FINAL

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN 2018–2022

RED RIVER ARMY DEPOT TEXAS

August 2018

***Prepared by*:** **Tetra Tech, Inc.**
Fairfax, VA

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INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN 2018–2022 RED RIVER ARMY DEPOT, TEXAS

This Integrated Natural Resources Management Plan has been developed on behalf of Red River Army Depot in cooperation with the U.S. Fish and Wildlife Service and the Texas Parks and Wildlife Department. The signatures below indicate the agreement of the signing parties concerning the conservation, protection, and management of fish and wildlife resources as presented in the Integrated Natural Resources Management Plan.

PLAN APPROVAL–RED RIVER ARMY DEPOT

_____ _____

Joe N. Thrash
Chief, Environmental Division
Red River Army Depot, TX

Date

_____ _____

STEPHEN M. YORK
Colonel, U.S. Army
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Red River Army Depot, TX

Date

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AGENCY AGREEMENT

_____ _____

Amy Lueders, Regional Director
U.S. Fish and Wildlife Service
500 Gold Avenue SW
Albuquerque, NM 87102

Date

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_____ _____

Carter Smith, Executive Director
Texas Parks and Wildlife Department
4200 Smith School Rd.
Austin, TX 78744

Date

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APPENDICES

ACRONYMS

ºF	Degrees Fahrenheit
AMC	Army Materiel Command
APHIS	Animal and Plant Health Inspection Service
AR	Army Regulation
AVMP	Aquatic Vegetation Management Plan
BGEPA	Bald and Golden Eagle Protection Act
BMP	Best Management Practice
BRAC	Base Realignment and Closure
CC	Compliance-Related Cleanup
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
DES	Directorate of Emergency Services
DMM	Discarded Military Munitions
DoD	Department of Defense
DoDI	Department of Defense Instruction
DoDM	Department of Defense Manual
DPW	Directorate of Public Works
EA	Environmental Assessment
ESA	Endangered Species Act
ESMP	Endangered Species Management Plan
GIS	Geographic Information System
GPS	Global Positioning System
I-	Interstate
IAP	Installation Action Plan
INRMP	Integrated Natural Resources Management Plan
IPM	Integrated Pest Management
IPMP	Integrated Pest Management Plan
IRP	Installation Restoration Program
ISMP	Invasive Species Management Plan
IWFMP	Integrated Wildland Fire Management Plan
LMB	Land Management Branch
LSAAP	Lone Star Army Ammunition Plant
MBTA	Migratory Bird Treaty Act
MC	Munitions Constituents
MMRP	Military Munitions Response Program
MOA	Memorandum of Agreement
msl	Mean Sea Level
MWR	Directorate for Morale, Welfare and Recreation
NEPA	National Environmental Policy Act

NFA	No Further Action
NRCS	Natural Resources Conservation Service
NWCG	National Wildfire Coordinating Group
OB	Open Burning
OD	Open Detonation
PCPI	Per Capita Personal Income
PLS	Planning Level Survey
PSP	Public Sale Parcel
RCRA	Resource Conservation and Recovery Act
RRAD	Red River Army Depot
RRRA	Red River Redevelopment Authority
SWPPP	Stormwater Pollution Prevention Plan
T&E	Threatened and Endangered
TCEQ	Texas Commission on Environmental Quality
TFS	Texas Forestry Service
TPWD	Texas Parks and Wildlife Department
U.S.	U.S. Highway
U.S.C.	United States Code
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
UXO	Unexploded Ordnance
WEP	Western Excess Parcel

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EXECUTIVE SUMMARY

This Integrated Natural Resources Management Plan (INRMP) addresses natural resources and their management on all lands over which Red River Army Depot (RRAD) has jurisdiction and control. RRAD is an installation of the Army Materiel Command. It occupies approximately 15,846 acres in northeastern Texas. This INRMP addresses natural resources and their management on all lands over which RRAD has jurisdiction and control, including land occupied by tenants or lessees and used by anyone else pursuant to a permit, license, right-of-way, or any other form of permission.

The purpose of this INRMP is to guide the natural resources management program at RRAD from 2018 through 2022 and to provide a solid foundation on which to continue building the program beyond 2022.

The INRMP has been prepared in accordance with Army Regulation 200-1, *Environmental Protection and Enhancement,* and Department of Defense Manual 4715.03, *Integrated Natural Resources Management Plan (INRMP) Implementation Manual*. The INRMP provides the guidance necessary for RRAD to maintain compliance with the Natural Resource Management on Military Lands Act of 1960 (Title 16 of the *United States Code* [U.S.C.] § 670 *et seq.*), commonly known as the Sikes Act; Department of Defense Instruction 4715.03, *Natural Resources Conservation Program*; the Endangered Species Act (16 U.S.C. § 1531 *et seq.*); the Migratory Bird Treaty Act (16 U.S.C. § 703 *et seq.*); the Bald and Golden Eagle Protection Act (16 U.S.C. § 668); and other applicable regulations, policies, guidance, and agreements related to natural resources management at RRAD.

The INRMP provides the Army and RRAD with a single document that describes the depot's natural resources. It contains goals and objectives to guide management of natural resources at RRAD as well as specific management measures and projects RRAD can implement to achieve measurable progress toward conserving its natural resources and ensuring the long-term sustainability of its lands to support the military mission. RRAD will initiate and complete the identified projects in accordance with current mission requirements and funding.

The INRMP is not intended as a stand-alone document, but is designed to document the condition and management of RRAD's natural resource assets and to assist in integrating management of those assets into other programs and activities across the depot. This INRMP should be used in conjunction with the installation master plan, Integrated Cultural Resources Management Plan, Integrated Pest Management Plan, Integrated Wildland Fire Management Plan, cleanup operations conducted under the Resource Conservation and Recovery Act and related provisions, and other appropriate plans and activities.

RRAD natural resources management personnel review the INRMP annually and update it at least once every 5 years to ensure that RRAD's natural resources management program reflects the latest guidance. All reviews are conducted in coordination with the U.S. Fish and Wildlife Service and the Texas Parks and Wildlife Department.

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SECTION 1.0 INTRODUCTION

1.1 PURPOSE

1.1.1 Purpose and Scope

> *The Army is committed to environmental stewardship in all actions as an integral part of its mission and to ensure sustainability (Army Regulation 200-1, Environmental Protection and Enhancement, 2007).*

The purpose of this Integrated Natural Resources Management Plan (INRMP) is to guide the natural resources management program at Red River Army Depot (RRAD) from 2018 through 2022 and to provide a solid foundation on which to continue building the program beyond 2022.

RRAD is an installation of the Army Materiel Command (AMC). It occupies approximately 15,846 acres in northeastern Texas. This INRMP addresses natural resources and their management on all lands over which RRAD has jurisdiction and control, including land occupied by tenants or lessees and used by anyone else pursuant to a permit, license, right-of-way, or any other form of permission.

1.1.2 Support of the Army Mission

Maintaining sustainable environmental conditions on RRAD's land is essential for the success of the Depot's military mission. It is the policy of the Department of Defense (DoD) to implement and maintain natural resources conservation programs to ensure access to land, air, and water resources for realistic military training and testing while ensuring that the natural resources under military stewardship and control are managed to support and be consistent with the military mission.

The INRMP fulfills natural resources stewardship requirements while enabling military preparedness and providing for no net loss in the capability of military land to support the military mission, pursuant to section 670a(b)(1)(I) of the Natural Resource Management on Military Lands Act of 1960 (Title 16 of the *United States Code* [U.S.C.] 670 *et seq*.), commonly known as the Sikes Act. Implementing this INRMP will enable RRAD to achieve its goal to sustain the Joint Warfighter's combat power by providing ground combat and tactical systems sustainment maintenance operations while maintaining ecosystem viability. In addition, implementing the INRMP will ensure that natural resources conservation measures and Army activities on RRAD land are integrated and consistent with federal stewardship requirements.

1.1.3 Benefits

The INRMP provides the Army and RRAD with a single document that describes the Depot's natural resources and a guide for managing those resources. It provides a concise analysis of all levels of the natural environment, from ecosystems, habitats, and individual species to goals, objectives, projects, and management measures that will sustain these resources at all levels. This larger picture provides a broader basis for understanding planning, budgeting, and implementing requirements.

1.2 GOALS AND MANAGEMENT PRACTICES

1.2.1 Natural Resources Management Goals

The guiding principles of RRAD's natural resources management program are to maintain ecosystem viability and to ensure the sustainability necessary to support military mission activities. RRAD executes its program to guarantee continued access to its land, air, and water resources to facilitate the military mission and mission readiness and to sustain the long-term ecological integrity of its resource base and the ecosystem services the resources provide.

This INRMP provides a comprehensive, coordinated framework for long-term and cost-effective management of natural resources in accordance with the Sikes Act and DoD policy. This framework enables RRAD to do the following:

- Ensure the long-term sustainability of its lands to support the military mission.
- Conserve and rehabilitate natural resources.
- Accommodate multiple uses of the land.
- Accommodate public access to and use of military lands within the limits of safety and military security requirements.
- Ensure that natural resources conservation measures and Army activities on RRAD land are integrated and consistent with federal stewardship requirements.

RRAD has developed specific goals for managing its natural resources that reflect the guiding principles of the management program, current state of natural resources on the Depot, and current needs for preserving and enhancing natural resources, such as:

- Goal 1: Protect and improve the habitats suitable for plant and animal species federally listed under the Endangered Species Act (ESA) as rare, threatened, or endangered or for species with the potential to be listed in the future.
- Goal 2: Provide high-quality habitat for native fish and wildlife species that supports healthy and balanced wildlife populations and enhances biodiversity.
- Goal 3: Manage game mammal, bird, and fish species to support healthy and balanced populations.
- Goal 4: Maintain and protect aquatic and riparian habitats and water quality, restore degraded aquatic habitats, and reduce the recreational impacts associated with aquatic vegetation.
- Goal 5: Protect and preserve wetlands in a manner consistent with DoD natural resources policy and that ensures no net loss of wetland habitat on the depot.
- Goal 6: Maintain and enhance the ecological integrity of forest habitats while supporting the military mission.

Section 8.0 discusses these and other goals in greater detail and presents the objectives and projects that will be implemented to enable RRAD to make measurable progress toward achieving them. Tables in section 8.0 contains additional project detail such as cost, timeframe, and responsibility.

The ability to achieve those goals depends directly on the health and condition of the natural resources at RRAD. Protecting the ecological and biological integrity of military lands ensures that they continue to provide the soil and vegetative cover necessary to support mission

activities, control erosion, minimize wildfire hazards, and sustain operational safety and efficiency.

1.2.2 Relationship to Current Management Practices

The management goals, objectives, projects, and management measures this plan contains have been updated to reflect the current condition of the natural resources and military mission-related activities that are anticipated to occur at RRAD. These plan elements have been designed to reflect the goals of long-term sustainability of RRAD's ecosystems and the balance between the ecosystem and the Depot's military mission.

The natural resources program must remain flexible if it is to achieve long-term success. The program will achieve and maintain this flexibility by incorporating adaptive management techniques. *Adaptive management* is a process by which new information from monitoring data, scientific literature, or both is used to evaluate the success of the management measures in place. That information is then used to determine changes in the management approach needed to ensure the program's continued success. The natural resources program might also be required to adapt to unforeseen changes in military mission and legal requirements.

1.3 ENVIRONMENTAL COMPLIANCE

As stated in Army Regulation (AR) 200-1, *Environmental Protection and Enhancement*, "the Army is committed to environmental stewardship in all actions as an integral part of its mission and to ensure sustainability," and will "sustain the environment to enable the Army mission and secure the future." This INRMP has been prepared in accordance with AR 200-1 and Department of Defense Manual (DoDM) 4715.03, *Integrated Natural Resources Management Plan (INRMP) Implementation Manual* (DoD 2013). It provides the guidance necessary for RRAD to maintain compliance with the Sikes Act (16 U.S.C. § 670 *et seq.*); Department of Defense Instruction (DoDI) 4715.03, *Natural Resources Conservation Program*; the Endangered Species Act (16 U.S.C. § 1531 *et seq.*); the Migratory Bird Treaty Act (MBTA) (16 U.S.C. § 703 *et seq*.); the Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. § 668); and other applicable regulations, policies, guidance, and agreements related to natural resources management at RRAD.

