U. S. AIR FORCE INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN

BARKSDALE AIR FORCE BASE

(See INRMP signature pages for plan approval date)

ABOUT THIS PLAN

This installation-specific Environmental Management Plan (EMP) is based on the U.S. Air Force's (AF) standardized Integrated Natural Resources Management Plan (INRMP) template. This INRMP has been developed in cooperation with applicable stakeholders, which may include Sikes Act cooperating agencies and/or local equivalents, to document how natural resources will be managed. Non-U.S. territories will comply with applicable Final Governing Standards (FGS). Where applicable, external resources, including Air Force Instructions (AFIs); AF Playbooks; federal, state, local and FGS, biological opinion and permit requirements, are referenced.

Certain sections of this INRMP begin with standardized, AF-wide "common text" language that address AF and Department of Defense (DoD) policy and federal requirements. This common text language is restricted from editing to ensure that it remains standard throughout all plans. Immediately following the AF-wide common text sections are installation sections. The installation sections contain installation-specific content to address local and/or installation-specific requirements. Installation sections are unrestricted and are maintained and updated by AF environmental Installation Support Teams (ISTs) and/or installation personnel.

NOTE: The terms 'Natural Resources Manager', 'NRM' and 'NRM/POC' are used throughout this document to refer to the installation person responsible for the natural resources program, regardless of whether this person meets the qualifications within the definition of a natural resources management professional in DODI 4715.03.

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DOCUMENT CONTROL

Record of Review – The INRMP is updated not less than annually, or as changes to natural resource management and conservation practices occur, including those driven by changes in applicable regulations. In accordance with (IAW) the Sikes Act and AFI 32-7064, *Natural Resources Management*, the INRMP is required to be reviewed for operation and effect not less than every five years. Annual reviews and updates are accomplished by the base Natural Resources Manager (NRM), and/or an Installation Support Team Natural Resources Media Manager. The installation shall establish and maintain regular communications with the appropriate federal and state agencies. At a minimum, the installation NRM (with assistance as appropriate from the NR Media Manager) conducts an annual review of the INRMP in coordination with internal stakeholders and local representatives of the United States Fish and Wildlife Service (USFWS), state fish and wildlife agency, and National Oceanic and Atmospheric Administration (NOAA) Fisheries, where applicable, and accomplishes pertinent updates. Installations will document the findings of the annual review in an Annual INRMP Review Summary. By signature to the Annual INRMP Review Summary, the collaborating agency representative asserts concurrence with the findings. Any agreed updates are then made to the document, at a minimum updating the work plans.

INRMP APPROVAL/SIGNATURE PAGES

Commander, 2d Bomb Wing

Date _____

Field Supervisor, Louisiana Ecological Services Office
U.S. Fish and Wildlife Service

Date _____

Director, Louisiana Dept. of Wildlife and Fisheries

Date _____

EXECUTIVE SUMMARY

The purpose of this Integrated Natural Resources Management Plan (INRMP) is to provide broad strategic guidance for management of the natural resources for the 2d Bomb Wing (2 BW) at Barksdale Air Force Base (AFB) in Louisiana. The INRMP supports the mission, including the development and updating of the General Plan, Airfield Management Plan, Cultural Resources Management Plan, flight safety/Bird Aircraft Strike Hazard (BASH) prevention and reduction planning, preparation of Environmental Assessments (EAs)/Finding of No Practical Alternatives (FONPAs) and Environmental Impact Statements (EISs)/Record of Decisions (RODs), Geo-Base maps and data sharing. The INRMP provides a vision for the future and a framework for achieving the natural resource goals in support of the military mission. The plan will be implemented over the five-year period of 2018 through 2022.

This INRMP represents a continued commitment by the United States Air Force (USAF) and the 2 BW to protect the integrity and value of the natural resources on Barksdale AFB while integrating the Air Force (AF) mission using an interdisciplinary approach to ecosystem management. The INRMP does not contain any significant changes in management direction for the installation. Under the philosophy of ecosystem management, the focus of this plan will be to maintain ecosystems in a healthy, functioning state. An ecological approach will blend the needs of people with the health of the environment to ensure the ecosystems on Barksdale AFB are diverse, productive, and economically sustainable, while supporting the military mission. Implementation of the INRMP will help ensure that Barksdale AFB continues to support present and future mission requirements while preserving, improving and enhancing ecosystem integrity.

INRMP implementation supports the mission by providing bird and animal control to the BASH Reduction Program. In addition to maintaining a sound forest landscape throughout the base, the INRMP enhances training scenario realism for base units. The fisheries, wildlife, and outdoor recreation programs all support the base mission by improving the quality of life of our airmen by providing fishing, hunting, camping, and other outdoor activities. These integrated natural resources programs all support the mission through sound ecosystem conservation measures.

The implementation of the INRMP will help achieve the following natural resources management goals for Barksdale AFB:

- Goal 1: Assist Wing Safety to effectively reduce hazards to personnel and aircraft associated with bird and animal activity.
- Goal 2: Ensure oilfield development is compatible with the military mission and responsible environmental stewardship.
- Goal 3: Manage wetlands and moist soil impoundments for migratory wetland birds.
- Goal 4: Manage wetlands/floodplains for overall ecosystem health.
- Goal 5: Enhance bald eagle habitat through eradication of invasive aquatic vegetation.
- Goal 6: Establish and maintain liaison with federal, state, and local stakeholders, and regulators.
- Goal 7: Enhance natural resources programs by continual training updates.
- Goal 8: Improve the quality of fishing experiences for anglers on ponds and lakes.
- Goal 9: Provide hunting opportunities for the public.
- Goal 10: Manage white-tailed deer herd for optimum population levels and reproductive health.
- Goal 11: Protect habitat and forests from feral hog damage and reduce adverse impact on the ecosystem.
- Goal 12: Develop and maintain the wildlife habitat on Barksdale AFB to support existing and recovering wildlife species.

- Goal 13: Remove midstory vegetation in forest stands to increase wildlife habitat for selected species.
- Goal 14: Promote and provide pollinator habitat.
- Goal 15: Maintain facilities and opportunities for users at Harmon Lake Recreation Area.
- Goal 16: Promote the health and condition of forest ecosystems through sustainable timber harvests.
- Goal 17: Promote the health and condition of forest ecosystems through fire management.
- Goal 18. Promote ecosystem health through treatments to remove or reduce invasive plants.
- Goal 19: Promote urban forest sustainability.
- Goal 20: Maintain adequately trained personnel are serving as conservation law enforcement.
- Goal 21: Procure and maintain vehicles, equipment and supplies required for program management

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The INRMP goals were formulated from a comprehensive analysis of regulatory requirements, the current condition of the natural resources on Barksdale AFB and a consideration of the value of these resources to the people who live and work on the installation. Chapter 8 identifies the specific objectives and projects that will be implemented to achieve each goal. Chapter 9 is a work plan that provides a timeline for project execution. The implementation of the INRMP and the achievement of these goals will not significantly change the direction of natural resources management at Barksdale AFB.

1.0 OVERVIEW AND SCOPE

This INRMP was developed to provide for effective management and protection of natural resources. It summarizes the natural resources present on the installation and outlines strategies to adequately manage those resources. Natural resources are valuable assets of the United States Air Force. They provide the natural infrastructure needed for testing weapons and technology, as well as for training military personnel for deployment. Sound management of natural resources increases the effectiveness of Air Force adaptability in all environments. The Air Force has stewardship responsibility over the physical lands on which installations are located to ensure all natural resources are properly conserved, protected, and used in sustainable ways. The primary objective of the Air Force natural resources program is to sustain, restore and modernize natural infrastructure to ensure operational capability and no net loss in the capability of AF lands to support the military mission of the installation. The plan outlines and assigns responsibilities for the management of natural resources, discusses related concerns, and provides program management elements that will help to maintain or improve the natural resources within the context of the installation's mission. The INRMP is intended for use by all installation personnel. The Sikes Act is the legal driver for the INRMP.

1.1 Purpose and Scope

This INRMP was prepared to assist in the conservation of natural resources on Barksdale AFB. The INRMP provides the means for the 2 BW to achieve the goals of conservation and management of installation natural resources on the 21,945 acre parcel of land. The INRMP integrates an interdisciplinary approach to ecosystem management with planning for the military mission.

Ecosystem management is a land management system that seeks to protect viable populations of all native species, perpetuate natural disturbance regimes on the regional scale, and adopt a long-term planning timeline to allow human use at levels that do not result in long-term ecological degradation. This integrated approach will consider adverse impacts on the environment when considering timber sales, oilfield development, fisheries/wildlife habitat enhancement projects, etc.

1.2 Management Philosophy

The management philosophy is mission-oriented natural resources management in cooperation with federal, state, and local land management agencies, non-governmental organizations, private entities, including adjacent private landowners. The Louisiana Department of Wildlife and Fisheries (LDWF) wrote the first Barksdale AFB management plan in 1960. The INRMP is a continuation of 45 years of natural resources management and presents broad philosophical guidance as well as specific goals.

To accomplish management goals, natural resources managers must base their decisions on experience, ecological concepts, and scientific inquiry. Geospatial Information Systems (GIS) now provides more accurate spatial data and includes improved inventories of soils, wetlands, sensitive natural communities, threatened species, urban forest, and other natural and cultural resources.

Natural resources under control of the installation will be managed to support the military mission, while practicing the principles of ecosystem management, using scientific methods and an interdisciplinary approach. The conservation of natural resources and the military mission need not, and shall not, be mutually exclusive. This allows an integrated and interdisciplinary approach to ecosystem management with planning for the military mission.

Barksdale Natural Resources (BNR) partners with the Bureau of Land Management (BLM) in an effort to promote environmentally sound mineral production. The Louisiana Nature Conservancy assisted in identifying and cataloging exceptional natural communities. Other cooperative partnerships involve the Environmental Protection Agency (EPA), U.S. Army Corps of Engineers (USACE), LDWF and USFWS in the management of wetlands and habitat. LDWF provides assistance in wildlife management. Local universities support conservation research efforts. A listing of Barksdale AFB Natural Resources Studies is found in Wetland Functions and Values Table.

1.3 Authority

The Sikes Act of 1960, (Public Law 86-779) provides for cooperation between the Department of Defense (DoD) and Department of Interior (DOI) for the protection of natural resources on military lands. On 18 November 1997, Congress passed the Sikes Act Improvement Amendment (SAIA), which required the preparation and implementation of an INRMP to support the sustainable use by the public of natural resources to the extent that the use is consistent with the needs of fish and wildlife resources. Title 16, U.S.Code § 670 et. seq., implements the Sikes Act and states:

"…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, unless the Secretary determines that the absence of significant natural resources on a particular installation makes preparation of such a plan inappropriate."

As stated previously, the SAIA also requires the INRMP be prepared in cooperation with the

U.S. Fish and Wildlife Service (USFWS) and the fish and wildlife agency for the state in which the military installation is located. The cooperation with the USFWS and the state fish and wildlife agency is intended to "reflect the mutual agreement of the parties concerning conservation, protection and management of fish and wildlife resources." INRMP activities must comply with that portion of the Sikes Act at 16 U.S.C Sec. 70a(b)(2)(I), which provides for "no net loss in the capability of military installation lands to support the military mission of the installation."

This INRMP for Barksdale AFB will focus on the land and its associated land uses within the boundaries of the installation. Air Force Policy Directive (AFPD) 32-70, Environmental Quality (20 July 1994) and DoD Instruction 4715.3, March 18, 2011, Environmental Conservation Program state that natural resources at military installations will be managed through effective planning.

In AFPD 32-70, the Deputy Undersecretary of Defense (Environmental Security) states: "ecosystem management of natural resources draws on a collaboratively developed vision of desired future ecosystem conditions that integrates ecological, economic and social factors." To effectively integrate ecological, economic and social factors along with the military mission into an effective ecosystem management program, the policy directive further states: "On DoD installations, ecosystem management will be achieved by developing and implementing Integrated Natural Resources Management Plans (INRMPs) and insuring that they remain current."

AFI 32-7064 Integrated Natural Resources Management implements the Sikes Act and the DoD directives by establishing the INRMP as the primary planning document for natural resources at AF installations. AFI 32-7064 establishes the Installation or Wing Commander as the signatory authority for approval of the INRMP. The commander's signature commits the AF to the goals and objectives of the INRMP. Once signed by the cooperating agencies (USFWS and LDWF), the INRMP takes on the status of an interagency compliance agreement.

1.4 Integration with Other Plans

INRMP revisions and concurrence with the final plan must be coordinated through the installation chain of command, the USFWS, and LDWF. The NRM must ensure that the INRMP, and any other plans that may affect natural resources, are mutually supportive and not in conflict.

2.0 INSTALLATION PROFILE

Office of Primary Responsibility	2d Bomb Wing Commander has overall responsibility for implementing the Natural Resources Management program and is the lead organization for monitoring compliance with applicable federal, state and local regulations
Natural Resources Manager/POC	Natural Resource Manager 2 CES/CEIEA 456-3353
State and/or local regulatory POCs (For US-bases, include agency name for Sikes Act cooperating agencies)	Louisiana Department of Wildlife and Fisheries US Fish and Wildlife Service
Total acreage managed by installation	21,945
Total acreage of wetlands	1,244.52
Total acreage of forested land	16,000
Does installation have any Biological Opinions? (If yes, list title and date, and identify where they are maintained)	NO
NR Program Applicability (Place a checkmark next to each program that must be implemented at the installation. Document applicability and current management practices in Section 7.0)	☑ Invasive species ☑ Wetlands Protection Program ☑ Grounds Maintenance Contract/SOW ☑ Forest Management Program ☑ Wildland Fire Management Program ☐ Agricultural Outleasing Program ☑ Integrated Pest Management Program ☑ Bird/Wildlife Aircraft Strike Hazard (BASH) Program ☐ Coastal Zones/Marine Resources Management Program ☑ Cultural Resources Management Program

2.1 Installation Overview

2.1.1 Location and Area

Barksdale AFB is located in northwest Louisiana in Bossier Parish. The 21,945-acre installation (34 sq. miles) is east of the Red River and adjacent to a large urban region comprised of the twin cities Shreveport and Bossier City. State Highway 71 and Interstate 20 bound Barksdale AFB on the west and north. Figures 1 and 2 below, illustrate the installation layout and general management area.

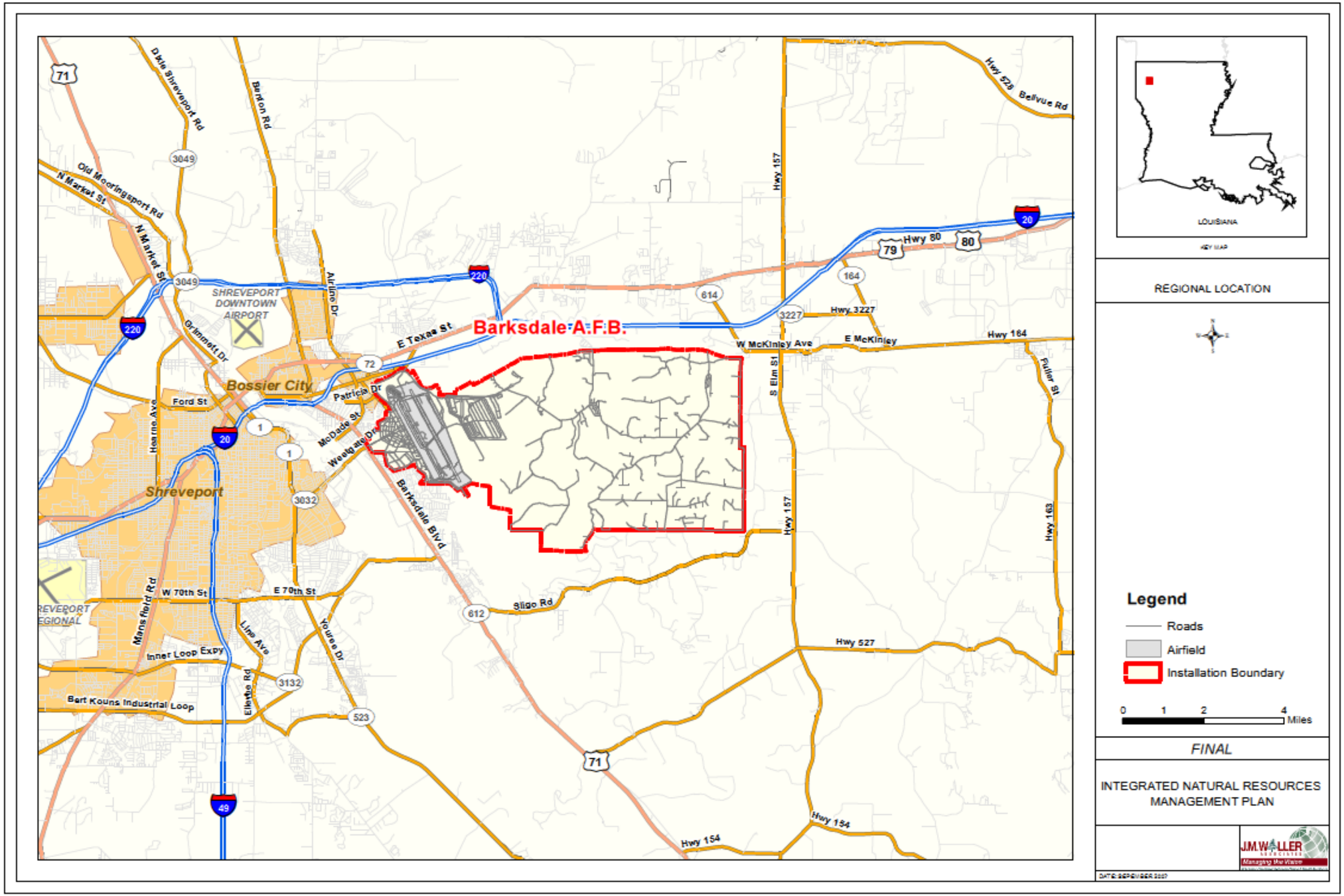

Figure 1. Regional Location

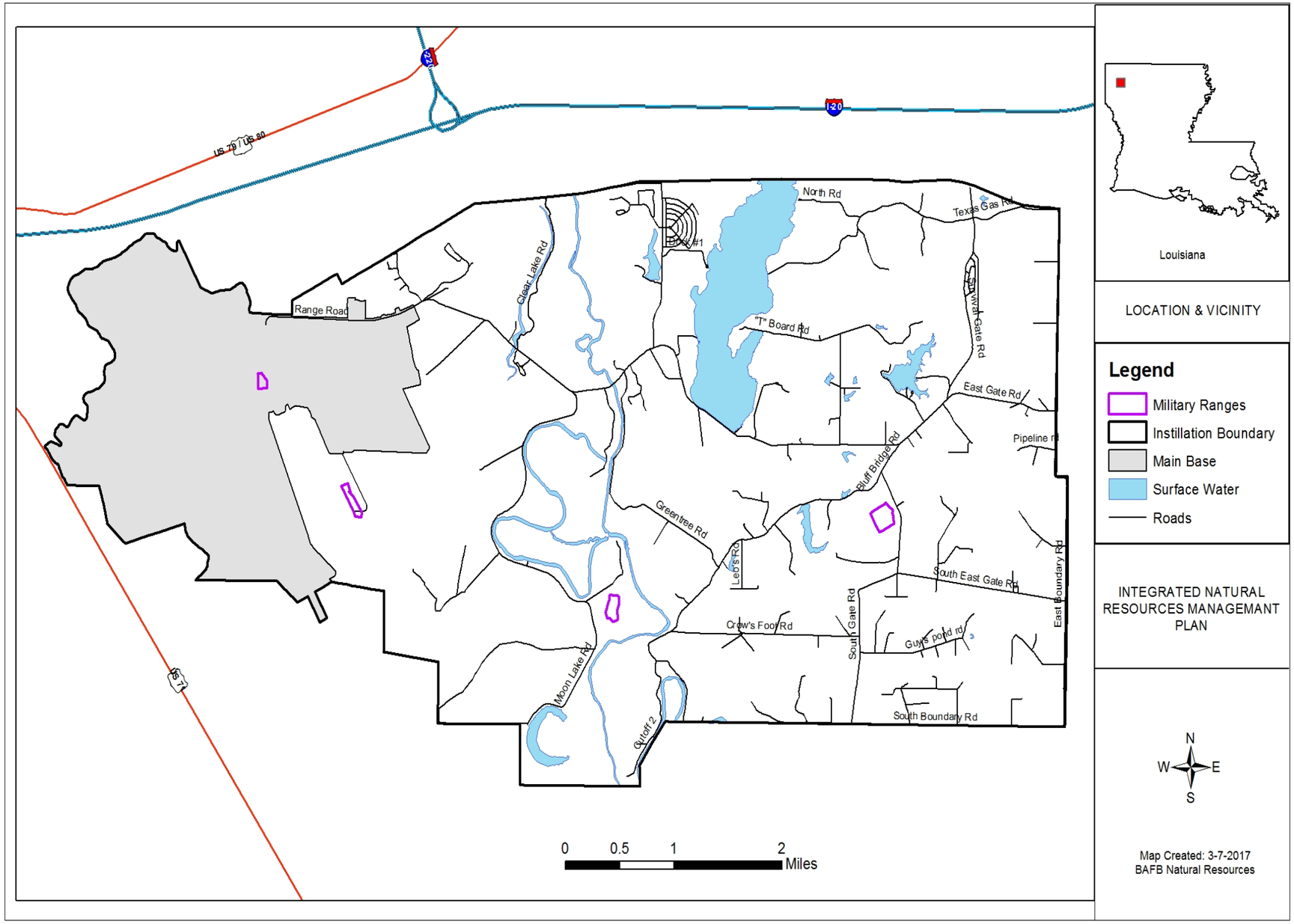

Figure 2. Location and Vicinity

2.1.2 Installation History

In the early 1800s, during the arrival of the first European immigrants, the area that is now Barksdale AFB was inhabited by the Caddo Indians. This fertile land was suitable for agriculture, stock raising, fishing, and hunting. The area was predominantly forest until the1830s, when the land was cleared for farming. Steep hills and un-drainable swamps less than 1,000 acres were the only areas left forested. The Civil War greatly reduced agricultural development in the region. With the decline of large plantations, the property was divided and sold in smaller tracts. By 1900, numerous farm owners and tenants occupied the area and in 1916, cotton remained the chief money crop, although its production had diminished from past years. Some fields cultivated before the Civil War supported a second growth of pine.

Large scale timber harvesting began near the turn of the century and by 1925, almost all virgin pine had been removed. The introduction of oil and gas production around 1922, in combination with a dramatic decrease in timber production, resulted in a population decrease and a return of much of the cropland to pasture and forest. Cattle grazing occurred in swamps and narrow first bottoms along smaller streams, as well as pastures. Feral hogs that ranged primarily in the bottoms were also present. The bottomlands were farmed for cotton until the citizens of Bossier and Caddo parishes purchased and gave the land to the U.S. government for an air base in 1929, at which time, the bottomland began to revert to bottomland hardwood forest. Bottomland forests in this region have primarily regenerated naturally over the last 80 years, with less than 5% having been planted.

Barksdale AFB, originally Barksdale Field, was dedicated in 1933 and for the remainder of the decade operated as a training facility for pursuit and fighter crews. This operation was phased out in the 1940s in favor of training for bomber crews with the east reservation used as a bombing and gunnery range. Barksdale AFB became part of Strategic Air Command in 1946 and by the 1950s, was the home of the first USAF all-jet strategic bombing, refueling and reconnaissance aircraft, including the B-52 Stratofortress and the KC-135 Stratotankers. Throughout the 1980s and until 1994, Barksdale AFB operated the KC-10 aerial re-fueler. With the 1992 reorganization of the major USAF commands, Barksdale AFB joined Air Combat Command (ACC).

In the late 1940s, the outer perimeter of the east reservation was leased for oil and gas production. The upland interior was leased in 1955, bringing the total petroleum lease to just over 12,000 acres. Prior to 2003, there were about 115 active gas and oil wells on six leases. For many years, the number of active wells remained more or less constant as new wells were established and non- producing wells were abandoned. Drilling activity increased significantly (2003–2007) and there are now 257 active gas and oil wells on six leases (three major oilfield lessees or operators). A network of electric power lines service oilfield infrastructure and numerous pipelines with wide, grass-covered right-of-ways cross the Barksdale AFB east reservation.

The east reservation serves as a military training area (light land use, no aerial gunnery or bombing ranges). Explosive Ordnance Demolition (EOD) maintains two ordnance demolition ranges on the east reservation. The ranges and an area of 304 acres surrounding the ranges are closed to unauthorized personnel. The impact of training on the EOD ranges is minimal. Environmental impacts (except for noise) are contained on the range. Large explosives are buried prior to detonation. Oilfield development is prohibited within 2,500 feet of the EOD ranges. There is an established training facility/area or Warrior Training Center (WTC) on 36 acres in the uplands. The WTC is set up with block buildings, a simulated air landing strip, latrines, drinking water, and tent shelters. Military training activities occur several times per year at or adjacent to the WTC. The 2 BW and 307th BW use the WTC and adjacent forested training areas for prime

beef training, bivouacs, and runway repair training. Survival, Evasion, Resistance and Escape (SERE) Training occurs monthly in Area B (northeast quadrant of the east reservation). The 2d Security Forces Squadron (2 SFS) conducts Field Training, Land Navigation, and simulated combat patrolling across the east reservation.

Oilfield History on Barksdale AFB

Barksdale AFB is located in an area where oil and natural gas resources have been extracted for many years. Sligo Oil and Gas Field was discovered on 7 September 1922, when the Skannal, et al. #1 Roscoe was completed as a gas well in Section 14, T17N, R12 W (BLM brief dated July 06). This well completed in the Nacatoch sand at 841 feet for an initial potential of 1,500 mcfg/d and was quickly followed up by a basal Upper Cretaceous completion in the Lands sand at 2,449 feet deep, by the Skannal, et al. #2 R. R. Lands. The well initially produced at a rate of 20 million cubic feet of gas per day.

By the time the airbase was created, there were eight producing wells on donated land. The Army Air Corps had those wells plugged in 1932. By 1949, eight discreet zones were found productive at Sligo field. Four zones were depleted in the intervening years since discovery and 79 wells were producing and draining the federal mineral estate. At the request of the AF, the Conservation Division of the U.S. Geological Survey undertook a study of drainage of federal minerals from Barksdale land. H. J. Duncan presented the report in a public hearing in Shreveport, Louisiana on 27-28 September 1949. This report and a subsequent consent of the AF lead to the issuance of Public Land Order 701 on 26 February 1951. This order withdrew the mineral estate from certain lands on the south and east edge of Barksdale AFB from the AF to the jurisdiction of the DOI.

The BLM issued its first protective lease at Barksdale by competitive bidding on 3 July 1951. The lease sale had been held on 6 June 1951 and a bonus bid of $1,858,600.00 was received for the 2,080 acre tract. The lease was designated LABLM-A-024527 and became effective 1 August 1951. With the consent of the AF and a further determination of drainage, Public Land Order 884 was issued. This order withdrew the mineral estate from certain lands on the north and east edge of Barksdale AFB from the Air Force to the jurisdiction of the DOI. The BLM issued the second of its protective leases, 30 July 1953. The lease sale had been held on 22 June 1953. The lease was designated LABLM-A- 034425 and became effective 1 August 1953. By 1956, 60 wells had been drilled and were producing on the two leases. Twenty-seven wells had been drilled in the south half of Section 12 T17N, R12W for the Harold oil sand alone. Further drainage was proven and consent was given by the AF to withdraw substantial acreage in the center of what is now known as the East Reservation of Barksdale AFB. Public Land Order (PLO) 2178 was issued on 10 August 1960. The BLM moved very quickly and offered the 8,604.5 acres that were made available by the PLO in a competitive lease sale. This land was offered as four tracts on 14 December 1960. The first tract containing 1,860 acres, now known as lease LABLM-A- 54489, received a bid of $1,155,299.42. The second tract (LABLMA-54490) containing 1,763.36 acres received a bid of $1,939,696.00. The third tract (LABLM-A54491) containing 2,419.3 acres received a bid of $2,936,874.36 and the last tract offered was (LABLM-A-54492). These leases were issued with an effective date of 1 February 1961. An additional PLO (2639) was issued for an 880 acre tract of land but these lands were already thought to be drained and when offered by the BLM competitively went un-leased. The executive orders (PLO's) transfer full control of the subsurface minerals from the AF to the DOI.

The DOI currently manages the mineral estate through the BLM and its duly promulgated regulations found in the 43 CFR 3100's. By 1971 there were 138 gas wells, 119 oil wells and 6 saltwater disposal wells active on the east reservation. Six wells had been plugged for unknown reasons making a total of 269 well locations. Drilling remained active through about 1982 when there were 318 producing wells on the base.

The intervening years (1983-2002) wells on the base were being plugged and abandoned at a rate of about 10 for every 2 new completions. By 2003, there were approximately 100 wells still producing on the base. The slow abandonment of the field ceased with the acquisition of the southernmost leases by Chesapeake and EOG Resources. These companies aggressively pursued a drilling program targeting reserves in the Cotton Valley and Hosston Sands and the other companies holding leases slowly followed suit. From 2003 to 2008 over 160 wells were drilled on base with Chesapeake and EOG Resources drilling the majority of these wells. Drilling activity came to a standstill after 2009 with no new wells drilled through late 2017.

2.1.3 Military Missions

Barksdale AFB's primary mission is to develop and maintain the operational capability required to conduct strategic warfare. The 2 BW is the host unit to the Eighth Air Force Headquarters, Air Force Global Strike Command Headquarters, and the 917th Wing, which are the major associate units on base.

The 2 BW is the host unit at Barksdale AFB, and has been operable since 1 April 1963. As the largest bomb wing in AFGSC, the wing controls 48 B-52H Stratofortress Bombers assigned to three squadrons. The 20th Bomb Squadron and 96 Bomb Squadron train combat aircrews, maintain combat readiness to support ground commanders in worldwide theater contingency operations and support the AF deterrent role by standing ready to strike specified targets. The 11th Bomb Squadron conducts academic, simulator and flight training for all initial, qualification, re-qualification and instructor upgrade of B-52 aircrews. The wing maintains a state of constant readiness to conduct strategic bombardment operations on a global scale and continues to reflect the heritage of its motto, "Liberty We Defend."

The Eighth Air Force Headquarters is responsible for the direct deployment of 76 B-52 and 20 B-2 bombers. The Eighth Air Force controls strategic bomber assets throughout the United States and overseas. The Mighty Eighth supports the U.S. Joint Forces and the U.S. Strategic Commands. The Eighth Air Force team consists of more than 16,000 active-duty, Air National Guard and Reserve professionals operating and maintaining three wings, two AF Reserve Total Force Integration wings, and one detachment in the Continental U.S. Major units include the 2nd and 5th Bomb Wings, the 509th Bomb wing, 608th Air and Space Operations Center, and Task Force 204.

The 917th Wing maintained combat ready B-52H bombers and A-10/OA-10 attack aircraft ready to mobilize and deploy to meet contingency taskings. The 917th Wing was deactivated in 2011. The 917th Wing is now part of the 307th Bomb Wing.

The 2 BW provides support services for other associate tenant units and organizations. Tenant units are shown in the below table.

Listing of Tenants and NR Responsibility

Tenant Organization	NR Responsibility
307th Bomb Wing	2 BW
608 Air Communications Squadron	2 BW
49th TEST Squadron	2 BW
340th Weapons Squadron (USAFWS B-52 Division)	2 BW
548th Combat Training Squadron	2 BW
Navy Regional Officer In Charge (ROIC) of Construction	2 BW
DET 3 29 Training Systems Squadron	2 BW

Tenant Organization	NR Responsibility
DET 13 ACC Training Support Squadron	2 BW
26th Operational Weather Squadron	2 BW
DET 219 Air Force Office of Special Investigations	2 BW
Area Defense Counsel	2 BW
Air Force Audit Agency	2 BW
Eighth Air Force Museum	2 BW
Army/Air Force Exchange Service (AAFES)	2 BW
Defense Commissary Agency (DECA)	2 BW
Federal Aviation Administration (FAA)	2 BW
USAF Technology Validation Office	2 BW

2.1.4 Surrounding Communities

The Shreveport-Bossier metropolitan area is the largest in northern Louisiana with an estimated population of 439,000. Agriculture, forestry, oil and gas, manufacturing, and entertainment are the major industries. The Port of Shreveport-Bossier is in a strategic location and has a superior network of interstate highway, rail, water and air. It is one of the fastest growing inland ports in America.

Bossier Parish contains a total of 540,000 acres of which 388,000 acres (72%) is timberland and 152,700 acres (28%) is non-timberland. Most of the timberland is in private ownership, with 210,000 acres owned by individuals and the rest of the timber is industry and government owned. Also, there is 21,600 acres of farmland and 10,800 acres owned by the parish.

For the most part, development has concentrated on the west boundary and adjacent to the area around the main base. The land adjacent to the East Reservation is still mainly rural, or industrial. There are some housing areas located along the south boundary. Installation encroachment issues have occurred and continue to be a discussion item between base officials and local governments.

Regional Land Use

Most of the land in the Barksdale AFB region is rural and used primarily for agriculture, forestry, mineral extraction, and manufacturing. Forestry is a large part of the economy as is the oil and gas industry.

Recently, low natural gas prices decreased drilling activity throughout the region. Drilling activity has slowed but is expected to continue in the area and will eventually return to the base once prices rise.

2.1.5 Local and Regional Natural Areas

Twenty miles to the north is a 32,000-acre USACE flood control project that is also a state wildlife management area (Bodcau). Fifteen miles to the south is another state wildlife management area of about 8,000 acres (Loggy Bayou). In 2000, Congress enacted legislation to establish the first national wildlife refuge in northwest Louisiana. The Red River National Wildlife Refuge provides for the restoration and conservation of fish and wildlife habitat in the Red River Valley ecosystem. This refuge opened in 2012 and is approximately six miles to the southwest. River walkways have been developed on both sides of the Red River and are located within 2 miles of the west gate, but these do not contain any unique characteristics. There are numerous parks, both city and parish, located within five miles but do not contain any ecologically significant natural areas.

2.2 Physical Environment

2.2.1 Climate

The climate in Louisiana is governed largely by the state's proximity to the Gulf of Mexico, its subtropical latitude, and its location relative to an extensive land mass to the north. Prevalent winds are from the south or southeast with much moist air from the Gulf bringing high levels of humidity.

Temperatures in the summer range from an average of 85°F to 95°F in the afternoons and 65°F to 75°F in the early morning. Physical conditions are favorable for regular development of isolated convectional thunderstorms scattered across the state. Occasional periods of hot dry weather interrupt prevailing moist summer conditions in north Louisiana. Tropical disturbances, which spawn high winds and excessive rainfall, regularly develop in the Gulf of Mexico and occasionally affect north Louisiana. In winter, temperatures are more variable on average, ranging from 55°F to 65°F in the afternoons and from 40°F to 50°F in early morning hours; although higher and lower temperatures occur. Periodic continental cold fronts from the northwest displace the warmer maritime air. Freezing temperatures are usually recorded 30 to 40 days in an average year. Average annual rainfall is 51.30 inches. The average number of days with thunderstorm activity is 57, with peak months in May and June. Relative humidity is high throughout the year with monthly values from 83% to 91%. Average temperatures are provided below in the table Barksdale AFB Climatic Conditions.

Barksdale AFB Climatic Conditions

MONTH	AVG TEMP	AVG LOW	AVG HIGH	AVG PRECIP
JAN	47	36.5	56.2	4.60
FEB	51	40.3	62.0	4.21
MAR	58	47.2	69.7	4.18
APR	66	53.8	76.6	4.42
MAY	73	62.7	83.2	5.25
JUN	81	69.9	89.8	5.05
JUL	83	73.4	93.3	3.99
AUG	83	72.3	93.4	2.71
SEP	77	66.4	87.6	3.21
OCT	68	55.0	78.3	4.45
NOV	55	45.3	66.8	4.68
DEC	49	38.3	58.5	4.55
YEAR AVG	66	55.1		51.30

Temperature in degrees Fahrenheit/Precipitation in inches (based on 30 years of records)

2.2.2 Landforms

Many of the general topographic features of this area are the result of the influence of the Red River, which has shifted its course many times. During recent times (geologically speaking), a giant logjam called the

"Great Raft" blocked various stretches of the Red River, forming a navigational barrier. The Great Raft had a major impact on wetland plant communities of Caddo and Bossier parishes, especially the bottomland and swamp communities. Natural lakes resulting from the Raft are a unique feature to this area.

The base topographic relief ranges from 155 feet mean sea level (msl) in the Red River floodplain (Flat River at Barksdale AFB south boundary) to 336 feet msl in the northeast uplands (ridgeline north of Harmon Lake). The land surface in the floodplain (west section of Barksdale AFB) is lower and generally level. Local relief in the floodplain is seldom more than 10 feet. A well-defined escarpment marks the relatively abrupt rise from the floodplains to the uplands, with some bluffs rising 70 feet or more above Red Chute Bayou. The most highly dissected topography present on the base is found in the northeastern section and in the ravine areas along the western escarpment where intermittent streams have down-cut through older strata.

The Red River alluvial plain, flatwood terraces and natural levee deposits all exhibit micro- topographic relief due to the presence of natural hillocks or "pimple mounds". These mounds average approximately 3 feet in height and 50 feet in diameter, and are especially evident in areas with Wrightsville soils.

2.2.3 Geology and Soils

Barksdale AFB encompasses portions of three significant physiographic units common to the Gulf Coastal Plain: the Red River alluvial valley, the Tertiary uplands and the broad stream terraces (locally known as flatwoods). Major features of the Red River valley include: river meanders, cutoffs and meander scars, winding tributary channels and large wetland areas. The uplands are characterized by gently sloping to hilly areas, steep escarpments and broad-crested ridges with knoll and gully development along the down slope margins. The stream terraces or flatwoods are generally level to gently sloping; dissection may be prominent along terrace margins adjacent to streams.

A soil survey for the forested area of Barksdale AFB and all land west of the airfield was completed in 1990. A soils map is provided in Figure 3. Soil associations vary for each physiographic region and are discussed for each as follows:

1) Red River alluvial floodplain soils consist of recent waterlain sediments transported by the Red River primarily from arid regions to the north and west. Soils in this physiographic region are predominately clays, silt loams, and silty clay loams that are poorly drained and slowly to moderately permeable. Sediments are predominantly derived from erosion of older Permian Red Beds, which gave them a characteristic red color. At the time of deposition, they are unweathered and contain free calcium carbonate, thus many soils present are mildly to moderately alkaline in the surface or subsurface. Only after considerable time, weathering, and leaching do acid soil horizons develop. Soil types present in the Red River alluvial plain are Armistead clay, Buxin clay, Caspiana silt loam, Gallion silt loam, Gallion silty clay loam, Moreland clay, Perry silty clay and Yorktown silty clay.

2) Tertiary uplands that occur in the northeast portion of Barksdale AFB consist of materials that range in texture from sand to clay. The oldest soils on the base, they developed from strata that were laid down during former extensions of the Gulf of Mexico. Some contain plinthite, a highly weathered mixture of clay with quartz, and may be underlain by ironstone that is formed from plinthite. Surface materials are acidic, loamy fine sands and silt loams that are excessively to moderately well drained, and rapidly to slowly permeable. Soil types include Betis loamy fine sand, 1-5% slopes; Keithville silt loam, 1-5% slopes; Metcalf silt loam; Ruston fine sandy loam, 1-5% slopes; Sacul fine sandy loam, 1-5% and 5-12% slopes; and Smithdale fine sandy loam, 8-30% slopes.

3) Terrace flatwoods contain old alluvial surfaces deposited by the Red River during the interglacial stages of the Pleistocene Epoch. Most of the soils are acidic in the upper horizons. However, in the lower horizons, soil reaction and base saturation increase as depth increases. Some are basic at or near the surface and are evidently calcareous, as indicated by the presence of plants considered calcareous soil indicators. Soils are predominately well to moderately well drained, slowly to moderately permeable silt loams over clays or silty clay loams. Soil types found in the terrace flatwoods include Forbing silt loam, 1-5% and 5-12% slopes; Gore silt loam, 1-5 % and 5-12% slopes; Guyton silt loam and Guyton silt loam, frequently flooded; Kolin silt loam, 1-5% slopes; Wrightsville silt loam, and possibly Metcalf silt loam. One soil present but not mentioned in the soil survey is Morse clay. This soil type was recognized but not mapped due to its occurrence in small patches typically less than five acres in size. Morse clays are typically deep, well-drained, and very slowly permeable. They are calcareous and moderately alkaline throughout, and calcium concretions are often present.

The geology of Louisiana, as a whole, is characterized by surface formations of relatively young age, with the oldest dating back about 65 million years before present (mybp) to the Mesozoic-Cenozoic boundary. The northern and northwestern parts of the state are largely underlain by semi-consolidated strata consisting of continental and marine sediments deposited between 1.8 and 65 mybp, during the Tertiary Period. These older formations, characteristic of the uplands, are sometimes quite hilly and provide the more drastic topographic relief in the area, especially where they are dissected by the Red River and its tributaries. Surface deposits in the southern and eastern regions of the state are mostly unconsolidated sediments deposited within the last 1.8 million years during the Quaternary Period.

Quaternary-aged strata consist of the flat to rolling terraces of the ancient Red River valleys deposited during the Pleistocene Epoch and sediments found along the current alluvial valleys of the Red River and its tributaries, deposited during the Holocene Epoch.

