Indiana bats • Develop Educational Materials • Implement Guidelines and Restrictions for Pesticide Use • Implement Sediment Erosion Control Measures • Conduct ESA Section 7 Consultation with the USFWS for all Training and Mission-Related Activities • Implement Monitoring of Indiana Bats • Monitoring of Evening Bats • Maintain Suitable Habitat for Grassland Species

Table 7.3 Camp Atterbury Joint Maneuver Training Center Natural Resources Projects Anticipated for 2007 and Beyond				
				of Birds • Develop a Grassland Management Plan • Improve Habitat Conditions for Other Grassland Birds • Implement Monitoring of Other Grassland Birds • Manage for Rare Plants at the Community or Guild Level
Indiana Bat Management Zone (IBMZ) habitat improvement - Tree Planting and follow-up invasive plant removal work for habitat improvement in Training Area 210. This involves the purchase of approximately 20,000 seedlings from Indiana Department of Natural Resources State Tree Nursery and hiring a private contractor to carry out the mechanical planting operation.	2007	$25,000	Environmental	• Implement USFWS-BFO timber management guidelines for Indiana bats • Preserve snags and trees with natural cavities • Maintain IBMZs • Implement the Endangered Species Management Component • Restrict use of training materials toxic to Indiana Bat
Develop and implement an Indiana bat mist net and telemetry study	2007	$50,000	Environmental	• Implement Monitoring of Indiana Bats
Surface Water and Wetland Management Program **GOAL:** Manage and maintain diverse natural aquatic communities and protect their associated watersheds. In addition to supporting the military mission, these communities will promote native flora and fauna and provide recreational opportunities while ensuring				

Table 7.3 Camp Atterbury Joint Maneuver Training Center Natural Resources Projects Anticipated for 2007 and Beyond				
compliance with Section 404 of the Clean Water Act and state wetland/water quality regulations.				
Surface Waters and Wetlands Objective 1. ***Maintain and protect Camp Atterbury surface waters in order to promote the biodiversity of the region, protect water quality and aquatic species, and to ensure the long-term use of Camp Atterbury lands for training.***				
Anticipated Project	Start Year	Estimated Cost	Potential Funding Source	Associated Management Actions
				• Maintain 100-foot vegetative buffers around all sides of surface waters, including lakes and ponds, where possible. • Establish 100-foot vegetated riparian buffers around streams on CAJMTC where possible. • Limit the impact on surface waters and riparian areas in the impact areas caused by training exercises. • Use salt for deicing roadways only when necessary. • Apply minimal amounts of pesticides and fertilizers. • Limit vehicle use within 100 feet of the water bodies. • Control nuisance species to the extent possible.
Surface Waters and Wetlands Objective 2. ***Maintain and protect Camp Atterbury aquatic habitat in order to promote the biodiversity of the region, protect water quality and aquatic species, and to ensure the long-term use of Camp Atterbury lands for training***				
Anticipated Project	Start Year	Estimated Cost	Potential Funding Source	Associated Management Actions
				• Conduct physical habitat assessments. • Direct stream crossings to bridges and hardened stream crossings. • Evaluate the potential for stormwater runoff to

Table 7.3 Camp Atterbury Joint Maneuver Training Center Natural Resources Projects Anticipated for 2007 and Beyond				
				enter surface waters and measure the corresponding water quality at sites where stormwater currently discharges to surface waters.
Surface Waters and Wetlands Objective 3. ***Maintain and protect Camp Atterbury riparian areas in order to promote the biodiversity of the region, protect water quality and aquatic species, and to ensure the long-term use of Camp Atterbury lands for training.***				
Anticipated Project	Start Year	Estimated Cost	Potential Funding Source	Associated Management Actions
Stream Restoration Project Maintenance - Reconstruct portions of the damaged bank with gabion walls on Nineveh Creek Bridge on Mauxferry Road	2008-2009	$70,000	ITAM, Conservation	• Conduct riparian habitat assessments to document conditions, assess status and trends, and monitor future conditions. • Using results from habitat assessments identify and prioritize reaches requiring stabilization of streambanks. • Establish and maintain 100-foot vegetated buffers around surface waters. • Maintain tree canopy over streams. • Plan training exercises to minimize shoreline and streambank erosion. • Plant native vegetation for riparian stabilization. • Restore degraded riparian habitat or mitigate impacts on the habitat when requirements are identified and resources are available. • Restrict or redirect vehicle traffic on roads that traverse riparian areas. • Locate bivouac sites at least 300 feet from surface waters. • Encourage diverse species composition in the riparian areas, particularly with respect to canopy species.
Stream Restoration Project - Possible installation of gabion walls to stabilize banks of Nineveh Creek Bridge on Wilder Road	2007-2011	$100,000	ITAM, Conservation	