The INRMP is not intended as a stand-alone document, but is designed to document the condition and management of RRAD's natural resources assets and to assist in integrating management of those assets into other programs and activities across the Depot. This INRMP should be used in conjunction with the installation Wildlife Management Plan, Aquatic Vegetation Management Plan (AVMP), Fisheries Management Plan, Invasive Species Management Plan, Integrated Cultural Resources Management Plan, Integrated Pest Management Plan (IPMP), Integrated Wildland Fire Management Plan, Installation Action Plan (IAP), Stormwater Pollution Prevention Plan (SWPPP), and other appropriate plans and activities.

1.4 IMPLEMENTATION

If implemented as written, this INRMP will fulfill the intent and requirements of the Sikes Act and other applicable federal, state, and local rules and regulations in managing natural resources on RRAD. Furthermore, flora, fauna, and habitats will be managed to achieve self-sustaining populations and ecosystems, while federally listed T&E species will be accorded special management prescriptions. Natural resources such as soils subject to erosion and groundwater will be monitored and preserved while invasive, nonnative species will be managed and

controlled to the maximum extent practicable. Although safety and military security concerns at RRAD require that public access be controlled, RRAD will seek to provide public access to facilitate public awareness and outreach programs to the maximum extent practicable.

1.5 USE, SCOPE, AND FUNCTION OF THE INRMP

1.5.1 Use of the INRMP to Guide Natural Resources Management

This INRMP is intended to serve as an effective tool for RRAD personnel to use in managing natural resources consistent with mission goals and requirements. Implementing this adaptive plan will support consistency with the military mission while protecting and enhancing resources for multiple use, sustainable yield, and biological diversity and will ensure that natural resources conservation activities on mission land are integrated into and consistent with federal stewardship requirements.

1.5.2 Scope of the INRMP

This INRMP addresses natural resources and their management throughout RRAD. While it does not address managing natural resources on properties beyond the boundaries of the Depot, management activities are coordinated with adjacent landowners and other property managers in areas where the activities involve resource management planning on a landscape scale.

1.5.3 Function of the INRMP

This INRMP helps ensure that environmental considerations continue to be an integral part of planning activities at RRAD and that natural resources are protected in accordance with applicable regulations and policies. It represents a review and update of the previous RRAD INRMP (2011), reflecting the natural resources activities undertaken at RRAD over the intervening years and proposing new projects to be implemented in 2018 through 2022 and beyond.

Instead of functioning as a comprehensive compilation of detailed information on all these related topics, the INRMP briefly summarizes the key interrelationships among the plans and explains where copies of the plans and additional information can be obtained.

1.6 REGULATORY AND POLICY FRAMEWORK

This section provides an overview of regulations, policies, and guidance related to the development, review, and implementation of INRMPs.

1.6.1 The Sikes Act

The Natural Resource Management on Military Lands Act of 1960 (16 U.S.C. 670 *et seq*.), or Sikes Act, requires DoD to develop comprehensive INRMPs that are fully coordinated with the U.S. Fish and Wildlife Service (USFWS) and the appropriate state agency. The INRMPs will assist DoD in carrying out a program that will provide for (1) the conservation and rehabilitation of natural resources on military installations; (2) the sustainable multipurpose use of those resources, including hunting, fishing, trapping, and nonconsumptive uses; and (3) public access to military installations to facilitate sustainable use subject to safety requirements and military security.

An installation's INRMP shall address the following:

- Fish and wildlife management, land management, forest management, and fish- and wildlife-oriented recreation.
- Fish and wildlife habitat enhancement or modifications.
- Wetland protection, enhancement, and restoration, where necessary, to support fish, wildlife, or plants.
- Integration of, and consistency among, the various activities conducted under the plan.
- Establishment of specific natural resources management goals and objectives and time frames for proposed action(s).
- Sustainable use by the public of natural resources to the extent that the use is not inconsistent with the needs of fish and wildlife resources.
- Public access to the military installation necessary or appropriate for the use described above, subject to requirements necessary to ensure safety, military security, and fulfillment of the military mission.
- Enforcement of applicable natural resources laws (including regulations).
- No net loss in the capability of military installation lands to support the military mission of the installation.
- Such other activities as the Secretary of the military department determines appropriate.

1.6.2 Sikes Act Tripartite Memorandum of Understanding

The Sikes Act Tripartite Memorandum of Understanding established a cooperative relationship between DoD, USFWS, and state fish and wildlife agencies (represented by the Association of Fish and Wildlife Agencies) for preparing, reviewing, and implementing INRMPs (DoD et al. 2013).

1.6.3 DoDI 4715.03, Natural Resources Conservation Program

DoDI 4715.03 provides policy and procedures for developing, implementing, and evaluating effective integrated natural resource management programs on DoD lands, including preparing an INRMP as required by the Sikes Act. DoDI 4715.03 states that INRMPs shall (1) incorporate the principles of ecosystem-based management, (2) contain information needed to support natural resources decision-making, (3) contain flora and fauna species lists, (4) ensure that significant or sensitive natural resources are monitored and managed for long-term sustainability, and (5) ensure no net loss to the installation's training and testing capabilities and enhance those capabilities to the maximum extent practicable.

1.6.4 DoDM 4715.03, Integrated Natural Resources Management Plan (INRMP) Implementation Manual

DoDM 4715.03 provides procedures to prepare, review, update, and implement INRMPs in compliance with the Sikes Act. This revised INRMP was prepared in accordance with DoDM 4715.03.

1.6.5 AR 200-1, Environmental Protection and Enhancement

AR 200-1 reflects the Army's commitment to the conservation of its natural resources. It requires the preparation of INRMPs and provides guidance on their preparation,

implementation, review, and approval. AR 200-1 requires that INRMPs include specific goals and measurable objectives and be consistent with other installation management plans.

1.6.6 Title 32 of the Code of Federal Regulations Part 651, Environmental Effects of Army Actions

Title 32 of the *Code of Federal Regulations* (CFR) part 651:

> *… implements the National Environmental Policy Act of 1969 (NEPA), setting forth the Army's policies and responsibilities for the early integration of environmental considerations into planning and decision-making.*

NEPA requires federal agencies to consider the environmental consequences of major proposed actions such as implementing this INRMP. When RRAD's INRMP was originally prepared, the Depot assessed the expected consequences of implementing it in an environmental assessment (EA) dated April 2013, in accordance with NEPA and 32 CFR part 651. The EA and associated Finding of No Significant Impact are on file in the Natural Resources office.

1.6.7 Headquarters, Department of the Army INRMP Policy Memorandum, March 21, 1997

The Headquarters, Department of the Army INRMP policy memorandum dated March 21, 1997, and titled *Army Goals and Implementing Guidance for Natural Resources Planning Level Surveys and Integrated Natural Resources Management Plan*, states that the purpose for completing the INRMP and planning level surveys (PLSs) is "to ensure that natural resource conservation measures and Army activities on mission land are integrated and are consistent with federal stewardship requirements."

1.7 RRAD Roles and Responsibilities

Successfully managing RRAD's natural resources requires a cooperative effort among the parties directly responsible for implementing this INRMP. The level of success can be enhanced by developing partnerships among the parties that have a vested interest in the responsible management of natural resources at RRAD. Outside parties and their roles and responsibilities are described in section 7.1. Brief descriptions of the parties directly responsible for implementing this INRMP are provided in this section. Figure 1 illustrates how the Land Management Branch (LMB) fits within the Depot hierarchy.

1.7.1 RRAD Commander

The Commanding Colonel has overall responsibility for implementing the INRMP, including sustaining readiness training and complying with all laws and regulations associated with the protection of the installation's natural resources.

1.7.2 RRAD Organizations

Directorate for Public Works (DPW). DPW comprises five divisions that provide support to soldiers by actively supporting the Depot's core mission. DPW supervises and coordinates planning, organizing, staffing, directing, controlling, constructing, and maintaining all facilities and utilities required on RRAD. It provides engineering and master planning to modernize the Depot. One of DPW's five divisions, the Environmental Division, provides environmental management, including hazardous waste management; air quality monitoring; and land, wildlife,

and fisheries management. DPW also oversees environmental permitting, boiler plant operation, and laboratory testing.

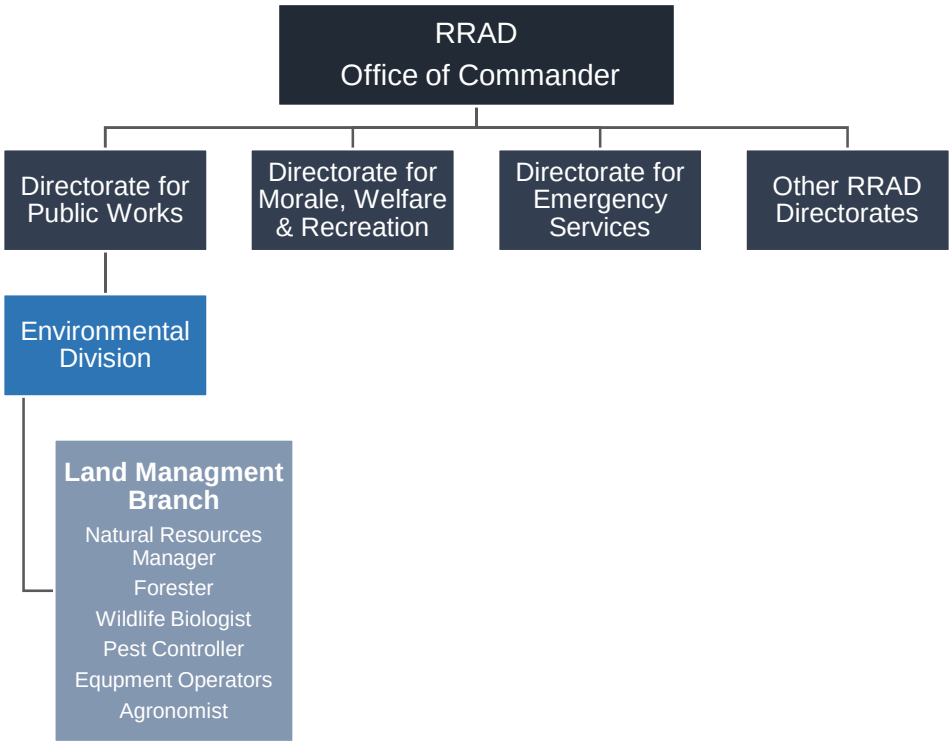


Figure 1. RRAD Land Management Structure

Environmental Division. The Environmental Division has overall responsibility for the installation's environmental programs, including air and water resources, solid waste, natural resources, agronomy, pest management, cultural resources, installation restoration, and hazardous material and waste handling and spill response activities. This division also oversees the LMB and manages personnel responsible for monitoring or managing the potential effect of natural resources management activities on the environment.

Land Management Branch (LMB). The LMB oversees land, forestry, wildland fire, cultural resources, fish and wildlife, grounds maintenance, and pest control and provides current natural resources management information to the Environmental Division. The LMB ensures continuous planning and application of the INRMP; promotes and fosters natural beauty, ecosystem restoration, management and maintenance, and landscape enhancement; natural resource enhancement, protection, and compliance; and cooperation with local communities. Process Action Teams are formed on a project-specific basis and combine key employees from the various directorates.

Directorate for Morale, Welfare and Recreation (MWR). MWR administers fee collection for hunting, fishing, and firewood permits. In addition, MWR, the US Army G9 Division of the U.S. Army Installation Management Command, establishes and administers policies and controls for the recreational use of designated recreational areas and facilities.

Directorate for Emergency Services (DES). DES is responsible for wildfire suppression and supports the prescribed burn program as outlined in the Integrated Wildland Fire Management Plan. DES qualifies and permits forestry and wildlife personnel on weapons annually to enable them to check out shotguns to dispatch, as needed, feral hogs on the Depot. DES is also responsible for conservation law enforcement in accordance with DoDI 5525.17.