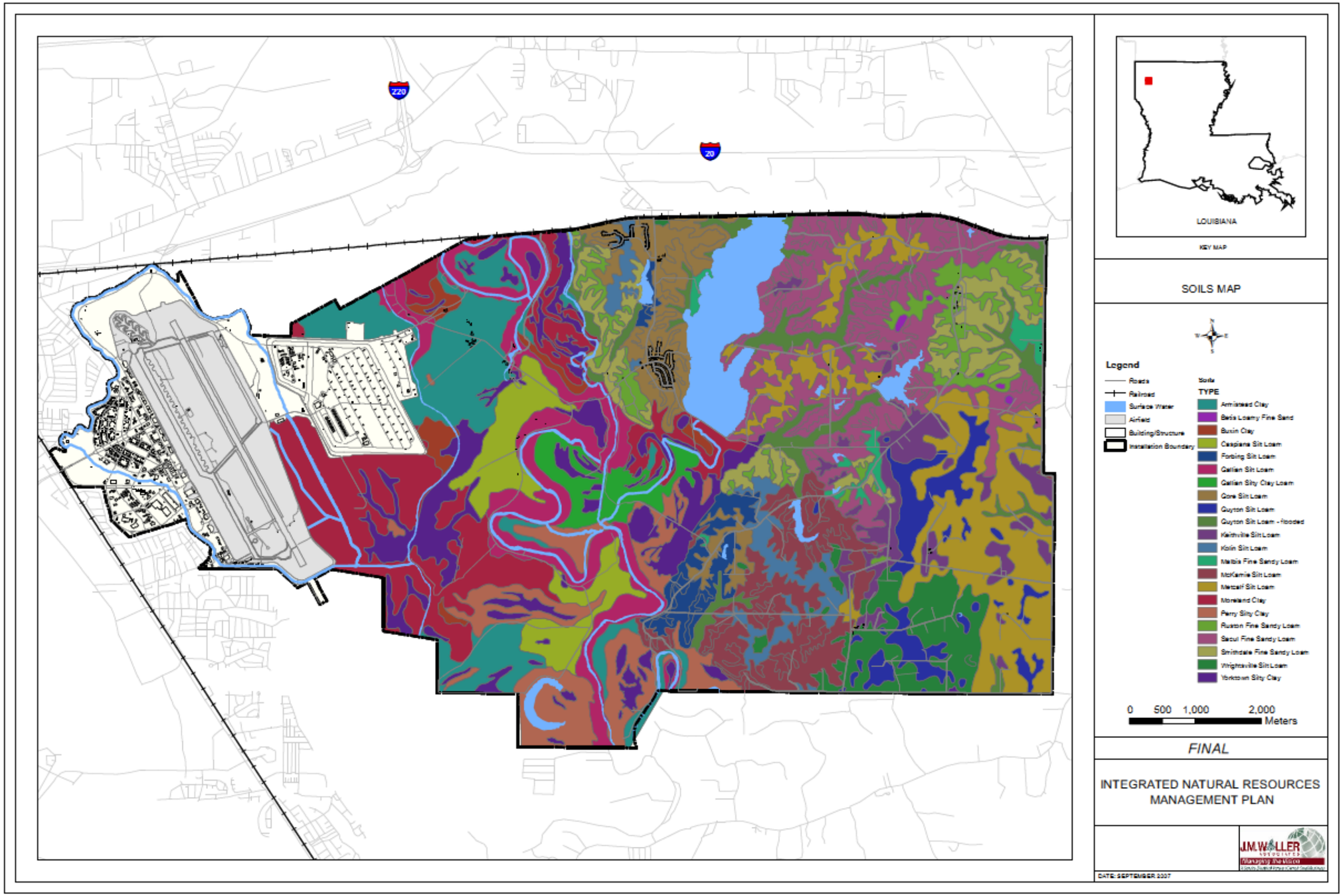

Figure 3. Soils Map

Soils at Barksdale AFB (USDA Soil Conservation Service 1990)

Soil Name	Taxonomic Classification
Armistead clay	Fine-silty, mixed, thermic Aquic Argiudolls
Betis loamy fine sand, 1–5% slopes	Fine, siliceous, thermic Psammentic Paleudults
Buxin clay	Fine, mixed, thermic Vertic Hapludolls
Caspiana silt loam	Fine-silty, mixed, thermic Typic Argiudolls
Forbing silt loam, 1–5%, 5–12% slopes	Very-fine, montmorillonitic, thermic Vertic Paleudalfs
Gallion silt loam	Fine-silty, mixed thermic Typic Hapludalfs
Gallion silty clay loam	Fine-silty, mixed thermic Typic Hapludalfs
Gore silt loam, 1–5%, 5–12% slopes	Fine, mixed, thermic, Vertic Paleudalfs
Guyton silt loam	Fine-silty, siliceous, thermic, Typic Glossaqualfs
Guyton silt loam, frequently flooded	Fine-silty, siliceous, thermic, Typic Glossaqualfs
Keithville silt loam, 1–5% slopes	Fine-silty, siliceous, thermic Glossaquic Paleudalfs
Kolin silt loam, 1–3% slopes	Fine-silty, siliceous, thermic Glossaquic Paleudalfs
Malbis fine sandy loam, 1–3% slopes	Fine-loamy, siliceous, thermic Plinthic Paleudults
McKamie silt loam, 1–5%, 5–12% slopes	Fine, mixed, thermic Vertic Hapludalfs
Metcalf silt loam	Fine-silty, siliceous, thermic Aquic Glossudalfs
Moreland clay	Fine, mixed, thermic Vertic Hapludolls
Morse clay	Fine, mixed, thermic, Entic Chromuderts
Perry silty clay	Very-fine, montmorillonitic, nonacid, thermic Vertic Haplaquepts
Ruston fine sandy loam, 1–3% slopes	Fine-loamy, siliceous, thermic, Typic Paleudults
Sacul fine sandy loam, 1–12% slopes	Clayey, mixed, thermic Aquic Hapludults
Smithdale fine sandy loam, 5–30% slopes	Fine-loamy, siliceous, thermic Typic Hapludults
Wrightsville silt loam	Fine, mixed, thermic Typic Glossaqualfs
Yorktown silty clay	Very-fine, montmorillonitic, nonacid, thermic Typic Aquents

2.2.4 Hydrology

Approximately half of Barksdale AFB lies within the Red River alluvial floodplain and is characterized by flat, slow-draining systems. Flat River and Red Chute Bayou are the two main water bodies flowing through the installation. Both Flat River and Red Chute Bayou are channelized. The Red Chute project created a straight-leveed channel that bypassed several meander bends of the bayou (Red Chute Cutoff #1

and #2). Surface waters from Barksdale AFB are directed into Red Chute Bayou or Flat River and ultimately flow into the Red River. Other streams in the Red River alluvial floodplain include Macks, Cooper, Fifi, and Musselshell Bayous. Several intermittent streams occur in the uplands. Two small, unnamed, perennial streams on the northeast portion of the base flow into Foxskin Bayou (found east of the base) which in turn flows into Lake Bistineau. Naturally occurring lakes include: Flag Lake (677 acres), the largest lake on the base, and Moon and Clear Lakes (oxbow lakes). Flag Lake was increased to its present day level with the construction of a dam and water control structure at Fifi Bayou in 1959. Built in 1958, Harmon Lake (55 acres) is the largest impoundment in the uplands, fed by a spring-fed creek as well as by rainfall. Water levels in these lakes and many of the east reservation water impoundments can be manipulated using water-control structures (See Table Water Impoundments on Barksdale AFB and Figure 4 - Water Impoundments Map).

The majority of Barksdale water resources are located on the east reservation with a total of 814 acres. Water resources in the Main Cantonment area and Barksdale East are 80 acres in area and primarily limited to drainage channels. Natural drainage is generally south and southwest for the western two- thirds of the base and to the southeast for the eastern portion of the base. American beavers (Castor canadensis) manipulate local hydrology, causing long-term flooding in some areas. Cantonment land areas drain by overland flow to diversion structures, drainage ditches and finally to local surface streams, primarily Macks and Cooper Bayous. Flooding is a concern, particularly along major drainage routes. Parts of the reservation above 160 feet and not located between red chute bayou and flat river are not within the 100-year floodplain.

Wetlands occur on Barksdale AFB primarily in the Red River alluvial floodplain. Typical wetlands include floodplain and other lower elevation areas where standing water is present for prolonged periods of time (>10%) during the growing season. Most wetlands and areas supporting wetland plants lack standing and waterlogged soils during at least part of the season.

The USACE, EPA, USFWS and the public rigorously examine wetland permit applications. Executive Order (EO) 11990, Protection of Wetlands directs all federal agencies, including the military, to avoid the destruction, loss or degradation of wetlands whenever there is a practical alternative.

Greentree reservoirs (GTR) were first introduced to the southeastern United States in the 1930s in the Grand Prairie area near Stuttgart, Arkansas. Since then, GTRs have been used from the Mississippi to the Atlantic Flyway as a means of producing favorable habitat for wintering waterfowl. BNR alternately floods approximately 1,230 acres in four GTRs. GTR management revolves around a policy of maintaining forest health and sustainability while providing both wildlife habitat and recreation opportunities. Since inception, GTR health on Barksdale AFB has slowly been declining due to annual and prolonged flooding. To reverse the decline, flooding will alternate between GTRs to allow two normal years between flooding events with the goal of promoting normal root growth and seedling establishment. GTRs will be flooded no sooner than following fall cessation (about 1 November of each year). Floodwaters are drawn down immediately following the close of duck season (about 1 February) to facilitate tree root growth prior to spring leaf out. Future flooding regimes will alternate flood times from year to year to mimic natural flooding regimes. Water for flooding is obtained by allowing water to flow from Flag Lake to flood the 281 acres within the Duck Refuge GTR. Releasing water from Harmon and Red Horse Lakes floods 300 acres of the Bluff Bridge GTR. Pumping from Red Chute Bayou over the levee into adjacent bottomlands floods another 650 acres. This area comprises both Duck Slough and Flat River GTRs. Current plans call for pumping water into these areas no more than one out of every six years. Low level flooding for small pockets of waterfowl habitat is to occur in Duck Slough and Flat River GTRs no more than one out of every three years. Other management guidelines include (1) water control structures will remain open during time of drawdown to

facilitate water, nutrient, and / or organism exchanges; (2) snags will be allowed to remain standing to provide habitat for cavity nesting species; (3) no significant modification to existing wetland vegetation will occur within the impoundment.

Water Impoundments on Barksdale AFB

Water Resource	Acres	Primary Use	Description	Water Quality / other Description
Flag Lake	677	Fishing, boating, Waterfowl hunting (404ac) Waterfowl refuges (270ac) Watchable wildlife	Original Flag lake expanded thru dam on Fifi Bayou	Shallow, aquatic vegetation concern Most popular lake for fishing, Giant Salvinia concern
Harmon Lake	49	Fishing, boating, camping	Largest upland lake, spring-fed	Deep lake, clear of vegetation, Giant Salvinia concern
Moon Lake	43	Waterfowl hunting,Fishing	Oxbow lake	Aquatic vegetation (Giant Salvinia) concern
Clear Lake	10	Fishing, canoeing	Shallow oxbow < 3m	Low oxygen
Austin Lake	19	Fishing	Man-made lake just south of Heritage Heights	Giant Salvinia Concern
Red Horse Lake	20	Fishing	Leveed beaver pond	Giant Salvinia concern
Cutoff # 1	66	Fishing, Waterfowl hunting, Watchable wildlife boating, canoeing	Red Chute Bayou cutoff	Low oxygen
Cutoff # 2	21	Fishing, Waterfowl hunting, canoeing	Red Chute Bayou cutoff Along BAFB south boundary, adjacent to housing subdivision	Low oxygen
Jack's Pond	4.0	Fishing, canoeing Waterfowl hunting, Watchable wildlife	Oxbow lake, remote	
Juanita Pond	2.5	Fishing	Upland	
Wood Duck Pond	2.0	Fishing	Upland	
Flat Pond	0.9	Fishing	Upland	
Steepbank Pond	1.1	Fishing	Upland	
Texas Pond	1.6	Fishing	Upland	
Tank Pond	2.6	Fishing	Upland	
Spring Pond	1.7	Fishing	Upland	
Dixon Pond	2.7	Fishing	Terrace flatwoods	
Guy Pond	0.4	Fishing	Terrace flatwoods	

Water Impoundments on Barksdale AFB Continued

Water Resource	Acres	Primary Use	Description	Water Quality / other Description
Bluff Bridge GTR	301	Waterfowl hunting	Seasonal	Nov-Jan/Variable Flood Timing
Duck Refuge GTR	281	Waterfowl refuge	Seasonal	Nov-Jan Timing
Flat River GTR	382	Waterfowl hunting	Seasonal	Nov-Jan/Variable Flood Timing
Duck Slough GTR	269	Waterfowl hunting	Seasonal	Nov-Jan/Variable Flood Timing
Moist Soil Unit 1	63	Waterfowl refuge	Seasonal	
Moist Soil Unit 2	14	Waterfowl refuge	Seasonal	
Moist Soil Unit 3	16	Waterfowl refuge	Seasonal	
Moist Soil Unit 4	7	Waterfowl refuge	Seasonal	
Moist Soil Unit 5	24	Waterfowl refuge	Seasonal	
Cocklebur Slough	82	Waterfowl hunting	Seasonal	Nov-Jan/Variable Flood Timing
Stumpy Slough	12	Waterfowl hunting	Seasonal	Nov-Jan/Variable Flood Timing
Cooper's Slough	30	Waterfowl hunting	Seasonal	Nov-Jan/Variable Flood Timing
Bell's Slough	15	Waterfowl refuge	Seasonal	Nov-Jan/Variable Flood Timing
Pharr Hole	29	Waterfowl hunting	Seasonal	Nov-Jan/Variable Flood Timing
Cypress Brake	21	Waterfowl hunting	Seasonal	Nov-Jan/Variable Flood Timing
Moon Lake Impoundment	22	Waterfowl hunting	Seasonal	Nov-Jan/Variable Flood Timing
Total Permanent	**924.5**			
Total Seasonal	**1,568.0**			

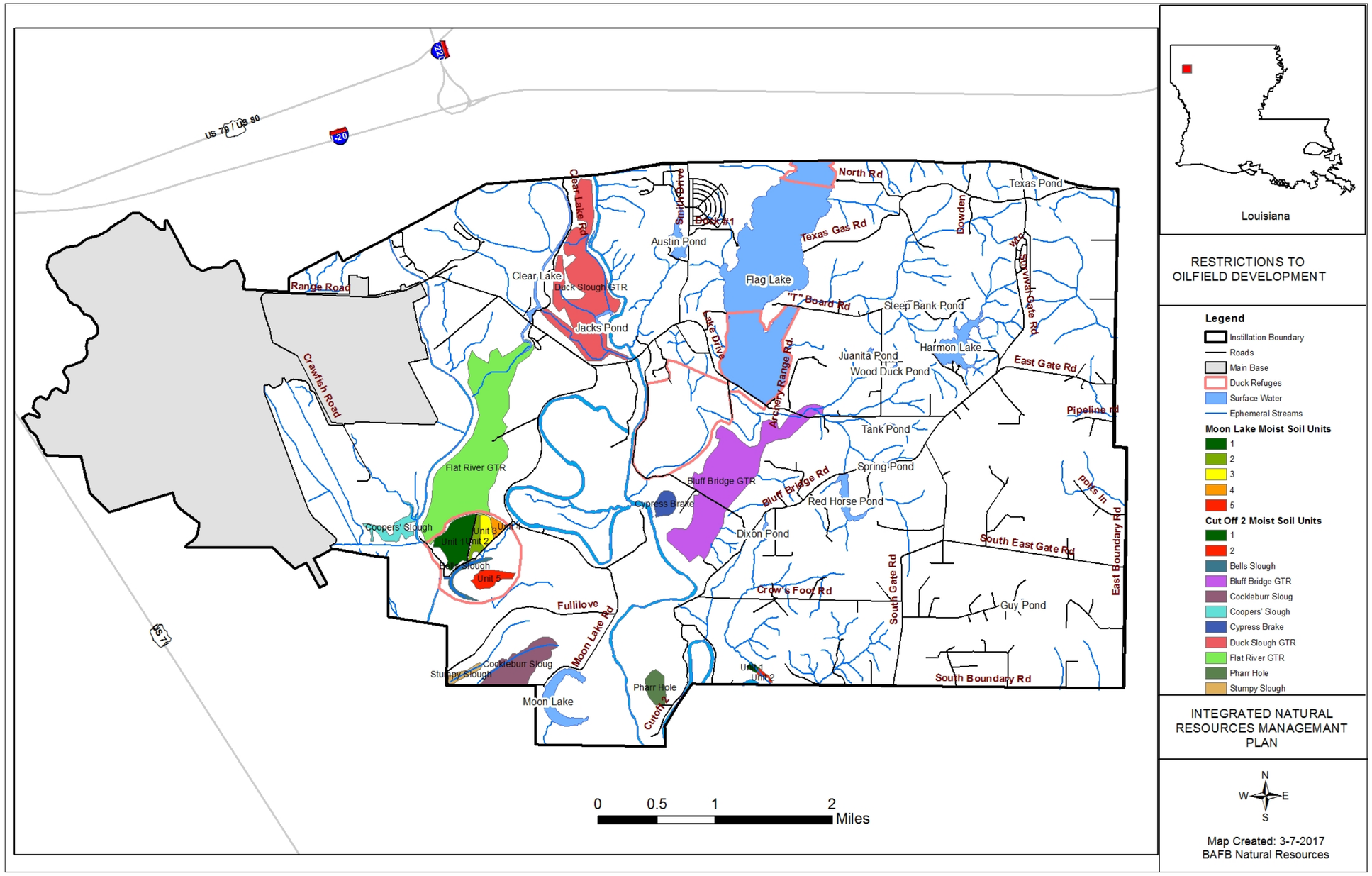

Figure 4. Water Impoundments Map

2.3 Ecosystems and the Biotic Environment

2.3.1 Ecosystem Classification

According to Bailey's ecoregion classification, Barksdale AFB lies in the Southeastern Mixed Forest Province. This province comprises the Piedmont and the irregular Gulf Coastal Plains, where 50% to 80% of the area slopes gently toward the sea. Local relief is 100 feet to 600 feet on the Gulf Coastal Plains, and 300 feet to 1,000 feet on the Piedmont. The flat coastal plains have gentle slopes and local relief of less than 100 feet. Most of the numerous streams in the region are sluggish; marshes, lakes, and swamps are numerous. More information about Bailey's 1995 Ecoregion classification can be found at: http://www.fs.fed.us/land/ecosysmgmt/.

2.3.2 Vegetation

2.3.2.1 Historic Vegetative Cover

Prior to settlement, the predominant ecosystem was forest. The uplands were loblolly pine (*Pinus taeda*), shortleaf pine (*P. echinata*) and upland hardwood forest, broken only by a few very small prairies where poor soils (heavy clays and high pH) and frequent fires suppressed tree growth. The alluvial river bottom was completely forested with bottomland hardwoods except for a few small lakes and stream courses. The landscape in the present-day boundary of Barksdale AFB was comprised of 10 major plant communities including batture forests found marginal to the Red River, bottomland hardwood forests and cypress swamps on the Red River alluvial plain, riparian forests along upland stream bottoms that undoubtedly flooded several times during the year, mixed hardwood-loblolly forests adjacent to and upslope from the riparian areas, hardwood slope forests on the steeper mesic slopes, shortleaf pine/oak-hickory forests and calcareous forests in the drier areas of the uplands, pine/oak- hickory flatwoods and flatwood depression hardwood forests on the upland flats. Also present in the pre-settlement landscape were two other terrestrial communities smaller in extent than the ones mentioned above, including wooded seeps and calcareous prairie openings. Lastly, ecotonal areas would have existed throughout the base occurring between adjacent plant communities. These areas exhibit gradients in species composition between the differing communities.

2.3.2.2 Current Vegetative Cover

In general, the current vegetation can be divided into two coarse areas: upland pine-hardwood forests to the east, and bottomland hardwood forests to the west. These areas correspond to the three physiographic units mentioned earlier: Red River alluvial valley to the west, and to the east, terrace Flatwoods, and rolling to dissected hills of the Tertiary uplands. Plant communities found today in the three major physiographic units in decreasing order of abundance. Figure 5 shows the current vegetation associations.

1) Red River alluvial floodplain - bottomland hardwood forest

2) Tertiary uplands - loblolly pine-shortleaf pine/oak-hickory forest, shortleaf pine/oak hickory forest, riparian or small stream forest, mixed hardwood/loblolly pine forest, and forested seeps.

3) Terrace flatwoods - loblolly pine-shortleaf pine/oak-hickory flatwoods (referred also as pine flatwoods), flatwood depression forest, small stream forest, calcareous forest, Morse clay calcareous prairie, mixed hardwood/loblolly pine forest.

2.3.2.3 Turf and Landscaped Areas

A variety of shrubs and trees, both exotic and native to the region, are present on the improved areas of Barksdale AFB. The most frequently occurring urban forest species are live oak (*Quercus virginiana*), crepe-myrtle (*Lagerstroemia indica*), loblolly pine, pecan (*Carya illinoensis*), sweetgum (*Liquidambar styraciflua*), water oak (*Q. nigra*), red oak (*Quercus sp*.), American elm (*Ulmus americana*), and sugarberry (*Celtis laevigata*). The majority of existing grass cover, on the improved grounds is St. Augustine (*Stenotaphrum secundatum*), common Bermuda (*Cynodon dactylon*) and paspalums (dallis and bahia). Semi-improved grounds of approximately 1,798 acres have a cover of common grasses and weeds.

2.3.3 Fish and Wildlife

Barksdale AFB has a diversity of wildlife and wildlife habitats on base. White-tailed deer (*Odocoileus virginianus*) are abundant and are managed through a Quality Deer Management Program (QDMP). The wild turkey (*Meleagris gallopavo*), Northern Bobwhite quail (*Colinus virginianus*) and American Mourning dove (*Zenaida macroura*) are dispersed intermittently throughout the base. Of the 102 different bird species confirmed by The Nature Conservancy (TNC) to occur on base, examples include the pine warbler (*Dendroica pinus),* northern cardinal (*Cardinalis cardinalis*), summer tanager (*Piranga rubra*), Carolina wren (Thryothorus ludovicianus), ruby-throated hummingbird (*Archilochus colubris*), blue jay (*Cyanocitta cristata*), eastern (Rufous-sided) towhee (*Pipilo erythrophthalmus*), and tufted titmouse (*Baeolophus bicolor*). A full inventory of plant and animal species found on Barksdale AFB is listed in Appendix Common Plant and Wildlife Species on Barksdale. Fisheries on Barksdale AFB are good; however, there is always a concern due to the potential for low oxygen levels. Largemouth bass (*Micropterus salmoides*) are the primary game fish, but there is also a diversity of other fish species. A full list of fish species can be found in the Appendix Common Fish species on Barksdale AFB.

2.3.4 Threatened and Endangered Species and Species of Concern

The staff monitors for known species on Barksdale AFB. The bald eagle (*Haliaeetus leucocephalus*) is found on BAFB (Figure 6*).* While no longer listed as threatened or endangered, it is still protected under the Bald and Golden Eagle Protection Act. Flag Lake is considered important habitat for the bald eagle. For the past 20 years, eagles have over- wintered on the lake. In February 2007, the first bald eagle nest was found on north end of Flag Lake and two young were produced. Since that time, active nests have been observed yearly. Eagles may now reside on the base through the nesting season or mid-May. As many as 3 adults and two juveniles have been observed simultaneously. The eagles have been spotted in many locations on BAFB. When not seen on Flag Lake, the eagles are most often observed in the moist soil impoundments, but also have been found at Harmon and Red Horse lakes, Dixon pond, and the airfield. The vegetation in the lakes are managed to maximize the potential for the bald eagle.

The following species of animals found in Bossier parish are considered state-rare and monitored by the LDWF Natural Heritage Program: Warbling Vireo (*Vireo gilvus*), Crystal Darter (*Crystallaria asprella*), Western Sand Darter (*Ammocrypta clara*), Red-Cockaded woodpecker (*Picoides borealis*), Bald Eagle (*Haliaeetus leucocephalus*), Bachman's sparrow (*Aimophila aestivalis*), Long-tailed weasel (*Mustela frenata*), and Interior Least Tern (*Sternula antillarum athalassos*) Pursuant to the Endangered Species Act (ESA) of 1973 Section 4, state listed species have the potential of attaining a federal candidate, threatened or endangered status. Any state rare animals located on the installation will be protected to the extent practical. If state rare species are located on the installation, and protection is not practical, discussions with the state will be initiated to develop a documentation or management strategy.

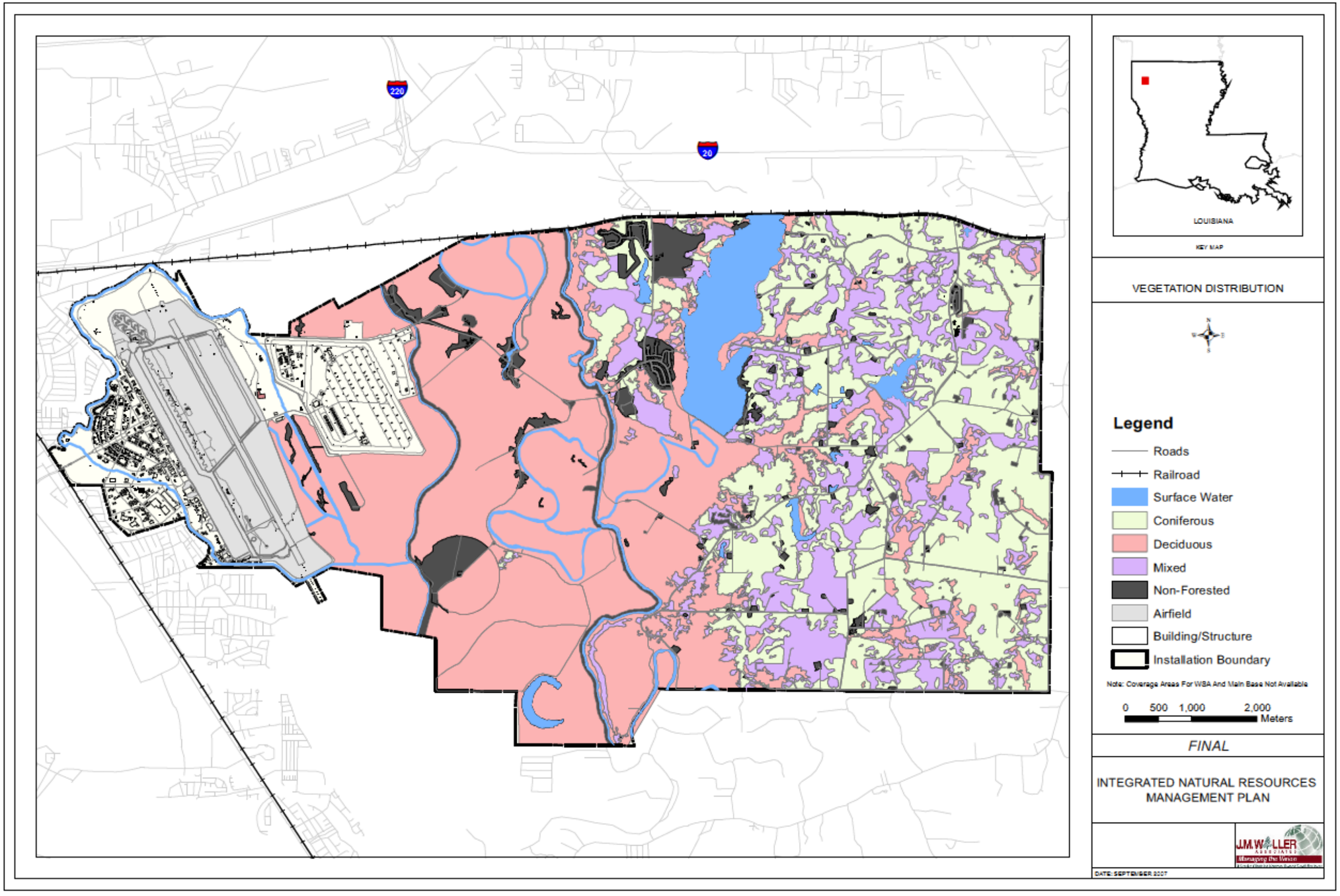

Figure 5. Vegetation Distribution

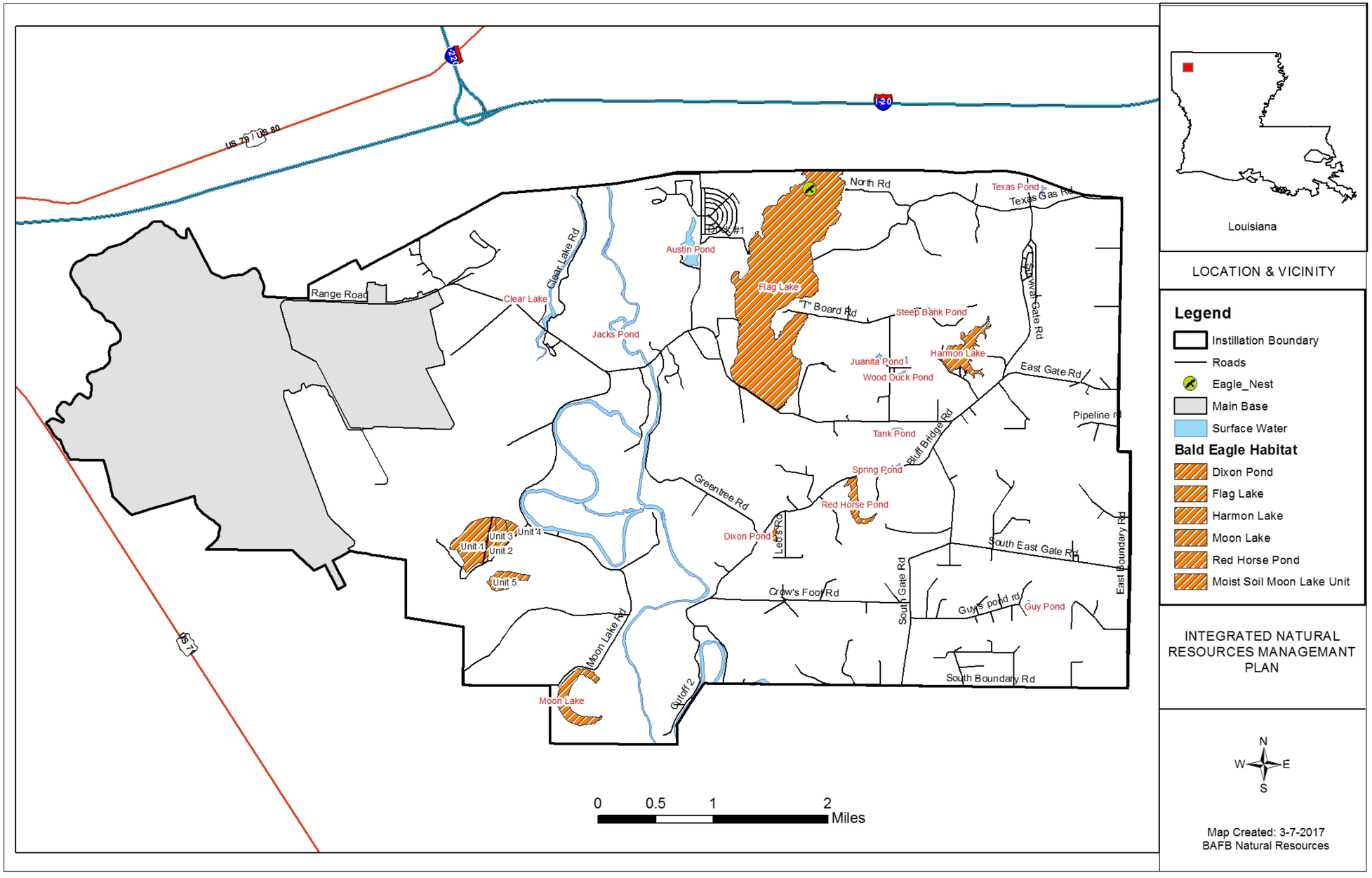

Figure 6. Threatened and Endangered Species

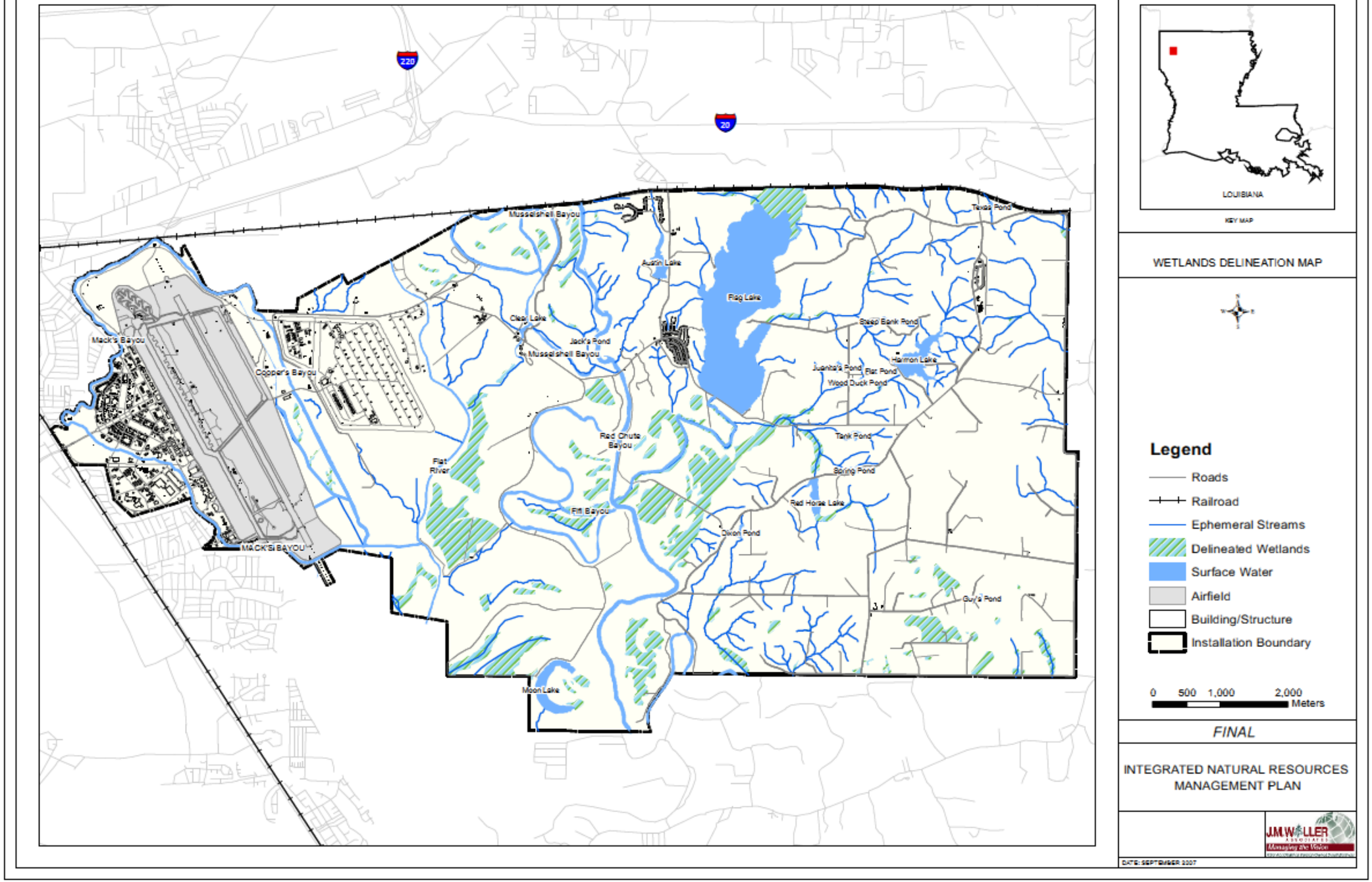

Figure 7. Wetlands Delineation

The northern long-eared bat is federally listed as a threatened species. The northern long-eared bat can be found in much of the eastern and north central United States and all Canadian provinces from the Atlantic Ocean west to the southern Yukon Territory and eastern British Columbia. In Louisiana, there have been confirmed reports of sightings in Winn and Grant parishes; although they can possibly be found in other parishes in the state. Some individuals were documented during mist net and bridge surveys on the Winn District of the Kisatchie National Forest and were also observed under bridges on the Winn District in Grant Parish.

Northern long-eared bats can be found in mixed pine/hardwood forest with intermittent streams. Northern long-eared bats roost alone or in small colonies underneath bark or in cavities or crevices of both live trees and snags (dead trees). During the winter, northern long-eared bats can be found hibernating in caves and abandoned mines, although none have been documented using caves in Louisiana. Northern long-eared bats emerge at dusk to fly through the understory of forested hillsides and ridges to feed on moths, flies, leafhoppers, caddis flies and beetles, which they catch using echolocation. This bat can also feed by gleaning motionless insects from vegetation and water surfaces. Barksdale AFB is currently conducting acoustical bat surveys to determine if this species is present on BAFB.

As of the date of this INRMP, no federally threatened or endangered species have been observed on Barksdale AFB. An inventory of federally listed threatened and endangered species in Bossier Parish Louisiana is found in the Appendix B (Threatened and Endangered Species Found in Bossier Parish Louisiana).

2.3.5 Wetlands and Floodplains

Wetlands are managed to protect or enhance their overall value. Emphasis will be to avoid locating projects that will impact wetlands. If avoidance is not practical, proposed projects or actions will include all practical measures to minimize impacts to wetlands. Barksdale AFB follows jurisdictional wetland delineation as depicted from the USACE and obtains permits for all sited projects.

The most recent wetlands survey for the remaining property was completed by Stephen F. Austin State University in 2005. This survey determined that Barksdale AFB has 1,244.52 acres of wetlands in accordance with the Corps of Engineers Wetland Delineation Manual (1987). The average size of a wetland is 12 acres; with the largest being 110 acres while the smallest 0.17 acres in size. These numbers are subject to change as the USACE is currently updating their criteria for wetland delineation.

BNR reviews projects that might jeopardize the integrity of Barksdale AFB wetlands. If the project does not contain or affect wetlands, BNR provides a statement of no impact for inclusion in project documents. Proper permits (404, nationwide, etc.) are obtained if the project encompasses or degrades wetlands. Should any projects involving wetlands be proposed, compliance with the Clean Water Act (Public Law 95-217, as amended) will be accomplished as part of the EIAP process performed for compliance with the National Environmental Policy Act (NEPA). The Wetlands Delineation *map* for Barksdale AFB is located in the below.

2.3.6 Other Natural Resource Information

Native flora identified as state-rare by the TNC survey

Texas aster (*Aster drummondii var. texanus*), Atlantic camas (*Camassia scilloides*), hyaline caric sedge (*Carex hyaline*), caric sedge (*C. meadii*), stiff tickseed (Coreopsis palmate), white trout lily (*Erythronium albidum*), large whorled pogonia (*Isotria verticillata*), junegrass (*Koeleria macrantha*), pale umbrella-wort

(*Mirabilis albida*), American pinesap (*Monotropa hypopithys*), celestial lily (*Nemastylis geminiflora*), starry campion (*Silene stellata*), meadowrue (*Thalictrum revolutum*) and three-birds orchid *(Triphora trianthophora*). Areas of rare/uncommon plants, forested seeps, prairies, and streamside management zones shall be protected. As of the date of this INRMP, no federally threatened or endangered plants have been observed on Barksdale AFB. If any populations are identified, disturbance to the immediate area will be avoided to the extent practical. If avoidance is not possible, then discussions with the state will take place to develop an approach to documentation or relocation of the population.

Exemplary Natural Areas

Although most of the vegetation structure and composition at Barksdale AFB has been altered over the last 150 years since presettlement times, several ecologically significant natural areas remain on base. At least 11 sites possess high-quality natural communities and are considered worthy of exemplary natural area designation (TNC 1997). These areas, shown in the figure Natural Areas**,** most closely resemble the best estimate of the structure and composition of presettlement (early 1800s) plant communities. Other criteria used to assess natural areas include biotic diversity of the site, presence of stenotypic (narrow ecological niche) native species, absence of exotics, time since last significant perturbation, extent of habitat, and potential recovery from unnatural disturbance. This does not mean that other areas not specifically designated here as natural areas are of no ecological value, but that they are considered to deviate significantly from presettlement conditions. A description of the 11 Exemplary Natural Areas is provided in the table Description of Exemplary Natural Areas of Barksdale AFB**.**

At the time of this document, Barksdale AFB is currently considering locating a school in the Austin Pond Natural Area. Should the school location be located in this area, this action will be noted in future INRMP's.

Louisiana Wildlife Action Plan

Barksdale AFB shares, with LDWF, the interest in protecting and managing Louisiana's wildlife and supports the goals of the Comprehensive Wildlife Conservation Strategy (CWCS) or Louisiana Wildlife Action Plan. Details of the Louisiana Wildlife Action Plan are found at: http://www.wlf.louisiana.gov/wildlife/wildlife-action-plan. LDWF's strategic plan lists several goals relative to the threats posed to non-game fish and wildlife species. Some of the objectives in reaching these goals include:

- Developing plans for the recovery of five rare, threatened, or endangered species (RTE) and for the management of other non-game species. Strategies for accomplishing this objective include conducting biological surveys, concentrating on populations and ranges of RTEs and native plants, and determining management options for identified species.

- Development of recovery plans for all species of threatened and endangered fish. Strategies for accomplishing this objective include the development of a list of threatened and endangered fish species in Louisiana, gathering information on historical accounts of RTE species, and the development of recovery plans for RTE species.

The State Wildlife Grants (SWG) Program is used to support research and status surveys for species of concern and the habitats that support them. Two of Barksdale AFB's natural areas are a focus of study. Fire tower Seep Natural Area and Morse Clay calcareous prairies found within Escarpment Natural Area are cited in the Louisiana Wildlife Action Plan. The LDWF proposal to study Morse Clay prairies was approved by the SWG committee and the USFWS. Ecological consultants conducted a status survey of the habitat in Louisiana, and a detailed inventory of the prairie at Barksdale AFB. As of the date of this INRMP,

monitoring has not observed any rare, threatened, or endangered species on Barksdale. NRO will continue to monitor for the existence of such species and if located will work with LDWF to develop a feasible plan where practical

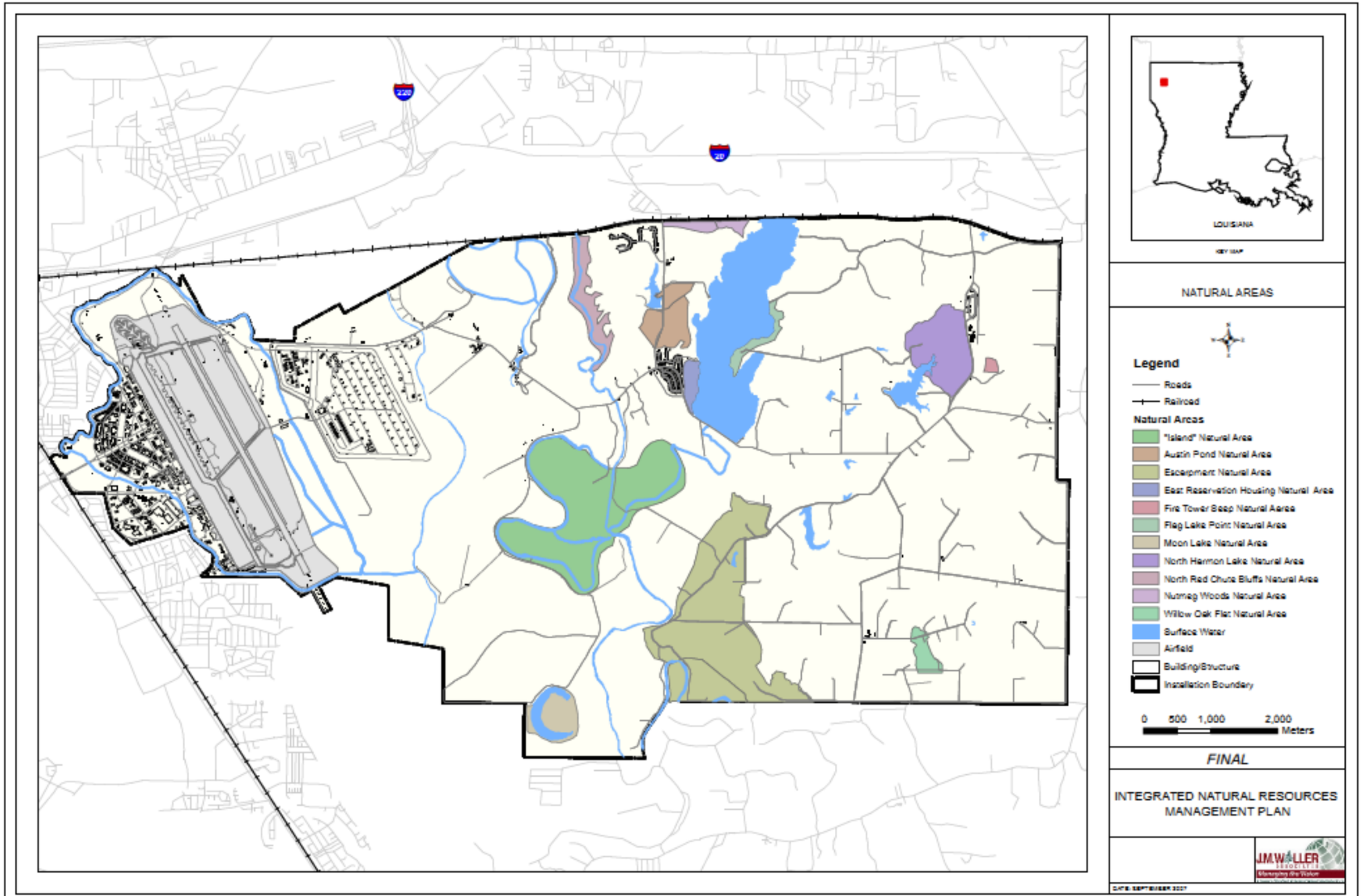

Figure 8. Natural Areas

Description of Exemplary Natural Areas at Barksdale AFB

Natural Area (NA)	Acres	Description
Escarpment NA	828	A mosaic of calcareous prairies and forests on the eastern escarpment of the Red River Floodplain. The site contains some of the most dissected topography on the base, with steep ravines and bluffs along the western boundary of the area, providing scenic vistas of Red Chute Bayou and surrounding bottomland hardwood forest. The Escarpment NA is actually a part of the interior pine flatwoods region of the base, with the eastern portion of the natural area relatively flat. The primary portion of the natural area contains about 700 acres, of which approximately 60 acres are small prairie openings. An additional secondary portion of the site contains about 128 acres of quality bottomland hardwood forest.
North Harmon Lake NA	220	This natural area is mature upland shortleaf pine-oak-hickory forest on the ridges and upper side slopes, and mixed hardwood-loblolly pine natural community along lower slopes and tributaries. The area, with its steep slopes and dissected topography, forms the upper watershed for Harmon Lake. The North Harmon Lake NA is biologically important because it contains one of the best remaining West Gulf Coastal Plain upland shortleaf pine/oak - hickory forests remaining in Louisiana.
Austin Pond NA	115	A mosaic of prairies and calcareous forest south and east of Austin Pond, the Austin Pond Natural Area contains small linear prairie openings (area 3-A). A mildly to moderately calcareous forest also occurs east of Bodcau Road (area 3-B), just north of the East Reservation housing complex.
Nutmeg Woods NA	40	A wet-mesic calcareous forest along the northern boundary of the base, west of Flag Lake, the site is named for the numerous nutmeg hickories (uncommon in Louisiana) scattered throughout the area and contains the highest quality wet-mesic calcareous forest found at Barksdale.
Island NA	837	An extensive bottomland hardwood forest within the floodplain of the meandering channels of Red Chute and Fifi Bayous. As indicated on an old (circa 1938) aerial photograph of Barksdale, much of the area was formerly cleared for agriculture except for the wettest sloughs and swales. The Island Natural Area contains numerous wet swales and sloughs that remained forested during this time.
Flag Lake Point NA	45	This peninsula-like area is a high quality example of a relatively undisturbed mixed hardwood - loblolly pine forest on rich mesic slopes leading to Flag Lake.
North Red Chute Bluffs NA	121	The North Red Chute Bluffs NA is a relatively narrow band of steep slopes on a small escarpment adjacent to and east of Red Chute Bayou. The site is a composite of mixed hardwood - loblolly pine forest and moderately calcareous forest with a narrow zone of bottomland hardwood forest adjacent to Red Chute and small tributaries near Red Chute.