Table 7.3 Camp Atterbury Joint Maneuver Training Center Natural Resources Projects Anticipated for 2007 and Beyond				
				• Monitor for the presence of exotic and invasive species. • Limit activities within the riparian buffer zones to those which would cause little or no impact. • Plan recreational development and training exercises to minimize shoreline and stream bank erosion and mitigate for unavoidable impacts. • Limit pesticide and fertilizer use in riparian buffers. • Avoid constructing recreational structures (e.g., beaches, docks) in riparian areas with vital aquatic habitat.
Surface Waters and Wetlands Objective 4. ***Maintain and protect Camp Atterbury wetlands in order to promote the biodiversity of the region, protect water quality and aquatic species, and to ensure the long-term use of Camp Atterbury lands for training.***				
Anticipated Project	Start Year	Estimated Cost	Potential Funding Source	Associated Management Actions
Wetlands re-assessment specific to project sites that may affect wetlands	2007-2011	$65,000	Environmental	• Develop Wetland Inventory Database • Maintain 100-ft buffers around wetlands • Wetland restoration/mitigation • Water Quality Management Procedures. • Plan Maintenance, Development and Training to Avoid Wetland Areas. • Control Invasive Species.
Forest Management Program **GOAL:** The goal of the forestry program at CAJMTC is to maintain the forest cover required for military training, while complying with the Endangered Species Act by protecting and enhancing habitat for the federally listed Indiana bat, maintaining ecosystem viability, and providing for the production of commercial forest products.				
Forest Management Objective 1. ***Maintain and protect the Camp Atterbury forest community in order to maintain the natural diversity of the forest, to preserve the biodiversity of the region and to ensure the long-term use of this habitat for***				

Table 7.3 Camp Atterbury Joint Maneuver Training Center Natural Resources Projects Anticipated for 2007 and Beyond				
training.				
Anticipated Project	Start Year	Estimated Cost	Potential Funding Source	Associated Management Actions
Forestry Program – Management and Implementation	2007-2011	$300,000	Forestry	• Timber Inventory. • Manage for Commercial Forest Production. • Timber harvest activities • Utilize Uneven-aged Management. • Utilize single-tree and group tree selection as the preferred harvesting method. • In stands with a large percentage of cull trees: remove half of the culls during the first cutting cycle and remove most of the remaining culls during the next cutting cycle. • Retain a minimum of four cull trees per acre as wildlife trees. • TSI will be achieved concurrently with timber harvesting where practical. • Salvage sales will be conducted, as dictated by the military mission, to minimize expense to the installation and to recover the monetary value of the resource. • Utilize Appropriate Timber Harvest Procedures. • Utilize Urban Forestry
Develop and implement a Forest Management Plan				
Implement an urban forestry program	2007-2011	$100,000	DPW, MWR, Forestry	
Tree planting projects for tactical concealment, visual breaks, shade, beautification of Training Areas and ranges - Training Areas 111, 107, 200, 302, 303,		$50,000	Forestry, ITAM	