1.8 MANAGEMENT PHILOSOPHY

1.8.1 How this INRMP Supports the Army Military Mission

Maintaining sustainable environmental conditions on military lands is essential for the success of the military mission at RRAD. The management measures in this INRMP have been developed on the basis of the existing conditions of RRAD's natural resources and the military mission and current and anticipated mission activities. Implementing this INRMP will help RRAD achieve its mission to sustain the Joint Warfighter's combat power by providing ground combat and tactical systems sustainment maintenance operations. Implementing this INRMP will guide natural resources management at RRAD for the next 5 years, 2018 through 2022, and provide a solid foundation on which to continue building the program beyond 2022.

1.8.2 How this INRMP Was Developed

This updated INRMP was developed by an interdisciplinary team of biologists, environmental scientists, and natural resources personnel. Its preparation involved review and analysis of past natural resources management practices, ongoing programs, and current conditions of natural resources at RRAD. The team interviewed RRAD LMB personnel, collected and analyzed existing environmental documentation, and conducted a field reconnaissance of the installation.

1.8.3 How this INRMP Implements the Army Principles for Ecosystem Management

In accordance with DoD policy, this INRMP uses an ecosystem management approach to natural resources management. Each element of the ecosystem is studied and managed in relationship to other parts of the ecosystem, so that natural biological integrity is maintained to the maximum extent feasible. Stewardship of natural resources on an ecosystem scale addresses requirements of water quality, soil productivity, biological diversity of native flora and fauna, and compliance concerns.

This INRMP, therefore, emphasizes protection and management of natural resources and lower levels of the food chain, which will, in turn, support the sustainability of biological resources and of mission activities. Ecosystem management objectives in this INRMP are based on a regional context and emphasize moving toward a desired future condition that is anticipated within 10, 20, or more years.

1.8.4 How this INRMP Supports the Installation Planning Process

This INRMP supports RRAD's planning process by identifying and prioritizing natural resources management goals, identifying projects to support those goals, and identifying the schedule and resources (labor and funding) required to perform those projects. These functions help guide the larger planning process, including budgeting, hiring, and acquisition. The installation follows a specific set of guiding principles for environmental protection:

- Environmental stewardship is the responsibility of every member of the work force, strategic partners, and residents.

- Environmental impacts are important considerations when assessing operations and setting new objectives and targets.
- Planning, monitoring, and revising are key components in continuously improving RRAD's environmental management system.
- The installation will continue to implement innovative ways to prevent pollution, minimize waste, manage natural resources, and conserve energy.
- The installation will ensure that all activities comply with relevant environmental legislation, regulations, and policies.
- The installation will maintain a positive relationship with the local community, regulators, and other governmental agencies.

RRAD's environmental policy is integral to the military mission and RRAD strives to be one of the national leaders in environmental, energy, and natural resources stewardship by focusing on prevention, compliance, restoration, and conservation of the Depot's land.

1.9 IMPLEMENTATION AND REVISION

1.9.1 Implementation

The RRAD LMB has the primary role and responsibility for implementing this INRMP, which will be in effect from 2018 through 2022.

1.9.2 Review and Revisions

The LMB personnel will conduct an annual review of this INRMP in light of the preceding year's accomplishments. According to DoDI 4715.03, reviews of the INRMP for operation and effect must be performed no less frequently than every 5 years by DoD, USFWS, and applicable state fish and wildlife agencies. This review will determine if the INRMP is being implemented to meet Sikes Act requirements and if the plan needs to be revised. The existing INRMP remains in effect until DoD, USFWS, and TPWD mutually agree on any revisions.

SECTION 2.0 DEPOT AND SURROUNDING AREAS

2.1 LOCATION AND SURROUNDINGS

RRAD is located in Bowie County (population 93,390) in northeast Texas, approximately 18 miles west of the cities of Texarkana, Texas and Arkansas (population 67,240) (see Figure 2). Hooks, Texas (population 2,770) is adjacent to RRAD to the north; New Boston, Texas (population 4,550), the county seat, is to the west; Redwater, Texas (population 1,060) is to the south, and the former Lone Star Army Ammunition Plant (LSAAP) is adjacent to RRAD to the east. LSAAP was closed under Base Realignment and Closure (BRAC) 2005 and is now known (partially) as TexAmericas East (RRAD 2016).

U.S. Highway (U.S.) 82 bounds the installation to the north, Interstate (I-) 30 runs north and parallel to U.S. 82, U.S. 67 runs southwesterly of the installation, and State Highway 8 is to the west. The installation is located within 200 miles of Dallas and Fort Worth, Texas; Shreveport, Louisiana; Little Rock, Arkansas; and Oklahoma City, Oklahoma.

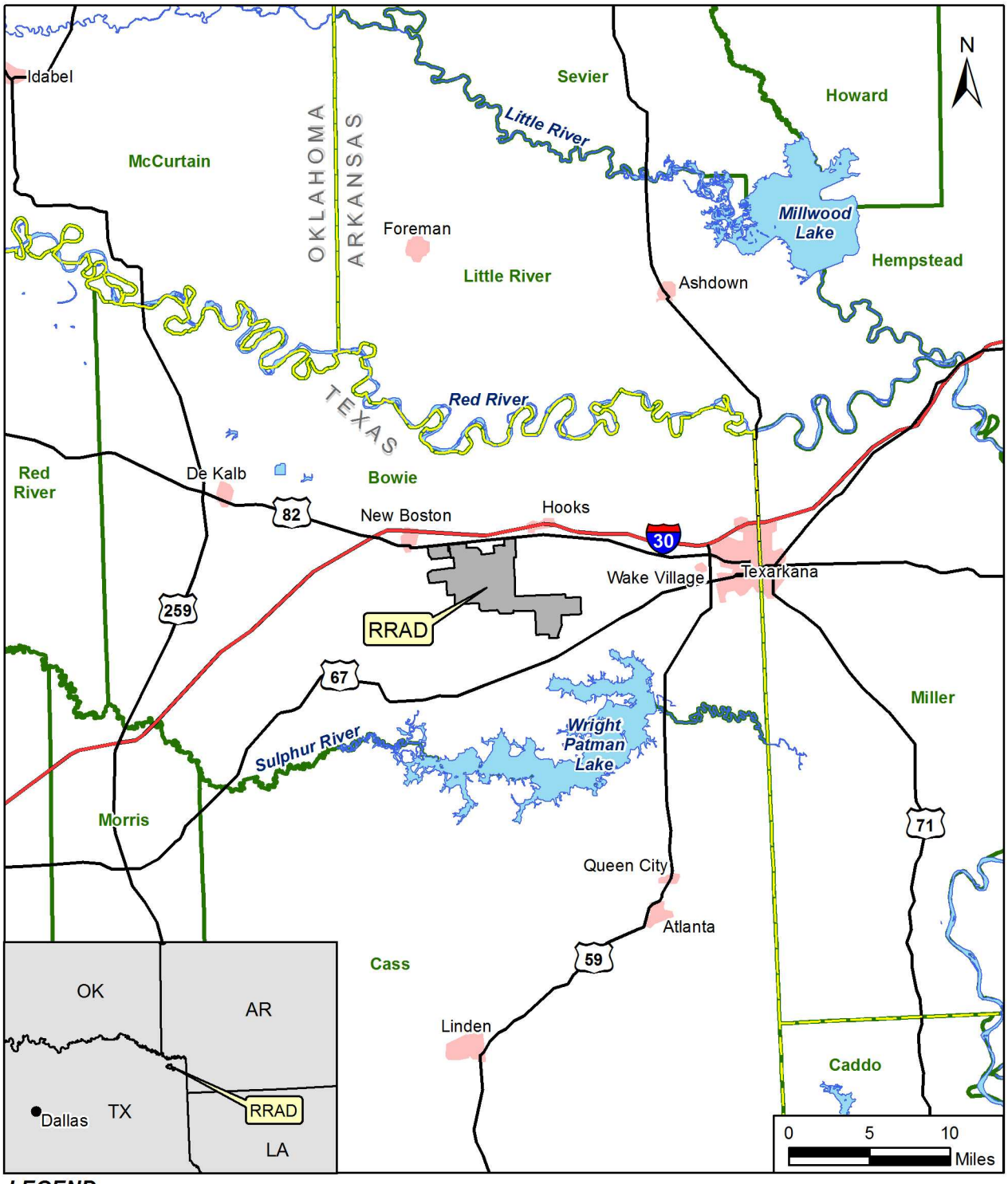
RRAD comprises approximately 15,846 acres. Under BRAC 1995 the Depot lost approximately 835 acres in various land transfers. The BRAC 2005 realignment identified an additional 3,839 acres of the Depot for transfer, consisting of the Western Excess Parcel (WEP), subdivided into the WEP Timber Parcel (approximately 2,859 acres) and the WEP Public Sale Parcel (PSP) (approximately 980 acres). In 2016, approximately 311 acres of the Public Sale Parcel were sold and 27 acres along State Highway 8 were transferred to the state. The portion of the PSP retained by the Army—678 acres east of Walnut Road and north of North Patrol Road—includes a closed hazardous waste landfill. The Army plans to sell the remaining acreage of the PSP by 2021.

The installation is primarily semi-improved acreage and storage areas surrounded by pine and hardwood forests (see Figure 3). RRAD semi-improved and improved areas include 1,400 buildings with storage igloos; standard magazines, warehouses, and administrative offices; a supplies training center; a light-track vehicle overhaul facility; a rubber operations facility, a central distribution center; and deactivated demolition facilities. The man-made Caney Creek and Elliott Creek reservoirs are located in the southeast portion of the facility.

2.2 HISTORY

RRAD was established in 1941 with funding provided by the Fifth Supplemental National Defense Appropriation Act of Congress during World War II. Before the installation was constructed, more than 100 Texas farms and ranches occupied the area. Before Bowie County was converted to agriculture, the land belonged to the Caddo Indian Nation (RRAD 2011). The installation served for a short time as a training facility, but over the past 70 years it has primarily supported military missions through combat and tactical systems maintenance, munitions assembly, ammunition storage, and rubber production.

Under BRAC 1995, all maintenance missions associated with the M113 tactical vehicle series were moved to other Army depots (RRAD 2016). RRAD retains its Bradley Fighting Vehicle series and tactical vehicle maintenance missions, road wheel and track remanufacturing missions, Defense Logistics Agency, and rubber products renovation/production/fluidized bed combustion facilities. Land was designated for transfer to the Red River Redevelopment Authority under BRAC 1995. Under BRAC 2005, RRAD's Red River Munitions Center ammunition storage mission, open burning (OB)/open detonation (OD) mission, and Patriot and Hawk missile recertification missions were lost. In a separate realignment action, the intern