Natural Area (NA)	Acres	Description
Willow Oak NA	45	This site contains a relatively undisturbed flatwood depression forest natural community. This community is found in depressional areas within the pine-oak/hickory flatwoods, a broad, flat upland region on ancient Red River terraces in the southeast portion of Barksdale AFB.
Moon Lake NA	110	The Moon Lake NA is a good representative of bottomland hardwood forest in the historic Red River floodplain. The "half-moon" shaped lake is an old oxbow of Red Chute Bayou, and is surrounded by a natural levee, with bottomland forest in ridge and swale topography in the central portion of the area encompassed by the lake.
Firetower Seep NA	7	This site is present along a small ravine just northeast of the Lookout Tower. The forested seep consists of a series of small, clear seepage pools that "stair-step" downstream along the drainage area. The pools have developed as a result of water seeping from the adjacent sandy substrate due to the presence of an impermeable substrate below, presumably ironstone.
East Reservation Housing NA	32	This site is in a topographically diverse area adjacent to the west side of Flag Lake, just south of the East Reservation housing complex. As the name implies, this site is adjacent to the East Reservation Housing area and provides an important natural park-like buffer for this urban region.

Barksdale AFB Natural Resources Studies

BAFB STUDY	*AUTHOR(S)*	*DATE*
A Vegetative Survey of Barksdale Air Base	Pam Balogh	1976
Effects of Winter and Spring Flooding on Understory Vegetation at Barksdale Air Force	Louisiana Tech University	1980
Base Soil Survey of the forested part of Barksdale Air Force Base	Natural Resources Conservation Service (NRCS)	1990
Resource Inventory of Barksdale Air Force Base East Reservation	NRCS	1993
National Wetlands Inventory, Mapping Report for Barksdale Air Force Base	USFWS GEONEX	1994
Wetland Delineations of the Cantonment Area, Flightline, and Forested Portion of Barksdale Air Force Base, Louisiana	USACE GEO-MARINE	1995
An Inventory of Fishes and their Reproduction in the Managed Red Chute Bayou Wetlands, Barksdale Air force Base, Louisiana	Northeast Louisiana University	1995
Barksdale Air Force Base Forest Inventory, Wetland Restoration – Growth Study Area	USFWS	1995
Contaminant Survey of the Barksdale Air Force Base	USFWS	1996
Survey of Lepidoptera and Other Selected Insects at Barksdale Air Force Base	Mississippi State University	1996
Threatened and Endangered Species – Natural Areas Survey, Barksdale Air Force Base	TNC	1997
An Ecological Assessment of Shortleaf Pine- Oak-Hickory Forests of Barksdale Air Force Base	TNC	1998
Urban Forest Management Plan / Inventory	Davey Resource Group and World Tree	1999
Natural Resources Geographic Information System, Barksdale Air Force Base	USACE GEO-MARINE	1999
Comparative Use of Nest Boxes and Man-Made Cavities with a Face Plate	Louisiana State University	1999
Habitat Influences on Non-Game Bird Nest Success in a Managed and Fragmented Southern Pine Forest	Louisiana State University	2000
Assessment of the Bottomland Hardwood Forest Resource, Barksdale	Stephen F. Austin State University	2004
Bottomland Silviculture Techniques for Future Hardwood Management Practices	U.S. Forest Service – Southern Hardwoods Lab	2002 - Present
Urban Forest Sustainability Plan, Barksdale AFB	C-K Associates	2004
Natural Resources Liability and Asset Management (NRLAM) Strategy for Barksdale AFB	CH2M Hill	2004
Jurisdictional Wetland Delineation of Barksdale Air Force Base East Reservation	Stephen F. Austin State University	2005
White-tailed Deer Habitat Use, Movements, and Reproduction at Barksdale Air Force Base, Louisiana	Stephen F. Austin State University	2012

2.4 Mission Impacts on Natural Resources

2.4.1 Natural Resource Constraints to Mission and Mission Planning

Natural resources constraints to missions and mission planning on Barksdale AFB are listed below.

Natural Resources Constraints to Barksdale AFB Missions

Constraints	Planning and Mission Restriction
Wildlife/Threatened and Endangered Species	Protect/maintain bald eagle habitat
Wetlands	Protect
Floodplains	No construction in the 100 YR Floodplain
Exemplary Natural Areas	Protect unique natural communities
Oil/gas development and production	Physical-loss of available training lands

The east reservation provides a large land base should Barksdale AFB require expansion for mission needs. Constraints to this expansion consist of threatened species, land conditions, and oil and gas leases. The guidelines in the National Bald Eagle Management Guidelines include restriction of certain activities and construction depending on distance to bald eagle nests, foraging areas, communal roost sites and time of year. Therefore, development could potentially be limited within the vicinity of bald eagles. No land clearing or construction is anticipated to occur within the recommended buffer zones. The INRMP and all other activities at BAFB will adhere to management guidelines to avoid or minimize impacts to bald eagles. Water, wetlands, floodplains, poor soils, and terrain are the most significant constraint to future development. They contain a larger area, most of which overlaps important plant and wildlife habitat.

Eleven exemplary natural areas on 2,453 acres are described Other Natural Resource Information**.** Barksdale AFB will protect the unique natural communities. Management guidelines for TNC-identified exemplary natural areas are as follows:

- In general, exemplary natural areas will be excluded from the standard timber production land base. Any timber removal would be for the purpose of restoring natural community composition and structure, with exceptional care taken to minimize disturbance.
- Re-establish, as much as possible, the natural processes that historically occurred on the pre-settlement landscape, such as natural fire and hydrologic regimes.
- Use existing firebreaks such as roads or streams when possible to minimize the use of plowed or disked firebreaks.
- Mechanical disturbances that may unnaturally disrupt the vegetative/soil surface layer, including disking, plowing, food plot establishment, and all-terrain vehicles (ATVs) will be prevented or minimized as much as possible, except when needed for management purposes.
- No new roads, including access roads for logging adjacent general forest areas, will be constructed within the boundaries of a natural area except for critical management needs.
- All new mineral exploration and removal will be strongly discouraged.
- Placement of transmission lines, pipelines, or other rights-of-way, including seismic exploration lines, are to be strongly discouraged in natural areas.

- If beaver populations reach a level considered significantly damaging to the natural area, trapping and removal will be conducted.
- Placement of trails through natural areas may be conducted after careful consideration.
- Hunting is allowed in exemplary areas, including the use of deer stands, because these activities do not significantly disturb these areas.
- To minimize erosion, impact to rare plant populations, and other concerns. Horseback and mountain bike riding will be restricted to trails.

A major constraint to future development and mission expansion is the increased natural gas drilling and oilfield operations on the east reservation as shown in the figure 9 (*Major Constraints to Missions)*. In 2004 there were 135 gas wells on Barksdale, and by 2009 there were 264 active wells. Between 2010 and 2011 seven wells were plugged and abandoned leaving the current well count at 257 active wells. A major impact of oilfield development is a reduction of diverse vegetative cover and fragmentation of large land areas that are required for training realism. From 2000 to 2009 approximately 300 acres were lost to oilfield development. Currently the total surface acreage impacted by oil and gas lease development is approximately 1,100 acres. Other impacts include wildlife habitat loss, changes to land drainage patterns, soil compaction/erosion, and increased noise/air pollution. Continued oilfield development has the potential to reduce available military training lands. Locations selected for well sites and oilfield infrastructure will be planned to minimize long-term disruption of the surface resources and existing uses, and to promote successful reclamation. Additional information on oilfield development is in Section 2.4.2, Land Use.

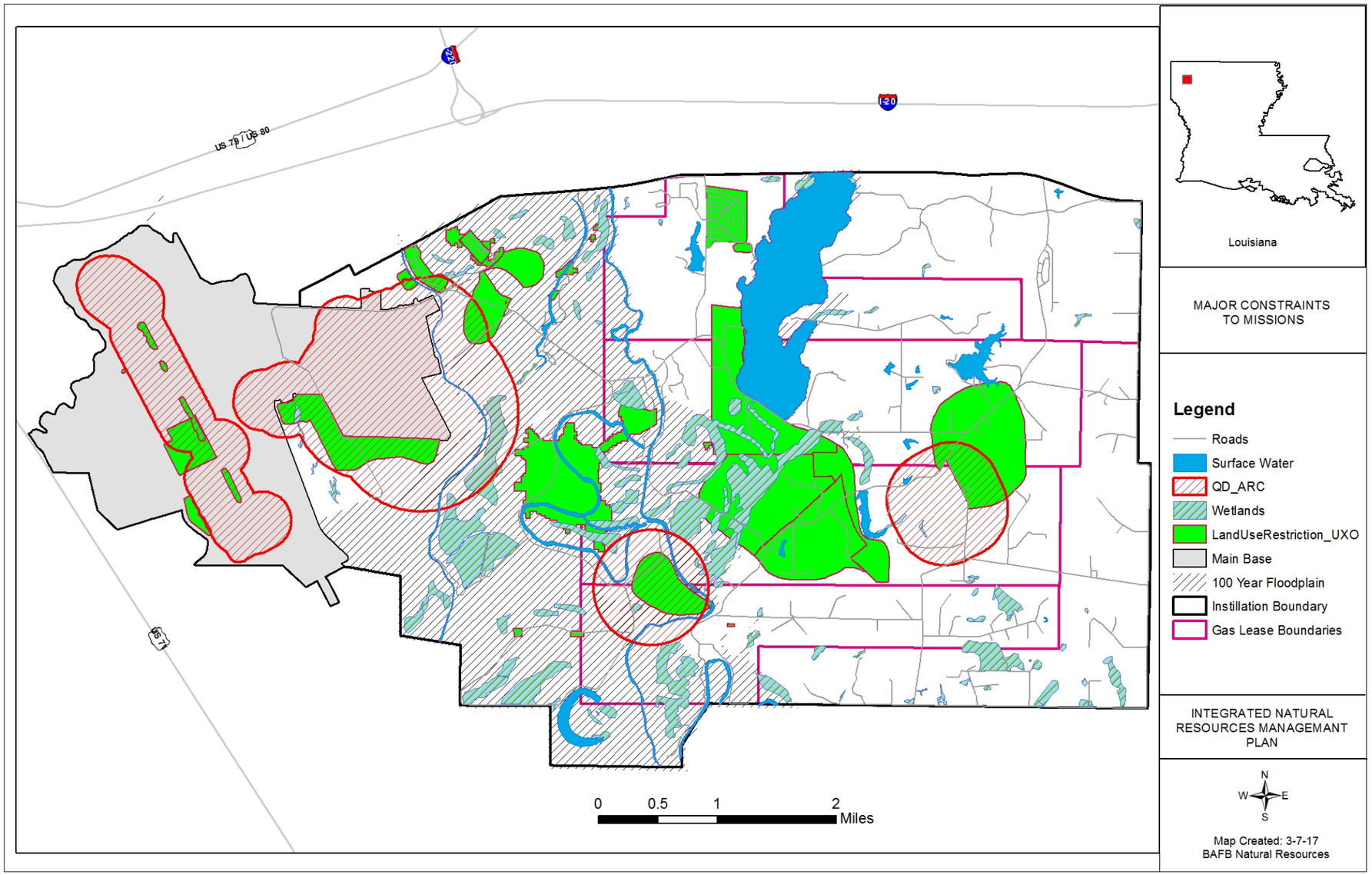

Figure 9. Major Constraints to Missions

2.4.2 Land Use

Barksdale East encompasses approximately 1,921 acres between the airfield runway and Flat River containing mostly industrial uses and some administrative uses (e.g., Weapons Storage Area (WSA), Leadership School, DET 1 307th Red Horse Civil Engineer Squadron, and Navy ROIC Construction). The east reservation contains approximately 17,896 acres including the area east of Cooper Bayou not including Barksdale East.

The east reservation contains several industrial and administrative areas, community facilities, Liberty Heights and Heritage Heights housing areas, Cullen and Clear Lake Parks, and oil/gas leases. Approximately 16,000 acres of the east reservation are forested lands and approximately 2,000 acres is water, to include wetlands. Land uses at Barksdale AFB are divided into 12 functional classes, as represented below in the table **(**Table 4c1 Excerpted from the Barksdale AFB General Plan 2007). AFI 32-7062 establishes and defines these categories and the principal uses allowed in each specific category. Land use categories and corresponding development criteria are defined and described below.

Land Use Categories at Barksdale AFB

AREA			
Category	**Acres**	**Percent**	**Principal Permitted Uses**
Airfield	1,525	7.0	Runway, taxiway, apron, arm/disarm pad, various navigational and air traffic control facilities
Aircraft Operations and Maintenance	97	0.4	Aircraft hanger, aircraft organizational maintenance, maintenance control, AGE shop maintenance, base operations, crew readiness, passenger terminal, radar/aircraft guidance systems, primary radar station facilities
Industrial	901	4.1	Base supply warehouse, vehicle maintenance and operations, Civil Engineering maintenance and storage, fuel storage, POL operations, fire station, fire training, electrical substations
Administrative	141	0.6	Education center, Wing/Group/Headquarters, Eighth Air Force, command post, civilian personnel, supply administration, civil engineering administration, communication center
Community (Commercial)	97	0.4	Commissary, cold storage, AAFES facilities, open mess facilities, gymnasium, theater, bowling center, recreation center, arts-crafts and auto hobby shop, youth center
Community (Services)	13	0.1	Post office, library, chapel, education center, credit union, American Red Cross
Medical	16	0.1	Hospital, dental clinic, area clinics
Housing, Accompanied	220	1.0	MFH units, Capehart area housing
Housing, Unaccompanied	26	0.1	VOQ, VAQ, BAQ, dormitories, transient facilities
Outdoor Recreation	142	0.6	Softball fields, tennis courts, football field, MWRSS supply/storage, parks/picnic areas, FamCamp, pools
Open Space	16,450	75.0	Conservation areas, forest stands, safety clearance, security areas, utility easements
Water	2,317	11.0	Ponds, lakes, streams, wetlands
Total	**21,945**	**100.0**	
Source: Barksdale Air Force Base GeoBase Files			

For purposes of this INRMP, land use categories can be divided into improved, semi-improved, and unimproved areas. Improved areas (approximately 1,551 acres) are high visibility areas that require intensive and continued maintenance including mowing, irrigation and landscaping (e.g., land located around offices and residential buildings). Land use categories that are usually associated with improved grounds are: Housing (Accompanied), Housing (Unaccompanied), Community (Commercial), Community (Services), Medical, Administrative, and WSA. Outdoor recreation and selected open space areas may be improved (heavily landscaped open areas including golf courses, parks, playgrounds and athletic fields).

Semi-improved areas (approximately 1,870 acres) are those that require infrequent or unscheduled mowing and maintenance and little or no irrigation. Land use categories that are usually associated with semi-improved grounds are: outdoor recreation (unimproved parks and picnic areas, open fields), light industrial, aircraft operations and maintenance and airfield. Unimproved areas (approximately 18,524 acres) do not require mowing maintenance. Maintenance by grounds maintenance contractors includes occasional brush control.

Land use categories that are usually associated with unimproved grounds are open space, such as roads, forests, wetlands and other surface water.

Recent Oilfield Development

There are currently 257 active wells on the east reservation, many of which are on multi-well pads. Natural gas wells account for about 98% of all wells. The BLM Jackson Field Office has oversight responsibilities for minerals production on Barksdale AFB. The BLM prepares NEPA documentation prior to approval of an application for permit to drill (APD) or notices that would result in new or additional surface disturbance incorporating conditions of approval from Barksdale AFB (Table 7-2). Barksdale AFB is identified as a Cooperating Agency, as defined under NEPA regulations. Barksdale should be identified as a Cooperating Agency on BLM EA's (required for applications to drill). EA's related to mineral development should show Barksdale as a Cooperating Agency. Surface management issues are managed jointly by the BLM and BNR personnel. The petroleum lessees are responsible for following construction, maintenance, and environmental regulations. The location of each proposed well or well road, storage area, pipeline, or other installation, is subject to Base Commander approval prior to commencement of drilling operations or construction. Prior to 2004, the number of active wells on Barksdale AFB totaled approximately 100 wells (reference Section 6.5). In October 2006, the number of active wells exceeded 190 wells and surpassed 260 wells by early 2009. With decreased revenue from lower gas prices and less productivity due to reduced gas reserves many wells have been shut in. Currently 20 percent of the wells on Barksdale are shut in and not producing. However, with several new lease operators and improved natural gas prices, there is a renewed interest in drilling on base. In order to accurately assess cumulative impacts related to oilfield development, a Reasonable Foreseeable Development (RFD) Scenario must be completed for Barksdale AFB. Once an RFD is completed, a comprehensive EA or EIS (if required by NEPA) will be necessary to adequately address cumulative impacts and potential mitigation measures. The AF believes primary responsibility should be jointly shared by AF/BLM or solely AF. Since lease inception, numerous federal environmental laws and regulations have been implemented giving the Base Commander's major compliance responsibilities to sustain the military mission, while providing realistic, high quality training lands and preventing encroachment. Barksdale AFB requires large parcels of land for jettison areas, future infrastructure development areas, explosive ordnance requirements, survival training and combat training areas. The most significant surface impacts caused by oil and gas lease activities are forest fragmentation, short and long term wildlife habitat loss, and impacts resulting in a net loss in the capability of military installation lands to support the military mission.

Oilfield Development Responsibilities

Agency/Personnel	Responsibility
2 BW/CC	Final approving authority for oilfield development on Barksdale AFB to include surface locations, infrastructure, surface management and environmental requirements
2 CES/CEI	Surface land management responsibilities, review of drilling and production facility proposals, NEPA compliance
2 BW/JA	Legal review
BLM	Oversight of leases and production activities, NEPA compliance
Lessees	Meet BLM and AF requirements as regards operations and environmental protection

Selected surface locations for proposed well sites will be approved in a manner such that these surface impacts will be minimized. Additional criteria including, but not limited to proximity to wetlands, environmentally sensitive or natural areas, encroachment on recreation areas, and other site specific factors will influence approval of proposed surface locations.

Payments for both timber loss and wildlife habitat loss will be determined on a per acre basis. Methodology for calculating payment amount is based on Natural Resource Liability and Assessment Management (NRLAM) values for wildlife and recreation uses and current timber markets. If wells are still producing after the estimated time used for loss calculations, the site may be re-assessed for an additional time period.

Directional drilling is encouraged by Barksdale AFB, where multiple wells can be drilled from the same surface location to minimize surface impacts. To date, directional drilling technology has successfully been used on Barksdale AFB to drill wells with bottom hole locations greater than 1,700 feet from the surface location or down hole. The BLM agrees to prepare NEPA documentation prior to approval of the APD or notices that would result in a new or additional surface disturbance incorporating conditions of approval from the base. Barksdale AFB is a cooperating agency in the NEPA process. A Memorandum of Understanding (MOU) between the BLM and Barksdale AFB, signed in 2007 governs the mutual responsibilities of both agencies. Conditions of Approval (COA) required by Barksdale AFB are provided to the BLM and lessees on oil and gas drilling and related development activities. Figure 10 shows some limitations to oil field development.

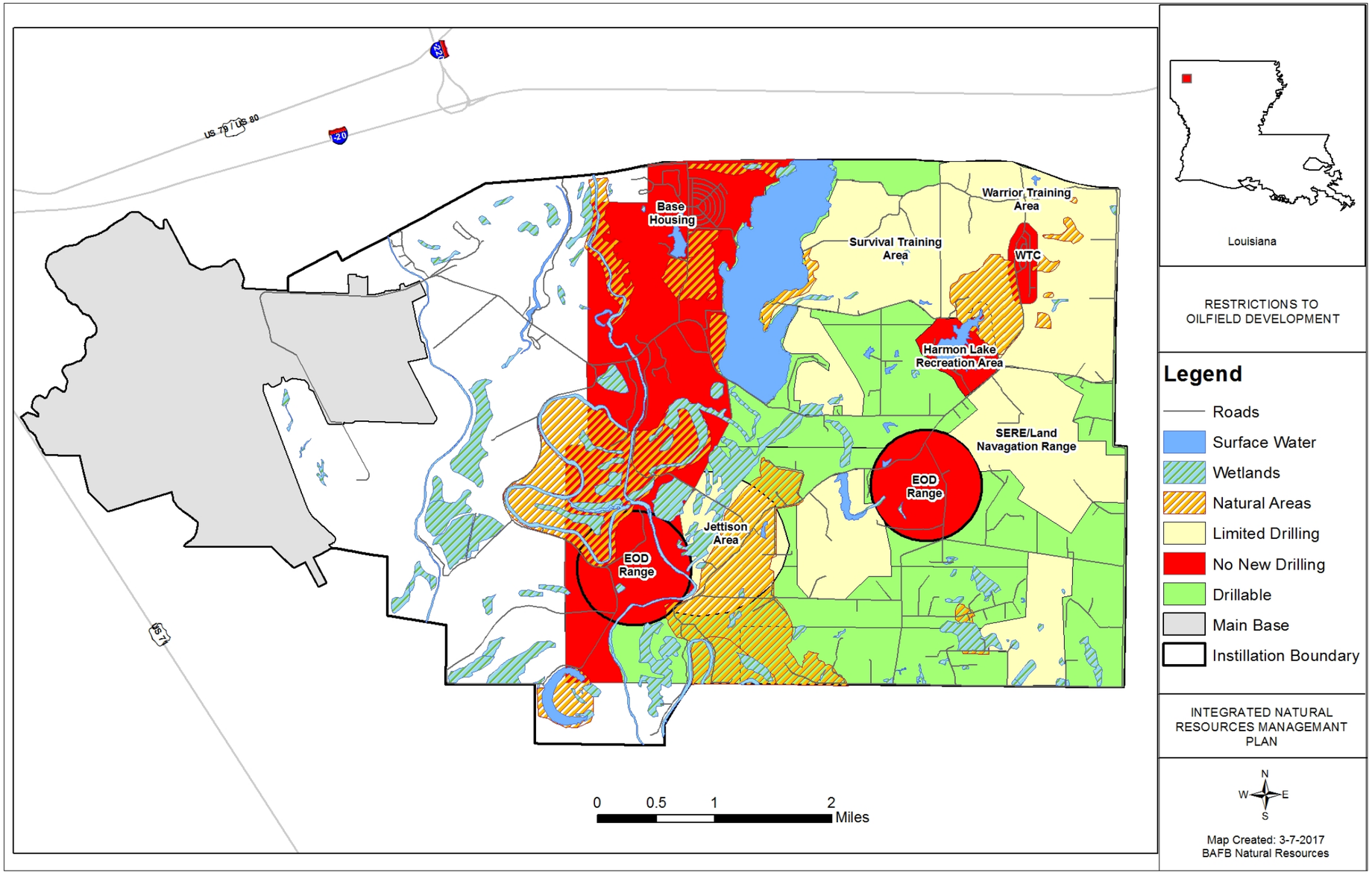

Figure 10. Restrictions to Oilfield Development

The COA document lists security, environmental protection and mitigation requirements for proposed oilfield projects. With regard to oil and gas development on the east reservation (reference - Surface Operating Standards for Oil and Gas Development "Gold Book"), the lessees must comply with all COA requirements including the following:

1. Locations selected for well sites and oilfield infrastructure will be planned so as to minimize long-term disruption of the surface resources and existing uses, and to promote successful reclamation. In addition, design and construction techniques and other practices will be employed that will minimize surface disturbance and the associated effects of proposed operations and maintain the reclamation potential of the site.
2. During well pad construction, all surface soil materials (topsoil) will be removed from the entire cut and fill area and temporarily stockpiled for reuse during interim and final reclamation. Topsoil will be segregated and stored separately from subsurface materials to avoid mixing during construction, storage, and interim reclamation. Subsurface materials will not be placed on top of topsoil material at any point in the operation. Stockpiles will be located and protected so that erosion is minimized and reclamation potential is maximized.
3. Reserve pits will not be constructed in natural watercourses. Watercourses include lake beds, gullies, draws, streambeds, washes, or channels that are delineated on a 1:24,000 U.S. Geological Survey (USGS) quadrangle map or have a hydrologic connection to streams, rivers, or lakes. The Grantee will avoid constructing reserve pits in areas of shallow groundwater.
4. Reserve pits shall be designed to contain all anticipated drilling muds, cuttings, fracture fluids, and precipitation while maintaining at least two feet of freeboard. Pits may be lined with synthetic liners or other materials such as bentonite or clay.
5. To prevent contamination of ground water and soils or to conserve water, the Grantee shall use a closed-loop drilling system or line reserve pits with an impermeable liner, when it is anticipated that pits will contain moderate or high levels of hydrocarbons and chloride, or pits are located in areas of shallow groundwater or porous soils over fractured bedrock aquifers.
6. Depending on the proposed contents of the pit and sensitivity of the environment, the Grantor may require a leak detection system or the use of self-contained mud systems with the drilling fluids, mud, and cuttings being transported to approved disposal areas.
7. Reclamation is required of any surface previously disturbed that is not necessary for continued production operations. Earthwork for interim and final reclamation generally must be completed within six months of well completion or plugging (weather permitting). Reclamation measures will begin as soon as possible after the disturbance and continue until successful reclamation is achieved.
8. During the life of the development, all disturbed areas not needed for active support of production operations shall undergo interim reclamation in order to minimize the environmental impacts of development on other resources and uses. At final abandonment, well locations, production facilities, and access roads must undergo final reclamation so that the character and productivity of the land and water are restored.
9. Interim reclamation consists of minimizing the footprint of disturbance by reclaiming all portions of the well site not needed for production operations. The portions of the cleared well site not needed for operational and safety purposes are recontoured to a final or intermediate contour that blends with the surrounding topography as much as possible. Sufficient level area remains for setup of a workover rig and to park equipment. In some cases, rig anchors may need to be pulled and reset after recontouring to allow for maximum reclamation. Topsoil is respread over areas not needed for all-weather operations. When practical, the operator will respread topsoil over the entire location and revegetate to within a few feet of the production facilities, unless an all-weather, surfaced, access route or turnaround is needed.

10. To achieve final reclamation of a recently drilled dry hole, the well site must be recontoured to original contour or a contour that blends with the surrounding landform, stockpiled topsoil redistributed, and the site revegetated. To achieve final reclamation of a formerly producing well, all topsoil and vegetation must be restripped from all portions of the old well site that were not previously reshaped to blend with the surrounding contour. All disturbed areas are then recontoured back to the original contour or a contour that blends with the surrounding landform, topsoil is redistributed, and the site revegetated. In recontouring areas that have been surfaced with gravel, soil cement, or similar materials, the material must be removed from the well location.
11. Salvaged topsoil must be respread evenly over the surfaces to be revegetated. The topsoiled site will be prepared to provide a seedbed for reestablishment of desirable vegetation. Site preparation will include ripping, scarifying, dozer track-walking, mulching, fertilizing, seeding, and planting.
12. The operator must achieve the short-term stability, visual, hydrological, and productivity objectives of the surface management agency and take the steps necessary to ensure that long-term objectives will be reached through natural processes.
13. At abandonment, oilfield access roads must be reclaimed by the Grantee unless requested otherwise by the Grantor. Final reclamation will include removal of road base and surface materials, recontouring the road back to the original contour, seeding, controlling noxious weeds, and other techniques to improve reclamation success, such as ripping, scarifying, replacing topsoil, placing water bars, mulching, redistributing woody debris, and barricading.
14. Reclamation will be judged successful when a self-sustaining, vigorous, diverse, native (or otherwise approved) plant community is established on the site, with a density sufficient to control erosion and non-native plant invasion and to re-establish wildlife habitat or forage production. The site must be free of State- or county-listed noxious weeds, oil field debris, contaminated soil, and equipment.
15. Other facilities and areas of surface disturbance associated with Federal oil and gas lease development, including water impoundments, power lines, metering buildings, gathering lines, compression facilities, and tank batteries must be removed and reclaimed in accordance with the standards identified previously.

2.4.3 Current Major Impacts

Mission impacts affect natural resources on Barksdale AFB. Air pollution sources are located in an area that is designated as in attainment for criteria pollutants. The base is classified as a minor source of air pollutants; therefore, no special regulatory restrictions are required. There are 74 permitted air pollution sources and 10 permitted storm water discharges. The base is responsible for minimizing the quantity of materials exposed to storm water discharge pollutants by implementing the Storm Water Pollution Prevention Plan.

Barksdale AFB has to deal with sources of noise pollution such as aircraft, machinery, etc. To manage the effects of these noise sources, the base maintains the Air Installation Compatible Use Zone (AICUZ) program to assist local, regional, state, and federal officials in protecting and promoting public health, safety and welfare while at the same time protecting the Barksdale AFB flying mission. The AICUZ area stretches north, south and east of the runway across much of Bossier Parish. The basic objective of the AICUZ program is to achieve compatible land uses of public and private land in the vicinity of Barksdale AFB by controlling incompatible development through local actions.

Barksdale AFB currently has no on-going problems with hazardous waste. Hazardous waste generated at the installation includes paint related materials, parts washer waste, waste paint, batteries, and spent solvents. There is one (less than 90 day) storage facility located at Building 5951, where all hazardous

waste is stored before disposal off base at an approved facility. Much of the hazardous waste has been placed on continued use or recycled programs for pollution prevention, i.e., spent solvents, batteries, anti-freeze, bead blast media used in painting operations. Personnel at the flightline fire station and all satellite accumulation points maintain spill cleanup readiness. A hazardous materials pharmacy or HAZMART has been established that tracks and controls ordering, storage, and distribution of all hazardous materials used on Barksdale AFB.

Non-hazardous solid waste is collected by contract and disposed of off base. There are no landfills in operation on base. The Environmental Function is in charge of the base-recycling program. There are recycle containers located throughout the base which the recycle contractor empties on a regular basis. There is no separation of recyclable items, all items are commingled. The base also operates a recycle drop off center located near the commissary. The drop off center is open 24 hours, 7 days a week and is serviced by a contractor. Items recycled include corrugated cardboard, newspaper, office paper, mixed paper, plastic beverage bottles, plastic jugs, detergent bottles, aluminum cans, magazines, telephone books, catalogs, steel food cans, and mail. Privatized on base housing operates a curbside recycling program.

The top of the Red River alluvial aquifer ranges from 10 to 60 feet below the ground surface. Water levels within the alluvial aquifer are responsive to adjacent surface water bodies. Some recharge occurs from the underlying Wilcox-Carrizo Aquifer, but most is derived from the infiltration of precipitation and local streams. Discharge occurs by natural processes into nearby surface water bodies, with regional groundwater flowing toward the Red River south and west of the Main Base area. Construction has therefore been limited to land areas above 160 feet in elevation to assure no groundwater will be contaminated.

Since 1986, 139 sites have been identified under the Environmental Restoration Program (ERP) throughout the base. 64 sites are currently under investigation or have long term remediation requirements, with 19 of these sites located on the Barksdale East Reservation. Four East Reservation sites, OW080 Red Horse Wash Rack Oil Water Separator Building 7284, and Underground Storage Tank sites TU502 Building 7251, TU503 Building 7835, and TU527 Building 7312 are currently undergoing soil and groundwater investigation.

Land Use Controls (LUCs) designed to be protective of human health and safety, and the environment, have been implemented at 13 East Reservation sites that were used during the 1930s through 1950s for munitions training. The LUCs include physical controls, such as fences and warning signs, and administrative measures including requirements for Unexploded Ordnance (UXO) recognition and disposal support for MILCON projects, UXO Safety and Awareness flyers and education programs, identification of munitions areas in GIS databases, and notation in the Installation Development Plan. These control measures are inspected and reviewed each year, and the review is documented in a LUC Inspection and Maintenance Report.

Barksdale has 3 former sanitary waste landfills on the East Reservation that were operated between the 1950s and late 1980s. These landfills also have LUCs including fences and gates to control access and restrictions on development. A list of all ERP sites with long term LUCs is provided below.

Site ID	Site Name	Site Type	Primary LUC Types
LF003	Landfill No. 2 and No. 3	Landfills	Boundary fence
LF004	Landfill No. 4	Landfills	Boundary fence
MU055	Remainder of East Reservation	Munitions	Warning signs
MU056	Western Bomb Target	Munitions	Warning signs
XU559	Flat River South Range	Munitions	Warning signs
XU560	Musselshell Bayou Range	Munitions	Warning signs
XU562	Flag Lake Range	Munitions	Warning signs
XU562a	Flag Lake Range Horse Stable Area	Munitions	Warning signs
XU562c	Flag Lake Water Range	Munitions	Warning signs
XU562d	Flag Lake Range Housing Area	Munitions	Administrative
XU563	Fifi Bayou Range	Munitions	Warning signs
XU564	Bluff Bridge Range	Munitions	Warning signs
XU565	Harmon Lake Range Center Target Area	Munitions	Warning signs
XU565a	Harmon Lake Range Target Area	Munitions	Warning signs
XU643	Red Chute Bayou Range	Munitions	Warning signs

2.4.4 Potential Future Impacts

Base infrastructure continues to expand and the east reservation has become a focal point for new development. On Barksdale East, mission growth is mostly along exiting roads and utility corridors. A five year development goal relocated the Defense Reutilization and Marketing Office (DRMO) off-base, and placed recycling, and equipment rental in the old Lake house Restaurant on the east side of main base. Since 2007, mission growth onto the east reservation included a new Explosive Ordnance Disposal range, and expanded facilities at both Famcamp and the Red Chute Shotgun Club. The Heritage Heights Housing and Liberty Heights housing areas were recently completed under the privatization initiative.

2.4.5 Natural Resources Needed to Support the Military Mission

Healthy vegetation that stabilizes the soil is the most important natural resource that supports the mission at Barksdale AFB. This allows for healthy forest cover for training as well as stable soils to train on. Utilization of grass, native landscaping shrubs and trees, forestry stands, and forested wetlands provides quality training. This vegetation should be protected to preserve soil at Barksdale AFB. The forest and aquatic habitat provide realistic training scenarios for base operations. For example, military training activities occur monthly at or adjacent to the WTC. The 2 BW, and 307th Wing, use the WTC and adjacent forested training areas for prime beef training, bivouacs, and runway repair training. SERE Training occurs in Area B (northeast quadrant of the east reservation). The 2 SFS conducts Field Training, Land Navigation, and simulated combat patrolling across the east reservation. In addition, the forest and lakes provide a mission essential ingredient to base Quality of Life initiatives by providing base personnel outdoor recreation opportunities for camping, fishing, hunting, hiking and nature study.

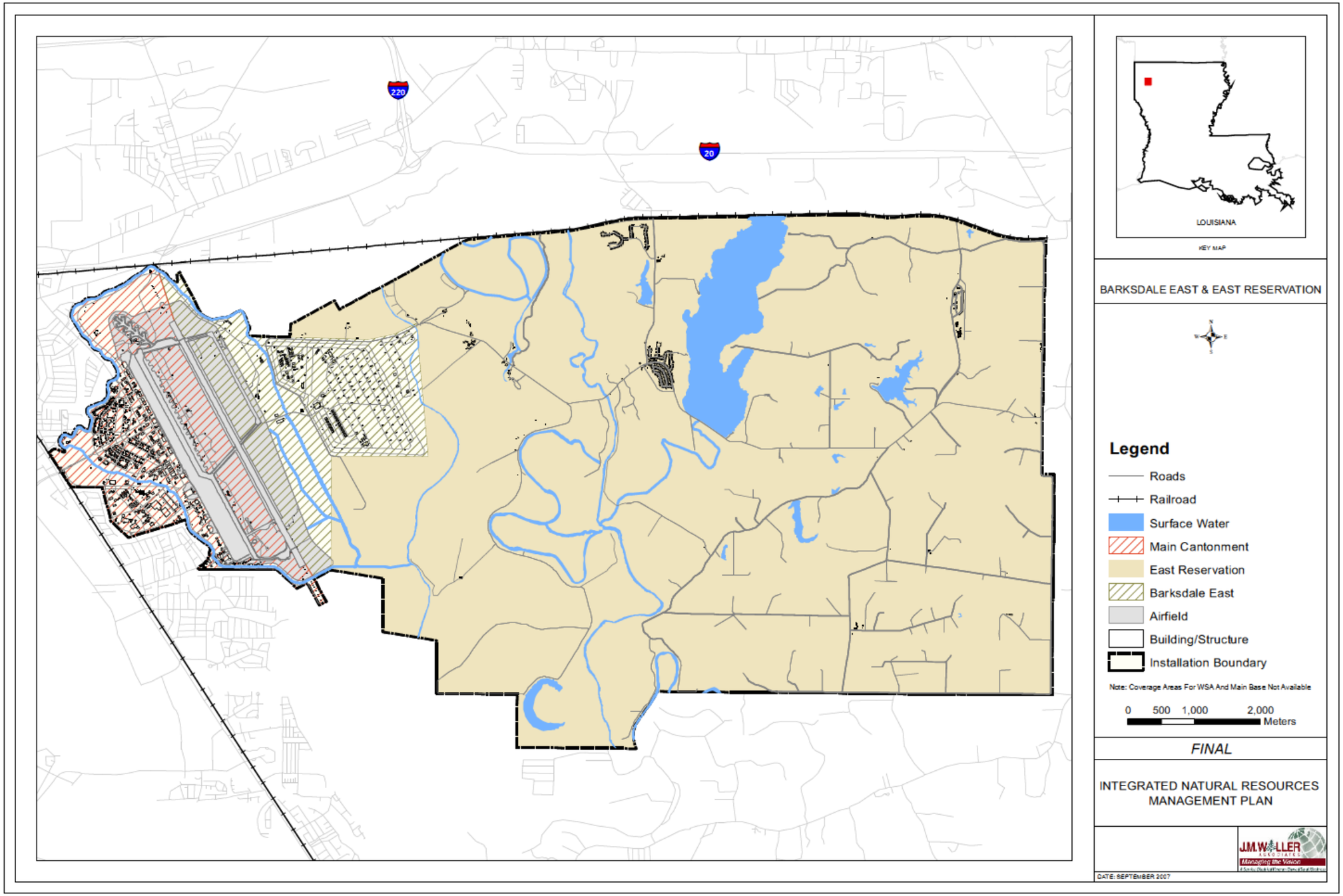

Figure 11. Barksdale East and East Reservation

3.0 ENVIRONMENTAL MANAGEMENT SYSTEM

The AF environmental program adheres to the Environmental Management System (EMS) framework and it's Plan, Do, Check, Act cycle for ensuring mission success. Executive Order (EO) 13693, *Planning for Federal Sustainability in the Next Decade*, U.S. Department of Defense Instruction (DoDI) 4715.17, *Environmental Management Systems*, AFI 32-7001, *Environmental Management*, and international standard, ISO 14001:2004, provide guidance on how environmental programs should be established, implemented, and maintained to operate under the EMS framework.

The natural resources program employs EMS-based processes to achieve compliance with all legal obligations and current policy drivers, effectively managing associated risks, and instilling a culture of continuous improvement. The INRMP serves as an administrative operational control that defines compliance-related activities and processes.

4.0 GENERAL ROLES AND RESPONSIBILITIES

General roles and responsibilities that are necessary to implement and support the natural resources program are listed in the table below. Specific natural resources management-related roles and responsibilities are described in appropriate sections of this plan.

Office/Organization/Job Title (Listing is not in order of hierarchical responsibility)	**Installation Role/Responsibility Description**
Installation Commander	Approves the INRMP and is responsible for ensuring that base-assigned and tenant units comply with the laws and requirements associated with the management of natural resources and that funding and staffing are sufficient to accomplish the projects and objectives of the INRMP.
AFCEC Natural Resources Media Manager/Subject Matter Expert (SME)/ Subject Matter Specialist (SMS)	NONE
Installation Natural Resources Manager/POC	Primary responsibility for natural resources management. The NRM is the principal point-of-contact for determining consistency of proposed actions and projects with the INRMP. Plan and direct the activities of the Natural Resources Element. Establish goals for the element that contribute to the success of Wing and Civil Engineer mission objectives. Ensure that integrated programs meet customer needs and comply with legal and regulatory requirements.
Installation Security Forces	Provides for law enforcement of natural resources regulations.
Installation Unit Environmental Coordinators (UECs); see AFI 32-7001 for role description	
Installation Wildland Fire Program Manager	Plan and direct the prescribed burning and wildfire response activities on the East Reservation. Ensure that personnel are trained and the program meets legal and regulatory requirements.
Pest Manager	
Range Operating Agency	
Conservation Law Enforcement Officer (CLEO)	N/A

Office/Organization/Job Title (Listing is not in order of hierarchical responsibility)	**Installation Role/Responsibility Description**
NEPA/Environmental Impact Analysis Process (EIAP) Manager	
National Oceanic and Atmospheric Administration (NOAA)/ National Marine Fisheries Service (NMFS)	N/A
US Forest Service	N/A
US Fish and Wildlife Service	Tripartite Cooperating Agency – Signatory to INRMP
Base Civil Engineer	Responsible for the preparation, maintenance and day-to-day implementation of the INRMP and is the focal point for all plan actions and issues. The BCE also establishes mechanisms to review and analyze the impacts using the EIAP for all proposed actions of the INRMP.
Forester	Provide management and planning for diverse, interrelated forestry program. Develop and oversee the implementation of silvicultural prescriptions and forest management plans. Prepares recommendations for budgetary requirements of equipment and materials; documents work progress and accountability of the forestry program. Protect archaeological sites. Maintain and protects forest resources in accordance with Public Law
Wildlife Biologist	Responsible for general natural resources management, fish and wildlife management including game and non-game species, conservation of neotropical migratory birds, surveys and inventories, habitat enhancement, wetland management and restoration associated primarily with wildlife management, state and federal game law compliance, endangered species compliance, and conservation education. Ensure compatibility of military and conservation activities.
Biological Science Tech	Perform work for maintenance, management and improvement of wetlands, greentree reservoirs, waterfowl refuges, surface management of oil and gas activities, wildlife food plot and other recreation activities. Conduct nuisance animal control, operate heavy equipment to excavate, backfill, grade, or level earth to rough specifications on such projects as breaking new ground for trails, roads, firebreaks, wetland projects and other sites.
Biological Science Techs/Forestry	Perform duties in support of management, protection and improvement of natural resources as they relate to activities that impact forest values and forestry.

5.0 TRAINING

AF installation NRMs/POCs and other natural resources support personnel require specific education, training and work experience to adequately perform their jobs. Section 107 of the Sikes Act requires that professionally trained personnel perform the tasks necessary to update and carry out certain actions required within this INRMP. Specific training and certification may be necessary to maintain a level of competence in relevant areas as installation needs change, or to fulfill a permitting requirement.

Installation Supplement – Training

Natural resources management training is provided to ensure that base personnel, contractors, and visitors are aware of their role in the program and the importance of their participation to its success. Training records are maintained IAW the Recordkeeping and Reporting section of this plan. Below are key NR management-related training requirements and programs:

- *NRMs at Category I installations must take the course, DoD Natural Resources Compliance, endorsed by the DoD Interservice Environmental Education Review Board and offered for all DoD Components by the Naval School, Civil Engineer Corps Officers School (CECOS). See http://www.netc.navy.mil/centers/csfe/cecos/ for CECOS course schedules and registration information. Other applicable environmental management courses are offered by the Air Force Institute of Technology (http://www.afit.edu), the National Conservation Training Center managed by the USFWS (http://www.training.fws.gov), and the Bureau of Land Management Training Center (http://training.fws.gov).*
- *Natural resource management personnel shall be encouraged to attain professional registration, certification, or licensing for their related fields, and may be allowed to attend appropriate national, regional, and state conferences and training courses.*
- *All individuals who will be enforcing fish, wildlife and natural resources laws on AF lands must receive specialized, professional training on the enforcement of fish, wildlife and natural resources in compliance with the Sikes Act. This training may be obtained by successfully completing the Land Management Police Training course at the Federal Law Enforcement Training Center (http://www.fletc.gov/).*
- *Individuals participating in hunting on base are required to attend the Barksdale Hunter Safety course prior to participating in hunting activities on base.*
- *Personnel supporting the BASH program should receive flight line drivers training, training in identification of bird species occurring on airfields, and specialized training in the use of firearms and pyrotechnics as appropriate for their expected level of involvement.*
- *The DoD supported publication Conserving Biodiversity on Military Lands -- A Handbook for Natural Resources Managers (http://dodbiodiversity.org) provides guidance, case studies and other information regarding the management of natural resources on DoD installations.*

6.0 RECORDKEEPING AND REPORTING

6.1 Recordkeeping

The installation maintains required records IAW Air Force Manual 33-363, *Management of Records*, and disposes of records IAW the Air Force Records Management System (AFRIMS) records disposition schedule (RDS). Numerous types of records must be maintained to support implementation of the natural resources program. Specific records are identified in applicable sections of this plan, in the Natural Resources Playbook and in referenced documents.