Table 7.3 Camp Atterbury Joint Maneuver Training Center Natural Resources Projects Anticipated for 2007 and Beyond				
Ranges 3-24, Range 34 & 37				
Installation wide terrestrial insect survey	2008	$80,000	Environmental	• Implement forest protection
Fire Management Program **Goal:** Wildfire prevention and suppression that involves minimizing fire occurrence by educating personnel on fire prevention techniques, reducing natural fire fuels, and restricting the types of ammunition and pyrotechnics that can be used based on the level of fire danger they pose, being well prepared for fires, and when necessary, rapidly responding and suppressing the spread of wildfires that do occur.				
Fire Management Objective 1. ***Prevention and suppression of wild fires in order to promote the biodiversity of the region, protect native species and ecosystems, and ensure the long-term use of the lands for training.***				
Anticipated Project	Start Year	Estimated Cost	Potential Funding Source	Associated Management Actions
Wildland Fire Program – Management and Implementation	2007-2011	$110,000	Forestry, ITAM, and Fire Emergency Funds	• Conduct Prescribed Burning. • Maintain and Improve Firebreaks • Conduct Wildfire Suppression
Development of Integrated Wildland Fire Management Plan (IWFMP) - This should correlate with DoD wildland fire policy/requirements and relate to control of vegetation in prescribed fire burn units and fire suppression efforts.	2007	$45,000	Forestry	
Implement a firebreak maintenance schedule that identifies existing breaks and areas where	2007-2008	$150,000	Forestry, Fire, ITAM, and Emergency	• Maintain and improve firebreaks

Table 7.3 Camp Atterbury Joint Maneuver Training Center Natural Resources Projects Anticipated for 2007 and Beyond				
breaks are desired				
Rehabilitate existing fire access roads and establish new ones to serve as fire and forest management access roads as well as fire breaks and access for military training - Existing in trails in Training Area 601, 604, 609, and 615. New trails Training Area 500, 506, 520, 606, 607, 608, and 614.				
Erect fire danger warning signs at various locations on the installation - Purchase, erect, and manage Smokey Bear Fire Danger Rating signs at (1) County Line and Durbon St. intersection, (1) Eggleston St. and Hendricks Ford Road intersection, (1) County Line and Schoolhouse Road Intersection, (1) Range 37		$2,000	Forestry, ITAM	

Table 7.3 Camp Atterbury Joint Maneuver Training Center Natural Resources Projects Anticipated for 2007 and Beyond

Agricultural Outleasing Program

Goal: Assist in maintaining a sufficient acreage of open areas in a condition suitable for specific (e.g. air to ground cargo drops, personnel drops, etc.) military training. Agricultural hay lease activities provide CAJMTC with a low-cost means of preventing encroachment of woody vegetation and maintaining certain areas with specific grassy conditions conducive to military exercises. This in turn provides low-cost outleasing opportunities for local farmers to produce crops.

Agricultural Outleasing Objective 1. *Provide the military with a low-cost means to reduce woody growth throughout the open areas of the installation.*

Anticipated Project	Start Year	Estimated Cost	Potential Funding Source	Associated Management Actions
Agricultural Outleasing Program - Continue with agricultural hay lease in Training Areas 101, 102, 103, 211, 213, and 214. Also continue pursuing additional hay lease areas such as Training Areas 800, 801, and 802 to benefit the mission and to reduce installation costs.	2007-2011	$5,000		• Continue Current Outleases and Pursue New Ones

Pest Management Program

GOAL: Pest management priorities at Camp Atterbury include control of disease vectors, protection of stored food products, protection of real estate, control of nuisance pests, control of undesirable vegetation, protection of beneficial plants, and control of miscellaneous animal pests (e.g., rodents, birds, bats). The goal is to manage pests while reducing reliance on pesticides, enhancing environmental protection, and maximizing the use of Integrated Pest Management (IPM) techniques.

Table 7.3 Camp Atterbury Joint Maneuver Training Center Natural Resources Projects Anticipated for 2007 and Beyond				
Pest Management Objective 1. ***Maintain and protect the Camp Atterbury native wildlife and vegetation communities in order to promote the biodiversity of the region, protect native species and ecosystems, and ensure the long-term use of the lands for training.***				
Anticipated Project	Start Year	Estimated Cost	Potential Funding Source	Associated Management Actions
				• Protect Beneficial Plants
Pest Management Objective 2. ***Maintain and protect the Camp Atterbury timber communities in order to promote commercial timber sales and ensure the long-term use of the lands for training.***				
Anticipated Project	Start Year	Estimated Cost	Potential Funding Source	Associated Management Actions
				• Implement Forest Protection • Continue to coordinate recreational hunting with INDR to control deer populations.
Invasive Species Management Program **GOAL:** Reduce or eliminate invasive plant populations, in order to protect biodiversity and ecosystem stability.				
Invasive Species Objective 1. ***Maintain and protect the Camp Atterbury native wildlife and vegetation communities in order to promote the biodiversity of the region, protect native species and ecosystems, and ensure the long-term use of the lands for training.***				
Anticipated Project	Start Year	Estimated Cost	Potential Funding Source	Associated Management Actions
Vegetative management of invasive, noxious, and encroaching woody species - Control vegetation by mechanical and/or chemical means (Glyphosate (Roundup)/Triclopyr (Gralon)) in multiple use sites (LZ, bivouac sites,	2007-2011	$130,000	Forestry, ITAM, Conservation	• Control Undesirable Vegetation. • Evaluate the efficacy of using nonchemical means to control invasive species.