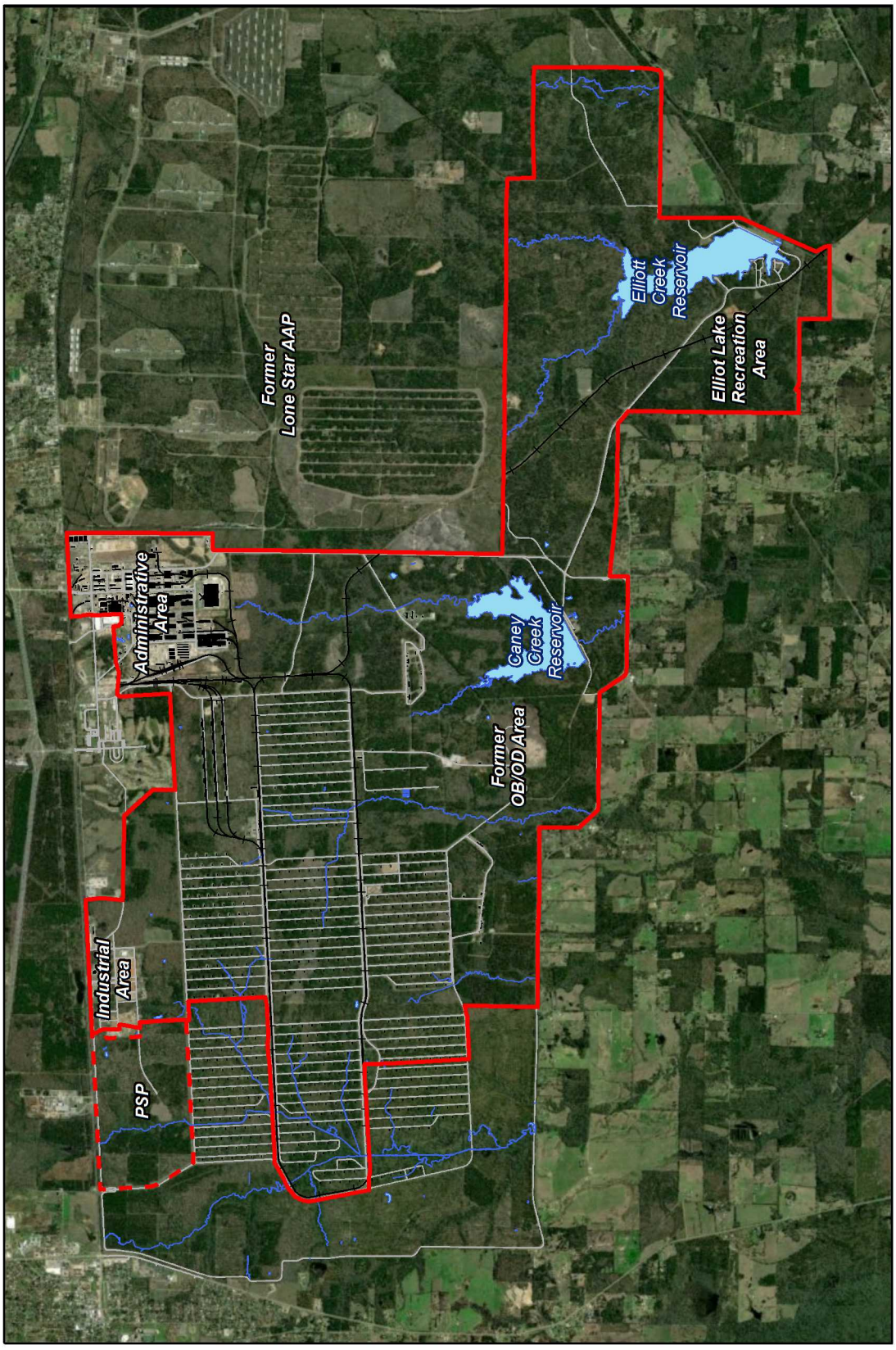


LEGEND

- State Boundary
- County Boundary
- Interstate
- U.S. Route
- Surface Water
- Urban Area

RRAD Location

Figure 2


RRAD Installation Map
Figure 3
Former Lone Star AAP
Elliott Creek Reservoir
Elliot Lake Recreation Area
Administrative Area
Caney Creek Reservoir
Former OB/OD Area
Industrial Area
PSP
LEGEND
RRAD Boundary
Surface Water
Road
Building
Railroad
Source: RRAD GIS 2016.

training center (AMC Logistics Leadership Center) was closed in January 2013. Combat and tactical systems maintenance remain in operation at the installation.

2.3 MILITARY MISSION

RRAD's Mission. *The mission is to sustain the Joint Warfighter's combat power by providing ground combat and tactical systems sustainment maintenance operations.*

RRAD's Vision. *The vision is to build and rebuild the highest quality vehicles at the lowest cost in the least amount of time–on time or ahead of schedule every time. We are here to serve and protect the Warfighter by our commitment to excellence in manufacturing.*

RRAD repairs, rebuilds, overhauls, and converts the Army's light-tracked combat vehicle fleet, including the Bradley Fighting Vehicle System, the Multiple Launch Rocket System, and associated components. The installation's technical resources also are capable of designing, fabricating, and manufacturing a wide range of specialty parts for prototype vehicles. Repaired vehicles are tested on the South Test Track, which consists of roads in areas where unused igloos are located. Vehicles are stored in unimproved areas on the Depot along unused roadways. RRAD has been reducing the number vehicles stored on the Depot.

RRAD has a rubber production facility that has been in operation since 1953 and is the Army's only rubber production facility. The facility produces rubber tracks and road wheels for tracked vehicles and manufactures all configurations of track shoes and road tires in the DoD supply system to support a ready defense system.

2.3.1 Tenant Organizations

RRAD is under the command of the Tank-Automotive and Armaments Command. The Depot hosts the following tenant organizations: the Defense Distribution Depot; Defense Automated Printing Services; Defense Logistics Agency Disposition Services Red River; General Services Administration Utilization Office; Army Contracting Command–Warren (RRAD); Civilian Personnel Advisory Center; Non-Appropriated Fund Financial Services; Non-Appropriated Fund System Support Office; U.S. Army Health Clinic; and U.S. Army Test, Measurement, and Diagnostic Equipment System Support Center (RRAD 2014a).

2.4 DEPOT AND LOCAL FACILITIES

2.4.1 Land Use

Land uses on RRAD are administrative; maintenance, repair, and storage; outdoor recreation; and undeveloped (forested). Administrative operations are concentrated in the north-central portion of the Depot near the main entrance, except for the MWR and LMB administrative offices, which are located near Elliott Creek Reservoir in the southeastern portion of the installation.

Combat and tactical vehicle maintenance and storage are the primary land uses supporting the military mission. Munitions storage and detonation activities were deactivated as part of the BRAC actions, and munitions were transferred to McAlester Army Ammunition Plant in Oklahoma. Five igloos on RRAD have been set aside to store munitions. The OB/OD area was deactivated in June 2011.

Most of the installation's land is in pine and hardwood forests. Forested land serves as safety-zone acreage surrounding test ranges, ammunition storage magazines, and igloos. Hardwood

forests comprise the majority of the forests on RRAD, followed by pine forests and mixed pine and hardwood forests.

Elliott Lake Recreation Area offers camping and lodging along the southwestern edge of Elliott Lake Reservoir. The site includes a visitor's center, boat launch, fishing pier, community recreation building, playground, and swimming beach, as well as cabins and camping pads. The lake is also available for general boating and sailing and kayaking lessons. Caney Creek Reservoir is located near the southern boundary of the site. It formerly was used as the primary source of potable drinking water for RRAD, but no longer serves that purpose. It is now used for fishing, wildlife habitat, and recreation.

2.4.2 Personnel

RRAD has a depot population of more than 4,500 employees, including civilians, contractors, and tenants (MilitaryINSTALLATIONS 2017). That population is not expected to change substantially over the coming years.

2.4.3 Structures

RRAD has 998 buildings, 548 earth-covered igloos, 200 miles of fences, and 57 miles of railroad tracks (RRAD 2014a). The buildings include warehouses, administrative buildings, and buildings for support functions such as security, fire, and maintenance. The Depot has no on-post housing.

2.4.4 Transportation System

The internal road network on the installation consists of approximately 250 miles of improved and 149 miles of unimproved roads. Improved roads are paved or concrete-surfaced and maintained by the Depot Property Division. LMB maintains unimproved roads—which consist of gravel and grassed roadways for logging, forest access, fire breaks, and railroads—by mowing, grading, removing brush, controlling access, and maintaining drainage easements along the roads. Three principal highways provide access to RRAD: U.S. 67, U.S. 82, and I-30. Access onto RRAD is through the Main Gate, West Gate, South Gate, and Commercial Gate.

2.4.5 Utilities

The RRAD drinking water supply is off-depot sourced water purchased from Riverbend Utilities. RRAD transferred ownership for the potable water production and distribution, sanitary sewer collection and treatment, and industrial wastewater collection and treatment systems to the Red River Redevelopment Authority in compliance with the BRAC 1995 recommendations. Most wastewater generated at RRAD is transferred by pipeline to treatment plants on adjacent property (the former Lone Star Army Ammunition Plant), where it is treated and discharged. Area K on RRAD is served by a small sanitary package plant that treats 750 gallons per day of wastewater.

Stormwater on RRAD flows to Big Creek, Rock Creek, Caney Creek, and Elliott Creek. RRAD holds a Texas Commission on Environmental Quality (TCEQ) Industrial Stormwater Multi-Sector General Permit that requires a SWPPP. The stormwater system serving the main industrial system of RRAD is designed to collect and transport surface runoff. The stormwater system consists of approximately 11,460 linear feet of pipeline.

RRAD has a 20 kilovolt-amp electric utility system consisting of a 12.47-kilovolt electricity distribution system owned and operated by Southwestern Electric Power Company (SWEPCO).

The system comprises approximately 138 miles of overhead lines, 44.5 miles of underground lines, substations, transformers, and exterior lighting.

Natural gas is provided by Constellation NewEnergy - Gas Division, LLC, through a Centerpoint Energy gas transmission pipeline. Most of the system was upgraded in 1988. Propane and fuel oil are available from local distributors.

Solid waste collection and disposal service for RRAD is provided by Western Waste of Texas, LLC, doing business as New Boston Landfill, which is owned by Waste Management of Texas. New Boston Landfill is located approximately 5 miles west of New Boston and provides collection and disposal of nonhazardous waste. Recycling services are offered in the area by Defense Logistics Agency Disposition Services Red River and RRAD MWR.

2.5 PROJECTED CHANGES IN DEPOT FACILITIES

Land use on the Depot is expected to remain largely unchanged for the foreseeable future. Two major construction projects are planned—two Defense Logistics Agency Disposition Services Red River general purpose warehouses, one measuring 243,000 square feet and the other measuring 445,000 square feet—but neither project would appreciably affect the Depot's land use.

2.6 REGIONAL LAND USE AND NATURAL AREAS

2.6.1 Surrounding Communities and Land Use

RRAD is located in northeast Texas, near the corners of four states: Arkansas, Louisiana, Oklahoma, and Texas. The Depot is in Bowie County about 18 miles west of the cities of Texarkana, Texas and Arkansas, which sit on the Texas-Arkansas border and are the metropolitan hub of the area. About one-half of the RRAD workforce lives in Texarkana (RRAD 2010). The Depot is surrounded by several small towns—New Boston, Redwater, and Hooks—which have small downtown centers with shops, restaurants, and commercial businesses.

Medium- to low-residential and commercial developments and large tracts of undeveloped lands surround RRAD. The undeveloped lands are small farms and evergreen and deciduous forests. The Red River is located north of the Depot, forming the northeast border between Texas and Arkansas. South of RRAD is the Wright Patman Dam and Lake on the Sulphur River, providing flood control, water supply for Texarkana and the surrounding communities, and recreational opportunities (USACE 2017).

2.6.2 Regional Land Use

RRAD is located in the center of Bowie County, which comprises approximately 885 square miles (U.S. Census Bureau 2017a). Most of the land in the county is rural, with hay and pasture land, ranchland, and pine and hardwood forests. The county has seven lakes, the largest being Wright Patman Lake at 20,300 acres. The county has abundant forest lands harvested for timber as well as mineral resource production, including oil, gas, lignite, and ceramic clay (USACE 2007).

Federal and state government landowners in Bowie County include the U.S. Department of Defense, U.S. Army Corps of Engineers (USACE), Texas Department of Criminal Justice, and Federal Bureau of Prisons.

The Federal Correctional Institution–Texarkana, operated by the Federal Bureau of Prisons, is located southwest of Texarkana and southeast of RRAD. The Barry B. Telford Unit, operated by

the Texas Department of Criminal Justice, is located west of RRAD and southwest of New Boston.

Wright Patman Dam and Lake is located along the southern border of Bowie County and operated by USACE, Fort Worth District. The district, TPWD, Cass County, and private owners operate campgrounds, parks, and marinas around the lake (TPWD 2017c).

2.6.3 Regional Natural Areas

The only state park located near RRAD is the Atlanta State Park in Atlanta, Texas, about 10 miles south of the Depot (TPWD 2016a). The park is on the south shore of Wright Patman Lake in the forested portion of the West Gulf Coastal Plains physiographic province. This area features gently rolling hills covered with a mixture of hardwoods and pines, very similar to the natural features on RRAD. Common woodland birds in the park include the brown-headed nuthatch (*Sitta pusilla*) and pine warbler (*Dendroica pinus*). Ducks (e.g., buffleheads [*Bucephala albeola*] and ruddy ducks [*Oxyura jamaicensis*]) visit the lake in the winter, as do American white pelicans (*Pelecanus erythrorhynchos*) and double-crested cormorants (*Phalacrocorax auritus*). Various species of gulls frequent the area around the dam. Fish in the lake include crappie (*Pomoxis* sp.), largemouth bass (*Micropterus salmoides*), white bass (*Morone chrysops*), several species of sunfish (*Lepomis* sp.), and channel, blue, and flathead catfish (*Ictalurus punctatus, I*. *furcatus,* and *Pylodictis olivaris*, respectively).