Installation Supplement – Recordkeeping

Click here to enter text.

6.2 Reporting

The installation NRM is responsible for responding to natural resources-related data calls and reporting requirements. The NRM and supporting AFCEC Media Manager and Subject Matter Specialists should refer to the Environmental Reporting Playbook for guidance on execution of data gathering, quality control/quality assurance, and report development.

Installation Supplement –Reporting

Click here to enter text.

7.0 NATURAL RESOURCES PROGRAM MANAGEMENT

This section describes the current status of the installation's natural resources management program and program areas of interest. Current management practices, including common day-to-day management practices and ongoing special initiatives, are described for each applicable program area used to manage existing resources. Program elements in this outline that do not exist on the installation are identified as not applicable and include a justification, as necessary.

Installation Supplement –Natural Resources Program Management

Specific responsibilities of the 2 BW are outlined in ***Roles and Responsibilities***. However, responsibility for implementing the INRMP is a combined effort of many parties. Federal and state agencies involved in implementing the INRMP are as follows:

- BLM & Louisiana Department of Environmental Quality (LDEQ) oversee oil/gas production
- USACE & EPA provide wetlands expertise
- LDWF & USFWS assist with wildlife management
- NRCS provides expertise in natural resource conservation
- LDAF & USFS assist with forest management/protection
- TNC assists in preserving natural communities
- U.S. Department of Agriculture (USDA) APHIS/WS provides expertise to resolve wildlife conflicts (BASH, safety and health issues)

7.1 Fish and Wildlife Management

Applicability Statement

This section applies to all AF installations that maintain an INRMP. The installation is required to implement this element.

Program Overview/Current Management Practices

Of special note (on 16 August 2007), President Bush signed Executive Order 13443, Facilitation of Hunting Heritage and Wildlife Conservation. Barksdale meets the goal of this order to "facilitate the expansion and enhancement of hunting opportunities and the management of game species and their habitat" consistent with mission requirements.

This section will reflect the mutual agreement of the installation and the cooperating agencies of the LDWF and the USFWS for the conservation, protection, and management of wildlife resources.

LDWF cooperates with Barksdale AFB in multiple aspects of wildlife and fisheries management, including the following:

Fishery surveys
Law enforcement
Wildlife management
Emergency wildlife control
Depredation permits
Monitoring state-rare species
Review of management plans

USFWS provides assistance in the following:

Threatened and endangered species management
Depredation permits
Review of management plans

Sound management of natural resources is reflected in the health of fish and wildlife populations present in the ecosystem. Wildlife management requires managing the plant communities as well as the wildlife. A variety of tools are utilized in managing both wildlife and their habitats. Many tools are traditional silvicultural practices that have a positive effect on wildlife populations. Practices such as prescribed burning and forest thinning are cornerstone tools for managing wildlife. Other tools, such as wildlife population control are key components of a sound wildlife management program. These management techniques are supplemented by a number of activities such as food plot construction, mineral licks and wildlife openings that are equally important to wildlife management, but are not usually associated with timber production. Wildlife openings are created in forest areas that lack adequate cover. These openings range in size from two to five acres and are created by removing most merchantable trees and felling and leaving non-merchantable trees. Several large mast- producing trees are left within the openings. The felled trees provide immediate cover within the branches of the treetops. Subsequent growing seasons bring on thick cover that progresses in much the same way as a clearcut, providing excellent wildlife cover for the next 12-15 years. Placed in strategic locations, these openings fill an important role in wildlife habitat management.

Additionally, droughts have caused a significant number of trees, especially in hardwood bottomlands, to decline or die. Many have been salvaged by loggers creating additional forest openings that will aid in an increase of understory vegetation and with that, an increase in available browse and cover. Wildlife food plots cover 70 acres and are planted semi-annually, spring and fall. Fall plantings are primarily planted in winter forage species for white-tailed deer. However, the plantings mature into a source of high quality seeds for other wildlife species including migrating neotropical birds. Spring plots are planted in abundant seed producing plants for birds and as high protein summer browse for deer. Only non-invasive species are used for food plot production. While native forage plants are abundant and available year-round, nutritional levels of most browse species decline severely during the warmer summer and fall months. Supplemental food plots provide a means of supplying a food source high in protein levels and other nutritional requirements throughout the warmer months. Additionally, winter brings about a loss of many plants available for foraging. Food plots planted in species tolerant of cold weather provide high quality food during a time of year when more energy is required because of higher metabolic rates. Plots planted in species that produce an abundance of seeds provide valuable foods for many species of birds including neotropical migrants headed south during the fall. It is understood that creating food plots may negatively impact neotropical migrants; however, the acreage in food plots is less than 1% of the total forest area and wildlife food plots are located primarily in the pine forest. Current management practices encourage forest diversity and provide a wide range of habitats for migratory birds. Mineral licks are installed because deer require adequate levels of salt and trace minerals to maintain their health. Artificial mineral licks are dispersed over the East Reservation in a relatively uniform spread providing minerals to deer. These mineral licks are utilized as camera sites when yearly camera surveys are performed, as they act as an attractant much like a bait site. Each year, 20–30 licks are recharged. Studies have shown that use of licks occurs mostly at night. Very little use is noted during the hunting season or the fall and early winter months.

The hunting and fishing recreation on Barksdale AFB is among the best in northern Louisiana. DoD personnel are authorized to escort guests onto the reservation to hunt and fish. The overall hunting pressure at Barksdale AFB is light versus that normally associated with public hunting lands. The most sought after game species are white-tailed deer, squirrel, rabbit, turkey, and ducks. Barksdale AFB fishing and hunting

season dates follow those of LDWF seasons, with the exception of white-tailed deer and wild turkey. Deer and wild turkey seasons occur within the state season; however, Barksdale AFB firearm deer hunting days are limited to a smaller percentage of the total days allowed by the state. Base permits are sold for fishing and hunting. Hunters are allowed to register deer stands for a fee. The known stand locations improve hunter success and promote a safer hunt.

Permit sales help fund the fish and wildlife program. These funds are supplemented by payments for habitat loss resulting from new oilfield construction. Base hunting/fishing rules and regulations (BAFB Instruction 32-7064) are enforced through policies found in the section 7.3 **Conservation Law Enforcement.**

Fisheries management is dependent on fish population, water quality management, and aquatic vegetation control. Flag Lake is the largest fishery. The lake is shallow but deep enough to support excellent sport fishing. Bass (*Micropterus salmoides*), crappie (*Pomoxis* sp.), bluegill (*Lepomis macrochirus*) and channel catfish (*lctalurus punctatus*) are the most popular game fish in Flag Lake. There are six other lakes plus 10 ponds that offer fishing. LDWF provides fisheries management expertise and support.

Fishing pressure varies by seasons, weather factors, and fishing success but is considered light to moderate. Fishing is a popular activity on Barksdale AFB. Management goals have been established to maintain or increase the current fish population levels/health and to promote fishing as a sustainable recreational activity. To improve the fisheries, BNR stocks fish fingerlings in viable fisheries as needed to supplement fish populations.

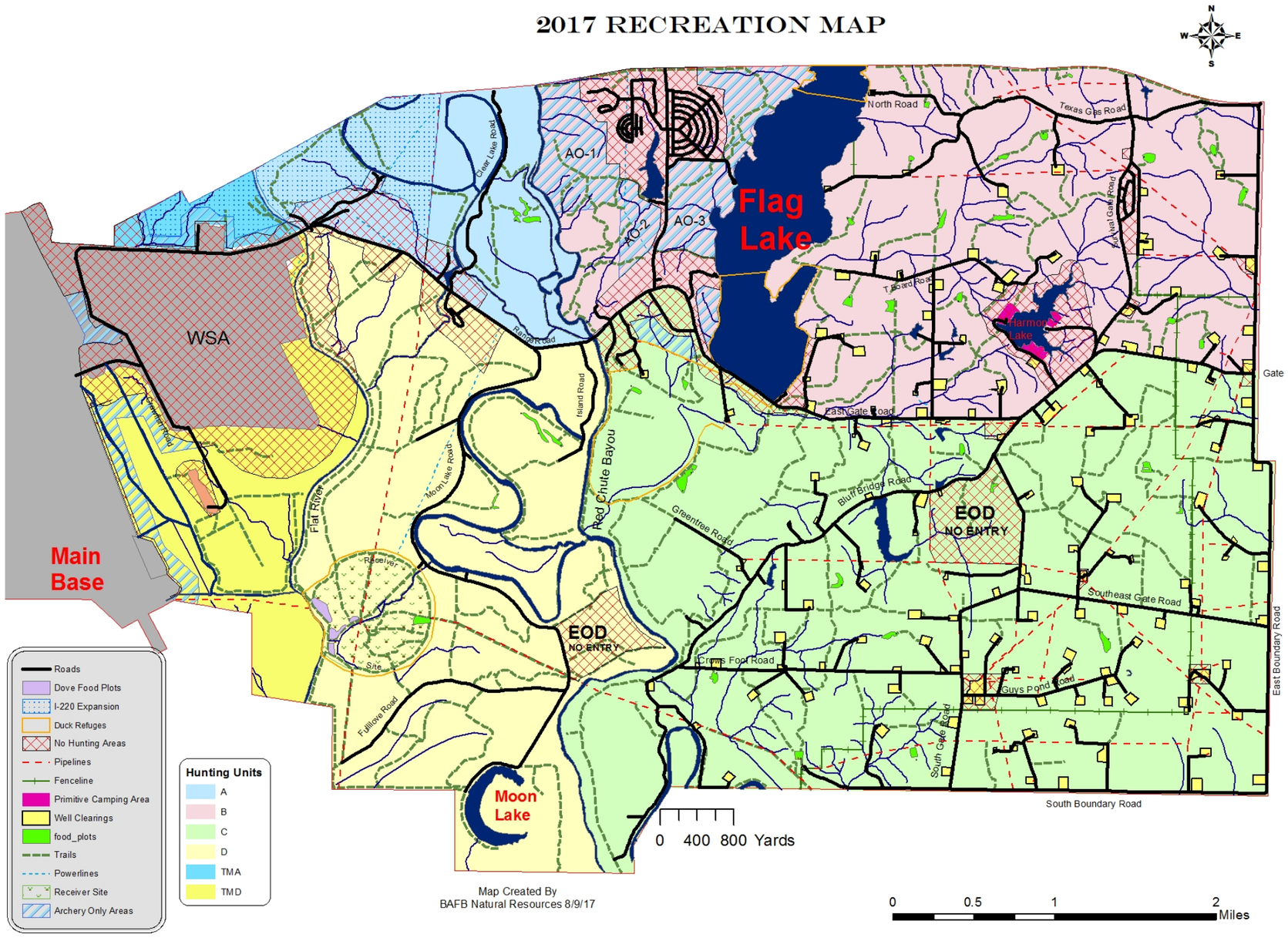

Figure 12. Hunting Areas

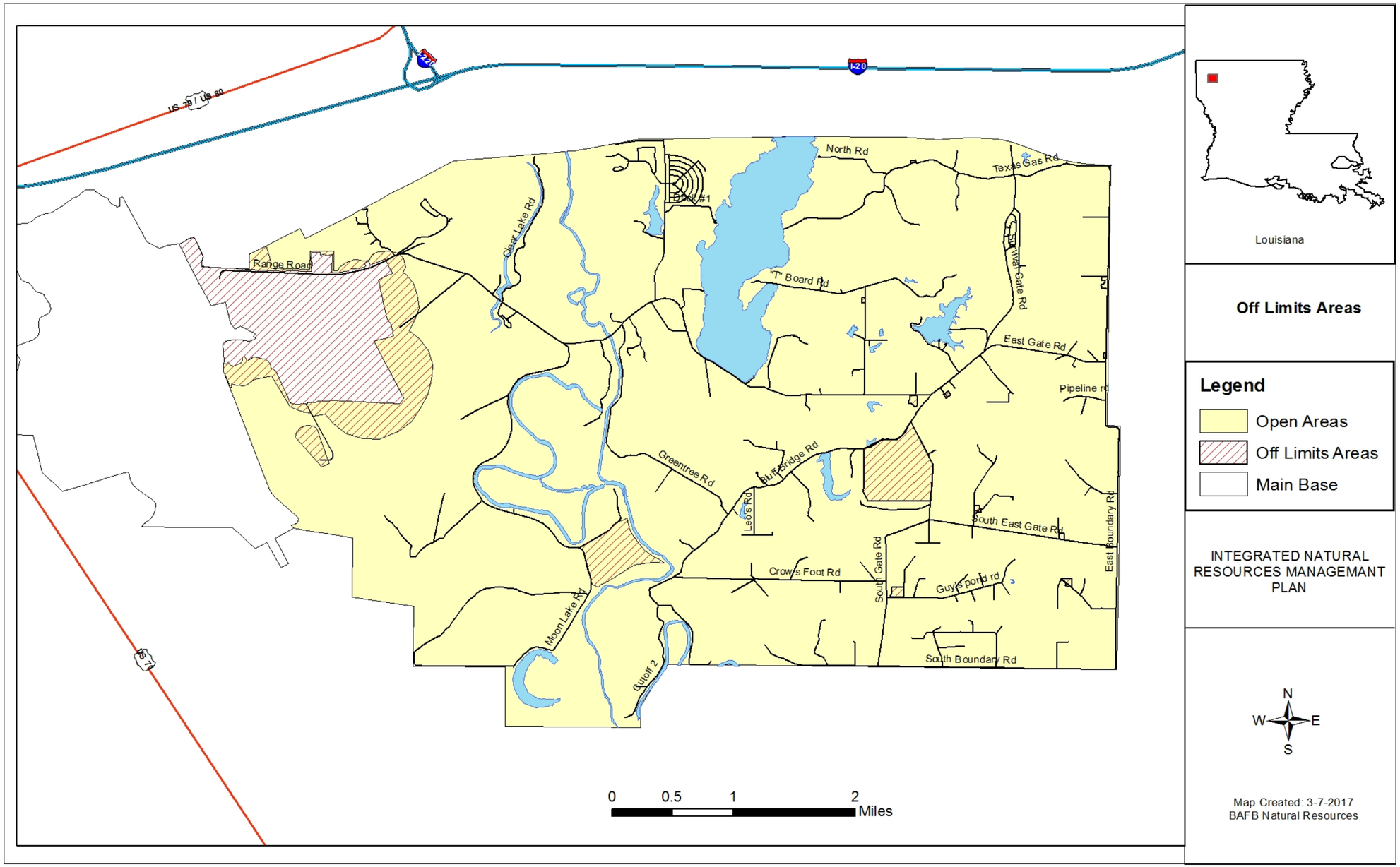

Figure 13. Hunting Areas

White-tailed deer and turkey are the featured big game species on Barksdale AFB. The population of white-tailed deer is an estimated 1100 to 1400 animals. Game camera surveys are conducted in spring and late summer to estimate the deer population and to develop a population index over time.

An installation map showing hunting areas can be found is located above. Hunting units are broken down into 4 basic areas (A, B, C, D) and 2 sub-areas (TMA, TMD). The average deer from Area B is slightly smaller in weight than from other hunting areas on base. This is attributed to poorer, sandier soils. Therefore there is a greater concentration of food plots in B Area.

In order to bring buck-to-doe ratios back into a more natural proportion, and increase reproductive success, a QDM Program was started in 2003. Harvesting of does is encouraged and antler restrictions have been set for bucks. Occasionally, tweaks are made to QDM to improve certain areas or to address negative results. Rifle season averages 24 days spread over a three-month period. Deer harvests average 220 deer per year including all methods and seasons. LDWF personnel assist BNR in conducting deer herd health checks on an as needed basis, dependent on local disease concerns or routine periodic sampling.

Archery hunters average harvesting 10 to 15 deer per year. The long four-month archery deer season provides an added incentive or opportunity to promote this recreational activity. There are currently seven archery-only hunting areas on 560 acres. These areas are closed to any form of firearm use. Starting in 2001, archery permits were required for all bow hunters. This permit allows managers to better monitor hunter numbers, safety, use patterns, and hunter preferences.

Turkeys on base have had mixed success. Sixteen turkeys were released on Barksdale AFB in 1986. Their population numbers grew well initially. Annual spring hunting began in 1994 with a four-day season. In 2002, the season was increased to 12 days and to 21 days in 2004. Hunter success increased and did well until 2009 with an average of 13 gobblers harvested each season from 2004 through 2008. At that point, a downward trend in Turkey reproduction in our region began and was further hampered by droughts in the summer of 2011-12. Turkey harvests began dropping off in 2009 and by the 2011 and 2012 seasons, only 2 and 3 birds were harvested each season, respectively. For the near future, there will be no turkey season.

A Turkey population study was initiated in 2015. This study was designed and implemented through a cooperative agreement with the Louisiana Department of Wildlife and Fisheries and Louisiana State University (LSU). A graduate student from LSU began trapping turkeys in Fall 2015. Due to funding cuts, the project was cancelled in 2016 before restocking efforts could take place.

Barksdale AFB has many small game species that require wildlife management. The mature bottomland hardwood timber located in Areas A, C, and D offer excellent squirrel habitat. Hunting does little to affect the population numbers. The squirrel population is controlled by natural predators and other limiting factors. Rabbit populations are fair to good. There are many clearings and openings to support the cover needed by rabbits. Wildlife openings created in the bottomland hardwoods offer excellent cover for rabbits. Natural predators and lack of cover serve to maintain the population of rabbits at carrying capacity. The common raccoon (*Procyon lotor*) population is also high but there is little interest in hunting raccoons. Raccoon hunting on base is allowed from 1 August through 31 March only.

Waterfowl hunting is a major recreational activity on Barksdale AFB. Barksdale AFB is located in the Mississippi Flyway. Barksdale AFB serves as resting stops for a sizeable population of waterfowl.

There are six lakes and 10 forest ponds, one moist soil impoundment, four GTRs, and multiple impoundments, all of which serve as waterfowl habitat at some time.

An existing 60-acre moist-soil wetland was recently enlarged to 127 acres and this area is broken down into five units. All five units have independent water control for both flooding and dewatering. This area

provides a tremendous amount of food and cover for many species of migratory birds and waterfowl. The entire moist-soil wetland is closed to waterfowl hunting and is part of the Receiver Site Refuge.

GTRs provide an abundance of flooded timber. These areas are periodically flooded to create waterfowl habitat. Flooding is limited and varied to assure and maintain tree health and vigor. Some additional bottomland acreage is occasionally flooded in years with adequate rainfall.

On Barksdale AFB, several food plots offer excellent dove hunts on occasion. It would not be feasible to increase the dove habitat because it would cause a loss of the land for other more valuable uses.

Barksdale AFB is home to a very healthy year-round wood duck (*Aix sponsa*) population. Flooded sloughs, GTRs, and oxbows offer a prime and abundant habitat. The seasonally flooded hardwood bottoms are a valuable source of natural nesting cavities and mast. LDWF occasionally traps and bands waterfowl on base water bodies. This banding assists LDWF and USFWS in determining population trends in waterfowl.

Quail populations at Barksdale AFB, as in the rest of the Southeast, have declined over time. According to data from the North American Breeding Bird Survey, quail populations in Louisiana have declined by about 85% in the past 35 years. This is due in part to habitat degradation and intensive pine management that involves short rotations of densely stocked stands with infrequent prescribed burning. Barksdale AFB has a longer timber rotation and a more aggressive prescribed burning program than most managed forested uplands in the local area. Forest thinning has opened up some acreage that is suitable habitat and food strips have been placed throughout these areas and are planted annually with species desirable to quail. Quail receive very little hunting pressure on Barksdale AFB; therefore, hunting has minimal impact on the population levels.

Barksdale AFB has an abundance of wildlife viewing opportunities. Throughout most of the year, the east reservation is open to individuals wishing to observe wildlife in their natural setting. The seven-mile Big Tree Hiking Trail meanders through most of the different habitat types located on Barksdale AFB and offers a chance to view native wildlife in the wild. Many other trails and access routes are available throughout the forest.

Forestry practices at Barksdale AFB improve habitat for non-game bird species. A confirmed 102 bird species occur on base. Examples of known species are the pine warbler, cardinal, summer tanager, Carolina wren, ruby-throated hummingbird, blue jay, eastern (Rufous-sided) towhee and tufted titmouse. The presence of these species provides enjoyable wildlife viewing opportunity for the outdoor recreation users on base.

Barksdale AFB has three categories for unimproved lands utilized for outdoor recreation: Open Areas, where all participants are permitted; Restricted Areas, where certain restrictions are imposed on participants; and Off Limits Areas, where no recreational activities are allowed.

Maps showing these areas are available for all participants, additional description follows:

- Open Areas - The majority of the Barksdale AFB east reservation is open to all participants.
- Restricted Areas - There are seven areas designated for archery hunting only, where no firearms are allowed. There are three duck refuges, one encompasses the lower third of Flag Lake and is open to fishing only throughout the year. The other two refuges are open for small game hunting prior to waterfowl season and are restricted to deer rifle hunting once waterfowl season begins.
- Off Limits Areas - Most of the areas off limits are safety buffer areas. These areas are located near sensitive areas; such as the airfield, FAA facilities, base housing, administrative offices, oil and

gas production facilities, recreational parks, camping areas and military compounds like the WSA, small arms range and EOD ranges.

Several user groups are granted the privilege to hunt, fish, and participate in other outdoor recreational activities on Barksdale AFB. These groups include: DoD personnel and their guests and civilians employees who work full time on Barksdale AFB. DoD personnel are defined as active duty, retired, and reserve military personnel, dependents of the aforementioned, DoD civilian employees and retired Barksdale AFB DoD civilian employees.

Public group events have also been authorized including running clubs, gun clubs, fishing tournaments, and raccoon cast events. All hunters with unescorted access privileges must attend a Barksdale AFB Hunter Safety Class. In the class, BNR presents important hunter education information on hunting safety, responsible hunting, conservation, and the regulations governing use of the east reservation. DoD personnel sponsoring guests must instruct guests on hunting rules and safety practices.

Barksdale AFB does have wildlife nuisance pest issues. Beaver control is required annually to prevent widespread loss of timber resources. Beavers block water control structures in the spring when BNR is working to remove water from GTRs or other seasonally flooded areas. If beaver dams are not removed, flooding during summer months will cause tree mortality and the loss of large areas of forest. Many beaver dams are torn out annually in areas where large concentrations of beavers occur near water control structures. Beavers are trapped as they repair damage to dams blocking water control structures. Lethal trapping is used to remove nuisance beavers. Live trapping is a difficult, time- consuming and costly process. Due to high beaver populations and limited free habitat into which trapped animals may be released, live trapping of nuisance beavers is not a practical alternative. There is no attempt to eradicate all beavers. Beaver population is controlled in the areas around structures or key drainage areas. On occasion, EOD personnel may assist in removing large beaver dams while gaining explosives training.

BNR also provides emergency wildlife control. Alligator (*Alligator mississippiensis*) incidents are the most frequent emergency calls. Alligators sometimes establish a territory in areas that create a safety concern. Several bayous cross the cantonment area and Clear Lake are adjacent to two picnic areas. These waterways are readily available to the public. A potential safety hazard exists when an alligator becomes a public attraction or when humans feed alligators. Humans feeding alligators causes the greatest risk as alligators receiving food from humans start to associate humans with food, thereby reducing their fear of humans. Lack of fear enables alligators to approach humans more readily and frequently, which increases the possibility of a hazardous human/alligator encounter. Signs are placed at areas where human/alligator interaction is likely to dissuade the public from feeding or harassing alligators. Additionally, large alligators are persuaded to move through behavior modification practices or are trapped, following LDWF approval, with the assistance of a state-approved nuisance trapper. Annual alligator surveys are performed to create an index of current populations. These are used to determine if hunts are justified.

Feral hogs (*Sus scrofa*) have become a major concern on the East Reservation in recent. Feral hogs damage trees and reduce regeneration, change the composition of forest plants, disturb the soil, destroy understory plants, food plots, and directly complete with native wildlife. The hog population on base is currently estimated at 800-900. A combination of efforts are employed to control feral hogs. This includes trapping, opportunistic shooting, and the utilization of hog hunting dogs. A substantial number of hogs have to be removed from the population each year to maintain the current level. Therefore, BNR focuses on reducing hog populations where their damage does the most harm and in areas with high human use. Such areas include habitat adjacent to Fam Camp, Red Chute Shotgun Club, along major roadsides, food plots, etc.

7.2 Outdoor Recreation and Public Access to Natural Resources

Applicability Statement

This section applies to all AF installations that maintain an INRMP. The installation is required to implement this element.

Program Overview/Current Management Practices

The public access goal is to provide for maximum outdoor recreation opportunity within mission, safety, and resource constraints. Barksdale AFB uses unimproved grounds and areas that will not interfere with the military mission to achieve this goal. The 2d Forces Support Squadron (2 FSS) is responsible for daily operation of outdoor recreation such as the Shotgun club, FamCamp, parks, picnic areas, and athletic fields. The 2d Civil Engineer Squadron/Operations Flight (2CES/CEO) is responsible for outdoor recreation facilities attached to the ground such as pavilions. Boat docks, launches, piers, and fishing lakes/ponds, garden plots and wooded areas are maintained by BNR. The Outdoor Recreation Section of 2 FSS and BNR work together in planning, developing and operating outdoor recreation.

The use of off-road vehicles including ATVs, OHV's, and other motorized vehicles such as dirt bikes is prohibited at Barksdale AFB. There is a high demand for outdoor recreation at Barksdale AFB from the military as well as the general public. Activities such as paintball, archery and skeet shooting through the gun club are extremely popular activities on base.

A specific planning goal for Barksdale AFB is to promote the quality of life for personnel by providing abundant outdoor recreational opportunity. Base hunting and fishing programs managed by BNR serve as an important element in supporting AF Quality of Life program goals. BNR incorporates quality of life objectives into planning and management of hunting seasons on base. Season dates are designed to provide maximum opportunity for all user groups. BNR educates personnel on outdoor recreation safety, hunting/fishing areas, base regulations and policies. For a detailed description of hunting and fishing programs refer to Fish and Wildlife Management in Section 7.***1*** and BAFI 32-7064 (Barksdale AFB 11 August 2017).

Access and Participation Categories

Areas open to all recreation can be found in Figure 12. Barksdale has no Restricted Areas (Areas open only to certain user groups). Barksdale AFB does have Off Limits Areas (Figure 13).

BAFI 32-7064 sets forth categories with access to east reservation and hunting, fishing, and other dispersed outdoor recreation. The following DoD personnel have unescorted recreation privileges: active duty, reservists, retired military, DoD civilians, dependents of the aforementioned groups, Louisiana national guard, DoD civilian retirees, and 100% disable veterans with PRMDAV credentials. Contractors and the general public may recreate, but must have a DoD sponsor with them at all times while recreating.

7.3 Conservation Law Enforcement

Applicability Statement

This section applies to all AF installations that maintain an INRMP. The installation is required to implement this element.

Program Overview/Current Management Practices

Enforcement of the fish and wildlife rules and regulations is an important part of a successful natural resources program. Barksdale users are provided a handout synopsis of Barksdale AFB Hunting, Fishing, and Outdoor Recreation Regulations. Barksdale AFB Instruction 32-7064 is available online and prescribes rules and procedures and sets forth policies regarding the protection of fish, wildlife, and related

natural resources and the control of hunting and fishing. Hunters are also required to attend an instructional safety briefing before participating in hunting on the base.

The 2d Security Forces Squadron (2 SFS) provides enforcement support. The 2 SFS Game Wardens are trained in law enforcement. Wardens receive additional training from the Federal Law Enforcement Training Center (FLETC) in GA, as funding is available. There are six game warden positions with one being a head warden. Should future SFS manpower change, it may become practical to establish a permanent conservation law enforcement personnel (CLEP) position as the head game warden or a 2CES position that would coordinate closely with game wardens. The CLEP officer would be trained and certified in conservation law enforcement and would provide continuity and supervision in the section. The game wardens work closely with BNR personnel and have exclusive jurisdiction to enforce base, state, and federal laws and regulations. A violation matrix provides enforcement officers and commanders a list of specific violations including guidelines on suspensions and penalties. A Conservation Enforcement Board (CEB) has been established to provide rulings on serious violations of base, state, or federal hunting and fishing regulations. The CEB is comprised of the 2MSG/CD, BNR manager, and 2SFS.

7.4 Management of Threatened and Endangered Species, Species of Concern and Habitats

Applicability Statement

This section applies to AF installations that have threatened and endangered species on AF property. This section **IS** applicable to Barksdale AFB.

Program Overview/Current Management Practices

The bald eagle was officially removed from the federal list of threatened and endangered species 8 August 2007, but will continue to be protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. Flag Lake is considered to be an important habitat area for the bald eagle. Flag Lake is managed to protect the wintering, nesting and feeding areas for the eagles. For the past 20 years, eagles have over-wintered on the lake. In February 2007 a bald eagle nest was found on the north end of Flag Lake and two young were produced. Since that time, active nests have been observed yearly. Eagles may now reside on the base through the nesting season or mid-May. The eagles have been observed foraging on many locations on base. As many as 3 adults and two juveniles have been observed simultaneously.

Nuisance aquatic vegetation management in base lakes is a major ongoing issue. Especially considering our problematic aquatic species reduce foraging habitat for Bald Eagles. Currently, lakes are managed to control hydrilla (*Hydrilla verticillata*), American lotus (*Nelumbo lutea*), water hyacinth (*Eichhornia crassipes*), and most recently, giant salvinia (*Salvinia molesta*) as well as other native plant growth issues to a lesser degree. These species include: alligator weed (*Alternanthera philoxeroides*), water pennywort (*Hydrocotyle* spp.), and coon tail (*Ceratophyllum demersum*).

The invasive aquatic weed, hydrilla was found on Flag Lake in the early 1990s and gradually clogged the waterway to such an extent that it was nearly impenetrable for the eagles to feed. In the past, Sonar™ herbicide has been used to treat hydrilla. Recently, larger numbers of triploid grass carp (*Ctenopharyngodon idella*) have been stocked are controlling hydrilla very well.

American lotus became an issue in the 2000s on Flag and Moon Lakes. It has been controlled by herbicide treatment, but takes repeated treatments to fully control. It has continued to cause issues on Flag Lake and is still a major issue on Moon Lake.

But, recent growth explosions of water hyacinth and giant salvinia have created mats covering the surface of Flag Lake. Water hyacinth has been present in Flag Lake for many years, but controlled in the past through contracted herbicide spray crews. Giant Salvinia is a recent arrival, only being observed in Flag

Lake in the past 5 years. This rapid growth rate makes surface herbicide spraying of Salvinia and exhaustive effort as the number of acres sprayed per day must exceed the number of acres grown per day to make any progress at all. Flag Lake has a couple of additional issues to consider when treating Flag Lake. First is accessibility to the vegetation as much of the lakes shoreline is behind rows of cypress trees, preventing boat access, and the northernmost reaches of the lake are in shallow buttonbrush thickets. The second issue is private flooded lands to the north of Flag Lake act as a seed source that can repopulate Flag Lake with new plants or seeds even if a total 100% eradication of all nuisance vegetation growing in Flag Lake was obtained. Being private property, the government has no ability to control vegetation growing north of Flag Lake.

A boom system is being planned with the intended purpose to help keep plants from flowing into Flag Lake from the private property to the north. Additionally, a boom system is being installed to surround the primary Flag Lake boat launch. This will keep existing floating plants away from the launch area in an effort to prevent the spread of nuisance vegetation to other lakes AND to capture any new vegetation that may be introduced to Flag Lake from boat trailers transporting it from other locations.

Another practice being utilized to prevent the spread of nuisance aquatic vegetation is the closing of Red Horse Lake and Moon Lake boat ramps to loading and unloading boats from trailers. Only small boats loaded from trucks may be used in these lakes. Boaters and fishermen must ensure no nuisance aquatic vegetation is attached to any boat or equipment being used that may transfer it to any base water body.

Northern Long-Eared Bats

The northern long-eared bat, federally listed as a threatened species, is a medium sized bat about 3 to 3.7 inches in length but with a wingspan of 9 to 10 inches and is distinguished by its long ears. Its fur color can range from medium to dark brown on the back and tawny to pale-brown on the underside. The northern long-eared bat can be found in much of the eastern and north central United States and all Canadian provinces from the Atlantic Ocean west to the southern Yukon Territory and eastern British Columbia. In Louisiana, there have been confirmed reports of sightings in Winn and Grant parishes; although they can possibly be found in other parishes in the state. Some individuals were documented during mist net and bridge surveys on the Winn District of the Kisatchie National Forest and were also observed under bridges on the Winn District in Grant Parish.

Northern long-eared bats can be found in mixed pine/hardwood forest with intermittent streams. Northern long-eared bats roost alone or in small colonies underneath bark or in cavities or crevices of both live trees and snags (dead trees). During the winter, northern long-eared bats can be found hibernating in caves and abandoned mines, although none have been documented using caves in Louisiana. Northern long-eared bats emerge at dusk to fly through the understory of forested hillsides and ridges to feed on moths, flies, leafhoppers, caddis flies and beetles, which they catch using echolocation. This bat can also feed by gleaning motionless insects from vegetation and water surfaces.

The most prominent threat to this species is white-nose syndrome, a disease known to cause high mortality in bats that hibernate in caves. Other sources of mortality for northern long-eared bats are wind energy development, habitat destruction or disturbance, climate change and contaminants.

Migratory Bird Management

The requirements for migratory bird species cover a wide range of habitats. While it is impractical to manage for all migratory bird species, current management practices encourage forest diversity to the benefit of migratory birds. Examples include forest thinnings in bottomland hardwoods that create a denser ground story and provide habitat to Kentucky Warblers (*Oporornis formosus*), Swainson's Warblers (*Limnothlypis swainsonii*), Louisiana Waterthrush (*Seiurus motacilla*) and Yellow-breasted Chats (*Icteria*

virens). Barksdale's bottomland hardwood forest is mature and areas feature wide open understories favored by Red-eyed Vireos (*Vireo olivaceus*), Worm-eating Warblers (*Helmitheros vermivorus*) and Ovenbirds (Seiurus aurocapillus). In upland pine areas, early successional neotropical migrants such as Prairie Warblers (*Dendroica discolor*) benefit from the creation of clearcuts, prescribed burns and other silvicultural activities. Eleven exemplary natural areas on 2,453 acres are described in the Exemplary Natural Areas Section. Barksdale AFB protects these unique natural communities.

Additionally, BNR manages 5 moist soil units for migratory wetland birds and waterfowl. Moist-soil impoundments provide plant and animal foods that are a critical part of the diet of wintering and migrating waterfowl. Moist soil units have become a significant part of management efforts on many USFWS refuges and some private lands projects. These wetland areas are intermittently flooded during the growing season to produce wetland vegetation. The areas provide migrating birds with necessary habitat during migration periods.

BNR manages multiple GTRs. These areas are periodically flooded to create waterfowl habitat. Flooding is limited and varied to assure and maintain tree health and vigor. Some additional bottomland acreage is occasionally flooded in years with adequate rainfall.

Barksdale AFB shall:

- Strive to protect, restore, enhance, and manage habitat of migratory birds, and prevent or minimize the loss or degradation of habitat.
- Identify and avoid management actions that have the potential to adversely affect migratory bird populations, including breeding, migration, or wintering habitats.
- Develop and implement, as appropriate, conservation and management measures that enhance the quality of the habitat used by migratory birds.
- Notify the USFWS if unintentional take of migratory birds, reasonably attributable to AF Actions, is having, or is likely to have a measurable negative effect on migratory bird populations, and implement conservation measures as specified in E.O. 13186 Sec 3(e)(9).

7.5 Water Resource Protection

Applicability Statement

This section applies to AF installations that have water resources. This section **IS** applicable to Barksdale AFB.

Program Overview/Current Management Practices

The Louisiana Environmental Quality Act and the Louisiana Water Pollution Control Law provide the regulatory mechanisms for the LDEQ to protect and enhance the quality of Louisiana's surface and ground water. The Water Quality Management Division of the Office of Water Resources is responsible for monitoring and assessing the quality of Louisiana's surface and ground water by enforcing the state and federal laws. Barksdale AFB is not involved in any regional issues related to watersheds affected by the base or any regional water resource programs.

Meeting the state of Louisiana's surface water quality standards is a primary concern for the installation. Potential non-point source (NPS) pollution related to natural resources management include silvicultural activities as well as the construction and maintenance of firebreaks, roads, and other improvements. Construction of well pads, pipeline and electric line right-of-ways, roads, and other surface disturbance activities are additional sources of NPS pollution on base. NPS pollution issues, specifically associated

with surface drainage, are monitored by BNR personnel and the BLM on-site representative. It is the sole responsibility of the lessee to control, prevent, and mitigate NPS pollution resulting from lease activity. Point source (PS) pollution is associated with oil and gas activity and exploration. PS pollution, although infrequent, caused by ruptured pipelines, and storage and production facility spills related to oil and gas lease production and development does occur. When a PS pollution event does occur, the approved and appropriate response regarding who must be informed and what action to take is outlined in a Spill Response Plan (SRP) that each lease holder is required to maintain. The SRP is mandated, reviewed, and approved by the BLM. BNR will monitor NPS pollution related to natural resource management activities and implement corrective measures as necessary, such as immediate seeding, mulching or other immediate means of erosion control. Louisiana Best Management Practices (BMP) guidelines set forth by the LDAF were developed and implemented with minimizing and controlling NPS pollution in mind. Therefore, all forest activities on Barksdale AFB are in accordance with Louisiana state BMPs. Louisiana provides BMP guidelines on:

Establishment of Streamside Management Zones (SMZs)
Construction and Use of Access Roads
Erosion Control
Timber Harvesting
Reforestation Forest Chemicals

There are 10 permitted storm water discharges at Barksdale AFB. The base is responsible for minimizing the quantity of materials exposed to storm water by implementing the Storm Water Pollution Prevention Plan. Periodic laboratory analysis is conducted at air and water discharges to insure compliance with permit limitations.

7.6 Wetland Protection

Applicability Statement

This section applies to AF installations that have existing wetlands on AF property. This section **IS** applicable to Barksdale AFB.

Program Overview/Current Management Practices

Wetlands are managed to protect or enhance their overall value. The most recent wetlands survey was completed by Stephen F. Austin State University in 2005. This survey determined that Barksdale AFB has 1,244.52 acres of wetlands. The average size of a wetland is 12 acres with the largest being 110 acres while the smallest 0.17 acres in size. Barksdale AFB currently has no pending Section 401 or 404 permits. BNR has a wetland coverage that was created using USACE wetland delineation guidelines. Essential hydric soil data provided by NRCS (1993 survey) is displayed on a separate coverage. It is AF policy to request a jurisdictional wetland determination only when a project is proposed for an area identified by extensive survey as potential wetland. Proposed projects or actions will include all practical measures to minimize impacts to wetlands and floodplains in accordance with “No Net Loss” policy.

Barksdale AFB follows jurisdictional wetland delineation as depicted from the USACE and obtains permits for all sited projects. BNR reviews projects that might jeopardize the integrity of Barksdale AFB wetlands and floodplains. If the project does not contain or affect wetlands, BNR provides a statement of no impact for inclusion in project documents. Proper permits (404, nationwide, etc.) are obtained if the project encompasses or degrades wetlands. Should any projects involving wetlands be proposed, compliance with the Clean Water Act (Public Law 95-217, as amended) is accomplished as part of the EIAP process performed for compliance with NEPA.

To date, all wetland mitigation in support of mission planning has been accomplished on base. Barksdale AFB has no current plans to use off-base mitigation banks. Current or potential mitigation banks found in the COE Vicksburg District that can be used to support base project planning and decision making are listed in Appendix Vicksburg District Mitigation Banks. BNR routinely provides data and maps to base planners, and personnel showing locations of wetlands and floodplains for incorporation into daily planning and activities. Wetland conditions are monitored during delineation studies and daily conservation work. GTR's conditions are monitoring during and after flooding to achieve wildlife management and forest health objectives.

Barksdale AFB continues to cooperate with local, state, and federal agencies to protect and maintain the integrity of 100 year floodplain delineations and associated wetland ecosystems. Flat River and Red Chute Bayou are the two main water bodies flowing through the installation. Both Flat River and Red Chute Bayou are channelized. The Red Chute project created a straight leveed channel that bypassed several meander bends of the bayou. The Bossier Levee Board and the USACE manage the levee constructed in 1976 along Red Chute Bayou. The NRCS (formerly Soil Conservation Service), Bodcau Soil and Water Conservation District, was the lead agency in the channelization of Flat River in 1982. In 2004, Stephen F. Austin University completed an Assessment of the Bottomland Hardwood Forest Resource, which included and analysis of the wetland ecosystems within the 100 year floodplain delineation. Barksdale AFB also conducts interagency reviews of the management of a greentree reservoir project west of Red Chute Bayou. Agencies participating in this review include the USACE, EPA, USFWS, and LDWF.

7.7 Grounds Maintenance

Applicability Statement

This section applies to AF installations that perform ground maintenance activities that could impact natural resources. This section **IS** applicable to Barksdale AFB.

Program Overview/Current Management Practices

The Barksdale AFB urban forest is comprised of approximately 7,000 trees dispersed across 1,700 acres (Urban Forest Sustainability Plan Dec 2004). This acreage includes the Main Cantonment Area, Barksdale East, Liberty and Heritage Heights Housing areas, WSA, Clear Lake Park, Cullen Park, FamCamp, and the former Capehart Housing Area. The table below (*Ten Most Frequent Urban Forest Species*) shows the percentage of the 10 most common species identified during the 2004 survey that occur on Barksdale AFB.

Ten most frequent urban forest species

Species	Total	Percentage
Live oak	967	14.9%
Crepe-myrtle	669	10.3%
Loblolly pine	474	7.3%
Pecan	436	6.7%
Sweetgum	328	5.1%
Water oak	306	4.7%
Juniperus sp.	273	4.2%
Shumard / Cherrybark oak	239	3.7%
Elm	223	3.5%

Species	Total	Percentage
Sugarberry	219	3.4%

The appraised value of Barksdale AFB urban forest is $32,146,258.00 (1998 survey). This can be attributed to a number of large diameter trees, overall good condition of the urban forest, and a number of regionally valuable tree species. Sound urban tree management results in community residents, workers, and visitors receiving more benefits from urban forest resources while reducing maintenance costs and tree-hazard potential. The Urban Tree Inventory System (UTIS) and the Urban Forest Sustainability Plan were completed in December 2004.

The Urban Forest Sustainability Plan evaluated the current sustainability of the urban forest while developing specific strategies for planning and management on the base. In addition, the plan developed urban forest policies and cost effective solutions to preserving the safety, health, and appearance of the base urban forest. One problem identified is sidewalk-tree conflicts involving the predominant tree species. Roots of live oaks close to sidewalks lift and break the concrete causing an uneven walking path and safety concern. This can be avoided by root pruning the trees when sidewalks are replaced, using bio-barrier products to restrict roots from penetrating concrete, changing the path of sidewalks, and modifying of the materials used to create sidewalks. Another tree problem identified was tree root degradation resulting from sod and grass conflicts. This occurs when the feeder roots of trees are injured from tilling and heavy equipment use in close proximity to the trees.

Awareness education/planning and using mulch covers where grass will not grow can reduce root injury (Urban Forest Sustainability Plan Dec 2004). Tree and urban forest maintenance has been severely cut (FY07) due to funding constraints Prior to FY07, maintenance operations including crown cleaning, crown thinning, and crown cleaning of mistletoe, tree pruning, and tree removal were performed under an established contract. Adequate funding of tree maintenance operations is necessary to promote urban forest health, public safety, and base appearance. The key to success is to identify and correct small problems to safeguard plants, people and property before they become big problems. It has been proven that proper tree maintenance saves dollars over time as requirements are identified, prioritized and accomplished. If maintenance is not funded, the costs for storm cleanup will far exceed the cost of an adequate tree maintenance program. The overall health, safety and appearance of the urban forest environment are placed at risk when maintenance costs are reduced.