Table 7.3 Camp Atterbury Joint Maneuver Training Center Natural Resources Projects Anticipated for 2007 and Beyond				
mortar and artillery points, etc.) and Training Areas. Currently 18 multiple use sites and 2 training area sites have been identified within Training Areas 107, 313, 314, 315, 316, 402, 403, 408, 411, 413, 417, 501, 502, 516, 606, and 608.				
Cultural Resources Protection Program **GOAL:** Implement this Revised INRMP in compliance with laws and regulations governing cultural resources at CAJMTC.				
Cultural Resources Objective 1. ***Maintain and protect the Camp Atterbury native wildlife and vegetation communities, in accordance with cultural resources management goals, to promote the biodiversity of the region, protect native species and ecosystems, and ensure the long-term use of the lands for training.***				
Anticipated Project	Start Year	Estimated Cost	Potential Funding Source	Associated Management Actions
				• Consult the CRM as an early step in the natural resources management planning process.
Natural Resources Law Enforcement Program **GOAL:** The natural resources law enforcement program at CAJMTC has been established under the provisions of a cooperative agreement by the Department of Defense, the Department of the Interior, and the State of Indiana for the conservation and development of fish and wildlife on CAJMTC.				
Natural Resources Law Enforcement Objective 1. ***Maintain and protect the Camp Atterbury native wildlife and vegetation communities in order to promote the biodiversity of the region, protect native species and ecosystems, and ensure the long-term use of the lands for training.***				
Anticipated Project	Start Year	Estimated Cost	Potential Funding Source	Associated Management Actions
				• Call upon law enforcement services as needed when requested or approved by the Post

Table 7.3 Camp Atterbury Joint Maneuver Training Center Natural Resources Projects Anticipated for 2007 and Beyond				
				Commander, or his duly authorized representative, to investigate accidents and various criminal investigations.
Public Outreach Program **GOAL:** As good stewards of the land, it is CAJMTC's responsibility to involve the local community as well as other state and federal agencies when deemed necessary and appropriate, for technical advice, funding assistance, project design, manpower, training, etc.				
Public Outreach Objective 1. ***Maintain and protect the Camp Atterbury native wildlife and vegetation communities, in accordance with the public and other agencies, to promote the biodiversity of the region, protect native species and ecosystems, and ensure the long-term use of the lands for training.***				
Anticipated Project	Start Year	Estimated Cost	Potential Funding Source	Associated Management Actions
Develop informational and educational pamphlets for CAJMTC on the Indiana bat	2007-2011	$5,000	Environmental, ITAM	• Develop informational and educational pamphlets for natural resources species and programs on CAJMTC.
Develop informational and educational pamphlets for CAJMTC natural resources	2007-2011	$5,000	Environmental, ITAM, and Forestry	

7.2 NATURAL RESOURCES MANAGEMENT STAFFING

Currently, the Environmental Office at CAJMTC consists of an Environmental Manager Supervisor, Conservation Director, Compliance Director, GIS Specialist, Biologist, Field Biologist, and an Environmental Specialist.

Implementation of a number of the projects discussed in this Revised INRMP will require outside assistance; this assistance will come from state and federal agencies, and contractors. Using these resources is the most efficient and cost-effective method for acquiring expertise on a temporary basis. Some of the parties will be reimbursed for their assistance, in accordance with Memoranda of Understanding and contractual agreements; whereas others will supply their assistance in accordance with cooperative agreements.

CHAPTER 8

REFERENCES

CHAPTER 8 REFERENCES

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