2.7 Regional Socioeconomics

The principal mechanisms by which an Army installation affects the socioeconomics of a region are Army expenditures and changes in the population or employment level at the installation. This INRMP addresses Bowie County, Texas, as the region affected by RRAD. RRAD is centrally located in the county, and the county borders Arkansas and Oklahoma. The State of Louisiana is within an hour's drive of the installation. The area is commonly known as the Four States Area. Data for the State of Texas and the United States are presented in this discussion for comparison.

2.7.1 Population

Population in the local area increased between 2010 and 2016. Bowie County's population increased from 92,565 in 2010 to 93,860 in 2016, a 1-percent increase. During the same period, the population of Texas increased by 11 percent and the United States population increased by 5 percent. The population density (population per square mile) for 2016 was 106 for Bowie County, 107 for Texas, and 91 for the United States (U.S. Census Bureau 2017b).

The percent of the population that was of a minority race or ethnicity increased between 2010 and 2016 for Bowie County, Texas, and the United States. Bowie County's minority population increased from 34 percent in 2010 to 36 percent in 2016. Texas's minority population increased from 55 percent in 2010 to 57 percent in 2016, and the nation's minority population increased from 36 percent to 39 percent. The predominant minority races are black or African American and Hispanic or Latino (U.S. Census Bureau 2010, 2017b).

2.7.2 Employment and Income

The Bowie County 2016 labor force was about 39,530, with 37,660 people (95 percent of the labor force) employed (BLS 2017). The largest employers in Bowie County include AECOM/URS, Christus St. Michael Health System, Cooper Tire and Rubber, RRAD, Southern

Refrigerated Transport, the Texarkana Independent School District, and Wal-Mart (Texarkana CC 2017).

Consistent with the national trend, unemployment declined in the county and state from 2010 to 2016. Bowie County's annual unemployment rate declined from 8.4 percent in 2010 to 4.7 percent in 2016 (BLS 2017).

Bowie County income levels were lower than state and national levels. The Bowie County median household income of $42,683 was 78 percent of Texas's median household income of $54,727 and 77 percent of the United States' median household income of $55,322. The Bowie County per capita personal income (PCPI) was $23,705, which was 85 percent of the Texas PCPI of $27,828 and 79 percent of the national PCPI of $29,829 (U.S. Census Bureau 2017b).

2.7.3 Housing

Bowie County has lower housing costs and lower housing values than the State of Texas and the United States. The median value of owner-occupied housing units in Bowie County is $111,100; the median value in Texas is $161,500; and, for the United States, it is $205,000. Bowie County median monthly owner costs of a housing unit with a mortgage are $1,020; for Texas, they are $1,470; and, for the United States, they are $1,490. The median monthly gross rent of a renter-occupied unit in Bowie County is $720; for Texas, it is $960; and, for the United States, it is $980 (U.S. Census Bureau 2017c).

The county has 39,530 housing units, of which 84 percent (33,031 units) are occupied and 16 percent (6,499 units) are vacant. The majority (67 percent) of the housing units in the county are detached, single-family homes. Mobile homes make up the next largest portion of the housing supply at 13 percent. Approximately 15 percent of the county's housing units were built before 1959, and about 5 percent of the housing units were built after 2009, leaving the majority, or 80 percent, of the housing units built between 1960 and 2009 (U.S. Census Bureau 2017c).

RRAD has on-post 12 modular houses M777 through M788 available for soldiers on TDY. They are located off Officers Drive and managed through the local MWR. No childcare, youth services programs, or schools are available on-post. These facilities are available in the surrounding towns and cities (DoD 2017).

SECTION 3.0 PHYSICAL ENVIRONMENT

3.1 CLIMATE

The eastern area of Texas is located in the Piney Woods ecoregion and is within the humid subtropical climate zone. It receives more rainfall—more than 50 inches annually—than other parts of Texas because of gulf currents that carry humid air to the region. Fall, winter, and spring are the wettest seasons, with rainfall averaging 4 inches or more per month. Summer (July through September) has the most clear days. The area is prone to severe thunderstorms and tornadoes when the proper conditions exist, generally in the springtime. Hurricanes also strike the region.

Average temperatures are warmest in July and August with highs exceeding 90 degrees Fahrenheit (ºF) and lows exceeding 70 ºF. December and January are the coldest months, when highs reach the mid-50s and lows are in the mid-30s. Frost is possible from November 15 through March 13, and nearly certain from December 2 through February 18 (Dave's Garden 2017). The area is generally frost-free from April 6 through October 31, and has about 247 frost-free days per year.

3.2 TOPOGRAPHY

The topography of RRAD is hilly, with few areas other than the northern administrative and industrial areas and along the northern boundary that could be considered somewhat level terrain. The elevation undulates between 300 and 350 feet above mean sea level (msl) across the Depot, rising to 400 feet above msl in some central locations and descending to about 290–300 feet above msl near creeks. Topographic conditions on the Depot can be viewed on the Hooks and New Boston quadrangles 7.5-minute series topographic maps for Texas-Bowie County (USGS 2016a, 2016b).

3.3 GEOLOGY

The geologic strata of the RRAD area consist of clay, sandy clay, siltstone, and sand deposited during the Upper Cretaceous, Eocene, and Pleistocene periods (RRAD 2011). Exposures of Midway and Wilcox Groups dominate in Bowie County. Areas of alluvium of recent age and terrace deposits of Pleistocene age are found along the Red and Sulphur rivers and their tributaries. Outcrops of the Marlbrook Marl Formation and the Navarro Group are found in the northwest part of Bowie County.

The Midway and Wilcox Groups occur beneath RRAD. Those formations outcrop in roughly east-west parallel bands with the Midway Group occurring in the central and northern sections of the installation and the Wilcox Group occurring in the southern sections of the installation.

The Midway Group consists of clay shale poorly bedded with thin, discontinuous laminations of silt and fine silty sand and is weathered to a depth of about 42 feet. The weathered section of the formation is yellow-brown jointed clay shale that is soft and moist and has iron oxide staining along joint planes. Crystalline gypsum is infrequently found lining joint planes near the base of the weathered zone. Below the weathered zone, the shale is dark gray and generally not jointed. The Midway Group formation is approximately 600 feet thick below the installation and is not considered to be an aquifer. The Wilcox Group consists of mostly sands, silts, and clays that occur under sloping topography. Studies indicate that the Wilcox Group is as much as 700 feet thick. On RRAD, the maximum thickness of the Wilcox Group is probably not more than 100 feet. Gently rolling lowlands have developed on areas underlain by the Midway Group and more hilly terrain has developed on areas underlain by the Wilcox Group (URS 2006).

3.4 SOILS

The Soil Survey of Bowie County identifies 18 soil-mapping units occurring on RRAD (see Table 1 and Figure 4) (Appendix A) (USDA NRCS 2017). Four dominant soil series occur on the installation. The dominant soils on the installation are the Annona loam, Ruston fine sandy loam, Sardis silt loam, and Sawyer silt loam. Following is a brief discussion of the characteristics of those soils.

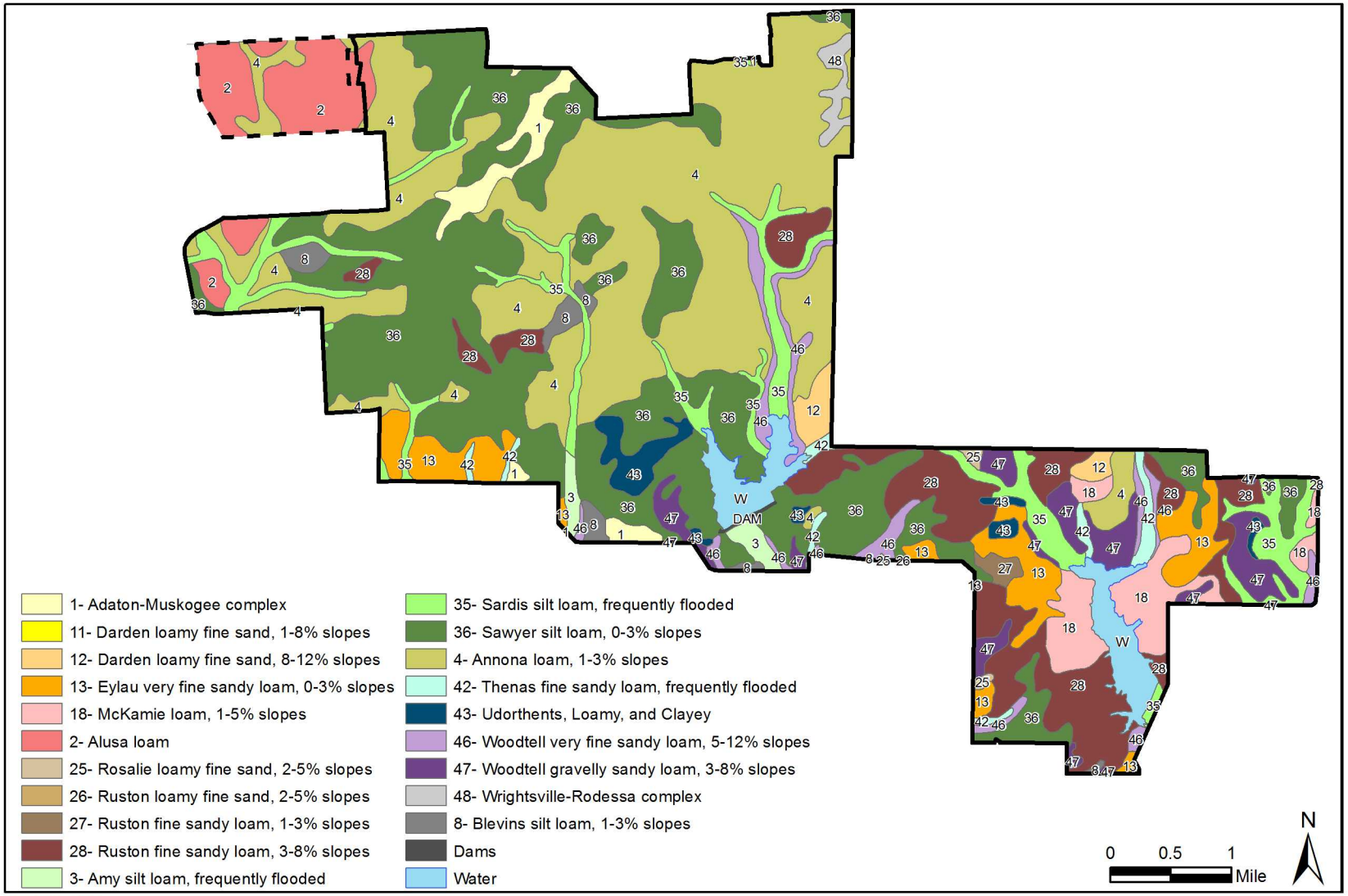
- Annona loam, 1- to 3-percent slopes. The Annona series consists of very deep, moderately well drained, very slowly permeable soils. They formed in clayey sediments and are 80 inches or more thick. Almost all of this soil is associated with pastures and woodlands (USDA NRCS 2017).
- Ruston fine sandy loam, 3- to 8-percent slopes. The Ruston series is a sandy loam about 18 inches deep overlying a subsoil of sandy clay loam about 60 inches deep. The soil is well drained and moderately permeable. Erosion hazard associated with the soil is moderate. This soil is associated with pastures and pine with mixed hardwood woodlands. The Ruston fine sandy loam, 3- to 8-percent slopes, occurs primarily in the south-central section of RRAD on convex upland terraces.
- Sardis silt loam, less than 1-percent slope. The Sardis series consists of silt loams on floodplains along the major creeks and drainageways that frequently flood (USDA NRCS 2017). The soil is somewhat poorly drained, and has slow runoff, moderate permeability, and a depth of 40 to 70 inches. It is poorly suited to most uses because of frequent flooding. The series occurs along most of the major drainageways on the Depot.
- Sawyer silt loam, 0- to 3-percent slopes. The Sawyer series is a silt loam with a depth of 6 inches overlying a silty clay loam, clay loam, and clay that is more than 80 inches deep. This soil is moderately well drained with slow-to-moderate permeability and is mostly found in loblolly (*P*. *taeda*) and shortleaf pine (*P*. *echinata*) forests (USDA NRCS 2017). The Sawyer series is the dominant soil occurring on the installation and is on uplands across the Depot.