Typical grounds maintenance activities including mowing, weed/grass trimming, edging, fertilization, pest management herbicide treatment, tree planting and related activities are accomplished under contract. Barksdale AFB possesses over twice the improved grounds acres (1,480) as compared to most other bases. A Bermuda Grass Release Program was initiated on the 830 acres of turf on the airfield in 1996 at the request of a HQ Air Force Wildlife Biologist responsible for the BASH Program. The program includes an integrated approach using herbicides, growth retardants, seeding, fertilization, liming and monitoring. The program was initiated on the flightline because of the continued problems with cattle egrets (Bubulcus ibis) feeding on insects in the area of the airfield, posing a potential BASH problem with aircraft. The predominant vegetation on the airfield is Bermuda grass, which when controlled as a monoculture environment, becomes sterile to birds feeding on insects. Bermuda grass only reaches an average height of 12 inches when controlled by herbicides to reduce vegetative growth and competing non-desirable grass and weed species that attract birds.

Since the program's inception, improvements have been made in airfield appearance, safety (program has reduced bird activity), and weed control. In addition, the Bermuda Grass Release Program provides a

significant cost savings by reducing required mowing by up to 50% when the airfield is maintained to the program standards. Monitoring of the airfield vegetation is discussed in the Barksdale BASH Plan.

Disease, insect, and general maintenance issues associated with turf and ornamental plantings throughout the cantonment area are addressed in the Urban Forest Sustainability Plan, BAFB, LA, December 2004, and the Base Integrated Pest Management Plan (IPMP), BAFB, 2012.

7.8 Forest Management

Applicability Statement

This section applies to AF installations that maintain forested land on AF property. This section **IS** applicable to Barksdale AFB.

Program Overview/Current Management Practices

The current forest program is managed for multiple uses and benefits including timber, wildlife, recreation, water and the military mission. The goals and objectives section will depict many of the initiatives the base plans to implement over the next five years. One of the forest management initiatives is to apply prescriptive fire as a tool to mimic the natural forces in fire maintained ecosystems.

Even-aged stand management is prescribed for most upland areas. However, the management strategy for each stand is determined by using forest surveys to determine what silvicultural tools are needed. These silvicultural operations shall be in accordance with the State of Louisiana BMP. Timber production is managed on a sustained yield basis for continuous production or a sustained flow of products with the aim of achieving an approximate balance between net annual growth and annual harvest.

Thinning is an important part of the forest management at Barksdale AFB because it represents the primary means by which forest stands can be controlled or altered during the course of their development. The pine forest is managed on an 80-year regulatory rotation. Each year mature pine sawtimber is removed from about 1/80th of the pine forest and the harvested acres will be promptly reforested with pine. The total acreage involved in the annual reproduction cut varies due to differences in stocking levels and the irregular distribution of stands across the forest. Forest ecosystem management is an adaptive management process integrated with research and monitoring to allow forestry operations to become a learning opportunity from which periodic adjustments are made.

Barksdale AFB incorporates a large contiguous tract of bottomland hardwoods within the Red River alluvial floodplain. Most private land within this type forest has been converted to farmland. The primary goal of this forest management will be to promote forest health while maintaining a viable resource. Even-aged stand management is prescribed for most bottomland hardwood areas. Forest inventories are used to determine silvicultural treatment needs and priorities. These bottomland hardwood areas will not be managed on a regulatory rotation. Each individual stand and unit will be assessed to determine that particular stands silvicultural needs. Thinning and small clearcuts will be used to promote forest health and encourage regeneration of future stands. Prior to a regeneration harvest, the advanced regeneration will be inventoried on that site to determine future stand composition. If regeneration present is inadequate, the harvested stand will be promptly reforested using bare-root seedlings.

Forest managers work to promote natural forest conditions to help provide a natural balance of both native game and non-game species. In forest stands where commercial timber production is not the main objective, dead or dying wood in the form of standing snags and downed logs provides forage and cover for many wildlife species, such as migratory birds, salamanders and bats. Snags also provide nest and roost habitat for a variety of species, including woodpeckers. A diverse forest ecosystem includes old-growth forest stands. Managers promote characteristics of late-succession or old-growth forests, especially in

designated “natural areas” and other areas where ecological considerations are more important than fiber production. These structurally-complex forests are characterized by multi-storied canopies, large-diameter trees and snags, heterogeneous overstory gaps, and patches of dense understory vegetation. Patches of sparse forest floor cover and a natural balance of dead/dying wood (e.g., snags) to live wood are additional characteristics of late-succession or “climax” forests.

Silvicultural Management Practices

Silvicultural management practice consists of the various treatments of forest stands that may be applied to maintain and enhance their health and productivity such as:

Thinning by cutting and removing a part of a timber stand is a land manager’s most useful method to manage forests. Thinnings of a forest stand are used to reduce tree density, thus utilizing trees that would eventually die. Each thinning opens up the forest canopy and allows sunlight to penetrate through to the forest floor. This sunlight and additional growing space permits herbaceous plants to grow on the forest floor and provides food and cover for animals living within the forest. By proper silvicultural practices, the forest life cycle can be greatly increased and many useful forest products produced that support community and economic growth.

Improvement cuts are generally made in mature stands to regulate species compositions and improve the quality of these stands by removing diseased or weakened trees. Improvement cuts are often conducted with thinning operations. Merchantable trees designated for elimination in improvement cuts are sold and commercially harvested in the conventional fashion. Improvement cuts are also accomplished through firewood sales to the local community, in which case, BNR sells permits ($10.00 per cord) for the harvest of hardwoods from designated sites on the east reservation.

Mechanical control of competing vegetation is used in pre-commercial situations where prescribed burning is ineffective, such as the preparation of certain hardwood sites prior to planting. It may also be applied through row thinning in overcrowded stands that have developed from exceedingly dense reproduction. Vegetation of sapling size or smaller is broken up with heavy disk plows or rolling brush choppers. Bulldozers may be used against vegetation of any size from small brush to large trees.

Prescribed burning is defined as fire applied in a knowledgeable manner to forest fuels on a specific land area under selected weather conditions to accomplish predetermined and well-defined management objectives. Prescribed burning is a desirable and economically sound practice on most southern pine sites. Few, if any, alternative treatments have been developed that can compete with fire from the standpoint of cost effectiveness. BNR conducts burns primarily in the upland pine forest.

Burns may be conducted year-round, dependent upon management objectives and other environmental and safety factors. Smoke management is a major concern given the proximity of the Barksdale AFB to Shreveport/Bossier City, Interstate 20, and the town of Haughton. Prior to any burn BNR notifies LDEQ, LDAF, local fire districts (as needed) and base officials.

Prescribed fire is applied to:

- Dispose of logging debris
- Prepare sites for seeding or planting
- Improve wildlife habitat
- Manage competing vegetation

Herbicides are used in site preparation techniques and pine tree release. Herbicides are a practical, cost effective method of vegetation control that may be used when management objectives deem other silvicultural methods unfeasible. Herbicides may be used for site preparation before seeding or planting,

herbaceous weed control during stand establishment, and crop tree release. Before planting, herbicides are used to kill all the vegetation on the site to assist in burning away debris for planting.

Pine releases consist of removing undesirable and woody competition thereby increasing survival and growth of the desired tree species. The local cooperative extension agent is contacted for the most recent information and details concerning the proper, safe and legal use of herbicides. Trained and certified state licensees will apply herbicides according to the label instructions.

Reforestation in the pine forest is accomplished either by hand planting pine seedlings or natural regeneration. With even-aged reproduction cutting method, a well-planned prescribed burning program in advance of the regeneration cut is the least expensive method of site preparation and brush control. Hand planting offers a method of reforestation that is often faster than the seed tree method and is relatively independent of fluctuations in seed crops. Under these circumstances, the site should be burned to facilitate proper planting from the tree planters. Loblolly and shortleaf pine are particularly susceptible to fire damage during the first 6 to 10 years following establishment. Firebreaks are maintained around young pine stands to provide protection from fire.

Reforestation in the hardwood forest may be achieved using the hardwood reproduction present in the understory. The preferred method of regeneration is waiting for advance hardwood reproduction to develop naturally, or to hasten it by thinning. Once established, the advance reproduction can be released through the harvest of the mature overstory. The artificial regeneration technique of hand planting is employed to implement faster reforestation and to manipulate the species composition of the stand. Planting is the chosen method of artificial regeneration of bottomland hardwood seedlings.

Successful bottomland hardwood planting requires successfully matching species to site. In bottomland hardwood plantings, only native species properly suited to the hydrology of the site will be used.

Forest Description

Barksdale AFB is situated in the western Gulf Coastal Plain in Northwestern Louisiana. This land is characterized by flat to rolling plains in the eastern portion and flat alluvial plains in the west. Barksdale AFB has two distinct forest types. Located in the eastern half of the base is the upland pine-hardwood forest (9,000 acres) and to the west is the bottomland hardwood forest (7,000 acres). The upland pine-hardwood area is adequately stocked with timber of all ages. The principal commercial species featured in management are loblolly and shortleaf pine. Site quality indexes generally range between fair and excellent. The bottomland hardwood forest is in various conditions, such as old fields, hardwood brush, cull hardwoods and quality hardwoods. A high proportion of the trees are between 50 and 80+ years old. Site quality indexes in these areas generally range from good to excellent. Several natural vegetative communities exist within Barksdale AFB including upland pine-hardwood forest, upland hardwood forest, and the bottomland hardwood forest.

Species common to the upland pine-hardwood forest include loblolly pine, shortleaf pine, post oak (*Q. stellata*), sweetgum, southern red oak (*Q. falcata*), white oak (*Q. alba*), cherrybark oak (*Q. pagoda*), blackjack oak (*Q. marilandica*), mockernut hickory (*Carya tomentosa*), pignut hickory (*C. glabra*), blackgum (*Nyssa sylvatica*), winged elm (*Ulmus alata*), flowering dogwood (*Cornus florida*), and sassafras (*Sassafras albidum*).

Species common to the upland hardwood forest include cherrybark oak, Shumard oak, (*Q. shumardii*), water oak, Chinkapin oak (*Q. muehlenbergii*), swamp chestnut oak (*Q. michauxii*), white ash (*Fraxinus americana*), black hickory (*C. texana*), ironwood (Carpinus caroliniana), eastern redcedar (*Juniperus virginiana*), redbud (*Cercis canadensis*), plums (*Prunus spp.*), hawthorns (*Crataegus spp.*), chalk maple,

(*A. saccharum var. leucoderme*), osage-orange (*Maclura pomifera)*, eastern hophornbeam (*Ostrya virginiana*), huckleberries (*Vaccinium spp.),* with some loblolly and shortleaf pine.

Species common to bottomland hardwood forests are divided into three groups:

Species found on the wettest soils typical in bottoms of major floodplains. These species include baldcypress (*Taxodium distichum*), water hickory (*C. aquatica*), overcup oak (*Q. lyrata*), Nuttall oak (*Q. nuttallii*), willow oak (*Q. phellos*), water oak, black willow (*Salix nigra*), green ash (*F. pennsylvanica*), honeylocust (*Gleditsia triacanthos*), red maple (*A. rubrum*), American elm, sweetgum, swamp dogwood (*C. drummondii*), and persimmon (*Diospyros virginiana*).

Species found primarily on former ridges and natural levees have soils higher in elevation and, therefore, they are typically no longer subjected to periodic flooding. These soils have improved drainage and are primarily silt loams. Species included in the group include cherrybark oak, Shumard oak, water oak, swamp chestnut oak, cottonwood (*Populus deltoides*), blackgum, red mulberry (*Morus rubra*), pecan, black cherry (*Prunus serotina*), sugarberry, American sycamore (*Platanus occidentalis*), ironwood, and some specimens of loblolly pine.

Species found primarily in minor bottoms are contained within the upland areas of the base. Many of these species are absent from major bottoms. These include white oak, shagbark hickory (*C. ovata*), cedar elm (*U. crassifolia*), slippery elm (*U. rubra*), devils-walkingstick (*Aralia spinosa*), American basswood (*Tilia caroliniana),* and some specimens of loblolly pine.

Commercial Forestry

Barksdale AFB commercial forestry practices achieve overall INRMP goals and objectives through an ecological approach to management that produces multiple, diverse benefits from forest lands by blending the needs of people and environmental values in such a way that these lands remain diverse, healthy, productive and sustainable ecosystems. This ecologically based approach to forest management is directed toward habitats, communities of species and forest health rather than single species or commodity production. Ecosystem management emphasizes biodiversity while maintaining contributions to human, social and economic needs and opportunities. The key issue is sustainability. Therefore, Barksdale AFB manages the forests ecologically in order to ensure commercial and noncommercial values are sustained for today's society and future generations.

The Barksdale AFB forest produces large pine sawlogs, which are highly valued for the production of plywood, poles, pilings and lumber. Pine sawtimber sales account for about 90% of annual timber sale revenues. Sales of pine pulpwood, hardwood pulpwood, hardwood sawtimber and firewood provide additional revenues. Under past management practices, hardwood sales from the bottomland hardwood forest have been limited to construction projects, salvage, and timber stand improvement cuts, such as, sweetgum removal to promote mast production and the growth of oaks. Current management within the bottomland hardwoods emphasizes forest health over timber production.

Hardwood timber sales have been initiated for the purpose of thinning within overstocked stands, small regeneration cuts to promote wildlife habitat, and some large regeneration cuts have been planned for areas with diseased trees.

Barksdale AFB is the highest income producer in Global Strike Command with annual timber sale revenues between $300,000.00 and $500,000.00. 10 U.S. Code 2665, as amended by Public Law 98- 407 and Public Law 99-561, provides for the distribution of net proceeds (collections versus obligations) from installation forest product sales. The State of Louisiana receives 40% of the net timber sale proceeds from Barksdale AFB earmarked for local parish schools and road improvements. Large lot timber sales, any lot valued over $25,000.00, are sold on a competitive bid basis through 2 CONS. AFI 32-7064 (Integrated Natural

Resources Management) authorizes BNR to sell timber in small lot sales valued at less than $25,000.00 where the total sale volume is not large enough to justify formal advertising for bids. Small lot sales also allow for the timely salvage of seriously damaged or dead timber. Timber harvesting on Barksdale AFB is accomplished by logging companies. Logging conditions are typical of those encountered in the south and are frequently curtailed during periods of wet weather.

Forest Organization

The upland forest is organized into seven compartments that are worked systematically on a seven- year cutting cycle. These compartments can be found in the figure 14 (Forest Compartments). Timber-cutting activities may occur outside of the annual compartment when planned Timber Stand Improvement (TSI) or regeneration of areas are better accomplished sooner rather than later and in cases where the amount of work required in a given compartment exceeds annual management goals. Other examples include seed tree removals, timber harvest at proposed construction sites and salvage of timber seriously damaged by storms, fire, insects, diseases and acts of man. The bottomland hardwood acreage is also divided into four compartments for management purposes other than harvest regulation.

The Barksdale AFB Forest is divided into three management classes:

1) Commercial forest - Forest practices will follow standard silvicultural practices with even-aged management. This means tree cohorts, groups of trees the same age, will be managed as a single age class until the stand is mature. Then, the stand will be regenerated from seedlings. Clearcuts will not exceed 100 acres or $1/80^{th}$ of the total pine forest given an 80-year regulatory rotation. The pine forest will be prescribed burned on a three to five year rotation based upon individual stand needs.

2) Modified commercial forest - This forest has special environmental characteristics, such as prairies, upland hardwoods, natural areas, or unique plants. Silviculture practices here consist of salvage cutting of diseased and dying trees, thinning dense stands, and prescribed burning. This forest type will be managed as an uneven-aged forest. Commercial harvesting of trees will be used only to perpetuate these unique areas.

3) Noncommercial forest - This forest is characterized by sites with a low potential for production of forest products including productive forest land on which mission requirements, accessibility or non-compatible uses preclude commercial forest management activities. This is the urban forest and special recreation areas. The only cutting here will be salvage cuttings, if warranted.

To facilitate the application of silvicultural prescriptions, compartments are subdivided into smaller administrative land areas or record units (see map titled Forest Record). Across the forest are defined a total of 85 record units, averaging 200 acres per unit. The record units constitute practical, operating units from a management standpoint. Forest stands within the record units are identified and categorized by age class. Eight broad age classes are used: 0-10 years, 10-20 years, 20-30 years, 30-40 years, 40-50 years, 50-60 years, 60-70 years and 70 + years.

Barksdale AFB has an existing network of over 50 miles of graveled roads that provide access to most forest areas. The petroleum company lessees and BNR/2 CES maintain these roads. BNR/2 CES provides maintenance support on roads subject to heavy traffic and associated with Barksdale AFB activities. Road maintenance generally involves grading and the placement of gravel and culverts.

Each year, about five miles of access roads are extensively reworked to provide improved access for silvicultural work and other management activities. BNR oversees the construction of any temporary or permanent access routes on the east reservation. New permanent access routes that are constructed are normally associated with increased oilfield activity. BNR denies the construction of any proposed road not be in accordance with stated INRMP goals and objectives and BMPs.

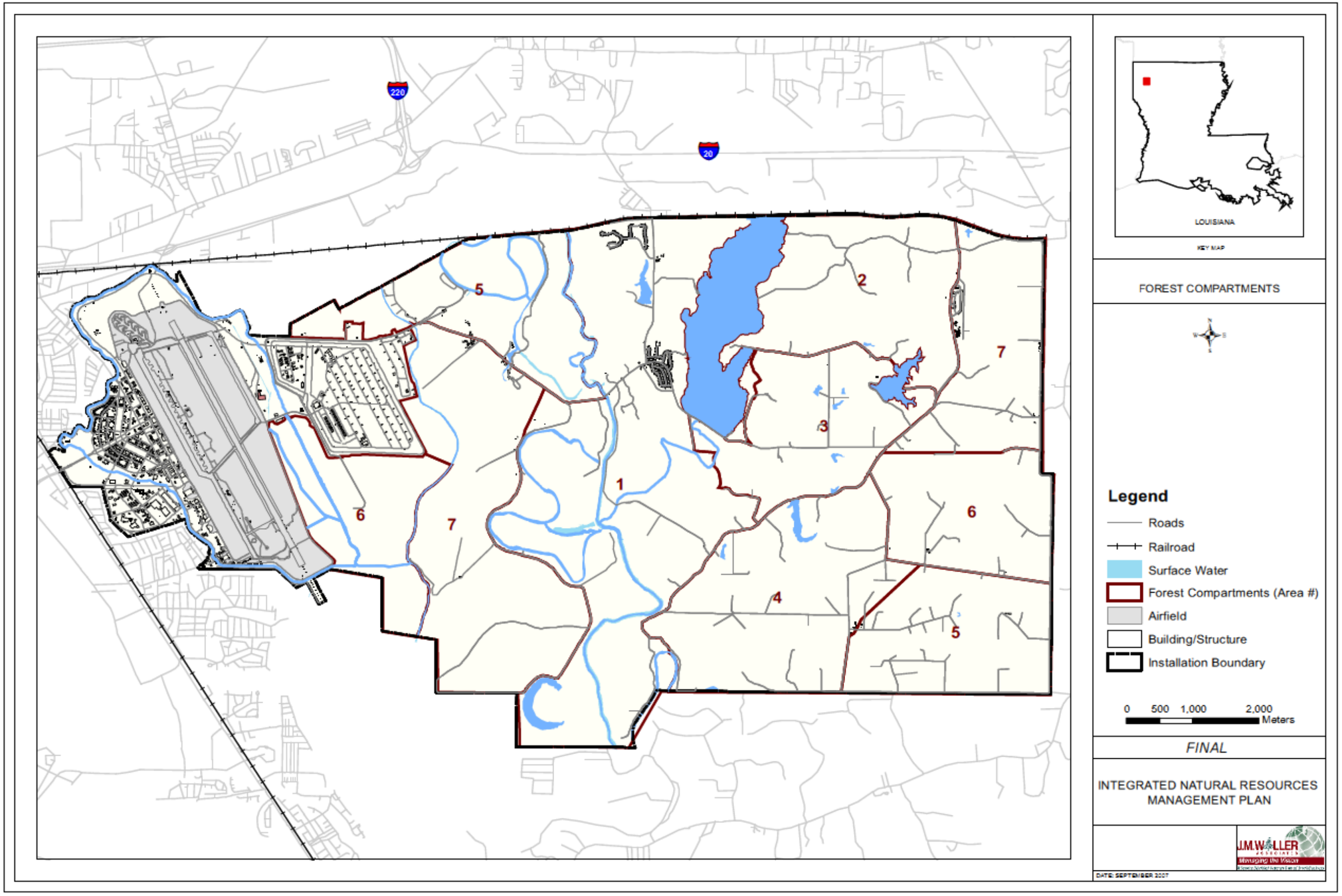

Figure 14. Forest Compartments

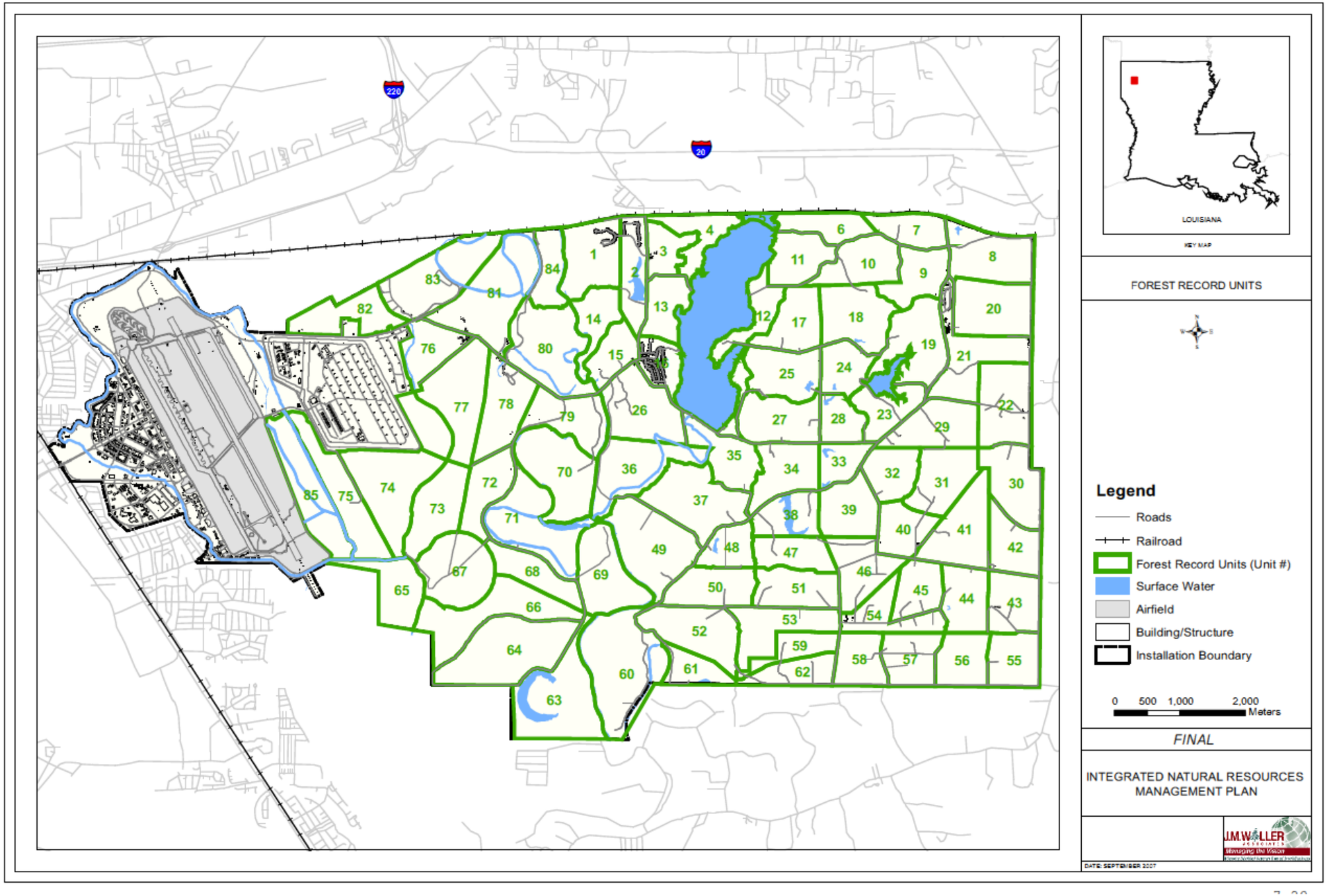

Figure 15. Forest Record Units

7.9 Wildland Fire Management

Applicability Statement

This section applies to AF installations with unimproved lands that present a wildfire hazard and/or installations that utilize prescribed burns as a land management tool. This section **IS** applicable to Barksdale AFB.

Program Overview/Current Management Practices

BNR is responsible for forest fire management and control, to include providing a forest fire crew that meets the applicable National Fire Protection Association (NFPA) Standards for wildland fire activities. When a forest wildfire is detected, the fire crew is dispatched to the fire location to then contain the fire. BNR may request fire suppression support from 2 CES/CEF (Fire Protection Flight) and LDAF in cases of high fire danger, large or multiple wildfires, and fires near urban-interface areas, remote facilities and base boundaries. Natural resources personnel have extensive training and experience in prescribed burning, fire effects and fire behavior. Barksdale AFB uses prescriptive fire as a tool to mimic the natural forces of fire to maintain a balanced ecosystem. BNR burns on average 2,000 acres a year using prescribed burns. Barksdale AFB has a Wildland Fire Management Component Plan (WFMP) with specific goals to support the AF mission, protect and improve forest values, enhance ecosystem management, and promote the safety of residents, public and firefighters. This Wildland Fire Plan is undergoing a major rewrite. The Wildland Fire Operational Component Plan, BAFB, LA Sept 2007 is incorporated by reference within the INRMP. It is written as an integral component of the INRMP and receives full effect. Copies may be obtained by contacting Barksdale Natural Resources Office at 318-456-3353.

7.10 Agricultural Outleasing

Applicability Statement

This section applies to AF installations that lease eligible AF land for agricultural purposes. This section **IS NOT** applicable to Barksdale AFB.

Program Overview/Current Management Practices

N/A.

7.11 Integrated Pest Management Program

Applicability Statement

This section applies to AF installations that perform pest management activities in support of natural resources management, e.g. invasive species, forest pests, etc. This section **IS** applicable to Barksdale AFB.

Program Overview/Current Management Practices

BNR program will adhere to guidelines set forth within the Barksdale AFB IPMP. IPMP is the selection and implementation of a variety of pest control methods based on predicted economic, ecological, and sociological consequences. IPMP incorporates various control measures including biological, cultural, physical, mechanical, and chemical. An aggressive use of integrated pest management practices will continue to help reduce the amount of pesticides sprayed at Barksdale AFB the main objective of the IPMP. The Integrated Pest Management Plan, BAFB, 2012 is incorporated by reference within the INRMP. It serves as an integral component of the INRMP and receives full effect. Copies may be obtained by contacting Barksdale Natural Resources Office at 318- 456-3353.

Continuous surveillance of the forest resources is an IPMP principle used at Barksdale AFB. USFS and LDAF are consulted on a regular basis concerning pest management. The most serious pest problem is the southern pine beetle (*Dendroctonus frontalis*). Surveillance results are used to guide control operations and to predict

future losses. Prompt salvage and utilization of the affected trees is the preferred method of control. Proper silvicultural treatment of forest stands is the essential element in developing long-term pest management strategies that reduce timber loss. IPMP has been practiced in the control of hydrilla by introducing grass carp to Flag Lake to help reduce growth between herbicide applications. Additionally, insect larvae have been used to help control water hyacinth. Any herbicidal control of noxious weeds would be performed by the natural resources staff certified in the appropriate categories with coordination through 2 CES (Entomology).

Invasive Species

Natural resources staff monitors for the presence of invasive species during daily activities. Of the following invasive species found at Barksdale AFB, hydrilla is by far the most damaging invasive species. Control of hydrilla is discussed in Section 7.4. Control of the all aquatic species is discussed in the IPMP.

Giant Salvinia (*Salvinia molesta*) is an aquatic fern native to Brazil. It is a free floating plant that does not attach to the soil, but instead remains buoyant on the surface of the water body. The plant is a major problem on area lakes and waterways. The plant was introduced to Flag Lake and has quickly spread to other lakes on base. Boaters can easily transport the plant on boat trailers, making control difficult.

Alligator weed (*Alternanthera philoxeroides*) is a perennial stoloniferous herb that can be found in many parts of the world infesting rivers, lakes, ponds, and irrigation canals, as well as many terrestrial habitats. The aquatic form of the plant has the potential to become a serious threat to waterways, agriculture and the environment.

Chinese tallowtree (*Sapium sebiferum*) in the forest understory can quickly dominate forest gaps (created by natural tree falls and management activities such as harvesting) slowing regeneration of other forest species. Tallowtree is slowly becoming a problem invasive at Barksdale AFB. Annual spot treatments are failing to keep it in check.

Chinese privet (*Ligustrum sinese*) in the forest understory can quickly dominate forest gaps (created by natural tree falls and management activities such as harvesting) slowing regeneration of other forest species.

Eurasian watermilfoil (*Myriophyllum spicatum*) is a submerged aquatic plant that can rapidly colonize a pond, lake or area of slow-moving water. It creates dense mats of vegetation that shade out other native aquatic plants, diminish habitat and food resource value for fish and birds, and decrease oxygen levels in the water when the plant decays.

Feral hogs (*Sus scrofa*) damage trees and reduce regeneration. Wild hogs root for their food, destroying understory plants, including canopy seedlings, and disturbing the soil. The hogs compete with native wildlife for food.

Hydrilla (*Hydrilla verticillata*) is a submerged aquatic weed that crowds out native plants by shading them and outcompeting them for nutrients. Dense masses of hydrilla interfere with recreational activities, such as boating, fishing, and swimming.

Nutria (*Myocastor coypus*) cause herbivory and burrowing damage in coastal Louisiana; nutria damage is currently only a minor problem at Barksdale AFB, but will be monitored.

Water hyacinth (*Eichhornia crassipes*) has become a serious weed in many tropical, warm and temperate freshwater habitats worldwide. In slow-moving to still water bodies it is especially problematic as it forms dense monospecific mats that lower dissolved oxygen levels in the water, alter river hydrology and increase organic sediment. These mats displace native aquatic plant and animal communities, drastically alter the ecosystem and puts native habitats and wildlife at risk. Furthermore, water hyacinth may interfere with the use of a water-body for cultural, social or commercial purposes.

7.12 Bird/Wildlife Aircraft Strike Hazard (BASH)

Applicability Statement

This section applies to AF installations that maintain a BASH program to prevent and reduce wildlife-related hazards to aircraft operations. This section **IS** applicable to Barksdale AFB.

Program Overview/Current Management Practices

Animal and bird populations on the flightline area will be controlled to prevent wildlife/aircraft collisions. This will be accomplished by habitat modification, fence maintenance around the flightline, noise and distress calls and as a last resort depredation permits. Flightline vegetation will be maintained between 7 and 14 inches in height to discourage birds and limit the number of mowings required, in addition to the Bermuda Grass Release Program as identified in Section 7.8 *Grounds Maintenance and Urban Forestry*. The BASH plan covers procedures and techniques for preventing bird aircraft strikes and hazards. Aircraft are exposed to bird and wildlife hazards by both migratory and resident birds. The Bird/Wildlife Aircraft Strike Hazard (BASH) Management Techniques, BAFB Pamphlet 91-212, Sept 2005 is incorporated by reference within the INRMP. It serves as an integral component of the INRMP and receives full effect. Copies may be obtained by contacting Barksdale Natural Resources Office at 318-456-3353.

Barksdale AFB is affected by a major migratory waterfowl flyway. The Red River, which serves as a natural guide for migratory waterfowl that use the Mississippi flyway, is located two miles west of the airfield. Migratory waterfowl also seek refuge within several areas located approximately two miles east of the runway. European Starlings (*Sturnus vulgaris*) and Brown-headed Cowbirds (*Molothrus ater*) flock the airdrome in mass. Soaring raptors (i.e., American Kestrels, Red-tailed Hawks, etc.) inhabit the airfield and surrounding air space. These raptors feed on an ample supply of rodents and other prey species found on and adjacent to the airfield. The airfield and surrounding area is home to numerous other species of birds such as cattle egrets, American crows (*Corvus brachyrynchos*), and Eastern meadowlarks (*Sturnella magna*). All bird activity poses a hazard to local flying and the 2 BW mission.

The 2 BW experienced 338 bird strikes in the five year period from FY10 to FY15 resulting in $599,100.38 in damage to aircraft. October through November poses an increased threat for bird strikes based on migratory patterns and larger waterfowl in the area. During this period flight operations have been modified to restrict transitions to avoid sunrise and sunset periods. An increased vigilance during these two months has led to a 30% decrease in bird strikes.

The greatest single threat to all aircraft throughout the year is the overabundance of Black Vultures (*Coragyps atratus*) in the local area. Black Vultures are usually present throughout the year to the south of the airfield. Due to their size, a vulture strike to any type of aircraft can be costly but they can cause massive damage to smaller aircraft such the A-10 and transit fighters that use Barksdale AFB.

During the winter and spring, large flocks of Brown-headed Cowbirds, European Starlings, Common Grackle (*Quiscalus quiscula*) and American Robins (*Turdus migratorius*) attempt to feed on the airfield. Flocks from 50 to 2,000 birds are a common occurrence. Controlling weeds and maintaining the grass height between 7 and 14 inches has proven to discourage them from feeding but an increased vigilance is still required. Bird cannons, pyrotechnics and depredation used daily for a week can usually break the flocks' habits and keep them from returning to the airfield.

American Mourning doves are also a significant threat throughout the year at Barksdale AFB. Mourning doves move into the airfield individually or in small groups and attract additional birds. They normally cross the active runway from roosting areas to feeding areas and they will land on the overruns of the runway to pick grit. Bird cannons have very little effect on the doves. Pyrotechnics have proven effective but the birds will return to the same area within a couple of hours.

Significant improvements have been made to manage the BASH program at Barksdale AFB. The second phase of a three-phase, multi-million dollar construction project to eliminate standing water on the airfield was completed in 2006. This led to a decrease in bird strikes from waterfowl. Numerous holes in the airfield perimeter fence were repaired to stop wildlife from entering. This eliminated deer on the airfield and reduced the number of coyotes and foxes. Coyotes and foxes still dig under the fence to gain access to the airfield to feed. Sections of fence material are now being buried under the fence to prevent wildlife from digging under the fence. The transition from Johnson to Bermuda grass is still continuing, along with continuous herbicide and insecticide treatments. This has proven to be one of the best programs to deter bird activity. The slower growing Bermuda grass does not require mowing as often and has reduced the nesting areas on the airfield. In addition, numerous structures on the airfield were demolished to eliminate nesting areas. Supervisors of Flying (SOFs) are continually trained to use the bird cannon system and have become more proactive with bird control measures.

Positive identification of bird remains increased to over 90% in the last four years. This allowed Flight Safety to pinpoint birds posing the greatest threat. As a result, bird depredation was conducted "as needed" targeting specific and immediate threats to the 2 BW mission.

BNR plays an important role in the BASH Working Group. BNR is responsible for acquiring the appropriate wildlife permits for depredation operations and assists Flight Safety in animal control. Natural Resources personnel developed and implemented the Bermuda Grass Release Program, as identified in Section 7.7 *Grounds Maintenance and Urban Forestry*, to reduce potential bird strikes on the airfield. Typical grounds maintenance activities including mowing, weed/grass trimming, edging, fertilization, pest management herbicide treatment, tree planting and related activities are accomplished under contract. Barksdale AFB possesses over twice the improved grounds acres (1,480) as compared to other AFGSC bases.

A Bermuda Grass Release Program was initiated on the 830 acres of turf on the airfield in 1996, at the request of a HQ Air Force Wildlife Biologist responsible for the BASH Program. The program includes an integrated approach using herbicides, growth retardants, seeding, fertilization, liming and monitoring. The program was initiated on the flightline because of the continued problems with cattle egrets feeding on insects in the area of the airfield, posing a potential BASH problem with aircraft. The predominant vegetation on the airfield is Bermuda grass, which when controlled as a monoculture environment, becomes sterile to birds feeding on insects. Bermuda grass only reaches an average height of 12 inches when controlled by herbicides to reduce vegetative growth and competing non- desirable grass and weed species that attract birds. Since the program's inception, improvements have been made in airfield appearance, safety (program has reduced bird activity), and weed control. In addition, the Bermuda Grass Release Program provides a significant cost savings by reducing required mowing by up to 50% when the airfield is maintained to the program standards.

7.13 Coastal Zone and Marine Resources Management

Applicability Statement

This section applies to AF installations that are located along coasts and/or within coastal management zones. This section **IS NOT** applicable to Barksdale AFB.

Program Overview/Current Management Practices

N/A.

7.14 Cultural Resources Protection

Applicability Statement

This section applies to AF installations that have cultural resources that may be impacted by natural resource management activities. This section **IS** applicable to Barksdale AFB.

Program Overview/Current Management Practices

Cultural resources will be considered before any project is implemented on Barksdale AFB. The Project Manager will ensure protection of resources in accordance with guidelines and procedures set forth in Barksdale AFB Cultural Resources Management Plan. The Project Manager will consult with the Cultural Resources Manager (CRM) to determine whether the area has been surveyed and whether National Registry of Historic properties (NRHP) are present. This includes file searches to locate any previously identified resources. Project Manager will determine whether the operation is ground disturbing. Then Natural Resources Management and CRM will determine treatment options applicable to each site. To ensure these sites are protected, BNR and CRM will mark locations of NRHP-eligible properties and resources of potential eligibility. Contracting will be informed of special requirements related to NRHP-eligible properties and resources of potential eligibility. A study conducted in 2011 identified only two sites that are eligible for the NRHP on East Reservation.

7.15 Public Outreach

Applicability Statement

This section applies to all AF installations that maintain an INRMP. The installation is required to implement this element.

Program Overview/Current Management Practices

BNR provides public tours that focus on conservation and preserving unique natural communities to raise awareness of Barksdale AFB natural resources. BNR personnel serve the public sportsman community as hunter safety instructors. Barksdale AFB has a hands-on display of native flora and fauna that is open to the public created by BNR and provides educational programs to local school children.

7.16 Geographic Information Systems (GIS)

Applicability Statement

This section applies to all AF installations that maintain an INRMP, since all geospatial information must be maintained within the AF GeoBase system. Barksdale AFB is required to implement this element.

Program Overview/Current Management Practices

GIS is a useful management tool that facilitates creating, storing, analyzing and managing spatial data and associated attributes. GIS allows managers to examine ecosystem components where each component is represented as a layer in a spatial format. Layers can be viewed individually for continuity or uniqueness, or several layers can be viewed at the same time to identify relationships.

Data are maintained by BNR and stored both locally and on the Base network. All data are maintained and displayed using ArcGIS. This software package gives BNR the ability to create theme related shape files, digitize maps, store data and compile reports or analyses for natural resource management. New information is incorporated into the system for immediate use by managers.

A brief description of several key layers and preparation status follows:

Archeology – A contractor has delivered several layers after a range-wide survey. These areas have been integrated into a standardized system. This practice will continue for future surveys.

Base Boundary – 2 CES/GEOBASE personnel provide this layer and coordinate GIS work as needed with BNR.

Firebreaks – BNR maintains the current firebreak layer. The objective is to maintain the most accurate map possible. Layers are updated to reflect changes in usage.

Military Operations – GIS is increasingly used to input military operations data such as pilot survival training, other military training and mission requirements. Barksdale AFB is a dynamic landscape with diverse flora and fauna that is subject to management and natural fluctuations in hydrology, fire, populations, and severe weather. For GIS to continue to support management activities and supply current information effectively, it must be equally dynamic to allow managers the ability to collect information and provide answers. BNR will continue data collection through the use of aerial photography, GPS location, contracting of services, and field reconnaissance, including oblique aerial photography, as needed. BNR will continue to update layers as new data become available.

Natural Areas – A layer has been created which adequately displays the natural areas on Barksdale AFB as identified by The Nature Conservancy (TNC) of Louisiana.

Oil and Gas Operations – BNR continuously update this layer to reflect changes in lease operations. The layer is changed to reflect locations of new and abandoned wells, roads, pipelines, and associated production facilities.

Plant communities – Several themes have been developed which adequately illustrate plant distributions throughout the base. These themes change and are updated to reflect modifications established through land management activities such as timber harvests, new construction and oil/gas development.

Recreation – A detailed color map for persons using the east reservation for fishing, hunting, hiking, birding, and other recreation activities is provided and updated annually.

Roads – BNR updates road layers as needed. A separate theme is maintained which illustrates roads open to the public. There is an ongoing effort to determine roads that should be closed

Soils – Data acquired from an NRCS soil survey of the East Reservation is displayed in a layer. Soils maps for Barksdale AFB are used to determine the quality of soils for future projects.

Threatened and Endangered Species – The bald eagle was officially removed from the federal list of threatened and endangered species 8 August 2007, but will continue to be protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. Flag Lake is considered to be an important habitat area for the bald eagle. The BNR will update this layer as needed.

Timber Stands – A layer has been developed showing the forest compartments and timber stands used in forest management. As new data is obtained on forest statistics, the data will be updated.

Wetlands – BNR has a wetland layer that was created using USACE wetland delineation guidelines. Essential hydric soil data provided by NRCS (1993 survey) is displayed on a separate coverage. It is AF policy to consult the USACE for a wetland determination only when a project is proposed for an area identified by extensive survey as potential wetland.

8.0 MANAGEMENT GOALS AND OBJECTIVES

The installation establishes long term, expansive goals and supporting objectives to manage and protect natural resources while supporting the military mission. Goals express a vision for a desired condition for the installation's natural resources and are the primary focal points for INRMP implementation. Objectives indicate a management initiative or strategy for specific long or medium range outcomes and are supported by projects. Projects are specific actions that can be accomplished within a single year. Also, in cases where off-installation land uses may jeopardize AF missions, this section may list specific goals and objectives aimed at eliminating, reducing or mitigating the effects of encroachment on military missions. These natural resources management goals for the future have been formulated by the preparers of the INRMP from an assessment of the natural resources, current condition of those resources, mission requirements, and management issues previously identified. Below are the integrated goals for the entire natural resources program.

The installation goals and objectives are displayed in the 'Installation Supplement' section below in a format that facilitates an integrated approach to natural resource management. By using this approach, measurable objectives can be used to assess the attainment of goals. Individual work tasks support INRMP objectives. The projects are key elements of the annual work plans and are programmed into the conservation budget, as applicable.

Installation Supplement – Management Goals and Objectives

GOAL 1: ASSIST WING SAFETY TO EFFECTIVELY REDUCE HAZARDS TO PERSONNEL AND AIRCRAFT ASSOCIATED WITH BIRD AND ANIMAL ACTIVITY.

- OBJECTIVE 1.1: Reduce the risk of bird and wildlife strikes through a multi-disciplinary approach.
    - PROJECT 1.1.1: Maintain current USFWS Depredation Permit to allow taking of birds posing a hazard to human life and equipment on and around the flight line.
    - PROJECT 1.1.2: Maintain current LDWF Nuisance Animal Permit to allow taking of non-migratory animals posing a hazard to human life and equipment on and around the flight line.

GOAL 2: ENSURE OILFIELD DEVELOPMENT IS COMPATIBLE WITH THE MILITARY MISSION AND RESPONSIBLE ENVIRONMENTAL STEWARDSHIP.

- OBJECTIVE 2.1: Minimize new disturbance that adversely affects the military mission, present and future training capabilities, and all forest values.
    - PROJECT 2.1.1: Procure in cooperation with BLM updated reasonable foreseeable development document and programmable environmental assessment for oilfield developments as they become available.
    - PROJECT 2.1.2: Coordinate compliance with and outline acceptable procedures for reclamation of oilfield sites.
    - PROJECT 2.1.3: In cooperation with BLM monitor ongoing oilfield production activities to include the correction of regulatory deficiencies.
    - PROJECT 2.1.4: Assess and monitor the impacts of oilfield development on wildlife habitat and timber loss and develop projects to mitigate those impacts as needed.

GOAL 3: MANAGE WETLANDS AND MOIST SOIL IMPOUNDMENTS FOR MIGRATORY WETLAND BIRDS.

- OBJECTIVE 3.1: Manage moist soils impoundments for migratory species.
    - PROJECT 3.1.1: Maintain water levels and provide wetland habitat for migratory wading and shore birds during fall and spring migrations.
    - PROJECT 3.1.2.: Maintain motor and water pump at Flat River. Work includes operating and pumping water from Flat River into wetland impoundments.
- OBJECTIVE 3.2: Manage moist soils impoundments for migrating and wintering waterfowl species.
    - PROJECT 3.2.1: Maintain Moist Soil Management Units 1-5 as high quality wetlands for wintering waterfowl usage. Manage and manipulate vegetation in impoundments to maintain over 50% coverage of preferred desirable plants. Work includes mowing, disking, and planting in impoundments.
    - PROJECT 3.2.2: Repair, and maintain wetland pumps, pipelines, and water control structures in management units.
    - PROJECT 3.2.3: Supplement natural food sources for waterfowl through supplemental planting of crops. Small plantings will be made where undesirable vegetation has established itself.
    - PROJECT 3.2.4: Study habitat use and propose methods to improve migratory waterfowl habitat.
- OBJECTIVE 3.3: Manage greentree reservoirs for migrating and wintering waterfowl species.

- PROJECT 3.3.1: Maintain and operate red chute pump for flooding of bottomland hardwood forest habitats.
- PROJECT 3.3.2: Maintain water levels in GTR's. Monitor health of trees to assess any negative effects of flooding.

GOAL 4: MANAGE WETLANDS/FLOODPLAINS FOR OVERALL ECOSYSTEM HEALTH.

- OBJECTIVE 4.1: Continue protection and management of valuable wetlands, watersheds, water quality and the other vital water resource functions.
  - PROJECT 4.1.1: Required work includes monitoring and enhancing ecosystem health, wetland habitat restoration, vegetation surveys.
  - PROJECT 4.1.2: Protect wetlands through administrative planning, access controls, and control of nuisance animals such as beavers which can alter and degrade forested wetlands.
  - PROJECT 4.1.3: Maintain levees and water control structures. Required work includes mowing/spraying around structures and periodic evaluations of water levels.

GOAL 5: ENHANCE BALD EAGLE HABITAT THROUGH ERADICATION OF INVASIVE AQUATIC VEGETATION.

- OBJECTIVE 5.1: Maintain suitable habitat for protected bald eagles that forage on base lakes. Quality of the foraging habitat on several lakes are threatened by encroaching water plants.
  - PROJECT 5.1.1: Annual surface treatment of the encroaching water plants is required to maintain the bald eagle habitat.
  - PROJECT 5.1.2: Utilize non-chemical Integrated Pest Management Plan (IPMP) methodology in controlling nuisance aquatic vegetation by maintaining triploid grass carp in lakes to feed on vegetation. Monitor grass carp population and supplement as needed.
  - PROJECT 5.1.3: Monitor fish population and stock fish as needed to provide an adequate forage base.
  - PROJECT 5.1.4: Use aquatic herbicide to control water hyacinth, hydrilla and giant salvania on Flag Lake.

GOAL 6: ESTABLISH AND MAINTAIN LIAISON WITH FEDERAL, STATE, AND LOCAL STAKEHOLDERS, AND REGULATORS.

- OBJECTIVE 6.1: Perform non-training travel such as to regulator or cooperator meetings to support objectives of Natural Resources Programs.
  - PROJECT 6.1.1: Provide TDY costs for Natural Resources staff to attend essential meetings and promote cooperative conservation.

GOAL 7: ENHANCE NATURAL RESOURCES PROGRAMS BY CONTINUAL TRAINING UPDATES.

- OBJECTIVE 7.1: Provide training for professional development.
  - PROJECT 7.1.1: Provide training opportunities that will provide Natural Resources staff with the current skills needed to keep program in compliance with applicable law.

GOAL 8: IMPROVE THE QUALITY OF FISHING EXPERIENCES FOR ANGLERS ON PONDS AND LAKES.

- OBJECTIVE 8.1: Increase the opportunities for anglers on lakes and ponds by maintaining open fishing areas on shorelines and levees.

- PROJECT 8.1.1: Manage pond shorelines adjacent to developed spawning areas for fishermen ease of access, removing woody vegetation and maintaining herbaceous vegetation.
- PROJECT 8.1.2: Develop and create spawning areas on base lakes to promote fishing opportunities.

GOAL 9: PROVIDE HUNTING OPPURTUNITIES FOR THE PUBLIC.

- OBJECTIVE 9.1: Staff and maintain check station during controlled managed hunts.
  - PROJECT 9.1.1: Maintain NRO personnel presence in check station during all managed firearm hunts.
  - PROJECT 9.1.2: Collect data from harvested deer during the check-in to be utilized for population management decisions.
  - PROJECT 9.1.3: Ensure safety of hunters and non-hunters during managed hunt days. Assure all hunters are accounted for and provide guidance to recreationists about areas closed or open to hunting.
- OBJECTIVE 9.2: Update and enforce BAFI 32-7064.
  - PROJECT 9.2.1: Maintain and enforce BAFI 32-7064. The OI protects and conserves natural resources on the east reservation.
- OBJECTIVE 9.3: Conduct annual youth waterfowl lottery in Flat River Waterfowl Refuge.
  - PROJECT 9.3.1: Transport and assist youth with accessing duck blinds.
  - PROJECT 9.3.2: Maintain youth waterfowl blinds in Flat River Waterfowl Refuge.
- OBJECTIVE 9.4: Provide duck hunting opportunities for hunters.
  - PROJECT 9.4.1: Maintain flooded areas for waterfowl hunters. Vary flooding schedules between GTR's to provide for some flooded timber for waterfowl hunters
  - PROJECT 9.4.2: Allow hunting in Red Chute Waterfowl Refuge during last two days of waterfowl season.
- OBJECTIVE 9.5: Provide stand locations for the Public.
  - PROJECT 9.5.1: Provide and maintain public stands and make available with priority for handicap members of the public.
- OBJECTIVE 9.6: Provide dove fields for recreational opportunities for the public.
  - PROJECT 9.6.1: Plant crops in multiple locations for shooting opportunities for hunters.

GOAL 10: MANAGE WHITE-TAILED DEER HERD FOR OPTIMUM POPULATION LEVELS AND REPRODUCTIVE SUCCESS.

- OBJECTIVE 10.1: Develop and implement management strategies designed to maintain deer herd health using harvest restrictions.
  - PROJECT 10.1.1: Manage hunts to maintain deer herd size below carrying capacity. Set annual harvest goals and encourage hunters to selectively harvest deer.
  - PROJECT 10.1.2: Monitor deer herd for signs of disease and parasites.
- OBJECTIVE 10.2: Advance the availability of high quality habitat and deer reproductive success. Increase the available fawning areas which provide cover for fawns and increase their survival.
  - PROJECT 10.2.1: Manage hunts to maintain herd size and increase quality habitat.
  - PROJECT 10.2.2: Increase fawning areas available by thinning selected areas.
- OBJECTIVE 10.3: Develop strategies to manipulate deer herd population sex ratios and age structure through harvest regulations.
  - PROJECT 10.3.1: Maintain sex ratios by protect younger antlered bucks from harvest.
  - PROJECT 10.3.2: Conduct annual fall and spring camera surveys to monitor and evaluate population dynamics.

GOAL 11: PROTECT HABITAT AND FORESTS FROM FERAL HOG DAMAGE AND REDUCE ADVERSE IMPACT ON THE ECOSYSTEM.

- OBJECTIVE 11.1: Remove invasive feral hogs from forested areas through trapping, shooting.
  - PROJECT 11.1.1: Conduct hog removal via opportunistic shooting. Maintain and operate up to 2 mobile utv's equipped to control pigs. Operate as needed.
  - PROJECT 11.1.2: Remove hogs by baiting and shooting as conditions warrant.
  - PROJECT 11.1.3: Utilize hog dogs to harass/remove hogs from areas unconducive to trapping or where urgent control of damage is needed.
  - PROJECT 11.1.4: Trap hogs as conditions warrant.
  - PROJECT 11.1.5: Obtain and maintain equipment and supplies for use in controlling hog populations.
  - PROJECT 11.1.6: Utilize aerial control of hogs as conditions warrant.

GOAL 12: DEVELOP AND MAINTAIN WILDLIFE HABITAT ON BARKSDALE AFB TO SUPPORT EXISTING AND RECOVERING WILDLIFE SPECIES.

- OBJECTIVE 12.1: Provide wildlife species with food sources containing enhanced levels of nutrition during times when native forage is nutrient deficient. Food plots on 70 acres are planted twice per year as supplemental food sources for deer, neotropical migratory and local game birds.
  - PROJECT 12.1.1: Install and maintain spring and fall food plots to provide wildlife species supplemental dietary foods. Add lime as needed to adjust the soil pH. Plantings include both perennials and annuals.
  - PROJECT 12.1.2: Install and maintain artificial mineral licks to supplement low mineral quantities available in local soils. Provide critical minerals during times of the year when offspring are being raised. Replenish artificial mineral licks will be replenished yearly during the early winter months. Licks also provide camera sites for camera surveys.
- OBJECTIVE 12.2: Provide areas of cover for wildlife species. Many of Barksdale's older-aged forests, especially bottomland hardwood areas are devoid of vegetation on the forest floor.
  - PROJECT 12.2.1: Select, create and maintain wildlife openings throughout the forest, especially in areas lacking in adequate cover for wildlife species; 6–15 acres of wildlife openings are created each year.
  - PROJECT 12.2.2: On an annual basis, thin 1-2 selected forest stands to promote understory growth/herbaceous vegetation and wildlife cover.

GOAL 13: REMOVE MIDSTORY VEGETATION IN FOREST STANDS TO INCREASE WILDLIFE HABITAT FOR SELECTED SPECIES.

- OBJECTIVE 13.1: Remove midstory woody vegetation from selected forest stands.
  - PROJECT 13.1.1: Harvest or use herbicide applications to remove woody vegetation and improve habitat for quail and other wildlife on 100 acres annually.

GOAL 14: PROMOTE AND PROVIDE POLLINATOR HABITAT.

- OBJECTIVE 14.1: Provide pollinators with native wildflowers and other pollinator friendly plantings.
  - PROJECT 14.1.1: Plant and maintain areas for pollinators. Work will involve planting, tilling, and mowing areas.

GOAL 15: MAINTAIN FACILITIES AND ENHANCE OPPORTUNITIES FOR USERS AT HARMON LAKE RECREATION AREA.

- OBJECTIVE 15.1: Maintain recreation opportunities at Harmon Lake and along Big Tree Hiking Trail.

- PROJECT 15.1.1: Maintain primitive camping areas and picnic area on island at Harmon Lake Recreation Area.
- PROJECT 15.1.2: Maintain hiking trail around Harmon Lake Recreation Area from primitive camping area to boat launch area.

GOAL 16: PROMOTE THE HEALTH AND CONDITION OF FOREST ECOSYSTEMS THROUGH SUSTAINABLE TIMBER HARVESTS.

- OBJECTIVE 16.1: Select annual forest product sale areas based on overall ecosystem health; such that, the ecological system remains stable, sustainable and resilient to stress.
  - PROJECT 16.1.1: Conduct annual inventories within one of the seven forest compartments to be harvested.
- OBJECTIVE 16.2: Conduct annual sale and harvest of forest products from selected forest compartments.
  - PROJECT 16.2.1: Develop and administer the sale of forest products. Establish sale boundaries, protecting Streamside Management Zones and other sensitive areas. Perform quality assurance for logging operations as per contract specifications.
- OBJECTIVE 16.3: Reforest timber sale areas.
  - PROJECT 16.3.1: Determine the site preparation needs on all areas immediately following harvesting estimated at 100 acres per year.
  - PROJECT 16.3.2: Develop and administer site preparation and reforestation contracts on all harvested areas estimated at 100 acres per year.
  - PROJECT 16.3.3: Conduct quality control on all site preparation and reforestation projects
  - PROJECT 16.3.4: Monitor the survival of all reforestation areas the following fall.
- OBJECTIVE 16.4: Perform Timber Stand Improvement operations for enhanced forest health.
  - PROJECT 16.4.1: Conduct timber stand improvement control using herbicides for pine release encompassing up to 200 acres annually.
  - OBJECTIVE 16.5: Maintain and enhance forest access roads throughout the east reservation.
  - PROJECT 16.5.1: Annually maintain and improve 5 miles of forest access roads to include rock, road grading, and pulling ditches.

GOAL 17: PROMOTE THE HEALTH AND CONDITION OF FOREST ECOSYSTEMS THROUGH FIRE MANAGEMENT.

- OBJECTIVE 17.1: Apply prescriptive fire as a tool to mimic the natural forces in fire maintained ecosystems.
  - PROJECT 17.1.1: Apply prescribed fire to 1,500-2,000 acres per year.
  - PROJECT 17.1.2: Maintain 5 miles of firebreaks per year, as required to protect forest resources and support prescribed fire activities. Firebreaks are lanes of exposed mineral soil or succulent vegetation that will not carry a fire. This is accomplished by mowing, disking, plowing, planting. Plantings serve additional purpose to hold/build soils and provide wildlife quality food/cover.
- OBJECTIVE 17.2: Maintain the ability of the natural resources personnel to control prescribed burns and wildfires.
  - PROJECT 17.2.1: Continue annual training of natural resources personnel who are involved in wildfire suppression and prescribed burning.
  - PROJECT 17.2.2: Annually assess, maintain and upgrade when appropriate the essential wild land fire equipment and personal protective equipment.

GOAL 18: PROMOTE ECOSYSTEM HEALTH THROUGH TREATMENTS TO REMOVE OR REDUCE INVASIVE PLANTS.

- OBJECTIVE 18.1: Control the spread of invasive plants using herbicides.
  - Project 18.1.1: Apply herbicides to terrestrially invasive species in selected forest stands.
  - Project 18.1.2: Annually assess the extent of invasive species in forest stands and develop yearly goals on amount of acreage to be treated to slow or stop the spread of these plants.
  - Project 18.1.3: Apply herbicides to aquatic invasive species.
  - Project 18.1.4: Annually assess the extent of invasive species in aquatic habitat and develop goals on amount of acreage to be treated to slow or stop the spread of these plants.

GOAL 19: PROMOTE URBAN FOREST SUSTAINABILITY.

- OBJECTIVE 19.1: Evaluate urban forest sustainability and provide locally specific strategies for sustainable urban forest planning and management.
  - PROJECT 19.1.1: Promote tree protection efforts on all construction projects.
  - PROJECT 19.1.2: Provide consultation on projects that impact trees on main base. As a general policy, plantings should occur at same or greater frequency than removals.
- OBJECTIVE 19.2: Provide science-based solutions, design and engineering perspectives for tree utility conflict avoidance, root system development, root guidance and hardscape resistance.
  - PROJECT 19.2.1: Participate in on-going tree care forums or project reviews within 2 CES.
  - PROJECT 19.2.2: Continue implementation of Base Tree Ordinance.

GOAL 20: MAINTAIN ADEQUATELY TRAINED PERSONNEL ARE SERVING AS CONSERVATION LAW ENFORCEMENT.

- OBJECTIVE 20.1: Provide consistency in game warden training and enforcement.
  - PROJECT **20**.1.1: Ensure FLETC trained personnel are available for conservation law enforcement.

GOAL 21: PROCURE AND MAINTAIN VEHICLES, EQUIPMENT AND SUPPLIES REQUIRED FOR PROGRAM MANAGEMENT.

- OBJECTIVE 21.1: Annually assess, procure, maintain and upgrade when appropriate the essential supplies, equipment and vehicles required for continued program management.
  - PROJECT 21.1.1: Purchase supplies required for program management. PROJECT 20.1.2: Purchase equipment required for program management. PROJECT 20.1.3: Purchase vehicles required for program management.
  - PROJECT 21.1.4: Maintain equipment related to program management.
  - PROJECT 21.1.5: Purchase parts and supplies for maintenance of equipment related to program management.

9.0 INRMP IMPLEMENTATION, UPDATE, AND REVISION PROCESS

9.1 Natural Resources Management Staffing and Implementation

The 2 BW Commander, Base Civil Engineer and NRM, will implement the INRMP upon review and approval. The INRMP, when approved by the Commander, will serve as the overall guide to management of natural resources at Barksdale AFB. The ESOHC provides the mechanism for Barksdale AFB natural resources personnel to identify, address and review other base projects (oilfield development, new and/or expanded housing, new facilities, etc.) with potential impacts to ecosystem integrity and natural resource programs.

The BNR office has four full-time personnel, one term employee, and two contractors to manage the ecosystem at Barksdale AFB and implement this INRMP. Management of this ecosystem presents a unique and complex working environment due to the abundant and diverse species associated with the 7,000 acres bottomland hardwood forest and 9,000 acres in upland pine forest. In addition, the diversity of wetlands, unique natural areas, more than 15 miles of streams, rivers, bayous, and other waterways, and 900 acres in lakes and ponds, subject to invasive aquatic plants. Also, with water resources in close proximity to oil/gas production facilities and mission-related infrastructure, it requires a multi-disciplinary approach to management. In April 2007, BNR lost a Forestry Technician to a Reduction in Force (RIF). The Urban Forester retired in 2011 and the position was eliminated. The current Biological Scientist / Natural Resources position responsible for oil and gas is a term and thus subject to renewal annually. Given increased oilfield-related administrative and field work demands on Natural Resources personnel, the AF should promote the funding of a permanent BNR position to oversee oilfield operations. A permanent position would help meet the following demands and concerns:

- Unprecedented pressure to drill for natural gas and concern for cumulative impact on resources.
- Possible net loss in the capability of east reservation to support the military mission.
- Need to develop communication/understanding between BLM, BAFB and lessees.
- Need to address mission and NEPA concerns with a comprehensive EA.

9.2 Monitoring INRMP Implementation

The 2d BW Commander will implement the INRMP upon review and approval. The INRMP will serve as the overall guide to management of natural resources at Barksdale AFB. The plan is integrated with the mission and base comprehensive planning process through an interdisciplinary team approach and the ESOHC. The ESOHC provides the mechanism for Barksdale AFB natural resources personnel to identify, address and review other base projects (oilfield development, new and/or expanded housing, new facilities, etc.) with potential impacts to ecosystem integrity and natural resources programs.

9.3 Annual INRMP Review and Update Requirements

This INRMP revision will be reviewed by the following agencies: USFWS, BLM, and LDWF. The ESOHC chairperson (Wing Commander, 2 BW) is the final approving authority for Barksdale AFB. The BCE in coordination with the USFWS and the LDWF will review the plan annually. The installation must update the INRMP at least once every five years, or when there is a significant change or realignment in the mission or landholdings of Barksdale AFB.

The INRMP will be reviewed annually by the BCE, in coordination with the USFWS, and the Louisiana Department of Wildlife and Fisheries. The annual reviews will be documented and included in updates to the INRMP. Operational component plans will be updated as needed during preparation of the Barksdale AFB natural resource budgets. The INRMP will be revised or updated every five years in accordance with AFI 32-7064.

10.0 ANNUAL WORK PLANS

The INRMP Annual Work Plans are included in this section. These projects are listed by fiscal year, including the current year and four succeeding years. For each project and activity, a specific timeframe for implementation is provided (as applicable), as well as the appropriate funding source, and priority for implementation. The work plans provide all the necessary information for building a budget within the AF framework. Priorities are defined as follows:

High: The INRMP signatories assert that if the project is not funded the INRMP is not being implemented and the Air Force is non-compliant with the Sikes Act; or that it is specifically tied to an INRMP goal and objective

and is part of a "Benefit of the Species" determination necessary for ESA Sec 4(a)(3)(B)(i) critical habitat exemption.
Medium: Project supports a specific INRMP goal and objective, and is deemed by INRMP signatories to be important for preventing non-compliance with a specific requirement within a natural resources law or by EO 13112 on Invasive Species. However, the INRMP signatories would not contend that the INRMP is not be implemented if not accomplished within programmed year due to other priorities.
Low: Project supports a specific INRMP goal and objective, enhances conservation resources or the integrity of the installation mission, and/or support long-term compliance with specific requirements within natural resources law; but is not directly tied to specific compliance within the proposed year of execution.

Yr.	Annual Work Plans (Include Year)	OPR	Funding Source	Priority Level
2018	**PROJECT 1.1.1**: Maintain current USFWS Depredation Permits to allow taking of birds posing a hazard to human life and equipment on and around the flightline.	OPR: BNR	Funding: Fish and Wildlife (FW) Cost: In-House Labor	HIGH
18	**PROJECT 1.1.2:** Maintain current LDWF Depredation Permits to allow taking of birds, mammals, etc. posing a hazard to human life and equipment on and around the flightline and base.	OPR: BNR	Funding: (FW) Cost: In-House Labor	HIGH
18	**PROJECT 2.1.1**: Procure in cooperation with BLM updated reasonable foreseeable development document and programmable environmental assessment for oilfield developments as they become available.	OPR: BNR	Funding: TBD Cost: In-House Labor	LOW
18	**PROJECT 2.1.2**: Coordinate compliance with protocol and outline acceptable procedures for reclamation of oilfield sites.	OPR: BNR	Funding: TBD Cost: In-House Labor	HIGH
18	**PROJECT 2.1.3**: In cooperation with BLM monitor ongoing oilfield production activities to include the correction of regulatory deficiencies.	OPR: BNR	Funding: TBD Cost: $51K	HIGH
18	**PROJECT 2.1.4**: Assess the impacts of oilfield development on wildlife habitat and timber loss and develop projects to mitigate those impacts.	OPR: BNR	Funding: TBD Cost: In-House Labor	HIGH
18	**PROJECT 3.1.1:** Maintain water levels and provide wetland habitat for migratory wading and shore birds during fall and spring migrations.	OPR: BNR	Funding: CN Cost: In-House Labor	HIGH

Yr.	Annual Work Plans (Include Year)	OPR	Funding Source	Priority Level
18	**PROJECT 3.1.2:** Maintain motor and water pump at Flat River.	OPR: BNR	Funding: CN Cost: $3K	HIGH
18	**PROJECT 3.2.1:** Maintain Moist Soil Mgmt Units 1-5 as high quality wetlands for wintering waterfowl usage.	OPR: BNR	Funding: CN Cost: $3K	HIGH
18	**PROJECT 3.2.2:** Fix, Repair, and maintain wetland pumps, pipelines, and water control structures in mgmt units.	OPR: BNR	Funding: CN Cost: See Project 3.1.2	HIGH
18	**PROJECT 3.2.3:** Supplement natural food sources for waterfowl through supplemental plantings.	OPR: BNR	Funding: CN Cost: $1K	MEDIUM
18	**PROJECT 3.2.4:** Study habitat use and propose methods to improve migratory waterfowl habitat	OPR: BNR	Funding: CN Cost: In-House Labor	LOW
18	**PROJECT 3.3.1:** Maintain and operate red chute pump for flooding of bottomland hardwood forest habitat	OPR: BNR	Funding: CN Cost: TBD	HIGH
18	**PROJECT 3.3.2:** Maintain water levels in GTR's. Monitor health of trees to assess any negative impacts of flooding	OPR: BNR	Funding: CN,FW Cost: In-House Labor	HIGH
18	PROJECT 4.1.1: Required work includes controlling access, monitoring and enhancing ecosystem health, wetland habitat restoration, vegetation surveys, beaver control and maintaining levees, water levels and control structures.	OPR: BNR	Funding: CN Cost: $25K	HIGH
18	PROJECT 4.1.2: Protect wetlands through administrative planning, access controls of nuisance animals.	OPR: BNR	Funding: CN Cost: Ref Project 4.1.1	HIGH
18	PROJECT 4.1.3: Maintain levees and water control structures.	OPR: BNR	Funding: CN Cost: Ref Project 4.1.1	HIGH
18	**PROJECT 5.1.1**: Annual surface treatment of the encroaching water plants is required to maintain the bald eagle habitat.	OPR: BNR	Funding: CN Cost: $150K	HIGH
18	**PROJECT 5.1.2**: Utilize non-chemical Integrated Pest Management Plan (IPMP) methodology in controlling nuisance aquatic vegetation by maintaining triploid grass carp in Flag Lake to feed on vegetation.	OPR: BNR	Funding: CN Cost: $8K	HIGH

Yr.	Annual Work Plans (Include Year)	OPR	Funding Source	Priority Level
	Monitor grass carp population and supplement as needed.			
18	**PROJECT 5.1.3**: Monitor fish population and stock fish as needed to provide an adequate forage base	OPR: BNR	Funding: CN, FW Cost: Ref Project 5.1.1	HIGH
18	**PROJECT 5.1.4**: Use aquatic herbicide to control water hydrilla and giant salvinia on Flag Lake.	OPR: BNR	Funding: CN Cost: $225K	HIGH
18	**PROJECT 6.1.1**: Provide TDY costs for Natural Resources staff to attend essential meetings and promote cooperative conservation	OPR: BNR	Funding: CN, F&W, Forestry (FOR) Cost: $10K	LOW
18	**PROJECT 7.1.1**: Provide training opportunities that will provide Natural Resources staff with the current skills needed to keep program in compliance with applicable law.	OPR: BNR	Funding: CN Cost: $5K	HIGH
18	**PROJECT 8.1.1**: Manage pond shorelines adjacent to developed spawning areas for fishermen ease of access, removing woody vegetation and maintaining herbaceous vegetation.	OPR: BNR	Funding: FW Cost: $5K	LOW
18	**PROJECT 8.1.2**: Develop and create spawning areas on base lakes to promote fishing opportunities.	OPR: BNR	Funding: FW Cost: $5K	LOW
18	**PROJECT 9.1.1**: Maintain NRO personnel presence in check station during all managed firearm hunts	OPR: BNR	Funding: TBD Cost: $25K	HIGH
18	**PROJECT 9.1.2:** Collect data from harvested game at check station.	OPR: BNR	Funding: FW Cost: In-House Labor	HIGH
18	**PROJECT 9.1.3:** Ensure safety of recreationists during managed hunts	OPR: BNR	Funding: FW Cost; In-House Labor	MEDIUM
18	**PROJECT 9.2.1**: Update and enforce BAFI 32-7064.	OPR: BNR	Funding: TBD Cost: In-House Labor	HIGH
18	**PROJECT 9.3.1**: Transport and assist youth with accessing duck blinds.	OPR: BNR	Funding: FW Cost: $1K	LOW
18	**PROJECT 9.3.2**: Maintain youth waterfowl blinds in Flat River Refuge	OPR: BNR	Funding: TBD Cost: $2.5K	LOW

Yr.	Annual Work Plans (Include Year)	OPR	Funding Source	Priority Level
18	**PROJECT 9.4.1**: Maintain flooded areas for waterfowl hunters.	OPR: BNR	Funding: FW Cost: $2.5K	LOW
18	**PROJECT 9.4.2**: Allow hunting in Red Chute Waterfowl Refuge during last 2 days of duck season	OPR: BNR	Funding: FW Cost: In-House Labor	LOW
18	**PROJECT 9.5.1**: Maintain public stands.	OPR: BNR	Funding: FW Cost: In-House Labor	MEDIUM
18	**PROJECT 9.6.1**: Plant dove fields for hunter opportunities	OPR: BNR	Funding: FW Cost: $1K	LOW
18	**PROJECT 10.1.1**: Manage hunts to maintain deer herd size below carrying capacity. Set annual harvest goals and encourage hunters to selectively harvest deer.	OPR: BNR	Funding: FW Cost: In-House Labor	MEDIUM
18	**PROJECT 10.1.2**: Monitor deer herd for signs of disease and parasites.	OPR: BNR	Funding: FW Cost: In-house labor	HIGH
18	**PROJECT 10.2.1**: Manage hunts to reduce herd size and increase quality habitat.	OPR: BNR	Funding: FW Cost: In-house labor	MEDIUM
18	**PROJECT 10.2.2**: Increase the amount of fawning areas.	OPR: BNR	Funding: FW Cost: In-house labor	MEDIUM
18	**PROJECT 10.3.1**: Maintain sex rotios by protecting younger antlered bucks from harvest.	OPR: BNR	Funding: FW Cost: In-house labor	MEDIUM
18	**PROJECT 10.3.2**: Conduct annual fall and spring camera surveys to monitor and evaluate population dynamics.	OPR: BNR	Funding: FW Cost: In-house labor	MEDIUM
18	**PROJECT 11.1.1**: Conduct hog removal via opportunistic shooting.	OPR: BNR	Funding: FOR FW, CN Cost: In-house labor	HIGH
18	**PROJECT 11.1.2**: Remove hogs by baiting and shooting as conditions warrant.	OPR: BNR	Funding: FW, FOR Cost: In-house labor	HIGH
18	**PROJECT 11.1.3:** Utilize hog dogs to harass/remove hogs from areas unconducive to trapping or where urgent control of damage is needed.	OPR: BNR	Funding: FW, FOR Cost: In-house labor	HIGH

Yr.	Annual Work Plans (Include Year)	OPR	Funding Source	Priority Level
18	**PROJECT 11.1.4:** Trap hogs as necessary.	OPR: BNR	Funding: FW, FOR, CN	HIGH
18	**PROJECT 11.1.5:** Obtain and maintain equipment and supplies for use in controlling hog populations.	OPR: BNR	Funding: FOR, FW, CN Cost: $2K	HIGH
18	**PROJECT 11.1.6:** Obtain assistance from federal agencies in aerial control services of hogs.	OPR: BNR	Funding: CN Cost: $10K	HIGH
18	**PROJECT 12.1.1**: Install and maintain spring and fall food plots to provide wildlife species supplemental dietary foods. Add lime as needed to adjust the soil pH.	OPR: BNR	Funding: FW Cost: $10K	MEDIUM
18	**PROJECT 12.1.2**: Install and maintain artificial mineral licks to supplement low mineral quantities available in local soils.	OPR: BNR	Funding: FW Cost: $1K	MEDIUM
18	**PROJECT 12.2.1**: Select, create and maintain wildlife openings throughout the forest, especially in areas lacking in adequate cover for wildlife species; 6–15 acres of wildlife openings are created each year.	OPR: BNR	Funding: FW Cost: In-house labor	HIGH
18	**PROJECT 12.2.2**: On an annual basis, thin 1-2 selected forest stands to promote understory growth/herbaceous vegetation and wildlife cover.	OPR: BNR	Funding: FW Cost: In-house labor	HIGH
18	**PROJECT 13.1.1**: Harvest or use herbicide applications to remove woody vegetation and improve habitat for quail and other wildlife on 200 acres annually.	OPR: BNR	Funding: FW Cost: $2K	HIGH
18	**PROJECT 14.1.1**: Plant and maintain areas for pollinators.	OPR: BNR	Funding: CN Cost: In-house labor	MEDIUM
18	**PROJECT 15.1.1:** Maintain primitive camping areas and picnic area on island at Harmon Lake Recreation Area.	OPR: BNR/Outdoor Rec	Funding: CN Cost: In-house labor	LOW
18	**PROJECT 15.1.2**: Maintain hiking trail around Harmon Lake Recreation Area from primitive camping area to boat launch area.	OPR: BNR/Outdoor Rec	Funding: CN Cost: In-house labor	LOW
18	**PROJECT 16.1.1**: Conduct annual inventories within one of the seven forest compartments to be harvested.	OPR: BNR	Funding: FOR Cost: TBD	HIGH

Yr.	Annual Work Plans (Include Year)	OPR	Funding Source	Priority Level
18	**PROJECT 16.2.1**: Develop and administer the sale of forest products. Establish sale boundaries, protecting Streamside Management Zones and other sensitive areas. Perform quality assurance for logging operations as per contract specifications.	OPR: BNR	Funding: FOR Cost: $5K	HIGH
18	**PROJECT 16.3.1**: Determine the site preparation needs on all areas immediately following harvesting estimated at 100 acres per year.	OPR: BNR	Funding: FOR Cost: In-house labor	HIGH
18	**PROJECT 16.3.2**: Develop and administer site preparation and reforestation contracts on all harvested areas estimated at 100 acres per year.	OPR: BNR	Funding: FOR Cost: $2K	HIGH
18	**PROJECT 16.3.3**: Conduct quality control on all site preparation and reforestation projects	OPR: BNR	Funding: FOR Cost: In-house labor	HIGH
18	**PROJECT 16.3.4**: Monitor the survival of all reforestation areas the following fall.	OPR: BNR	Funding: FOR Cost: In-house labor	HIGH
18	**PROJECT 16.4.1**: Conduct timber stand improvement control using herbicides for pine release encompassing 200 acres.	OPR: BNR	Funding: FOR Cost: TBD	HIGH
18	**PROJECT 16.5.1**: Annually maintain and improve 5 miles of forest access roads to include rock, road grading, and pulling ditches.	OPR: BNR	Funding: FOR Cost: $15K	HIGH
18	**PROJECT 17.1.1**: Apply prescribed fire to 1,500-2,000 acres per year.	OPR: BNR	Funding: CN Cost: $TBD	LOW
18	**PROJECT 17.1.2**: Maintain 5 miles of trails and firebreaks per year, as required to protect forest resources, support prescribed fire activities, and access to forest stands. This is accomplished by mowing, disking, plowing, planting. Plantings serve additional purpose to hold/build soils, provide wildlife quality food/cover, and prevent erosion.	OPR: BNR	Funding: FOR Cost: $5K	HIGH
18	**PROJECT 17.2.1**: Continue annual training of natural resources personnel who are involved in wildfire suppression	OPR: BNR	Funding: CN - AFWFC Cost: $12K	MEDIUM

Yr.	Annual Work Plans (Include Year)	OPR	Funding Source	Priority Level
	and prescribed burning.			
18	**PROJECT 17.2.2**: Annually assess, maintain and upgrade when appropriate the essential wildland fire equipment and personal protective equipment.	OPR: BNR	Funding: CN Cost: $10K	MEDIUM
18	**PROJECT 18.1.1**: Apply herbicides to terrestrially invasive species in selected forest stands	OPR: BNR	Funding: CN, FOR Cost: TBD	HIGH
18	**PROJECT 18.1.2**: Annually assess the extent of invasive species in forest stands and develop yearly goals on amount of acreage to be treated to slow or stop the spread of these plants.	OPR: BNR	Funding: CN, FOR Cost: TBD	HIGH
18	**PROJECT 18.1.3**: Apply herbicides to aquatic invasive species.	OPR: BNR	Funding: CN, Cost: $3K	HIGH
18	**PROJECT 18.1.4**: Annually assess the extent of invasive species in aquatic habitat and develop goals on amount of acreage to be treated to slow or stop the spread of these plants.	OPR: BNR	Funding: CN, Cost: Ref Proj. 18.1.3	HIGH
18	**PROJECT 19.1.1**: Promote tree protection efforts on all construction projects	OPR: BNR	Funding: CN Cost: In-house labor	LOW
18	**PROJECT 19.1.2**: Provide consultation on projects that impact trees on main base. As a general policy, plantings should occur at same or greater frequency than removals	OPR: BNR	Funding: CN, Grounds Maintenance Cost: In-house labor	LOW
18	**PROJECT 19.2.1**: Participate in on-going tree care forums or project reviews within 2 CES.	OPR: BNR	Funding: CN, Grounds Maintenance Cost: In-house labor	LOW
18	**PROJECT 19.2.2**: Continue implementation of Base Tree Ordinance.	OPR: BNR	Funding: CN Cost: In-house labor	LOW
18	**PROJECT 20.1:** Ensure FLETC trained personnel are available for conservation law enforcement.	OPR: BNR	Funding: **CN** Cost: In-house labor	HIGH
18	**PROJECT 21.1.1**: Purchase supplies required for program management.	OPR: BNR	Funding: FW, CN, FOR Cost: TBD	HIGH

Yr.	Annual Work Plans (Include Year)	OPR	Funding Source	Priority Level
18	**PROJECT 21.1.2**: Purchase equipment required for program management.	OPR: BNR	Funding: FW, CN, FOR Cost: TBD	HIGH
18	**PROJECT 21.1.3**: Purchase vehicles required for program management.	OPR: BNR	Funding: FW, CN, FOR Cost: TBD	HIGH
18	**PROJECT 21.1.4**: Maintain equipment related to program management FY 2018 – 2022.	OPR: BNR	Funding: FW, CN, FOR Cost: TBD	HIGH
18	**PROJECT 21.1.5**: Purchase parts and supplies for maintenance of equipment related to program management.	OPR: BNR	Funding: FW, CN, FOR Cost: TBD	HIGH
2019	**PROJECT 1.1.1**: Maintain current USFWS Depredation Permits to allow taking of birds posing a hazard to human life and equipment on and around the flightline.	OPR: BNR	Funding: Fish and Wildlife (FW) Cost: In-House Labor	HIGH
19	**PROJECT 1.1.2:** Maintain current LDWF Depredation Permits to allow taking of birds, mammals, etc. posing a hazard to human life and equipment on and around the flightline and base.	OPR: BNR	Funding: (FW) Cost: In-House Labor	HIGH
19	**PROJECT 2.1.1**: Procure in cooperation with BLM updated reasonable foreseeable development document and programmable environmental assessment for oilfield developments as they become available.	OPR: BNR	Funding: TBD Cost: In-House Labor	LOW
19	**PROJECT 2.1.2**: Coordinate compliance with protocol and outline acceptable procedures for reclamation of oilfield sites.	OPR: BNR	Funding: TBD Cost: In-House Labor	HIGH
19	**PROJECT 2.1.3**: In cooperation with BLM monitor ongoing oilfield production activities to include the correction of regulatory deficiencies.	OPR: BNR	Funding: TBD Cost: $51K	HIGH
19	**PROJECT 2.1.4**: Assess the impacts of oilfield development on wildlife habitat and timber loss and develop projects to mitigate those impacts.	OPR: BNR	Funding: TBD Cost: In-House Labor	HIGH
19	**PROJECT 3.1.1:** Maintain water levels and provide wetland habitat for migratory wading and shore birds during fall and spring migrations.	OPR: BNR	Funding: CN Cost: In-House Labor	HIGH

Yr.	Annual Work Plans (Include Year)	OPR	Funding Source	Priority Level
19	**PROJECT 3.1.2:** Maintain motor and water pump at Flat River.	OPR: BNR	Funding: CN Cost: $3K	HIGH
19	**PROJECT 3.2.1:** Maintain Moist Soil Mgmt Units 1-5 as high quality wetlands for wintering waterfowl usage.	OPR: BNR	Funding: CN Cost: $3K	HIGH
19	**PROJECT 3.2.2:** Fix, Repair, and maintain wetland pumps, pipelines, and water control structures in mgmt units.	OPR: BNR	Funding: CN Cost: See Project 3.1.2	HIGH
19	**PROJECT 3.2.3:** Supplement natural food sources for waterfowl through supplemental plantings.	OPR: BNR	Funding: CN Cost: $1K	MEDIUM
19	**PROJECT 3.2.4:** Study habitat use and propose methods to improve migratory waterfowl habitat	OPR: BNR	Funding: CN Cost: In-House Labor	LOW
19	**PROJECT 3.3.1:** Maintain and operate red chute pump for flooding of bottomland hardwood forest habitat	OPR: BNR	Funding: CN Cost: TBD	HIGH
19	**PROJECT 3.3.2:** Maintain water levels in GTR's. Monitor health of trees to assess any negative impacts of flooding	OPR: BNR	Funding: CN,FW Cost: In-House Labor	HIGH
19	PROJECT 4.1.1: Required work includes controlling access, monitoring and enhancing ecosystem health, wetland habitat restoration, vegetation surveys, beaver control and maintaining levees, water levels and control structures.	OPR: BNR	Funding: CN Cost: $25K	HIGH
19	PROJECT 4.1.2: Protect wetlands through administrative planning, access controls of nuisance animals.	OPR: BNR	Funding: CN Cost: Ref Project 4.1.1	HIGH
19	PROJECT 4.1.3: Maintain levees and water control structures.	OPR: BNR	Funding: CN Cost: Ref Project 4.1.1	HIGH
19	**PROJECT 5.1.1**: Annual surface treatment of the encroaching water plants is required to maintain the bald eagle habitat.	OPR: BNR	Funding: CN Cost: $150K	HIGH
19	**PROJECT 5.1.2**: Utilize non-chemical Integrated Pest Management Plan (IPMP) methodology in controlling nuisance aquatic vegetation by maintaining triploid grass carp in Flag Lake to feed on vegetation.	OPR: BNR	Funding: CN Cost: $8K	HIGH

Yr.	Annual Work Plans (Include Year)	OPR	Funding Source	Priority Level
	Monitor grass carp population and supplement as needed.			
19	**PROJECT 5.1.3**: Monitor fish population and stock fish as needed to provide an adequate forage base	OPR: BNR	Funding: CN, FW Cost: Ref Project 5.1.1	HIGH
19	**PROJECT 5.1.4**: Use aquatic herbicide to control water hydrilla and giant salvinia on Flag Lake.	OPR: BNR	Funding: CN Cost: $225K	HIGH
19	**PROJECT 6.1.1**: Provide TDY costs for Natural Resources staff to attend essential meetings and promote cooperative conservation	OPR: BNR	Funding: CN, F&W, Forestry (FOR) Cost: $10K	LOW
19	**PROJECT 7.1.1**: Provide training opportunities that will provide Natural Resources staff with the current skills needed to keep program in compliance with applicable law.	OPR: BNR	Funding: CN Cost: $5K	HIGH
19	**PROJECT 8.1.1**: Manage pond shorelines adjacent to developed spawning areas for fishermen ease of access, removing woody vegetation and maintaining herbaceous vegetation.	OPR: BNR	Funding: FW Cost: $5K	LOW
19	**PROJECT 8.1.2**: Develop and create spawning areas on base lakes to promote fishing opportunities.	OPR: BNR	Funding: FW Cost: $5K	LOW
19	**PROJECT 9.1.1**: Maintain NRO personnel presence in check station during all managed firearm hunts	OPR: BNR	Funding: TBD Cost: $25K	HIGH
19	**PROJECT 9.1.2:** Collect data from harvested game at check station.	OPR: BNR	Funding: FW Cost: In-House Labor	HIGH
19	**PROJECT 9.1.3:** Ensure safety of recreationists during managed hunts	OPR: BNR	Funding: FW Cost; In-House Labor	MEDIUM
19	**PROJECT 9.2.1**: Update and enforce BAFI 32-7064.	OPR: BNR	Funding: TBD Cost: In-House Labor	HIGH
19	**PROJECT 9.3.1**: Transport and assist youth with accessing duck blinds.	OPR: BNR	Funding: FW Cost: $1K	LOW
19	**PROJECT 9.3.2**: Maintain youth waterfowl blinds in Flat River Refuge	OPR: BNR	Funding: TBD Cost: $2.5K	LOW

Yr.	Annual Work Plans (Include Year)	OPR	Funding Source	Priority Level
19	**PROJECT 9.4.1**: Maintain flooded areas for waterfowl hunters.	OPR: BNR	Funding: FW Cost: $2.5K	LOW
19	**PROJECT 9.4.2**: Allow hunting in Red Chute Waterfowl Refuge during last 2 days of duck season	OPR: BNR	Funding: FW Cost: In-House Labor	LOW
19	**PROJECT 9.5.1**: Maintain public stands.	OPR: BNR	Funding: FW Cost: In-House Labor	MEDIUM
19	**PROJECT 9.6.1**: Plant dove fields for hunter opportunities	OPR: BNR	Funding: FW Cost: $1K	LOW
19	**PROJECT 10.1.1**: Manage hunts to maintain deer herd size below carrying capacity. Set annual harvest goals and encourage hunters to selectively harvest deer.	OPR: BNR	Funding: FW Cost: In-House Labor	MEDIUM
19	**PROJECT 10.1.2**: Monitor deer herd for signs of disease and parasites.	OPR: BNR	Funding: FW Cost: In-house labor	HIGH
19	**PROJECT 10.2.1**: Manage hunts to reduce herd size and increase quality habitat.	OPR: BNR	Funding: FW Cost: In-house labor	MEDIUM
19	**PROJECT 10.2.2**: Increase the amount of fawning areas.	OPR: BNR	Funding: FW Cost: In-house labor	MEDIUM
19	**PROJECT 10.3.1**: Maintain sex rotios by protecting younger antlered bucks from harvest.	OPR: BNR	Funding: FW Cost: In-house labor	MEDIUM
19	**PROJECT 10.3.2**: Conduct annual fall and spring camera surveys to monitor and evaluate population dynamics.	OPR: BNR	Funding: FW Cost: In-house labor	MEDIUM
19	**PROJECT 11.1.1**: Conduct hog removal via opportunistic shooting.	OPR: BNR	Funding: FOR FW, CN Cost: In-house labor	HIGH
19	**PROJECT 11.1.2**: Remove hogs by baiting and shooting as conditions warrant.	OPR: BNR	Funding: FW, FOR Cost: In-house labor	HIGH
19	**PROJECT 11.1.3:** Utilize hog dogs to harass/remove hogs from areas unconducive to trapping or where urgent control of damage is needed.	OPR: BNR	Funding: FW, FOR Cost: In-house labor	HIGH