Prime farmland soils are protected under the Farmland Protection Policy Act of 1981. The implementing procedures of the law and NRCS require federal agencies to evaluate the adverse effect of their activities on prime or unique farmland (by preparing the Farmland Conversion Impact Rating Form AD 1006) and farmland of statewide and local importance, and to consider alternative actions that could avoid adverse effects. The Army is not required to evaluate the RRAD properties for prime farmland status because land withdrawn from farmland inventory for military or national defense purposes is not subject to considerations related to farmland conversion.

3.5 WATER RESOURCES

Water resources management in Texas is divided into 16 regional water planning areas, and each group evaluates population projections, water demand projections, and existing water supplies available during drought conditions. RRAD is in Region D, Northeast Texas Region Water Planning Area, which encompasses the majority of 19 counties of northeast Texas, including Bowie County.

Sedimentation is an issue in Elliott Lake. A primary source of sediment is the land to the east that previously was the LSAAP, where timber was clearcut. Clearcutting on that land, however, is not the only source of sediment in Elliott Lake.



LEGEND

RRAD Boundary

PSP

RRAD Soils

Figure 4

Source: USDA NRCS 2017.

Table 1.
Soil mapping units on RRAD

Soil map unit	Acres
Adaton-Muskogee complex	239
Alusa loam	143
Amy silt loam, frequently flooded	94
Annona loam, 1- to 3-percent slopes	4,247
Blevins silt loam, 1- to 3-percent slopes	138
Darden loamy fine sand, 8- to 12-percent slopes	130
Eylau very fine sandy loam, 0- to 3-percent slopes	686
McKamie loam, 1- to 5-percent slopes	482
Rosalie loamy fine sand, 2- to 5-percent slopes	49
Ruston fine sandy loam, 1- to 3-percent slopes	44
Ruston fine sandy loam, 3- to 8-percent slopes	1,369
Sardis silt loam, frequently flooded	1,015
Sawyer silt loam, 0- to 3-percent slopes	4,578
Thenas fine sandy loam, frequently flooded	138
Udorthents, loamy and clayey	217
Water	450
Woodtell gravelly sandy loam, 3- to 8-percent slopes	474
Woodtell very fine sandy loam, 5- to 12-percent slopes	330
Wrightsville-Rodessa complex	83
TOTAL	**14,906**

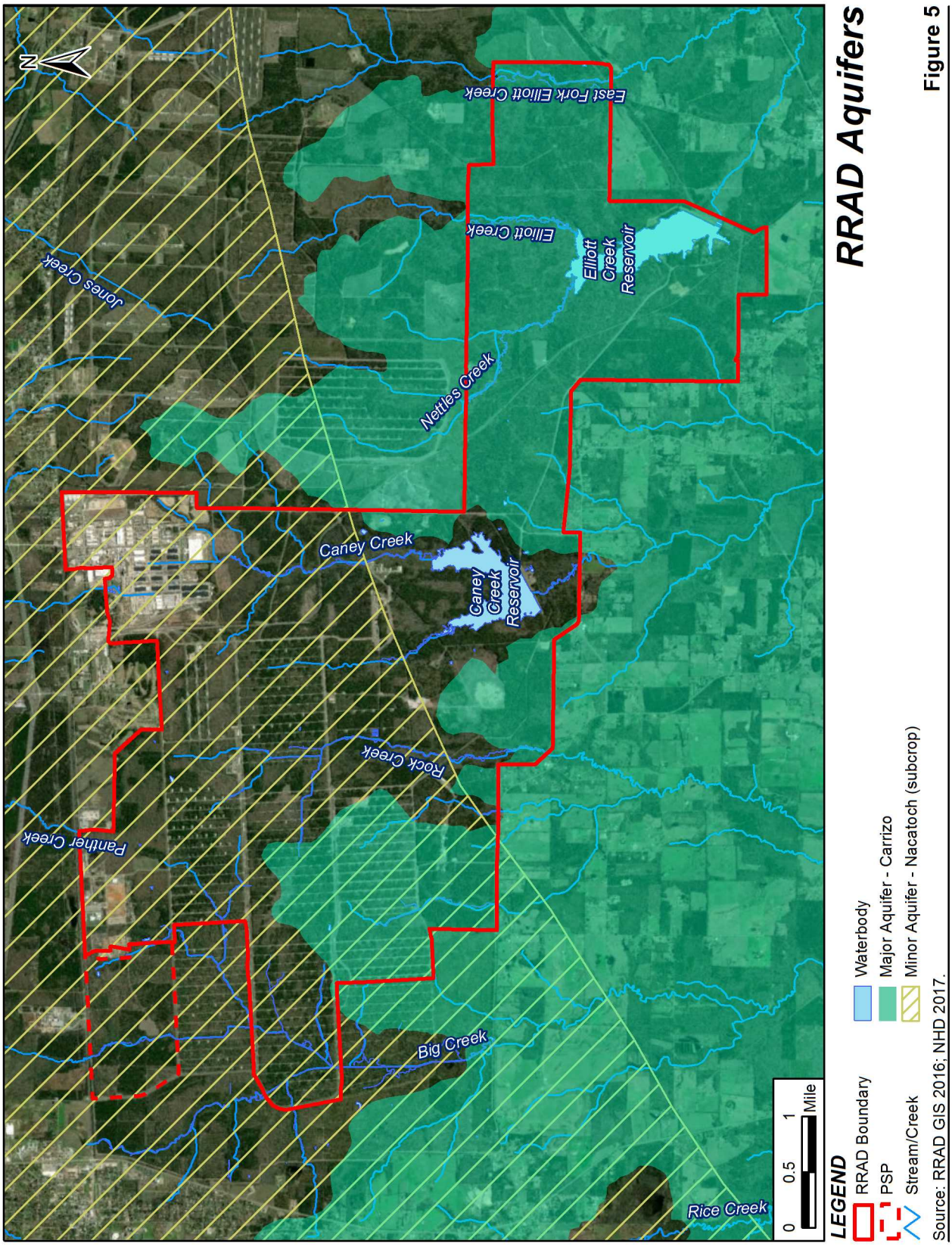
Water is no longer withdrawn from Caney Creek Reservoir for drinking water or raw water for industrial purposes. Caney Creek Reservoir is used for fishing, habitat, and recreation, and as aquatic habitat. Texarkana Water Utilities through Riverbend is now the primary provider of the potable water supply for RRAD.

3.5.1 Groundwater

RRAD overlies the outcrop of the Carrizo-Wilcox Aquifer, which extends across much of eastern Texas (see Figure 5). It consists of the Wilcox Group and the overlying Carrizo Formation of the

Claiborne Group. The aquifer is primarily composed of sand locally interbedded with gravel, silt, clay, and lignite deposited during the Tertiary Period. Groundwater, although hard, is generally fresh in the outcrop with high iron and manganese content, whereas softer groundwater with higher total dissolved solids occurs in the subsurface. Over half the water pumped is for irrigation and another 40 percent for municipal sources. Future groundwater supplies through 2060 are estimated to decrease very slightly to remain stable if proposed groundwater management practices are applied (TWDB 2007a).

The installation overlies the subsurface of the Nacatoch Aquifer, a narrow-banded, minor aquifer across northeast Texas. The aquifer consists of the Nacatoch Formation, which is composed of sequences of sand separated by impermeable layers of mudstone or clay. The aquifer also includes a hydraulically connected cover of alluvium that reaches a depth of up to 80 feet along major drainages. Groundwater generally moves to the south in the northern part of the aquifer and to the east in the western part of the aquifer. The Mexia-Talco Fault Zone generally forms



RRAD Aquifers

Figure 5

the downdip limit of the aquifer. The quality of groundwater in the aquifer is generally alkaline, high in sodium bicarbonate, and soft. Total dissolved solids increase in the subsurface portion of the aquifer, which is extensively used for rural domestic and livestock purposes. Groundwater supplies are expected to remain adequate and stable through 2060 (TWDB 2007b).

3.5.2 Surface Waters

Surface waters cover more than 500 acres of the installation in Caney Creek and Elliott Creek reservoirs, 11 ponds, and five perennial streams. A ridge extending east to west across the northeastern corner of RRAD topographically divides the installation into two drainage basins: the Red River basin to the north and the Sulphur River basin to the south (Figure 6). The southern portion of RRAD drains to Wright Patman Lake south of the Depot.

***Red River Basin*.** The Red River basin originates in the high plains of eastern New Mexico and flows eastward across the Caprock Escarpment to form the Texas-Oklahoma border for 400 miles. It continues for 40 miles, forming the Texas-Arkansas border, before flowing into Arkansas and south into Louisiana. The northeastern corner of RRAD drains to the Lower Red River watershed.

***Sulphur River Basin*.** The Sulphur River basin lies within 11 northeast Texas counties and drains 3,558 square miles in Texas, including most of the installation. The South Sulphur River originates in southeastern Fannin County northeast of Dallas, Texas, and flows eastward, joining the Middle Sulphur and North Sulphur rivers. It continues eastward into Wright Patman Lake. The Sulphur River converges with the Red River in Arkansas.

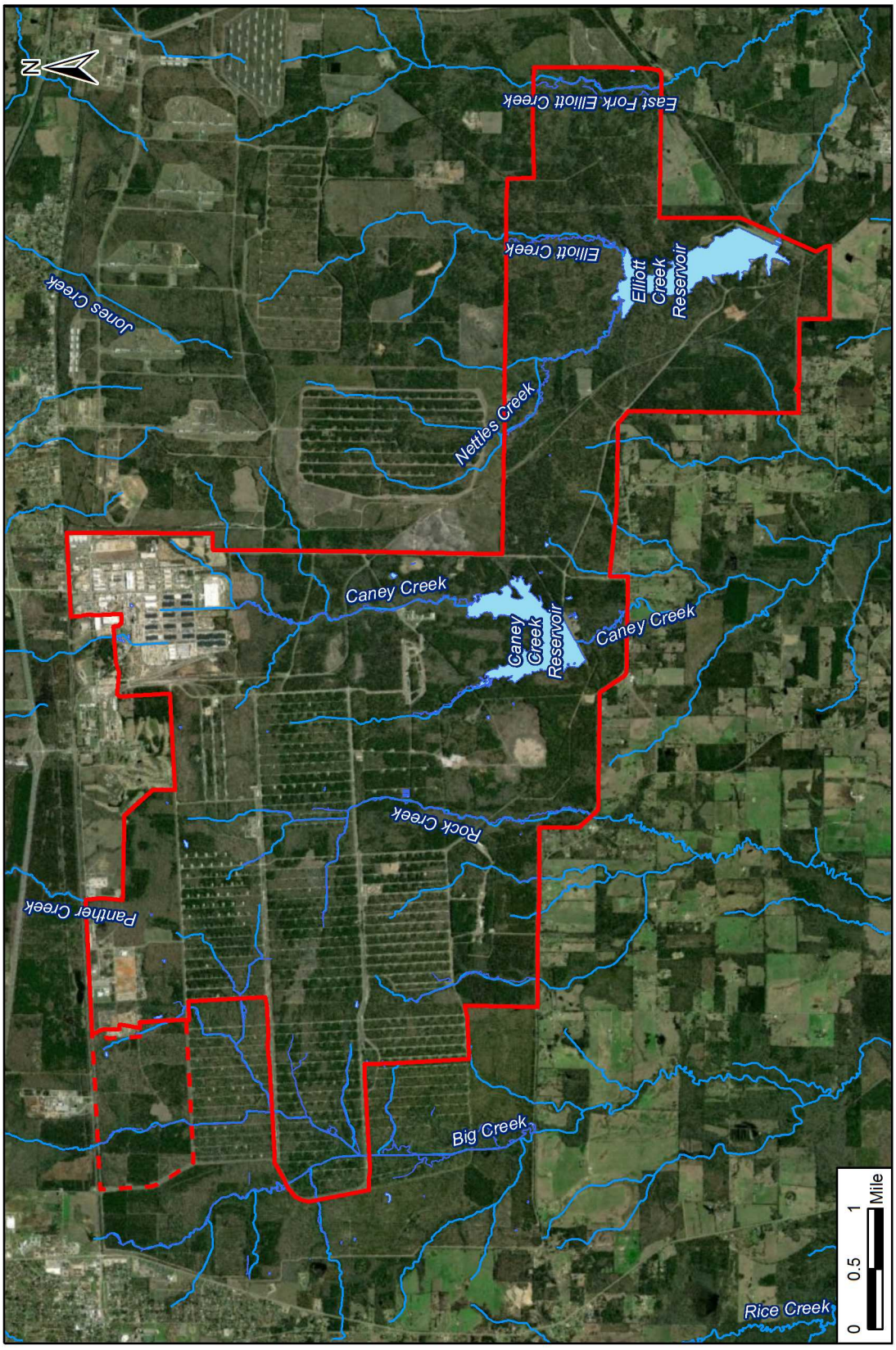
***Elliott Creek Reservoir*.** Elliott Creek Reservoir is located near the southeastern boundary of the Depot. The creek was dammed in 1942, and the reservoir was constructed as an alternate water supply. Today, it is mainly used for recreation, including boating, camping, fishing, and beach activities, and community outreach activities. The reservoir has 1,930 acre-feet of capacity and a maximum depth of 38 feet with an average depth of 7.8 feet.