Yr.	Annual Work Plans (Include Year)	OPR	Funding Source	Priority Level
19	**PROJECT 11.1.4:** Trap hogs as necessary.	OPR: BNR	Funding: FW, FOR, CN	HIGH
19	**PROJECT 11.1.5:** Obtain and maintain equipment and supplies for use in controlling hog populations.	OPR: BNR	Funding: FOR, FW, CN Cost: $2K	HIGH
19	**PROJECT 11.1.6:** Obtain assistance from federal agencies in aerial control services of hogs.	OPR: BNR	Funding: CN Cost: $10K	HIGH
19	**PROJECT 12.1.1**: Install and maintain spring and fall food plots to provide wildlife species supplemental dietary foods. Add lime as needed to adjust the soil pH.	OPR: BNR	Funding: FW Cost: $10K	MEDIUM
19	**PROJECT 12.1.2**: Install and maintain artificial mineral licks to supplement low mineral quantities available in local soils.	OPR: BNR	Funding: FW Cost: $1K	MEDIUM
19	**PROJECT 12.2.1**: Select, create and maintain wildlife openings throughout the forest, especially in areas lacking in adequate cover for wildlife species; 6–15 acres of wildlife openings are created each year.	OPR: BNR	Funding: FW Cost: In-house labor	HIGH
19	**PROJECT 12.2.2**: On an annual basis, thin 1-2 selected forest stands to promote understory growth/herbaceous vegetation and wildlife cover.	OPR: BNR	Funding: FW Cost: In-house labor	HIGH
19	**PROJECT 13.1.1**: Harvest or use herbicide applications to remove woody vegetation and improve habitat for quail and other wildlife on 200 acres annually.	OPR: BNR	Funding: FW Cost: $2K	HIGH
19	**PROJECT 14.1.1**: Plant and maintain areas for pollinators.	OPR: BNR	Funding: CN Cost: In-house labor	MEDIUM
19	**PROJECT 15.1.1:** Maintain primitive camping areas and picnic area on island at Harmon Lake Recreation Area.	OPR: BNR/Outdoor Rec	Funding: CN Cost: In-house labor	LOW
19	**PROJECT 15.1.2**: Maintain hiking trail around Harmon Lake Recreation Area from primitive camping area to boat launch area.	OPR: BNR/Outdoor Rec	Funding: CN Cost: In-house labor	LOW
19	**PROJECT 16.1.1**: Conduct annual inventories within one of the seven forest compartments to be harvested.	OPR: BNR	Funding: FOR Cost: TBD	HIGH

Yr.	Annual Work Plans (Include Year)	OPR	Funding Source	Priority Level
19	**PROJECT 16.2.1**: Develop and administer the sale of forest products. Establish sale boundaries, protecting Streamside Management Zones and other sensitive areas. Perform quality assurance for logging operations as per contract specifications.	OPR: BNR	Funding: FOR Cost: $5K	HIGH
19	**PROJECT 16.3.1**: Determine the site preparation needs on all areas immediately following harvesting estimated at 100 acres per year.	OPR: BNR	Funding: FOR Cost: In-house labor	HIGH
19	**PROJECT 16.3.2**: Develop and administer site preparation and reforestation contracts on all harvested areas estimated at 100 acres per year.	OPR: BNR	Funding: FOR Cost: $2K	HIGH
19	**PROJECT 16.3.3**: Conduct quality control on all site preparation and reforestation projects	OPR: BNR	Funding: FOR Cost: In-house labor	HIGH
19	**PROJECT 16.3.4**: Monitor the survival of all reforestation areas the following fall.	OPR: BNR	Funding: FOR Cost: In-house labor	HIGH
19	**PROJECT 16.4.1**: Conduct timber stand improvement control using herbicides for pine release encompassing 200 acres.	OPR: BNR	Funding: FOR Cost: TBD	HIGH
19	**PROJECT 16.5.1**: Annually maintain and improve 5 miles of forest access roads to include rock, road grading, and pulling ditches.	OPR: BNR	Funding: FOR Cost: $15K	HIGH
19	**PROJECT 17.1.1**: Apply prescribed fire to 1,500-2,000 acres per year.	OPR: BNR	Funding: CN Cost: $TBD	LOW
19	**PROJECT 17.1.2**: Maintain 5 miles of trails and firebreaks per year, as required to protect forest resources, support prescribed fire activities, and access to forest stands. This is accomplished by mowing, disking, plowing, planting. Plantings serve additional purpose to hold/build soils, provide wildlife quality food/cover, and prevent erosion.	OPR: BNR	Funding: FOR Cost: $5K	HIGH

Yr.	Annual Work Plans (Include Year)	OPR	Funding Source	Priority Level
19	**PROJECT 17.2.1**: Continue annual training of natural resources personnel who are involved in wildfire suppression and prescribed burning.	OPR: BNR	Funding: CN - AFWFC Cost: $12K	MEDIUM
19	**PROJECT 17.2.2**: Annually assess, maintain and upgrade when appropriate the essential wildland fire equipment and personal protective equipment.	OPR: BNR	Funding: CN Cost: $10K	MEDIUM
19	**PROJECT 18.1.1**: Apply herbicides to terrestrially invasive species in selected forest stands	OPR: BNR	Funding: CN, FOR Cost: TBD	HIGH
19	**PROJECT 18.1.2**: Annually assess the extent of invasive species in forest stands and develop yearly goals on amount of acreage to be treated to slow or stop the spread of these plants.	OPR: BNR	Funding: CN, FOR Cost: TBD	HIGH
19	**PROJECT 18.1.3**: Apply herbicides to aquatic invasive species.	OPR: BNR	Funding: CN, Cost: $3K	HIGH
19	**PROJECT 18.1.4**: Annually assess the extent of invasive species in aquatic habitat and develop goals on amount of acreage to be treated to slow or stop the spread of these plants.	OPR: BNR	Funding: CN, Cost: Ref Proj. 18.1.3	HIGH
19	**PROJECT 19.1.1**: Promote tree protection efforts on all construction projects	OPR: BNR	Funding: CN Cost: In-house labor	LOW
19	**PROJECT 19.1.2**: Provide consultation on projects that impact trees on main base. As a general policy, plantings should occur at same or greater frequency than removals	OPR: BNR	Funding: CN, Grounds Maintenance Cost: In-house labor	LOW
19	**PROJECT 19.2.1**: Participate in on-going tree care forums or project reviews within 2 CES.	OPR: BNR	Funding: CN, Grounds Maintenance Cost: In-house labor	LOW
19	**PROJECT 19.2.2**: Continue implementation of Base Tree Ordinance.	OPR: BNR	Funding: CN Cost: In-house labor	LOW
19	**PROJECT 20.1:** Ensure FLETC trained personnel are available for conservation law enforcement.	OPR: BNR	Funding: **CN** Cost: In-house labor	HIGH
19	**PROJECT 21.1.1**: Purchase supplies required for program management.	OPR: BNR	Funding: FW, CN, FOR Cost: TBD	HIGH

Yr.	Annual Work Plans (Include Year)	OPR	Funding Source	Priority Level
19	**PROJECT 21.1.2**: Purchase equipment required for program management.	OPR: BNR	Funding: FW, CN, FOR Cost: TBD	HIGH
19	**PROJECT 21.1.3**: Purchase vehicles required for program management.	OPR: BNR	Funding: FW, CN, FOR Cost: TBD	HIGH
19	**PROJECT 21.1.4**: Maintain equipment related to program management FY 2018 – 2022.	OPR: BNR	Funding: FW, CN, FOR Cost: TBD	HIGH
19	**PROJECT 21.1.5**: Purchase parts and supplies for maintenance of equipment related to program management.	OPR: BNR	Funding: FW, CN, FOR Cost: TBD	HIGH
2020	**PROJECT 1.1.1**: Maintain current USFWS Depredation Permits to allow taking of birds posing a hazard to human life and equipment on and around the flightline.	OPR: BNR	Funding: Fish and Wildlife (FW) Cost: In-House Labor	HIGH
20	**PROJECT 1.1.2:** Maintain current LDWF Depredation Permits to allow taking of birds, mammals, etc. posing a hazard to human life and equipment on and around the flightline and base.	OPR: BNR	Funding: (FW) Cost: In-House Labor	HIGH
20	**PROJECT 2.1.1**: Procure in cooperation with BLM updated reasonable foreseeable development document and programmable environmental assessment for oilfield developments as they become available.	OPR: BNR	Funding: TBD Cost: In-House Labor	LOW
20	**PROJECT 2.1.2**: Coordinate compliance with protocol and outline acceptable procedures for reclamation of oilfield sites.	OPR: BNR	Funding: TBD Cost: In-House Labor	HIGH
20	**PROJECT 2.1.3**: In cooperation with BLM monitor ongoing oilfield production activities to include the correction of regulatory deficiencies.	OPR: BNR	Funding: TBD Cost: $51K	HIGH
20	**PROJECT 2.1.4**: Assess the impacts of oilfield development on wildlife habitat and timber loss and develop projects to mitigate those impacts.	OPR: BNR	Funding: TBD Cost: In-House Labor	HIGH
20	**PROJECT 3.1.1:** Maintain water levels and provide wetland habitat for migratory wading and shore birds during fall and spring migrations.	OPR: BNR	Funding: CN Cost: In-House Labor	HIGH

Yr.	Annual Work Plans (Include Year)	OPR	Funding Source	Priority Level
20	**PROJECT 3.1.2:** Maintain motor and water pump at Flat River.	OPR: BNR	Funding: CN Cost: $3K	HIGH
20	**PROJECT 3.2.1:** Maintain Moist Soil Mgmt Units 1-5 as high quality wetlands for wintering waterfowl usage.	OPR: BNR	Funding: CN Cost: $3K	HIGH
20	**PROJECT 3.2.2:** Fix, Repair, and maintain wetland pumps, pipelines, and water control structures in mgmt units.	OPR: BNR	Funding: CN Cost: See Project 3.1.2	HIGH
20	**PROJECT 3.2.3:** Supplement natural food sources for waterfowl through supplemental plantings.	OPR: BNR	Funding: CN Cost: $1K	MEDIUM
20	**PROJECT 3.2.4:** Study habitat use and propose methods to improve migratory waterfowl habitat	OPR: BNR	Funding: CN Cost: In-House Labor	LOW
20	**PROJECT 3.3.1:** Maintain and operate red chute pump for flooding of bottomland hardwood forest habitat	OPR: BNR	Funding: CN Cost: TBD	HIGH
20	**PROJECT 3.3.2:** Maintain water levels in GTR's. Monitor health of trees to assess any negative impacts of flooding	OPR: BNR	Funding: CN,FW Cost: In-House Labor	HIGH
20	PROJECT 4.1.1: Required work includes controlling access, monitoring and enhancing ecosystem health, wetland habitat restoration, vegetation surveys, beaver control and maintaining levees, water levels and control structures.	OPR: BNR	Funding: CN Cost: $25K	HIGH
20	PROJECT 4.1.2: Protect wetlands through administrative planning, access controls of nuisance animals.	OPR: BNR	Funding: CN Cost: Ref Project 4.1.1	HIGH
20	PROJECT 4.1.3: Maintain levees and water control structures.	OPR: BNR	Funding: CN Cost: Ref Project 4.1.1	HIGH
20	**PROJECT 5.1.1**: Annual surface treatment of the encroaching water plants is required to maintain the bald eagle habitat.	OPR: BNR	Funding: CN Cost: $150K	HIGH
20	**PROJECT 5.1.2**: Utilize non-chemical Integrated Pest Management Plan (IPMP) methodology in controlling nuisance aquatic vegetation by maintaining triploid grass carp in Flag Lake to feed on vegetation.	OPR: BNR	Funding: CN Cost: $8K	HIGH

Yr.	Annual Work Plans (Include Year)	OPR	Funding Source	Priority Level
	Monitor grass carp population and supplement as needed.			
20	**PROJECT 5.1.3**: Monitor fish population and stock fish as needed to provide an adequate forage base	OPR: BNR	Funding: CN, FW Cost: Ref Project 5.1.1	HIGH
20	**PROJECT 5.1.4**: Use aquatic herbicide to control water hydrilla and giant salvinia on Flag Lake.	OPR: BNR	Funding: CN Cost: $225K	HIGH
20	**PROJECT 6.1.1**: Provide TDY costs for Natural Resources staff to attend essential meetings and promote cooperative conservation	OPR: BNR	Funding: CN, F&W, Forestry (FOR) Cost: $10K	LOW
20	**PROJECT 7.1.1**: Provide training opportunities that will provide Natural Resources staff with the current skills needed to keep program in compliance with applicable law.	OPR: BNR	Funding: CN Cost: $5K	HIGH
20	**PROJECT 8.1.1**: Manage pond shorelines adjacent to developed spawning areas for fishermen ease of access, removing woody vegetation and maintaining herbaceous vegetation.	OPR: BNR	Funding: FW Cost: $5K	LOW
20	**PROJECT 8.1.2**: Develop and create spawning areas on base lakes to promote fishing opportunities.	OPR: BNR	Funding: FW Cost: $5K	LOW
20	**PROJECT 9.1.1**: Maintain NRO personnel presence in check station during all managed firearm hunts	OPR: BNR	Funding: TBD Cost: $25K	HIGH
20	**PROJECT 9.1.2:** Collect data from harvested game at check station.	OPR: BNR	Funding: FW Cost: In-House Labor	HIGH
20	**PROJECT 9.1.3:** Ensure safety of recreationists during managed hunts	OPR: BNR	Funding: FW Cost; In-House Labor	MEDIUM
20	**PROJECT 9.2.1**: Update and enforce BAFI 32-7064.	OPR: BNR	Funding: TBD Cost: In-House Labor	HIGH
20	**PROJECT 9.3.1**: Transport and assist youth with accessing duck blinds.	OPR: BNR	Funding: FW Cost: $1K	LOW
20	**PROJECT 9.3.2**: Maintain youth waterfowl blinds in Flat River Refuge	OPR: BNR	Funding: TBD Cost: $2.5K	LOW

Yr.	Annual Work Plans (Include Year)	OPR	Funding Source	Priority Level
20	**PROJECT 9.4.1**: Maintain flooded areas for waterfowl hunters.	OPR: BNR	Funding: FW Cost: $2.5K	LOW
20	**PROJECT 9.4.2**: Allow hunting in Red Chute Waterfowl Refuge during last 2 days of duck season	OPR: BNR	Funding: FW Cost: In-House Labor	LOW
20	**PROJECT 9.5.1**: Maintain public stands.	OPR: BNR	Funding: FW Cost: In-House Labor	MEDIUM
20	**PROJECT 9.6.1**: Plant dove fields for hunter opportunities	OPR: BNR	Funding: FW Cost: $1K	LOW
20	**PROJECT 10.1.1**: Manage hunts to maintain deer herd size below carrying capacity. Set annual harvest goals and encourage hunters to selectively harvest deer.	OPR: BNR	Funding: FW Cost: In-House Labor	MEDIUM
20	**PROJECT 10.1.2**: Monitor deer herd for signs of disease and parasites.	OPR: BNR	Funding: FW Cost: In-house labor	HIGH
20	**PROJECT 10.2.1**: Manage hunts to reduce herd size and increase quality habitat.	OPR: BNR	Funding: FW Cost: In-house labor	MEDIUM
20	**PROJECT 10.2.2**: Increase the amount of fawning areas.	OPR: BNR	Funding: FW Cost: In-house labor	MEDIUM
20	**PROJECT 10.3.1**: Maintain sex rotios by protecting younger antlered bucks from harvest.	OPR: BNR	Funding: FW Cost: In-house labor	MEDIUM
20	**PROJECT 10.3.2**: Conduct annual fall and spring camera surveys to monitor and evaluate population dynamics.	OPR: BNR	Funding: FW Cost: In-house labor	MEDIUM
20	**PROJECT 11.1.1**: Conduct hog removal via opportunistic shooting.	OPR: BNR	Funding: FOR FW, CN Cost: In-house labor	HIGH
20	**PROJECT 11.1.2**: Remove hogs by baiting and shooting as conditions warrant.	OPR: BNR	Funding: FW, FOR Cost: In-house labor	HIGH
20	**PROJECT 11.1.3:** Utilize hog dogs to harass/remove hogs from areas unconducive to trapping or where urgent control of damage is needed.	OPR: BNR	Funding: FW, FOR Cost: In-house labor	HIGH

Yr.	Annual Work Plans (Include Year)	OPR	Funding Source	Priority Level
20	**PROJECT 11.1.4:**Trap hogs as necessary.	OPR: BNR	Funding: FW, FOR, CN	HIGH
20	**PROJECT 11.1.5:** Obtain and maintain equipment and supplies for use in controlling hog populations.	OPR: BNR	Funding: FOR, FW, CN Cost: $2K	HIGH
20	**PROJECT 11.1.6:** Obtain assistance from federal agencies in aerial control services of hogs.	OPR: BNR	Funding: CN Cost: $10K	HIGH
20	**PROJECT 12.1.1**: Install and maintain spring and fall food plots to provide wildlife species supplemental dietary foods. Add lime as needed to adjust the soil pH.	OPR: BNR	Funding: FW Cost: $10K	MEDIUM
20	**PROJECT 12.1.2**: Install and maintain artificial mineral licks to supplement low mineral quantities available in local soils.	OPR: BNR	Funding: FW Cost: $1K	MEDIUM
20	**PROJECT 12.2.1**: Select, create and maintain wildlife openings throughout the forest, especially in areas lacking in adequate cover for wildlife species; 6–15 acres of wildlife openings are created each year.	OPR: BNR	Funding: FW Cost: In-house labor	HIGH
20	**PROJECT 12.2.2**: On an annual basis, thin 1-2 selected forest stands to promote understory growth/herbaceous vegetation and wildlife cover.	OPR: BNR	Funding: FW Cost: In-house labor	HIGH
20	**PROJECT 13.1.1**: Harvest or use herbicide applications to remove woody vegetation and improve habitat for quail and other wildlife on 200 acres annually.	OPR: BNR	Funding: FW Cost: $2K	HIGH
20	**PROJECT 14.1.1**: Plant and maintain areas for pollinators.	OPR: BNR	Funding: CN Cost: In-house labor	MEDIUM
20	**PROJECT 15.1.1:** Maintain primitive camping areas and picnic area on island at Harmon Lake Recreation Area.	OPR: BNR/Outdoor Rec	Funding: CN Cost: In-house labor	LOW
20	**PROJECT 15.1.2**: Maintain hiking trail around Harmon Lake Recreation Area from primitive camping area to boat launch area.	OPR: BNR/Outdoor Rec	Funding: CN Cost: In-house labor	LOW
20	**PROJECT 16.1.1**: Conduct annual inventories within one of the seven forest compartments to be harvested.	OPR: BNR	Funding: FOR Cost: TBD	HIGH

Yr.	Annual Work Plans (Include Year)	OPR	Funding Source	Priority Level
20	**PROJECT 16.2.1**: Develop and administer the sale of forest products. Establish sale boundaries, protecting Streamside Management Zones and other sensitive areas. Perform quality assurance for logging operations as per contract specifications.	OPR: BNR	Funding: FOR Cost: $5K	HIGH
20	**PROJECT 16.3.1**: Determine the site preparation needs on all areas immediately following harvesting estimated at 100 acres per year.	OPR: BNR	Funding: FOR Cost: In-house labor	HIGH
20	**PROJECT 16.3.2**: Develop and administer site preparation and reforestation contracts on all harvested areas estimated at 100 acres per year.	OPR: BNR	Funding: FOR Cost: $2K	HIGH
20	**PROJECT 16.3.3**: Conduct quality control on all site preparation and reforestation projects	OPR: BNR	Funding: FOR Cost: In-house labor	HIGH
20	**PROJECT 16.3.4**: Monitor the survival of all reforestation areas the following fall.	OPR: BNR	Funding: FOR Cost: In-house labor	HIGH
20	**PROJECT 16.4.1**: Conduct timber stand improvement control using herbicides for pine release encompassing 200 acres.	OPR: BNR	Funding: FOR Cost: TBD	HIGH
20	**PROJECT 16.5.1**: Annually maintain and improve 5 miles of forest access roads to include rock, road grading, and pulling ditches.	OPR: BNR	Funding: FOR Cost: $15K	HIGH
20	**PROJECT 17.1.1**: Apply prescribed fire to 1,500-2,000 acres per year.	OPR: BNR	Funding: CN Cost: $TBD	LOW
20	**PROJECT 17.1.2**: Maintain 5 miles of trails and firebreaks per year, as required to protect forest resources, support prescribed fire activities, and access to forest stands. This is accomplished by mowing, disking, plowing, planting. Plantings serve additional purpose to hold/build soils, provide wildlife quality food/cover, and prevent erosion.	OPR: BNR	Funding: FOR Cost: $5K	HIGH
20	**PROJECT 17.2.1**: Continue annual training of natural resources personnel who are involved in wildfire suppression	OPR: BNR	Funding: CN - AFWFC Cost: $12K	MEDIUM

Yr.	Annual Work Plans (Include Year)	OPR	Funding Source	Priority Level
	and prescribed burning.			
20	**PROJECT 17.2.2**: Annually assess, maintain and upgrade when appropriate the essential wildland fire equipment and personal protective equipment.	OPR: BNR	Funding: CN Cost: $10K	MEDIUM
20	**PROJECT 18.1.1**: Apply herbicides to terrestrially invasive species in selected forest stands	OPR: BNR	Funding: CN, FOR Cost: TBD	HIGH
20	**PROJECT 18.1.2**: Annually assess the extent of invasive species in forest stands and develop yearly goals on amount of acreage to be treated to slow or stop the spread of these plants.	OPR: BNR	Funding: CN, FOR Cost: TBD	HIGH
20	**PROJECT 18.1.3**: Apply herbicides to aquatic invasive species.	OPR: BNR	Funding: CN, Cost: $3K	HIGH
20	**PROJECT 18.1.4**: Annually assess the extent of invasive species in aquatic habitat and develop goals on amount of acreage to be treated to slow or stop the spread of these plants.	OPR: BNR	Funding: CN, Cost: Ref Proj. 18.1.3	HIGH
20	**PROJECT 19.1.1**: Promote tree protection efforts on all construction projects	OPR: BNR	Funding: CN Cost: In-house labor	LOW
20	**PROJECT 19.1.2**: Provide consultation on projects that impact trees on main base. As a general policy, plantings should occur at same or greater frequency than removals	OPR: BNR	Funding: CN, Grounds Maintenance Cost: In-house labor	LOW
20	**PROJECT 19.2.1**: Participate in on-going tree care forums or project reviews within 2 CES.	OPR: BNR	Funding: CN, Grounds Maintenance Cost: In-house labor	LOW
20	**PROJECT 19.2.2**: Continue implementation of Base Tree Ordinance.	OPR: BNR	Funding: CN Cost: In-house labor	LOW
20	**PROJECT 20.1:** Ensure FLETC trained personnel are available for conservation law enforcement.	OPR: BNR	Funding: **CN** Cost: In-house labor	HIGH
20	**PROJECT 21.1.1**: Purchase supplies required for program management.	OPR: BNR	Funding: FW, CN, FOR Cost: TBD	HIGH

Yr.	Annual Work Plans (Include Year)	OPR	Funding Source	Priority Level
20	**PROJECT 21.1.2**: Purchase equipment required for program management.	OPR: BNR	Funding: FW, CN, FOR Cost: TBD	HIGH
20	**PROJECT 21.1.3**: Purchase vehicles required for program management.	OPR: BNR	Funding: FW, CN, FOR Cost: TBD	HIGH
20	**PROJECT 21.1.4**: Maintain equipment related to program management FY 2018 – 2022.	OPR: BNR	Funding: FW, CN, FOR Cost: TBD	HIGH
20	**PROJECT 21.1.5**: Purchase parts and supplies for maintenance of equipment related to program management.	OPR: BNR	Funding: FW, CN, FOR Cost: TBD	HIGH
2021	**PROJECT 1.1.1**: Maintain current USFWS Depredation Permits to allow taking of birds posing a hazard to human life and equipment on and around the flightline.	OPR: BNR	Funding: Fish and Wildlife (FW) Cost: In-House Labor	HIGH
21	**PROJECT 1.1.2:** Maintain current LDWF Depredation Permits to allow taking of birds, mammals, etc. posing a hazard to human life and equipment on and around the flightline and base.	OPR: BNR	Funding: (FW) Cost: In-House Labor	HIGH
21	**PROJECT 2.1.1**: Procure in cooperation with BLM updated reasonable foreseeable development document and programmable environmental assessment for oilfield developments as they become available.	OPR: BNR	Funding: TBD Cost: In-House Labor	LOW
21	**PROJECT 2.1.2**: Coordinate compliance with protocol and outline acceptable procedures for reclamation of oilfield sites.	OPR: BNR	Funding: TBD Cost: In-House Labor	HIGH
21	**PROJECT 2.1.3**: In cooperation with BLM monitor ongoing oilfield production activities to include the correction of regulatory deficiencies.	OPR: BNR	Funding: TBD Cost: $51K	HIGH
21	**PROJECT 2.1.4**: Assess the impacts of oilfield development on wildlife habitat and timber loss and develop projects to mitigate those impacts.	OPR: BNR	Funding: TBD Cost: In-House Labor	HIGH
21	**PROJECT 3.1.1:** Maintain water levels and provide wetland habitat for migratory wading and shore birds during fall and spring migrations.	OPR: BNR	Funding: CN Cost: In-House Labor	HIGH

Yr.	Annual Work Plans (Include Year)	OPR	Funding Source	Priority Level
21	**PROJECT 3.1.2:** Maintain motor and water pump at Flat River.	OPR: BNR	Funding: CN Cost: $3K	HIGH
21	**PROJECT 3.2.1:** Maintain Moist Soil Mgmt Units 1-5 as high quality wetlands for wintering waterfowl usage.	OPR: BNR	Funding: CN Cost: $3K	HIGH
21	**PROJECT 3.2.2:** Fix, Repair, and maintain wetland pumps, pipelines, and water control structures in mgmt units.	OPR: BNR	Funding: CN Cost: See Project 3.1.2	HIGH
21	**PROJECT 3.2.3:** Supplement natural food sources for waterfowl through supplemental plantings.	OPR: BNR	Funding: CN Cost: $1K	MEDIUM
21	**PROJECT 3.2.4:** Study habitat use and propose methods to improve migratory waterfowl habitat	OPR: BNR	Funding: CN Cost: In-House Labor	LOW
21	**PROJECT 3.3.1:** Maintain and operate red chute pump for flooding of bottomland hardwood forest habitat	OPR: BNR	Funding: CN Cost: TBD	HIGH
21	**PROJECT 3.3.2:** Maintain water levels in GTR's. Monitor health of trees to assess any negative impacts of flooding	OPR: BNR	Funding: CN,FW Cost: In-House Labor	HIGH
21	PROJECT 4.1.1: Required work includes controlling access, monitoring and enhancing ecosystem health, wetland habitat restoration, vegetation surveys, beaver control and maintaining levees, water levels and control structures.	OPR: BNR	Funding: CN Cost: $25K	HIGH
21	PROJECT 4.1.2: Protect wetlands through administrative planning, access controls of nuisance animals.	OPR: BNR	Funding: CN Cost: Ref Project 4.1.1	HIGH
21	PROJECT 4.1.3: Maintain levees and water control structures.	OPR: BNR	Funding: CN Cost: Ref Project 4.1.1	HIGH
21	**PROJECT 5.1.1**: Annual surface treatment of the encroaching water plants is required to maintain the bald eagle habitat.	OPR: BNR	Funding: CN Cost: $150K	HIGH
21	**PROJECT 5.1.2**: Utilize non-chemical Integrated Pest Management Plan (IPMP) methodology in controlling nuisance aquatic vegetation by maintaining triploid grass carp in Flag Lake to feed on vegetation.	OPR: BNR	Funding: CN Cost: $8K	HIGH

Yr.	Annual Work Plans (Include Year)	OPR	Funding Source	Priority Level
	Monitor grass carp population and supplement as needed.			
21	**PROJECT 5.1.3**: Monitor fish population and stock fish as needed to provide an adequate forage base	OPR: BNR	Funding: CN, FW Cost: Ref Project 5.1.1	HIGH
21	**PROJECT 5.1.4**: Use aquatic herbicide to control water hydrilla and giant salvinia on Flag Lake.	OPR: BNR	Funding: CN Cost: $225K	HIGH
21	**PROJECT 6.1.1**: Provide TDY costs for Natural Resources staff to attend essential meetings and promote cooperative conservation	OPR: BNR	Funding: CN, F&W, Forestry (FOR) Cost: $10K	LOW
21	**PROJECT 7.1.1**: Provide training opportunities that will provide Natural Resources staff with the current skills needed to keep program in compliance with applicable law.	OPR: BNR	Funding: CN Cost: $5K	HIGH
21	**PROJECT 8.1.1**: Manage pond shorelines adjacent to developed spawning areas for fishermen ease of access, removing woody vegetation and maintaining herbaceous vegetation.	OPR: BNR	Funding: FW Cost: $5K	LOW
21	**PROJECT 8.1.2**: Develop and create spawning areas on base lakes to promote fishing opportunities.	OPR: BNR	Funding: FW Cost: $5K	LOW
21	**PROJECT 9.1.1**: Maintain NRO personnel presence in check station during all managed firearm hunts	OPR: BNR	Funding: TBD Cost: $25K	HIGH
21	**PROJECT 9.1.2:** Collect data from harvested game at check station.	OPR: BNR	Funding: FW Cost: In-House Labor	HIGH
21	**PROJECT 9.1.3:** Ensure safety of recreationists during managed hunts	OPR: BNR	Funding: FW Cost; In-House Labor	MEDIUM
21	**PROJECT 9.2.1**: Update and enforce BAFI 32-7064.	OPR: BNR	Funding: TBD Cost: In-House Labor	HIGH
21	**PROJECT 9.3.1**: Transport and assist youth with accessing duck blinds.	OPR: BNR	Funding: FW Cost: $1K	LOW
21	**PROJECT 9.3.2**: Maintain youth waterfowl blinds in Flat River Refuge	OPR: BNR	Funding: TBD Cost: $2.5K	LOW

Yr.	Annual Work Plans (Include Year)	OPR	Funding Source	Priority Level
21	**PROJECT 9.4.1**: Maintain flooded areas for waterfowl hunters.	OPR: BNR	Funding: FW Cost: $2.5K	LOW
21	**PROJECT 9.4.2**: Allow hunting in Red Chute Waterfowl Refuge during last 2 days of duck season	OPR: BNR	Funding: FW Cost: In-House Labor	LOW
21	**PROJECT 9.5.1**: Maintain public stands.	OPR: BNR	Funding: FW Cost: In-House Labor	MEDIUM
21	**PROJECT 9.6.1**: Plant dove fields for hunter opportunities	OPR: BNR	Funding: FW Cost: $1K	LOW
21	**PROJECT 10.1.1**: Manage hunts to maintain deer herd size below carrying capacity. Set annual harvest goals and encourage hunters to selectively harvest deer.	OPR: BNR	Funding: FW Cost: In-House Labor	MEDIUM
21	**PROJECT 10.1.2**: Monitor deer herd for signs of disease and parasites.	OPR: BNR	Funding: FW Cost: In-house labor	HIGH
21	**PROJECT 10.2.1**: Manage hunts to reduce herd size and increase quality habitat.	OPR: BNR	Funding: FW Cost: In-house labor	MEDIUM
21	**PROJECT 10.2.2**: Increase the amount of fawning areas.	OPR: BNR	Funding: FW Cost: In-house labor	MEDIUM
21	**PROJECT 10.3.1**: Maintain sex rotios by protecting younger antlered bucks from harvest.	OPR: BNR	Funding: FW Cost: In-house labor	MEDIUM
21	**PROJECT 10.3.2**: Conduct annual fall and spring camera surveys to monitor and evaluate population dynamics.	OPR: BNR	Funding: FW Cost: In-house labor	MEDIUM
21	**PROJECT 11.1.1**: Conduct hog removal via opportunistic shooting.	OPR: BNR	Funding: FOR FW, CN Cost: In-house labor	HIGH
21	**PROJECT 11.1.2**: Remove hogs by baiting and shooting as conditions warrant.	OPR: BNR	Funding: FW, FOR Cost: In-house labor	HIGH
21	**PROJECT 11.1.3:** Utilize hog dogs to harass/remove hogs from areas unconducive to trapping or where urgent control of damage is needed.	OPR: BNR	Funding: FW, FOR Cost: In-house labor	HIGH

Yr.	Annual Work Plans (Include Year)	OPR	Funding Source	Priority Level
21	**PROJECT 11.1.4:**Trap hogs as necessary.	OPR: BNR	Funding: FW, FOR, CN	HIGH
21	**PROJECT 11.1.5:** Obtain and maintain equipment and supplies for use in controlling hog populations.	OPR: BNR	Funding: FOR, FW, CN Cost: $2K	HIGH
21	**PROJECT 11.1.6:** Obtain assistance from federal agencies in aerial control services of hogs.	OPR: BNR	Funding: CN Cost: $10K	HIGH
21	**PROJECT 12.1.1**: Install and maintain spring and fall food plots to provide wildlife species supplemental dietary foods. Add lime as needed to adjust the soil pH.	OPR: BNR	Funding: FW Cost: $10K	MEDIUM
21	**PROJECT 12.1.2**: Install and maintain artificial mineral licks to supplement low mineral quantities available in local soils.	OPR: BNR	Funding: FW Cost: $1K	MEDIUM
21	**PROJECT 12.2.1**: Select, create and maintain wildlife openings throughout the forest, especially in areas lacking in adequate cover for wildlife species; 6–15 acres of wildlife openings are created each year.	OPR: BNR	Funding: FW Cost: In-house labor	HIGH
21	**PROJECT 12.2.2**: On an annual basis, thin 1-2 selected forest stands to promote understory growth/herbaceous vegetation and wildlife cover.	OPR: BNR	Funding: FW Cost: In-house labor	HIGH
21	**PROJECT 13.1.1**: Harvest or use herbicide applications to remove woody vegetation and improve habitat for quail and other wildlife on 200 acres annually.	OPR: BNR	Funding: FW Cost: $2K	HIGH
21	**PROJECT 14.1.1**: Plant and maintain areas for pollinators.	OPR: BNR	Funding: CN Cost: In-house labor	MEDIUM
21	**PROJECT 15.1.1:** Maintain primitive camping areas and picnic area on island at Harmon Lake Recreation Area.	OPR: BNR/Outdoor Rec	Funding: CN Cost: In-house labor	LOW
21	**PROJECT 15.1.2**: Maintain hiking trail around Harmon Lake Recreation Area from primitive camping area to boat launch area.	OPR: BNR/Outdoor Rec	Funding: CN Cost: In-house labor	LOW
21	**PROJECT 16.1.1**: Conduct annual inventories within one of the seven forest compartments to be harvested.	OPR: BNR	Funding: FOR Cost: TBD	HIGH

Yr.	Annual Work Plans (Include Year)	OPR	Funding Source	Priority Level
21	**PROJECT 16.2.1**: Develop and administer the sale of forest products. Establish sale boundaries, protecting Streamside Management Zones and other sensitive areas. Perform quality assurance for logging operations as per contract specifications.	OPR: BNR	Funding: FOR Cost: $5K	HIGH
21	**PROJECT 16.3.1**: Determine the site preparation needs on all areas immediately following harvesting estimated at 100 acres per year.	OPR: BNR	Funding: FOR Cost: In-house labor	HIGH
21	**PROJECT 16.3.2**: Develop and administer site preparation and reforestation contracts on all harvested areas estimated at 100 acres per year.	OPR: BNR	Funding: FOR Cost: $2K	HIGH
21	**PROJECT 16.3.3**: Conduct quality control on all site preparation and reforestation projects	OPR: BNR	Funding: FOR Cost: In-house labor	HIGH
21	**PROJECT 16.3.4**: Monitor the survival of all reforestation areas the following fall.	OPR: BNR	Funding: FOR Cost: In-house labor	HIGH
21	**PROJECT 16.4.1**: Conduct timber stand improvement control using herbicides for pine release encompassing 200 acres.	OPR: BNR	Funding: FOR Cost: TBD	HIGH
21	**PROJECT 16.5.1**: Annually maintain and improve 5 miles of forest access roads to include rock, road grading, and pulling ditches.	OPR: BNR	Funding: FOR Cost: $15K	HIGH
21	**PROJECT 17.1.1**: Apply prescribed fire to 1,500-2,000 acres per year.	OPR: BNR	Funding: CN Cost: $TBD	LOW
21	**PROJECT 17.1.2**: Maintain 5 miles of trails and firebreaks per year, as required to protect forest resources, support prescribed fire activities, and access to forest stands. This is accomplished by mowing, disking, plowing, planting. Plantings serve additional purpose to hold/build soils, provide wildlife quality food/cover, and prevent erosion.	OPR: BNR	Funding: FOR Cost: $5K	HIGH
21	**PROJECT 17.2.1**: Continue annual training of natural resources personnel who are involved in wildfire suppression	OPR: BNR	Funding: CN - AFWFC Cost: $12K	MEDIUM

Yr.	Annual Work Plans (Include Year)	OPR	Funding Source	Priority Level
	and prescribed burning.			
21	**PROJECT 17.2.2**: Annually assess, maintain and upgrade when appropriate the essential wildland fire equipment and personal protective equipment.	OPR: BNR	Funding: CN Cost: $10K	MEDIUM
21	**PROJECT 18.1.1**: Apply herbicides to terrestrially invasive species in selected forest stands	OPR: BNR	Funding: CN, FOR Cost: TBD	HIGH
21	**PROJECT 18.1.2**: Annually assess the extent of invasive species in forest stands and develop yearly goals on amount of acreage to be treated to slow or stop the spread of these plants.	OPR: BNR	Funding: CN, FOR Cost: TBD	HIGH
21	**PROJECT 18.1.3**: Apply herbicides to aquatic invasive species.	OPR: BNR	Funding: CN, Cost: $3K	HIGH
21	**PROJECT 18.1.4**: Annually assess the extent of invasive species in aquatic habitat and develop goals on amount of acreage to be treated to slow or stop the spread of these plants.	OPR: BNR	Funding: CN, Cost: Ref Proj. 18.1.3	HIGH
21	**PROJECT 19.1.1**: Promote tree protection efforts on all construction projects	OPR: BNR	Funding: CN Cost: In-house labor	LOW
21	**PROJECT 19.1.2**: Provide consultation on projects that impact trees on main base. As a general policy, plantings should occur at same or greater frequency than removals	OPR: BNR	Funding: CN, Grounds Maintenance Cost: In-house labor	LOW
21	**PROJECT 19.2.1**: Participate in on-going tree care forums or project reviews within 2 CES.	OPR: BNR	Funding: CN, Grounds Maintenance Cost: In-house labor	LOW
21	**PROJECT 19.2.2**: Continue implementation of Base Tree Ordinance.	OPR: BNR	Funding: CN Cost: In-house labor	LOW
21	**PROJECT 20.1:** Ensure FLETC trained personnel are available for conservation law enforcement.	OPR: BNR	Funding: **CN** Cost: In-house labor	HIGH
21	**PROJECT 21.1.1**: Purchase supplies required for program management.	OPR: BNR	Funding: FW, CN, FOR Cost: TBD	HIGH

Yr.	Annual Work Plans (Include Year)	OPR	Funding Source	Priority Level
21	**PROJECT 21.1.2**: Purchase equipment required for program management.	OPR: BNR	Funding: FW, CN, FOR Cost: TBD	HIGH
21	**PROJECT 21.1.3**: Purchase vehicles required for program management.	OPR: BNR	Funding: FW, CN, FOR Cost: TBD	HIGH
21	**PROJECT 21.1.4**: Maintain equipment related to program management FY 2018 – 2022.	OPR: BNR	Funding: FW, CN, FOR Cost: TBD	HIGH
21	**PROJECT 21.1.5**: Purchase parts and supplies for maintenance of equipment related to program management.	OPR: BNR	Funding: FW, CN, FOR Cost: TBD	HIGH
2022	**PROJECT 1.1.1**: Maintain current USFWS Depredation Permits to allow taking of birds posing a hazard to human life and equipment on and around the flightline.	OPR: BNR	Funding: Fish and Wildlife (FW) Cost: In-House Labor	HIGH
22	**PROJECT 1.1.2:** Maintain current LDWF Depredation Permits to allow taking of birds, mammals, etc. posing a hazard to human life and equipment on and around the flightline and base.	OPR: BNR	Funding: (FW) Cost: In-House Labor	HIGH
22	**PROJECT 2.1.1**: Procure in cooperation with BLM updated reasonable foreseeable development document and programmable environmental assessment for oilfield developments as they become available.	OPR: BNR	Funding: TBD Cost: In-House Labor	LOW
22	**PROJECT 2.1.2**: Coordinate compliance with protocol and outline acceptable procedures for reclamation of oilfield sites.	OPR: BNR	Funding: TBD Cost: In-House Labor	HIGH
22	**PROJECT 2.1.3**: In cooperation with BLM monitor ongoing oilfield production activities to include the correction of regulatory deficiencies.	OPR: BNR	Funding: TBD Cost: $51K	HIGH
22	**PROJECT 2.1.4**: Assess the impacts of oilfield development on wildlife habitat and timber loss and develop projects to mitigate those impacts.	OPR: BNR	Funding: TBD Cost: In-House Labor	HIGH
22	**PROJECT 3.1.1:** Maintain water levels and provide wetland habitat for migratory wading and shore birds during fall and spring migrations.	OPR: BNR	Funding: CN Cost: In-House Labor	HIGH

Yr.	Annual Work Plans (Include Year)	OPR	Funding Source	Priority Level
22	**PROJECT 3.1.2:** Maintain motor and water pump at Flat River.	OPR: BNR	Funding: CN Cost: $3K	HIGH
22	**PROJECT 3.2.1:** Maintain Moist Soil Mgmt Units 1-5 as high quality wetlands for wintering waterfowl usage.	OPR: BNR	Funding: CN Cost: $3K	HIGH
22	**PROJECT 3.2.2:** Fix, Repair, and maintain wetland pumps, pipelines, and water control structures in mgmt units.	OPR: BNR	Funding: CN Cost: See Project 3.1.2	HIGH
22	**PROJECT 3.2.3:** Supplement natural food sources for waterfowl through supplemental plantings.	OPR: BNR	Funding: CN Cost: $1K	MEDIUM
22	**PROJECT 3.2.4:** Study habitat use and propose methods to improve migratory waterfowl habitat	OPR: BNR	Funding: CN Cost: In-House Labor	LOW
22	**PROJECT 3.3.1:** Maintain and operate red chute pump for flooding of bottomland hardwood forest habitat	OPR: BNR	Funding: CN Cost: TBD	HIGH
22	**PROJECT 3.3.2:** Maintain water levels in GTR's. Monitor health of trees to assess any negative impacts of flooding	OPR: BNR	Funding: CN,FW Cost: In-House Labor	HIGH
22	PROJECT 4.1.1: Required work includes controlling access, monitoring and enhancing ecosystem health, wetland habitat restoration, vegetation surveys, beaver control and maintaining levees, water levels and control structures.	OPR: BNR	Funding: CN Cost: $25K	HIGH
22	PROJECT 4.1.2: Protect wetlands through administrative planning, access controls of nuisance animals.	OPR: BNR	Funding: CN Cost: Ref Project 4.1.1	HIGH
22	PROJECT 4.1.3: Maintain levees and water control structures.	OPR: BNR	Funding: CN Cost: Ref Project 4.1.1	HIGH
22	**PROJECT 5.1.1**: Annual surface treatment of the encroaching water plants is required to maintain the bald eagle habitat.	OPR: BNR	Funding: CN Cost: $150K	HIGH
22	**PROJECT 5.1.2**: Utilize non-chemical Integrated Pest Management Plan (IPMP) methodology in controlling nuisance aquatic vegetation by maintaining triploid grass carp in Flag Lake to feed on vegetation.	OPR: BNR	Funding: CN Cost: $8K	HIGH

Yr.	Annual Work Plans (Include Year)	OPR	Funding Source	Priority Level
	Monitor grass carp population and supplement as needed.			
22	**PROJECT 5.1.3**: Monitor fish population and stock fish as needed to provide an adequate forage base	OPR: BNR	Funding: CN, FW Cost: Ref Project 5.1.1	HIGH
22	**PROJECT 5.1.4**: Use aquatic herbicide to control water hydrilla and giant salvinia on Flag Lake.	OPR: BNR	Funding: CN Cost: $225K	HIGH
22	**PROJECT 6.1.1**: Provide TDY costs for Natural Resources staff to attend essential meetings and promote cooperative conservation	OPR: BNR	Funding: CN, F&W, Forestry (FOR) Cost: $10K	LOW
22	**PROJECT 7.1.1**: Provide training opportunities that will provide Natural Resources staff with the current skills needed to keep program in compliance with applicable law.	OPR: BNR	Funding: CN Cost: $5K	HIGH
22	**PROJECT 8.1.1**: Manage pond shorelines adjacent to developed spawning areas for fishermen ease of access, removing woody vegetation and maintaining herbaceous vegetation.	OPR: BNR	Funding: FW Cost: $5K	LOW
22	**PROJECT 8.1.2**: Develop and create spawning areas on base lakes to promote fishing opportunities.	OPR: BNR	Funding: FW Cost: $5K	LOW
22	**PROJECT 9.1.1**: Maintain NRO personnel presence in check station during all managed firearm hunts	OPR: BNR	Funding: TBD Cost: $25K	HIGH
22	**PROJECT 9.1.2:** Collect data from harvested game at check station.	OPR: BNR	Funding: FW Cost: In-House Labor	HIGH
22	**PROJECT 9.1.3:** Ensure safety of recreationists during managed hunts	OPR: BNR	Funding: FW Cost; In-House Labor	MEDIUM
22	**PROJECT 9.2.1**: Update and enforce BAFI 32-7064.	OPR: BNR	Funding: TBD Cost: In-House Labor	HIGH
22	**PROJECT 9.3.1**: Transport and assist youth with accessing duck blinds.	OPR: BNR	Funding: FW Cost: $1K	LOW
22	**PROJECT 9.3.2**: Maintain youth waterfowl blinds in Flat River Refuge	OPR: BNR	Funding: TBD Cost: $2.5K	LOW

Yr.	Annual Work Plans (Include Year)	OPR	Funding Source	Priority Level
22	**PROJECT 9.4.1**: Maintain flooded areas for waterfowl hunters.	OPR: BNR	Funding: FW Cost: $2.5K	LOW
22	**PROJECT 9.4.2**: Allow hunting in Red Chute Waterfowl Refuge during last 2 days of duck season	OPR: BNR	Funding: FW Cost: In-House Labor	LOW
22	**PROJECT 9.5.1**: Maintain public stands.	OPR: BNR	Funding: FW Cost: In-House Labor	MEDIUM
22	**PROJECT 9.6.1**: Plant dove fields for hunter opportunities	OPR: BNR	Funding: FW Cost: $1K	LOW
22	**PROJECT 10.1.1**: Manage hunts to maintain deer herd size below carrying capacity. Set annual harvest goals and encourage hunters to selectively harvest deer.	OPR: BNR	Funding: FW Cost: In-House Labor	MEDIUM
22	**PROJECT 10.1.2**: Monitor deer herd for signs of disease and parasites.	OPR: BNR	Funding: FW Cost: In-house labor	HIGH
22	**PROJECT 10.2.1**: Manage hunts to reduce herd size and increase quality habitat.	OPR: BNR	Funding: FW Cost: In-house labor	MEDIUM
22	**PROJECT 10.2.2**: Increase the amount of fawning areas.	OPR: BNR	Funding: FW Cost: In-house labor	MEDIUM
22	**PROJECT 10.3.1**: Maintain sex rotios by protecting younger antlered bucks from harvest.	OPR: BNR	Funding: FW Cost: In-house labor	MEDIUM
22	**PROJECT 10.3.2**: Conduct annual fall and spring camera surveys to monitor and evaluate population dynamics.	OPR: BNR	Funding: FW Cost: In-house labor	MEDIUM
22	**PROJECT 11.1.1**: Conduct hog removal via opportunistic shooting.	OPR: BNR	Funding: FOR FW, CN Cost: In-house labor	HIGH
22	**PROJECT 11.1.2**: Remove hogs by baiting and shooting as conditions warrant.	OPR: BNR	Funding: FW, FOR Cost: In-house labor	HIGH
22	**PROJECT 11.1.3:** Utilize hog dogs to harass/remove hogs from areas unconducive to trapping or where urgent control of damage is needed.	OPR: BNR	Funding: FW, FOR Cost: In-house labor	HIGH

Yr.	Annual Work Plans (Include Year)	OPR	Funding Source	Priority Level
22	**PROJECT 11.1.4:**Trap hogs as necessary.	OPR: BNR	Funding: FW, FOR, CN	HIGH
22	**PROJECT 11.1.5:** Obtain and maintain equipment and supplies for use in controlling hog populations.	OPR: BNR	Funding: FOR, FW, CN Cost: $2K	HIGH
22	**PROJECT 11.1.6**: Obtain assistance from federal agencies in aerial control services of hogs.	OPR: BNR	Funding: CN Cost: $10K	HIGH
22	**PROJECT 12.1.1**: Install and maintain spring and fall food plots to provide wildlife species supplemental dietary foods. Add lime as needed to adjust the soil pH.	OPR: BNR	Funding: FW Cost: $10K	MEDIUM
22	**PROJECT 12.1.2**: Install and maintain artificial mineral licks to supplement low mineral quantities available in local soils.	OPR: BNR	Funding: FW Cost: $1K	MEDIUM
22	**PROJECT 12.2.1**: Select, create and maintain wildlife openings throughout the forest, especially in areas lacking in adequate cover for wildlife species; 6–15 acres of wildlife openings are created each year.	OPR: BNR	Funding: FW Cost: In-house labor	HIGH
22	**PROJECT 12.2.2**: On an annual basis, thin 1-2 selected forest stands to promote understory growth/herbaceous vegetation and wildlife cover.	OPR: BNR	Funding: FW Cost: In-house labor	HIGH
22	**PROJECT 13.1.1**: Harvest or use herbicide applications to remove woody vegetation and improve habitat for quail and other wildlife on 200 acres annually.	OPR: BNR	Funding: FW Cost: $2K	HIGH
22	**PROJECT 14.1.1**: Plant and maintain areas for pollinators.	OPR: BNR	Funding: CN Cost: In-house labor	MEDIUM
22	**PROJECT 15.1.1:** Maintain primitive camping areas and picnic area on island at Harmon Lake Recreation Area.	OPR: BNR/Outdoor Rec	Funding: CN Cost: In-house labor	LOW
22	**PROJECT 15.1.2**: Maintain hiking trail around Harmon Lake Recreation Area from primitive camping area to boat launch area.	OPR: BNR/Outdoor Rec	Funding: CN Cost: In-house labor	LOW
22	**PROJECT 16.1.1**: Conduct annual inventories within one of the seven forest compartments to be harvested.	OPR: BNR	Funding: FOR Cost: TBD	HIGH

Yr.	Annual Work Plans (Include Year)	OPR	Funding Source	Priority Level
22	**PROJECT 16.2.1**: Develop and administer the sale of forest products. Establish sale boundaries, protecting Streamside Management Zones and other sensitive areas. Perform quality assurance for logging operations as per contract specifications.	OPR: BNR	Funding: FOR Cost: $5K	HIGH
22	**PROJECT 16.3.1**: Determine the site preparation needs on all areas immediately following harvesting estimated at 100 acres per year.	OPR: BNR	Funding: FOR Cost: In-house labor	HIGH
22	**PROJECT 16.3.2**: Develop and administer site preparation and reforestation contracts on all harvested areas estimated at 100 acres per year.	OPR: BNR	Funding: FOR Cost: $2K	HIGH
22	**PROJECT 16.3.3**: Conduct quality control on all site preparation and reforestation projects	OPR: BNR	Funding: FOR Cost: In-house labor	HIGH
22	**PROJECT 16.3.4**: Monitor the survival of all reforestation areas the following fall.	OPR: BNR	Funding: FOR Cost: In-house labor	HIGH
22	**PROJECT 16.4.1**: Conduct timber stand improvement control using herbicides for pine release encompassing 200 acres.	OPR: BNR	Funding: FOR Cost: TBD	HIGH
22	**PROJECT 16.5.1**: Annually maintain and improve 5 miles of forest access roads to include rock, road grading, and pulling ditches.	OPR: BNR	Funding: FOR Cost: $15K	HIGH
22	**PROJECT 17.1.1**: Apply prescribed fire to 1,500-2,000 acres per year.	OPR: BNR	Funding: CN Cost: $TBD	LOW
22	**PROJECT 17.1.2**: Maintain 5 miles of trails and firebreaks per year, as required to protect forest resources, support prescribed fire activities, and access to forest stands. This is accomplished by mowing, disking, plowing, planting. Plantings serve additional purpose to hold/build soils, provide wildlife quality food/cover, and prevent erosion.	OPR: BNR	Funding: FOR Cost: $5K	HIGH
22	**PROJECT 17.2.1**: Continue annual training of natural resources personnel who are involved in wildfire suppression	OPR: BNR	Funding: CN - AFWFC Cost: $12K	MEDIUM

Yr.	Annual Work Plans (Include Year)	OPR	Funding Source	Priority Level
	and prescribed burning.			
22	**PROJECT 17.2.2**: Annually assess, maintain and upgrade when appropriate the essential wildland fire equipment and personal protective equipment.	OPR: BNR	Funding: CN Cost: $10K	MEDIUM
22	**PROJECT 18.1.1**: Apply herbicides to terrestrially invasive species in selected forest stands	OPR: BNR	Funding: CN, FOR Cost: TBD	HIGH
22	**PROJECT 18.1.2**: Annually assess the extent of invasive species in forest stands and develop yearly goals on amount of acreage to be treated to slow or stop the spread of these plants.	OPR: BNR	Funding: CN, FOR Cost: TBD	HIGH
22	**PROJECT 18.1.3**: Apply herbicides to aquatic invasive species.	OPR: BNR	Funding: CN, Cost: $3K	HIGH
22	**PROJECT 18.1.4**: Annually assess the extent of invasive species in aquatic habitat and develop goals on amount of acreage to be treated to slow or stop the spread of these plants.	OPR: BNR	Funding: CN, Cost: Ref Proj. 18.1.3	HIGH
22	**PROJECT 19.1.1**: Promote tree protection efforts on all construction projects	OPR: BNR	Funding: CN Cost: In-house labor	LOW
22	**PROJECT 19.1.2**: Provide consultation on projects that impact trees on main base. As a general policy, plantings should occur at same or greater frequency than removals	OPR: BNR	Funding: CN, Grounds Maintenance Cost: In-house labor	LOW
22	**PROJECT 19.2.1**: Participate in on-going tree care forums or project reviews within 2 CES.	OPR: BNR	Funding: CN, Grounds Maintenance Cost: In-house labor	LOW
22	**PROJECT 19.2.2**: Continue implementation of Base Tree Ordinance.	OPR: BNR	Funding: CN Cost: In-house labor	LOW
22	**PROJECT 20.1:** Ensure FLETC trained personnel are available for conservation law enforcement.	OPR: BNR	Funding: **CN** Cost: In-house labor	HIGH
22	**PROJECT 21.1.1**: Purchase supplies required for program management.	OPR: BNR	Funding: FW, CN, FOR Cost: TBD	HIGH

Yr.	Annual Work Plans (Include Year)	OPR	Funding Source	Priority Level
22	**PROJECT 21.1.2**: Purchase equipment required for program management.	OPR: BNR	Funding: FW, CN, FOR Cost: TBD	HIGH
22	**PROJECT 21.1.3**: Purchase vehicles required for program management.	OPR: BNR	Funding: FW, CN, FOR Cost: TBD	HIGH
22	**PROJECT 21.1.4**: Maintain equipment related to program management FY 2018 – 2022.	OPR: BNR	Funding: FW, CN, FOR Cost: TBD	HIGH
22	**PROJECT 21.1.5**: Purchase parts and supplies for maintenance of equipment related to program management.	OPR: BNR	Funding: FW, CN, FOR Cost: TBD	HIGH

11.0 REFERENCES

11.1 Standard References (Applicable to all AF installations)

- AFI 32-7064, *Integrated Natural Resources Management*
- Sikes Act
- eDASH Natural Resources Program Page
- Natural Resources Playbook – a Internal AF reference available at https://cs1.eis.af.mil/sites/ceportal/CEPlaybooks/NRM2/Pages/

11.2 Installation References

- Add installation-specific references

12.0 ACRONYMS

12.1 Standard Acronyms (Applicable to all AF installations)

- eDASH Acronym Library
- Natural Resources Playbook – Acronym Section
- U.S. EPA Terms & Acronyms

ACC - Air Combat Command
ACC/A7CO - Air Combat Command/CE Environmental Support
ACC/A7VS - Air Combat Command/CE Operations Management
AFWFC – Air Force Wildland Fire Center
AFGSC – Air Force Global Strike Command
APD - Application for Permit to Drill
BAFB - Barksdale Air Force Base
BCE - Base Civil Engineer
BEST - Barksdale AFB Environmental Stewardship Team
BNR - Barksdale Natural Resources
CBAT - Common Battlefield Airman Training
LDAF - Louisiana Department of Agriculture and Forestry
LDEQ - Louisiana Department of Environmental Quality

LDWF - Louisiana Department of Wildlife and Fisheries
LPDES - Louisiana Pollutant Discharge Elimination System
mcfg/d - Thousand cubic feet of gas per day
mybp - Million years before present
QDMP - Quality Deer Management Program
USFWS – United States Fish and Wildlife Service
2 BW - 2d Bomb Wing
2 CES - 2d Civil Engineer Squadron
2 CES/CEI - 2d Civil Engineer Squadron/Installation Management Flight
2 CES/CEF - 2d Civil Engineer Squadron/Fire Protection Flight
2 CES/CEO - 2d Civil Engineer Squadron/Operations Flight
2 CONS/LGCV - Barksdale Contracting Office
2 MDOS - 2d Medical Operations Squadron
2 MSG - 2d Mission Support Group
2 OSS - 2d Operations Support Squadron
2 SFS - 2d Security Forces Squadron
2 SVS - 2d Services Squadron

13.0 DEFINITIONS

13.1 Standard Definitions (Applicable to all AF installations)

- Natural Resources Playbook – Definitions Section

13.2 Installation Definitions

Agriculture Outleasing - The use of DoD lands under a lease to an agency, organization or person for growing crops or grazing animals.

Agricultural Land Improvements - Improvements that add potential value to an agricultural out grant such as irrigation features, cattle guards, water developments, livestock enclosures and other structural improvements, as well as non-structural improvements such as seeding, fertilizing and vegetation management.

Biological Diversity--The variety of life forms, the ecological roles they perform and the genetic variability they contain within any defined time and space.

Commercial Forest Land--Land under management capable of producing at least 20 cubic feet of merchantable timber per acre a year. It must be accessible and programmed for silvicultural prescriptions. The smallest area for this classification is 5 acres. Roadside, streamside, and shelterbelt strips of timber must have or be capable of producing a crown width of at least 120 feet to be classified as a commercial forest.

Cooperative Agreement--A written agreement between an Air Force installation and one or more outside agencies (federal, state or local) that coordinates planning strategies. It is a vehicle for obtaining assistance in developing natural resources programs.

Critical Habitat--Any air, land, or water area and constituents thereof that the USFWS has designated as essential to the survival and recovery of an endangered or threatened species or a distinct segment of its population.

Cropland--Land primarily suitable for producing farm crops, including grain, hay and truck crops.

Endangered Species--Any plant or animal listed as endangered by the Federal Government. Exotic Species--Any non-native species whose introduction does or is likely to cause economic, environmental harm or

harm to human health. This status can be applied to native plants that are not native to a particular ecosystem. Any plant or animal not native or indigenous to a region, state or country.

Floodplain-- Flat land bordering a stream or river onto which a flood will spread.

Forest Land--Land on which forest trees of various sizes constitute at least 10 percent of the area. This category includes open land that is capable of supporting trees and is planned for forest regeneration and management.

Forest Management-- The practice of applying scientific, economic, philosophical, and social principles to the administration, utilization, and conservation of all aspects of forested landscapes to meet specified goals and objectives, while maintaining the productivity of the forest.

Forest Products--Plant materials in wooded areas that have commercial value as sawlogs, veneer / plywood logs, poles, pilings, posts, pulpwood, and firewood.

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

Grazing Land--Land with vegetative cover that consists of grasses, forbs and shrubs valuable as forage.

Grazing Systems--Specialized methods of grazing management (the manipulation of livestock grazing to accomplish a desired result) that define systematically recurring periods of grazing and deferment for pastures or management units.

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

Highly Erodible Soils--Soils that, because of their physical properties or slope, the NRCS identifies as being highly susceptible to wind or water erosion.

Improved Grounds--Includes land under buildings and other permanent structures as well as lawns and landscape plantings on which personnel annually plan and perform intensive maintenance activities.

Improved Grounds usually include the cantonment area, parade grounds, drill fields, athletic areas, golf courses (excluding roughs), and housing areas.

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

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

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

“No Funds” Service Contract--An agreement by which a party performs a land management service for a consideration other than funds.

Noncommercial Forest Land--Land not capable of yielding forest products of at least 20 cubic feet per acre a year because of adverse site conditions. The classification also includes productive forest land on which mission requirements, accessibility or non- compatible uses preclude forest management activities.

Outdoor Interpretation--Observing and explaining the history, development and significance of our natural heritage and natural resources.

Outdoor Recreation--Recreation that relates directly to and occurs in natural and/or outdoor environments.

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

Prime Farmland--Land that has the best combination of chemical and physical characteristics for producing food, feed, forage, fiber and oil-seed crops and is also available or potentially available for these uses. It has the soil quality, growing season and moisture supply needed to economically produce sustained high yields of crops under modern farming methods. Existing pastureland, range land, forest land and other land not in an urban buildup condition is considered eligible for designation as prime farmland, providing it meets the other criteria.

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

Recreation Carrying Capacity--The level of recreational use that an area can sustain without damage to the environment.

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

Rotation Age--The planned number of years between the regeneration of a forest stand and its final cutting at a specified stage of maturity.

Semi-Improved Grounds--Grounds where personnel perform periodic maintenance primarily for operational and aesthetic reasons (such as erosion and dust control, bird control and visual clear zones). These usually include grounds adjacent to runways, taxiways and aprons; runway clear zones; lateral safety zones; rifle and pistol ranges; picnic areas; ammunition storage areas; antenna facilities and golf course roughs.

Silviculture-- The application of knowledge of silvics dealing with the development and care of forests.

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

Timber Management--The application of silvicultural knowledge and prescriptions to forest lands within economic and environmental constraints to produce a sustained yield of forest products.

Timber Stand Improvements (TSI)--Silvicultural treatments applied to existing stands to improve their quality, composition, condition or rate of growth (such as pruning, thinning, releasing and prescribed burning).

Unique Farmland--Land, other than prime farmland, used for producing specific high value food and fiber crops at the time of designation. It has the special combination of soil quality, location, growing season and moisture supply needed to produce sustained high quality or high yields of a specific crop under modern farming methods, e.g., citrus, tree nuts, olive and cranberries.

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

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

Wetlands--Areas inundated or saturated by surface or ground water at a frequency and a duration to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

14.0 APPENDICES

Appendix A. Annotated Summary of Key Legislation Related to Design and Implementation of the INRMP

Federal Public Laws and Executive Orders	
National Defense Authorization Act of 1989, Public Law (P.L.) 101-189; Volunteer Partnership Cost-Share Program	Amends two Acts and establishes volunteer and partnership programs for natural and cultural resources management on DoD lands.
Defense Appropriations Act of 1991, P.L. 101-511; Legacy Resource Management Program	Establishes the "Legacy Resource Management Program" for natural and cultural resources. Program emphasis is on inventory and stewardship responsibilities of biological, geophysical, cultural, and historic resources on DoD lands, including restoration of degraded or altered habitats.
EO 11514, Protection and Enhancement of Environmental Quality	Federal agencies shall initiate measures needed to direct their policies, plans, and programs to meet national environmental goals. They shall monitor, evaluate, and control agency activities to protect and enhance the quality of the environment.
EO 11593, Protection and Enhancement of the Cultural Environment	All Federal agencies are required to locate, identify, and record all cultural resources. Cultural resources include sites of archaeological, historical, or architectural significance.
EO 11987, Exotic Organisms	Agencies shall restrict the introduction of exotic species into the natural ecosystems on lands and waters which they administer.
EO 11988, Floodplain Management	Provides direction regarding actions of Federal agencies in floodplains, and requires permits from state, territory and Federal review agencies for any construction within a 100-year floodplain and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities for acquiring, managing and disposing of Federal lands and facilities.
EO 11989, Off-Road vehicles on Public Lands	Installations permitting off-road vehicles to designate and mark specific areas/trails to minimize damage and conflicts, publish information including maps, and monitor the effects of their use. Installations may close areas if adverse effects on natural, cultural, or historic resources are observed.
EO 11990, Protection of Wetlands	Requires Federal agencies to avoid undertaking or providing assistance for new construction in wetlands unless there is no practicable alternative, and all practicable measures to minimize harm to wetlands have been implemented and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities for (1) acquiring, managing, and disposing of Federal lands and facilities; and (2) providing Federally undertaken, financed, or assisted construction and improvements; and (3) conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities.
EO 12088, Federal Compliance With Pollution Control Standards	This EO delegates responsibility to the head of each executive agency for ensuring all necessary actions are taken for the prevention, control, and abatement of environmental pollution. This order gives the U.S. Environmental Protection Agency (US EPA) authority to

Federal Public Laws and Executive Orders	
	conduct reviews and inspections to monitor Federal facility compliance with pollution control standards.
EO 12898, Environmental Justice	This EO requires certain federal agencies, including the DoD, to the greatest extent practicable permitted by law, to make environmental justice part of their missions by identifying and addressing disproportionately high and adverse health or environmental effects on minority and low-income populations.
EO 13112, Exotic and Invasive Species	To prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause.
EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds	The U.S. Fish and Wildlife Service (USFWS) has the responsibility to administer, oversee, and enforce the conservation provisions of the Migratory Bird Treaty Act, which includes responsibility for population management (e.g., monitoring), habitat protection (e.g., acquisition, enhancement, and modification), international coordination, and regulations development and enforcement.
United States Code	
Animal Damage Control Act (7 U.S.C. § 426-426b, 47 Stat. 1468)	Provides authority to the Secretary of Agriculture for investigation and control of mammalian predators, rodents, and birds. DoD installations may enter into cooperative agreements to conduct animal control projects.
Bald and Golden Eagle Protection Act of 1940, as amended; 16 U.S.C. 668-668c	This law provides for the protection of the bald eagle (the national emblem) and the golden eagle by prohibiting, except under certain specified conditions, the taking, possession and commerce of such birds. The 1972 amendments increased penalties for violating provisions of the Act or regulations issued pursuant thereto and strengthened other enforcement measures. Rewards are provided for information leading to arrest and conviction for violation of the Act.
Clean Air Act, (42 U.S.C. § 7401– 7671q, July 14, 1955, as amended)	This Act, as amended, is known as the Clean Air Act of 1970. The amendments made in 1970 established the core of the clean air program. The primary objective is to establish Federal standards for air pollutants. It is designed to improve air quality in areas of the country which do not meet Federal standards and to prevent significant deterioration in areas where air quality exceeds those standards.
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 (Superfund) (26 U.S.C. § 4611–4682, P.L. 96-510, 94 Stat. 2797), as amended	Authorizes and administers a program to assess damage, respond to releases of hazardous substances, fund cleanup, establish clean-up standards, assign liability, and other efforts to address environmental contaminants. Installation Restoration Program guides cleanups at DoD installations.
Endangered Species Act (ESA) of 1973, as amended; P.L. 93-205, 16 U.S.C. § 1531 et seq.	Protects threatened, endangered, and candidate species of fish, wildlife, and plants and their designated critical habitats. Under this law, no Federal action is allowed to jeopardize the continued existence of an endangered or threatened species. The ESA requires consultation with the USFWS and the NOAA Fisheries (National Marine Fisheries Service) and the preparation of a biological

Federal Public Laws and Executive Orders	
	evaluation or a biological assessment may be required when such species are present in an area affected by government activities.
Federal Aid in Wildlife Restoration Act of 1937 (16 U.S.C. § 669–669i; 50 Stat. 917) (Pittman-Robertson Act)	Provides Federal aid to states and territories for management and restoration of wildlife. Fund derives from sports tax on arms and ammunition. Projects include acquisition of wildlife habitat, wildlife research surveys, development of access facilities, and hunter education.
Federal Environmental Pesticide Act of 1972	Requires installations to ensure pesticides are used only in accordance with their label registrations and restricted-use pesticides are applied only by certified applicators.
Federal Land Use Policy and Management Act, 43 U.S.C. § 1701–1782	Requires management of public lands to protect the quality of scientific, scenic, historical, ecological, environmental, and archaeological resources and values; as well as to preserve and protect certain lands in their natural condition for fish and wildlife habitat. This Act also requires consideration of commodity production such as timbering.
Federal Noxious Weed Act of 1974, 7 U.S.C. § 2801–2814	The Act provides for the control and management of non-indigenous weeds that injure or have the potential to injure the interests of agriculture and commerce, wildlife resources, or the public health.
Federal Water Pollution Control Act (Clean Water Act [CWA]), 33 U.S.C. §1251–1387	The CWA is a comprehensive statute aimed at restoring and maintaining the chemical, physical, and biological integrity of the nation's waters. Primary authority for the implementation and enforcement rests with the US EPA.
Fish and Wildlife Conservation Act (16 U.S.C. § 2901–2911; 94 Stat. 1322, PL 96-366)	Installations encouraged to use their authority to conserve and promote conservation of nongame fish and wildlife in their habitats.
Fish and Wildlife Coordination Act (16 U.S.C. § 661 et seq.)	Directs installations to consult with the USFWS, or state or territorial agencies to ascertain means to protect fish and wildlife resources related to actions resulting in the control or structural modification of any natural stream or body of water. Includes provisions for mitigation and reporting.
Lacey Act of 1900 (16 U.S.C. § 701, 702, 32 Stat. 187, 32 Stat. 285)	Prohibits the importation of wild animals or birds or parts thereof, taken, possessed, or exported in violation of the laws of the country or territory of origin. Provides enforcement and penalties for violation of wildlife related Acts or regulations.
Leases: Non-excess Property of Military Departments, 10 U.S.C. § 2667, as amended	Authorizes DoD to lease to commercial enterprises Federal land not currently needed for public use. Covers agricultural outleasing program.
Migratory Bird Treaty Act 16 U.S.C. § 703–712	The Act implements various treaties for the protection of migratory birds. Under the Act, taking, killing, or possessing migratory birds is unlawful without a valid permit.
National Environmental Policy Act of 1969 (NEPA), as amended; P.L. 91-190, 42 U.S.C. § 4321 et seq.	Requires Federal agencies to utilize a systematic approach when assessing environmental impacts of government activities. Establishes the use of environmental impact statements. NEPA proposes an interdisciplinary approach in a decision-making process designed to identify unacceptable or unnecessary impacts on the environment. The Council of Environmental Quality (CEQ) created Regulations for Implementing the National Environmental Policy Act [40 Code of

Federal Public Laws and Executive Orders	
	Federal Regulations (CFR) Parts 1500– 1508], which provide regulations applicable to and binding on all Federal agencies for implementing the procedural provisions of NEPA, as amended.
National Historic Preservation Act, 16 U.S.C. § 470 et seq.	Requires Federal agencies to take account of the effect of any federally assisted undertaking or licensing on any district, site, building, structure, or object included in or eligible for inclusion in the National Register of Historic Places (NRHP). Provides for the nomination, identification (through listing on the NRHP), and protection of historical and cultural properties of significance.
National Trails Systems Act (16 U.S.C. § 1241–1249)	Provides for the establishment of recreation and scenic trails.
National Wildlife Refuge Acts	Provides for establishment of National Wildlife Refuges through purchase, land transfer, donation, cooperative agreements, and other means.
National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. § 668dd–668ee)	Provides guidelines and instructions for the administration of Wildlife Refuges and other conservation areas.
Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. § 3001–13; 104 Stat. 3042), as amended	Established requirements for the treatment of Native American human remains and sacred or cultural objects found on Federal lands. Includes requirements on inventory, and notification.
Rivers and Harbors Act of 1899 (33 U.S.C. § 401 et seq.)	Makes it unlawful for the USAF to conduct any work or activity in navigable waters of the United States without a Federal Permit. Installations should coordinate with the U.S. Army Corps of Engineers (USACE) to obtain permits for the discharge of refuse affecting navigable waters under National Pollutant Discharge Elimination System (NPDES) and should coordinate with the USFWS to review effects on fish and wildlife of work and activities to be undertaken as permitted by the USACE.
Sale of certain interests in land, 10 U.S.C. § 2665	Authorizes sale of forest products and reimbursement of the costs of management of forest resources.
Soil and Water Conservation Act (16 U.S.C. § 2001, P.L. 95-193)	Installations shall coordinate with the Secretary of Agriculture to appraise, on a continual basis, soil/water-related resources. Installations will develop and update a program for furthering the conservation, protection, and enhancement of these resources consistent with other Federal and local programs.
Sikes Act (16 U.S.C. § 670a–670l, 74 Stat. 1052), as amended	Provides for the cooperation of DoD, the Departments of the Interior (USFWS), and the State Fish and Game Department in planning, developing, and maintaining fish and wildlife resources on a military installation. Requires development of an Integrated Natural Resources Management Plan and public access to natural resources, and allows collection of nominal hunting and fishing fees. NOTE: AFI 32-7064 sec 3.9. Staffing. As defined in DoDI 4715.03, use professionally trained natural resources management personnel with a degree in the natural sciences to develop and implement the installation INRMP. (T-0). 3.9.1. Outsourcing Natural Resources

Federal Public Laws and Executive Orders	
	Management. As stipulated in the Sikes Act, 16 U.S.C. § 670 et. seq., the Office of Management and Budget Circular No. A-76, Performance of Commercial Activities, August 4, 1983 (Revised May 29, 2003) does not apply to the development, implementation and enforcement of INRMPs. Activities that require the exercise of discretion in making decisions regarding the management and disposition of government owned natural resources are inherently governmental. When it is not practicable to utilize DoD personnel to perform inherently governmental natural resources management duties, obtain these services from federal agencies having responsibilities for the conservation and management of natural resources.
DoD Policy, Directives, and Instructions	
DoD Instruction 4150.07 DoD Pest Management Program dated 29 May 2008	Implements policy, assigns responsibilities, and prescribes procedures for the DoD Integrated Pest Management Program.
DoD Instruction 4715.1, Environmental Security	Establishes policy for protecting, preserving, and (when required) restoring and enhancing the quality of the environment. This instruction also ensures environmental factors are integrated into DoD decision-making processes that could impact the environment, and are given appropriate consideration along with other relevant factors.
DoD Instruction (DODI) 4715.03, Natural Resources Conservation Program	Implements policy, assigns responsibility, and prescribes procedures under DoDI 4715.1 for the integrated management of natural and cultural resources on property under DoD control.
OSD Policy Memorandum – 17 May 2005 – Implementation of Sikes Act Improvement Amendments: Supplemental Guidance Concerning Leased Lands	Provides supplemental guidance for implementing the requirements of the Sikes Act in a consistent manner throughout DoD. The guidance covers lands occupied by tenants or lessees or being used by others pursuant to a permit, license, right of way, or any other form of permission. INRMPs must address the resource management on all lands for which the subject installation has real property accountability, including leased lands. Installation commanders may require tenants to accept responsibility for performing appropriate natural resource management actions as a condition of their occupancy or use, but this does not preclude the requirement to address the natural resource management needs of these lands in the installation INRMP.
OSD Policy Memorandum – 1 November 2004 – Implementation of Sikes Act Improvement Act Amendments: Supplemental Guidance Concerning INRMP Reviews	Emphasizes implementing and improving the overall INRMP coordination process. Provides policy on scope of INRMP review, and public comment on INRMP review.
OSD Policy Memorandum – 10 October 2002 – Implementation of Sikes Act Improvement Act: Updated Guidance	Provides guidance for implementing the requirements of the Sikes Act in a consistent manner throughout DoD and replaces the 21 September 1998 guidance Implementation of the Sikes Act Improvement Amendments. Emphasizes implementing and improving the overall INRMP coordination process and focuses on coordinating with stakeholders, reporting requirements and metrics, budgeting for

Federal Public Laws and Executive Orders	
	INRMP projects, using the INRMP as a substitute for critical habitat designation, supporting military training and testing needs, and facilitating the INRMP review process.
USAF Instructions and Directives	
32 CFR Part 989, as amended, and AFI 32-7061, Environmental Impact Analysis Process	Provides guidance and responsibilities in the EIAP for implementing INRMPs. Implementation of an INRMP constitutes a major federal action and therefore is subject to evaluation through an Environmental Assessment or an Environmental Impact Statement.
AFI 32-7062, Air Force Comprehensive Planning	Provides guidance and responsibilities related to the USAF comprehensive planning process on all USAF-controlled lands.
AFI 32-7064, Integrated Natural Resources Management	Implements AFPD 32-70, Environmental Quality; DODI 4715.03, Natural Resources Conservation Program; and DODI 7310.5, Accounting for Sale of Forest Products. It explains how to manage natural resources on USAF property in compliance with Federal, state, territorial, and local standards.
AFI 32-7065, Cultural Resources Management	This instruction implements AFPD 32-70 and DoDI 4710.1, Archaeological and Historic Resources Management. It explains how to manage cultural resources on USAF property in compliance with Federal, state, territorial, and local standards.
AFPD 32-70, Environmental Quality	Outlines the USAF mission to achieve and maintain environmental quality on all USAF lands by cleaning up environmental damage resulting from past activities, meeting all environmental standards applicable to present operations, planning its future activities to minimize environmental impacts, managing responsibly the irreplaceable natural and cultural resources it holds in public trust and eliminating pollution from its activities wherever possible. AFPD 32-70 also establishes policies to carry out these objectives.
Policy Memo for Implementation of Sikes Act Improvement Amendments, HQ USAF Environmental Office (USAF/ILEV) on January 29, 1999	Outlines the USAF interpretation and explanation of the Sikes Act and Improvement Act of 1997.

Appendix B. Threatened and Endangered Species and Natural Communities Found in Bossier Parish, Louisiana

PARISH: Bossier

Scientific Name	Common Name	State Rank	Global Rank	State Status	Federal Status
Aimophila aestivalis	Bachman's Sparrow	S3	G3		
Ammocrypta clara	Western Sand Darter	S2	G3		
Anemone berlandieri	Ten Petal Thimbleweed	S2	G4?		
Bottomland hardwood forest	Bottomland Hardwood Forest	S4	G4G5		
Calcareous forest	Calcareous Forest	S2	G2?Q		
Camassia scilloides	Atlantic Camas	S2	G4G5		
Carex meadii	Mead's Sedge	S3	G4G5		
Cirsium engelmannii	Cirsium Terraenigrae	SU	G4		
Coreopsis palmata	Stiff Tickseed	S2	G5		
Crystallaria asprella	Crystal Darter	S2	G3		
Cypress swamp	Cypress Swamp	S4	G4G5		
Cypress-tupelo swamp	Cypress-tupelo Swamp	S4	G4G5		
Cypripedium kentuckiense	Southern Lady's-slipper	S1	G3		
Dodecatheon meadia	Common Shooting-star	S2	G5		
Eleocharis wolfii	Wolf Spikerush	S3	G3G4		
Erythronium albidum	White Trout-lily	S2	G5		
Forested seep	Forested Seep	S3	G3?		
Forestiera ligustrina	Upland Swamp Privet	S3	G4G5		
Glyceria septentrionalis	Eastern Managrass	S1	G5		
Haliaeetus leucocephalus	Bald Eagle	S3	G5	Endangered	Delisted
Hardwood slope forest	Hardwood Slope Forest	S3	G2G3		
Helenium campestre	Old Field Sneezeweed	S1	G4		
Houstonia purpurea var. calycosa	Purple Bluet	S2	G5T5		
Koeleria macrantha	June Grass	S1	G5		
Lindheimera texana	Texas Yellow-star	S1	G5		
Marshallia caespitosa var. signata	Barbara's Buttons	S1	G4T4		
Mirabilis albida	Pale Umbrella-wort	S1S2	G5		
Mixed hardwood-loblolly forest	Mixed Hardwood-loblolly Forest	S3	G3G4		
Monotropa hypopithys	American Pinesap	S2	G5		
Morse clay calcareous prairie	Morse Clay Calcareous Prairie	S1	G1G2		
Mustela frenata	Long-tailed Weasel	S3	G5		
Nemastylis geminiflora	Prairie Pleat-leaf	S2S3	G4		
Oenothera pilosella ssp. sessilis	Meadow Evening Primrose	S1?	G5T2Q		
Oenothera rhombipetala	Four-point Evening Primrose	S1?	G4G5		
Phlox pilosa ssp. ozarkana	Downy Phlox	S2?	G5TNR		

PARISH: Bossier

Scientific Name	Common Name	State Rank	Global Rank	State Status	Federal Status
Picoides borealis	Red-cockaded Woodpecker	S2	G3	Endangered	E
Pogonomyrm ex Comanche	Comanche Harvester Ant	S2	GNR		
Quercus arkansana	Arkansas Oak	S2	G3		
Quercus macrocarpa	Burr Oak	S1	G5		
Rudbeckia triloba	Three-lobed Coneflower	S2	G5		
Sanguinaria canadensis	Bloodroot	S2	G5		
Silene stellata	Starry Campion	S2	G5		
Small stream forest	Small Stream Forest	S2	G3		
Solanum dimidiatum	Western Horse-nettle	S2S3	G5		
Sterna antillarum athalassos	Interior Least Tern	S4BT1	G4T2Q	Endangered	E
Taenidia integerrima	Yellow Pimpernell	S2	G5		
Thalictrum revolutum	Windflower	S1	G5		
Trillium recurvatum	Reflexed Trillium	S2	G5		
Triosteum angustifolium	Yellowleaf Tinker's-weed	S2	G5		
Viola pubescens	Downy Yellow Violet	S1	G5		
Vireo gilvus	Warbling Vireo	S1B	G5		
Wet hardwood flatwoods	Wet Hardwood Flatwoods	S2S3	G2G3		
Zigadenus nuttallii	Nuttall Death Camas	S1	G5		

EXPLANATION OF RANKING CATEGORIES EMPLOYED BY NATURAL HERITAGE PROGRAMS NATIONWIDE

Each element is assigned a single global rank as well as a state rank for each state in which it occurs. Global ranking is done under the guidance of NatureServe, Arlington, VA. State ranks are assigned by each state's Natural Heritage Program, thus a rank for a particular element may vary considerably from state to state. Federal ranks are designated by the U.S. Fish & Wildlife Service under the provisions of the Endangered Species Act of 1973. **DISCLAIMER:** This document is not an official copy of the laws in effect and should not be utilized or relied upon as such. For this reason, the accuracy of the information contained within this document cannot be guaranteed and the reader is cautioned that it is his/her responsibility to be apprised of the laws in effect at any given time. These laws include those contained within the Louisiana Revised Statutes, particularly Title 56, the official regulations of the Louisiana Wildlife and Fisheries Commission, federal laws, and any local or parish ordinances.

FEDERAL RANKS (USESA FIELD):

LE = Listed Endangered
LT = Listed Threatened
PE = Proposed endangered
PT = Proposed Threatened
C = Candidate

PDL = Proposed for delisting

E (S/A) or T (S/A) = Listed endangered or threatened because of similarity of appearance
XE = Essential experimental population

XN = Nonessential experimental population

No Rank = Usually indicates that the taxon does not have any federal status. However, because of potential lag time between publication in the Federal Register and entry in the central databases and state databases, some taxa may have a status which does not yet appear.

(Rank, Rank) = Combination values in parenthesis = The taxon itself is not named in the Federal Register as having U.S. ESA status; however, all of its infraspecific taxa (worldwide) do have official status. The statuses shown in parentheses indicate the statuses that apply to infraspecific taxa or populations within this taxon. *THE SPECIES IS CONSIDERED TO HAVE A COMBINATION STATUS IN LOUISIANA*

(PS) = partial status= Status in only a portion of the species' range. Typically indicated in a "full" species record where an infraspecific taxon or population has U.S. ESA status, but the entire species does not. *THE SPECIES DOES NOT HAVE A STATUS IN LOUISIANA*

(PS: Rank) = partial status= Status in only a portion of the species' range. The value of that status appears because the entity with status does not have an individual entry in Natureserve. *THE SPECIES MAY HAVE A STATUS IN LOUISIANA*

GLOBAL ELEMENT RANKS:

G1 = critically imperiled globally because of extreme rarity (5 or fewer known extant populations) or because of some factor(s) making it especially vulnerable to extinction

G2 = imperiled globally because of rarity (6 to 20 known extant populations) or

because of some factor(s) making it very vulnerable to extinction throughout its range

G3 = either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range (e.g., a single physiographic region) or because of other factors making it vulnerable to extinction throughout its range (21 to 100 known extant populations)

G4 = apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery (100 to 1000 known extant populations)

G5 = demonstrably secure globally, although it may be quite rare in parts of its range, especially at the periphery (1000+ known extant populations)

GH = of historical occurrence throughout its range; i.e., formerly part of the established biota, with the possibility that it may be rediscovered (e.g., Bachman's Warbler)

GU = possibly in peril range-wide, but status uncertain; need more information G? = rank uncertain. Or a range (e.g., G3G5) delineates the limits of uncertainty GQ = uncertain taxonomic status

GX = believed to be extinct throughout its range (e.g., Passenger Pigeon) with virtually no likelihood that it will be rediscovered

T = subspecies or variety rank (e.g., G5T4 applies to a subspecies with a global species rank of G5, but with a subspecies rank of G4)

STATE ELEMENT RANKS:

S1 = critically imperiled in Louisiana because of extreme rarity (5 or fewer known extant populations) or because of some factor(s) making it especially vulnerable to extirpation

S2 = imperiled in Louisiana because of rarity (6 to 20 known extant populations) or because of some factor(s) making it very vulnerable to extirpation

S3 = rare and local throughout the state or found locally (even abundantly at some of its locations) in a restricted region of the state, or because of other factors making it vulnerable to extirpation (21 to 100 known extant populations)

S4 = apparently secure in Louisiana with many occurrences (100 to 1000 known extant populations)

S5 = demonstrably secure in Louisiana (1000+ known extant populations)

(B or N may be used as qualifier of numeric ranks and indicating whether the occurrence is breeding or nonbreeding)

SA = accidental in Louisiana, including species (usually birds or butterflies) recorded once or twice or only at great intervals hundreds or even thousands of miles outside their usual range

SH = of historical occurrence in Louisiana, but no recent records verified within the last 20 years; formerly part of the established biota, possibly still persisting

SR = reported from Louisiana, but without conclusive evidence to accept or reject the report SU = possibly in peril in Louisiana, but status uncertain; need more information

SX = believed to be extirpated from Louisiana

SZ = transient species in which no specific consistent area of occurrence is identifiable

STATE PROTECTION STATUS:

State status are contained in Title 56 of the Louisiana Revised Statutes as well as relevant rules and regulations adopted by the Louisiana Wildlife and Fisheries Commission and the Secretary of the Department of Wildlife and Fisheries. The Secretary of the Department of Wildlife and Fisheries is authorized to implement additional restrictions in emergency situations in order to protect fish and wildlife resources.

Endangered = Taking or harassment of these species is a violation of state and federal laws.

Threatened = Taking or harassment of these species is a violation of state and federal laws.

Threatened/Endangered = Taking or harassment of these species is a violation of state and federal laws.

Prohibited = Possession of these species is prohibited. No legal harvest or possession.

Restricted Harvest = There are restrictions regarding the taking and possession of these species

Appendix C. Points of Contact

BARKSDALE AFB	OFF BASE
Installation Mgmt Chief 2 CES/CEI 334 Davis Ave, Suite 208 Barksdale AFB, LA 71110 456-3757	Supervisor, Ecological Services Southeast Region 4 US Fish and Wildlife Service 646 Cajundome Blvd. Suite 400 Lafayette, LA 70506 337-291-3100
Natural Resource Manager 2 CES/CEIEA 456-2397	Federal Permits Coordinator US Fish and Wildlife Service 337-291-3121
Forester 2 CES/CEIEA 456-3926	
Wildlife Biologist 2 CES/CEIEA 456-1963	Supervisor, District 1 Louisiana Department of Wildlife and Fisheries 9961 Hwy 80 Minden, LA 71055 318-371-3050
Biological Scientist – Oil/Gas 2 CES/CEIEA 456-3926	District Forester 740 Covington Road Haughton, LA 71037 318-949-3225
Barksdale AFB Fire Chief 2 CES/CEF 456-2642	
Community Planner 2 CES/CEAO 456-4064	District Conservationist Natural Resources Conservation Service PO Box 247 Benton, LA 71006 318-965-2185
Pest Management 2 CES/CEQUI 456-1814	Area Agent Forestry LA Cooperative Extension Service LSU PO Box 188 Benton, LA 71006 318-965-2326
NEPA Coordinator 2 CES/CEI 456-5296	
Services Contracts Grounds Maintenance 2 CES/CEOSS 456-3750	Environmental Specialist (Jurisdictional Determinations) US Army Corps of Engineers 4155 Clay Street Vicksburg, MA 39183 601-631-5546

BARKSDALE AFB	OFF BASE
BASH Coordinator 2 BW/SEF 456-5618	Environmental Specialist (Permits) US Army Corps of Engineers 601-631-5499
Outdoor Recreation Director 2 FSS/FSCO 456-3426	
	Supervisory Geologist Bureau of Land Management 411 Briarwood Drive, Suite 404 Jackson, MS 39206 601-977-5425
	Mineral Lease Coordinator Bureau of Land Management 318-222-9352