***Caney Creek Reservoir*.** Caney Creek Reservoir, in the Sulphur River basin, is located near the center of the southern boundary. Caney Creek was dammed and the reservoir was constructed as a potable water source for the Depot in 1941. Approximately 10 square miles of the Depot drains to the reservoir. It has a total capacity of approximately 1,340 acre-feet at spillway height. The maximum depth is 22 feet with an average depth of 7.3 feet.

***Streams*.** Major streams crossing the installation are Big Creek, Caney Creek, Elliott Creek and the East Fork of Elliott Creek, Rock Creek, and Panther Creek. All streams on RRAD except for Panther Creek flow to Wright Patman Lake. Panther Creek flows to the Red River. Table 2 lists the length, average width, depth, side slope, and percent fall of each of the streams on the installation.

3.5.3 Wetlands

Jurisdictional wetlands in northeast Texas and on RRAD are located predominantly on floodplains along rivers and streams, along the margins of lakes and ponds, and in other low-lying areas. Wetlands and riparian corridors are high-priority fish and wildlife habitat and a resource of national concern. They serve as important sources of food, cover, and habitat for numerous species of resident and migratory birds, wildlife, and fish. Waterfowl and other migratory birds use wetlands and riparian corridors as stopover, feeding, and nesting areas. Installation activities near those areas are designed to avoid or minimize effects on fish and wildlife resources to the maximum extent practicable.



RRAD Surface Waters

Figure 6

Table 2.
Surface water streams

Water body	Length (miles)	Average width (feet)	Depth (feet)	Side slope ratio	Percent fall
Big Creek	10.0	30	9	2.25:1	0.4%
Caney Creek	5.0	17	6	1.25:1	0.5%
East Fork Elliott Creek	6.0	14	6	2:1	1%
Elliott Creek	4.25	16	5	2:1	0.4%
Panther Creek	0.75	16	5	1:1	1%
Rock Creek	4.25	27	9	1.75:1	0.4%

Source: RRAD 2011

A wetland inventory was conducted in 1998 for the installation using photo-interpretation techniques from mid-altitude aerial photography followed by field verification. Wetlands larger than 1 acre were classified according to the Cowardin classification system as deepwater or wetland habitat. On the basis of the inventory, the installation has approximately 1,582 acres of wetlands. An additional 826 acres of wetlands on the PSP brings the total to 2,408 acres of wetlands on RRAD. The predominant wetland type is deciduous forested wetlands, but shrub/emergent, scrub/shrub, and ponds are also present. Table 3 identifies the types of wetland and the acreage of each type, and Table 4 describes each wetland and its associated plant community. Figure 7 illustrates potential wetland habitat on the installation.

Table 3.
Wetland type and area

Wetland type	Area (acres)	Percentage
Forested		
Deciduous	878	60.5%
Evergreen	80	5.5%
Herbaceous		
Emergent	2	< 0.1%
Deciduous Scrub-Shrub	54	3.7%
Evergreen Scrub-Shrub	11	< 1.0%
Open Water		
Reservoirs	415	28.6%
Ponds	12	< 1.0%
Total	**1,452**	**100%**

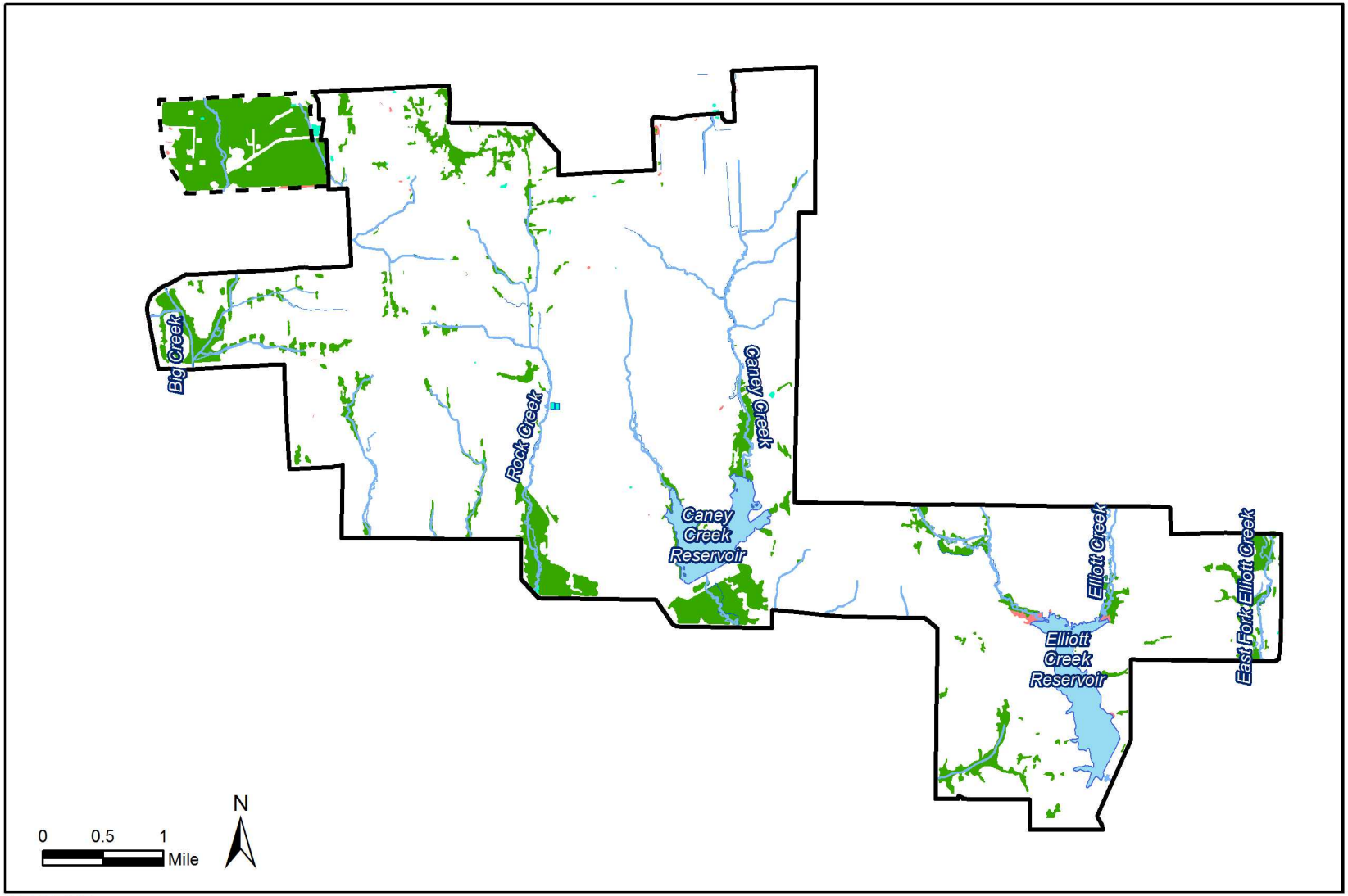
Source: RRAD n.d.

Table 4.
Cowardin wetland plant communities

Wetland classification code	Dominant species	Associated species
Forested Wetland, Seasonally Flooded (PFO1C)	Sweetgum (*Liquidambar styraciflua*)	• Black Gum (Nyssa sylvatica)
	Red Maple (*Acer rubrum*)	• Sweetgum • Possumhaw (Ilex deciduas) • Winged Elm (Ulmus alata) • Water Oak (Quercus nigra) • Ironwood (Carpinus carolinana) • American Beautyberry (Calicarpa americana) • Common Greenbriar (Smilax rotundifolia) Supplejack (Berchemia scandens) • Grape (Vitis spp.) • Sedges
Forested Wetland, Temporarily Flooded (PFO1A)	Post Oak (*Quercus stellata*)	• Sweetgum • Water Oak • Willow Oak (Quercus phellos) • Southern Red Oak (Quercus falcata) • Buttonbush (Cephalanthus occidentalis)
	Willow Oak	• Post Oak • Winged Elm • Sedges
	Sweetgum	• Water Oak • Green Ash (Fraxinus pennsylvanica) • Red Maple • Southern Red Oak
	Willow Oak	• Loblolly Pine (*Pinus taeda*)
	Willow Oak and Green Ash	• Winged Elm • Poison Ivy (Toxicodendron radicans) • Sedges
Forested Wetland, Saturated (PFO1B)	Sweet Gum	• Winged Elm • Supplejack • Sedges
	Loblolly Pine	• American Beautyberry • Japanese Honeysuckle (*Lonicera japonica*)
	Slash Pine (*Pinus elliottii*) with mixed herbs	• Narrowleaf Spring Beauty (*Claytonia virginica*) • Spikerush (*Eleocharis* sp.) • Crowfoot (*Ranunculus* sp.) • Various Grasses
Forested Wetland, Saturated (PFO4B)	Sweet Gum and Loblolly Pine	• Netted Chain Fern (*Woodwardia areolata*) • White Oak (*Quercus alba*) • Red Maple • Ironwood • Willow Oak • Possumhaw

Wetland classification code	Dominant species	Associated species
Scrub-Shrub Wetland, Semi-permanently Flooded (PSS1A)	Black Willow (*Salix nigra*)	• Soft Rush (Juncus effusus) • Brambles (*Rubus* sp.) • Japanese Honeysuckle • Willow Oak • Bulrush (*Scirpus* sp.)
Scrub-Shrub Wetland, Temporarily Flooded (PSS1A)	Privet	• Common Greenbriar • Saw Greenbriar (*Smilax bona-nox*) • Supplejack
Scrub-Shrub/Emergent Wetland, Saturated (PSS1/EM1B)	Groundsel Bush (*Baccharis halimifolia*) and Broomsedge (*Andropogon virginicus*)	• Spikerush (*Eleocharis* sp.) • Brambles
Emergent Wetland, Seasonally Flooded and Impounded (PEM1Eh)	Giant Plumegrass (*Erianthus gigantheus*)	• Soft Rush • False Nettle (Boehmeria cylindrica)
Emergent Wetland, Saturated (PEM1B)	Grasses (Poacea family)	• Loblolly Pine (Managed) • Panic Grass (*Panicum* sp.)

Source: RRAD 2011



LEGEND

- RRAD Boundary
- PSP
- Streams
- Lake
- Freshwater Pond
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Riverine

RRAD Wetlands

Figure 7

Source: RRAD GIS 2016; NHD 2017; USFWS NWI 2018.

SECTION 4.0 ECOSYSTEMS AND THE BIOTIC ENVIRONMENT

4.1 ECOSYSTEM CONTEXT

South Central Plains Ecoregion (Ecoregion 35). RRAD lies within the South Central Plains ecoregion, locally termed the *Piney Woods*. It is a region of mostly irregular plains representing the western edge of the southern coniferous forest belt. Historically, the area supported longleaf pine (*Pinus palustris*) forests and a mix of pine and hardwood forests with a species-rich herbaceous understory with bluestem grasses and a variety of forbs and shrubs. Much of the region is now in loblolly (*P. taeda*) and shortleaf pine (*P. echinata*) plantations. This type of ecoregion covers parts of Arkansas, Louisiana, Oklahoma, and east Texas. About one-sixth of the region is in cropland, primarily within the Red River floodplain, and about two-thirds of the region is in forests and woodland. Lumber, pulpwood, oil, and gas production are major economic activities.

Tertiary Uplands (Ecoregion 35a). The Tertiary Uplands is a subregion of the South Central Plains ecoregion that covers a large area of east Texas, southern Arkansas, and northern Louisiana and within which RRAD is located. Natural vegetation includes loblolly and shortleaf pine, southern red oak (*Quercus falcata*), post oak (*Q. stellata*), white oak (*Q. alba*), hickory (*Carya* sp.), and sweetgum (*Liquidambar styraciflua*); and short and tall grasses such as yellow Indiangrass (*Sorghastrum nutans*), pinehill bluestem (*Schizachyrium scoparium*), narrowleaf woodoats (*Chasmanthium laxum*), and panicums (*Panicum* sp.). American beautyberry (*Callicarpa americana*), sumac (*Rhus* sp.), greenbriar (*Smilax* sp.), and hawthorn (*Crataegus* sp.) are part of the understory. Sandier areas have more bluejack oak (*Q. incana*), post oak, and stunted pines. Many areas of the region have been replanted to loblolly pine for timber production or are in improved pasture. Lumber and pulpwood production, livestock grazing, and poultry production are typical land uses. Oil and gas production is also widespread.

4.2 VEGETATION COMMUNITIES AND FLORA

RRAD is within an area dominated by oak-pine, broadleaf, deciduous, and needle green-evergreen forests (Figure 8). Three primary forest associations commonly occur in the wooded areas of RRAD—loblolly-shortleaf pine, pine-hardwood, and mixed hardwood (see Figures 9 and 10). The dominant climax species found in the overstory of the installation include red maple (*Acer rubrum*), black hickory (*Cayra texana*), southern hackberry (*Celtis* sp.), persimmon (*Diospyros virginiana*), sweetgum, shortleaf and loblolly pine, and southern red and post oak. The loblolly-shortleaf pine association occurs on the Depot on gravel ridges, slopes, and areas that were previously cleared, cultivated, or machine-planted. The pine-hardwood association occurs on ridges, slopes, and bottomlands cultivated before acquisition by the installation. The mixed hardwood association occurs in undisturbed bottomlands of creeks and drains and in areas that are not well drained.

Shrub species commonly found on RRAD include American beautyberry, hawthorne (*Crataegus brainerdii*), sumac, blackberry (*Rubus* sp.), and tree huckleberry (*Gaylussacia* sp.) (RRAD 2011).

Grass species common to RRAD include longleaf uniola (*Uniola* sp.), purple top (*Tridens flavus*), little bluestem (*Andropogon scoparius*), and broomsedge (*Andropogon virginicus*) (Tetra Tech EM 2002). Grasses typically grow along roadsides, utility easements, demolition grounds, ammunition production facilities, training areas, and food plots (RRAD 2011). Lawn areas have been planted in the developed portions of the installation and around the outside of office buildings in outlying areas.

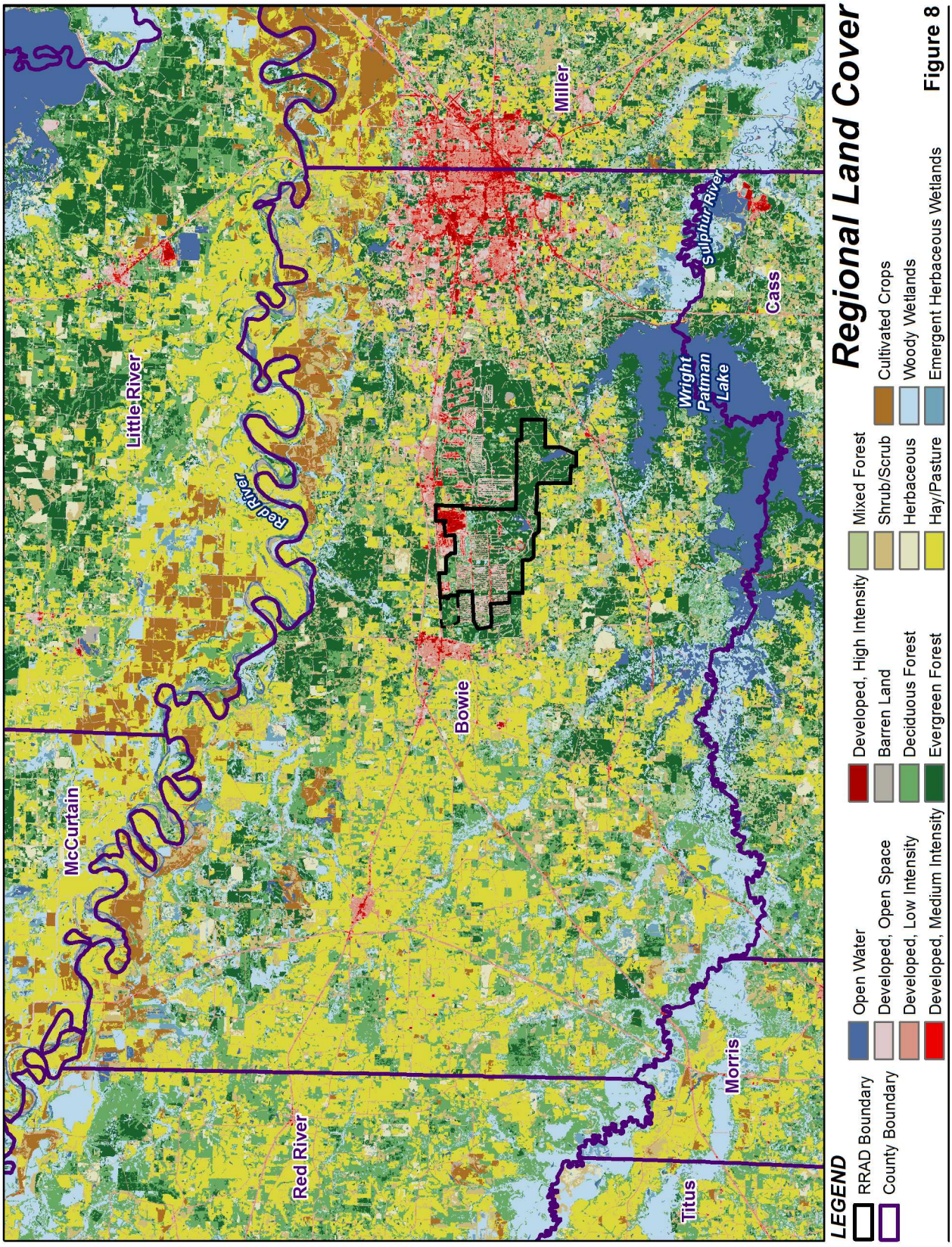

Regional Land Cover
McCurtain
Little River
Red River
Bowie
Miller
Cass
Sulphur River
Wright Patman Lake
Morris
Titus
Red River
LEGEND
RRAD Boundary
County Boundary
Open Water
Developed, Open Space
Developed, Low Intensity
Developed, Medium Intensity
Developed, High Intensity
Barren Land
Deciduous Forest
Evergreen Forest
Mixed Forest
Shrub/Scrub
Herbaceous
Hay/Pasture
Cultivated Crops
Woody Wetlands
Emergent Herbaceous Wetlands
Source: NLCD 2014.

Figure 8

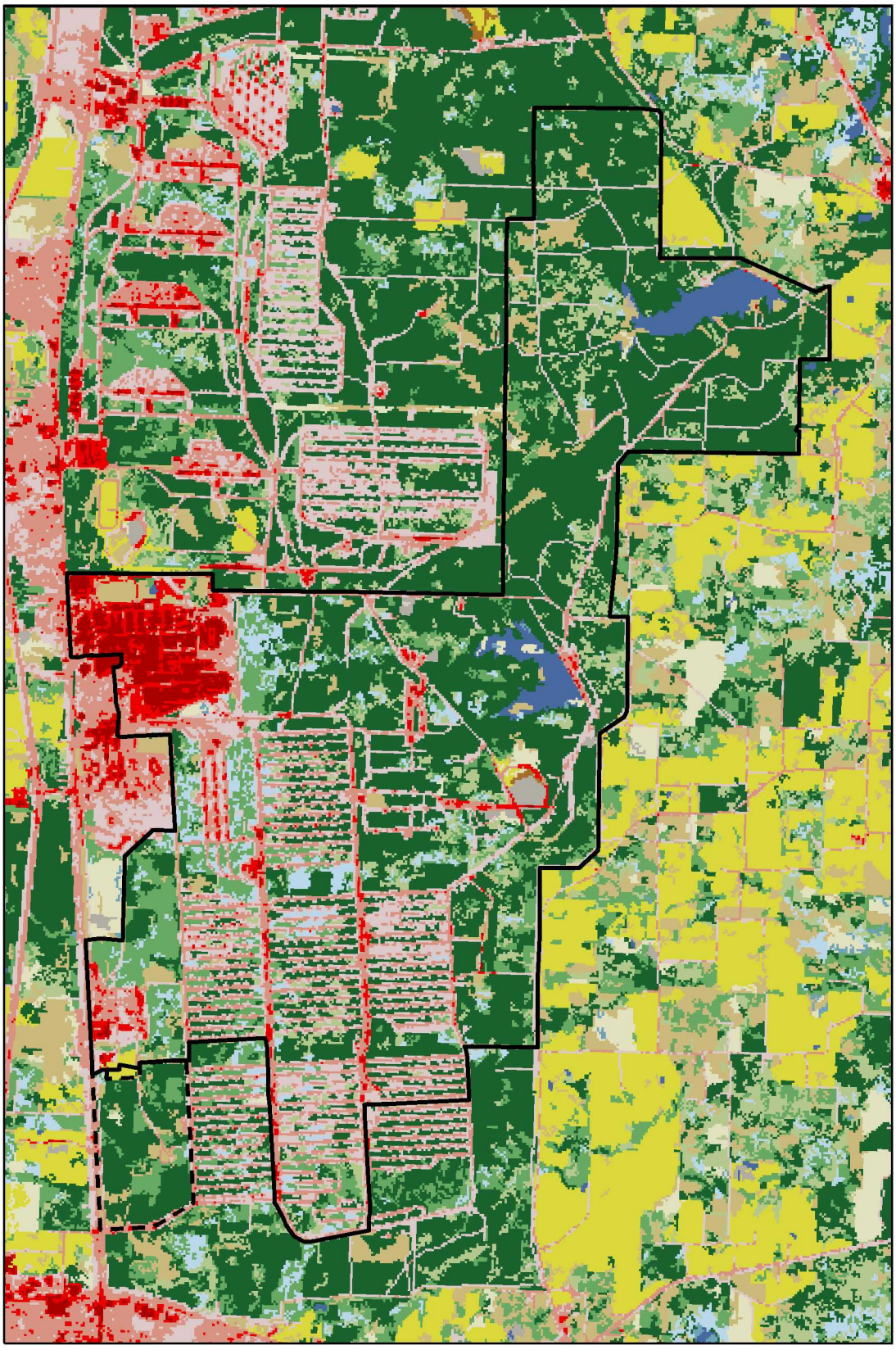
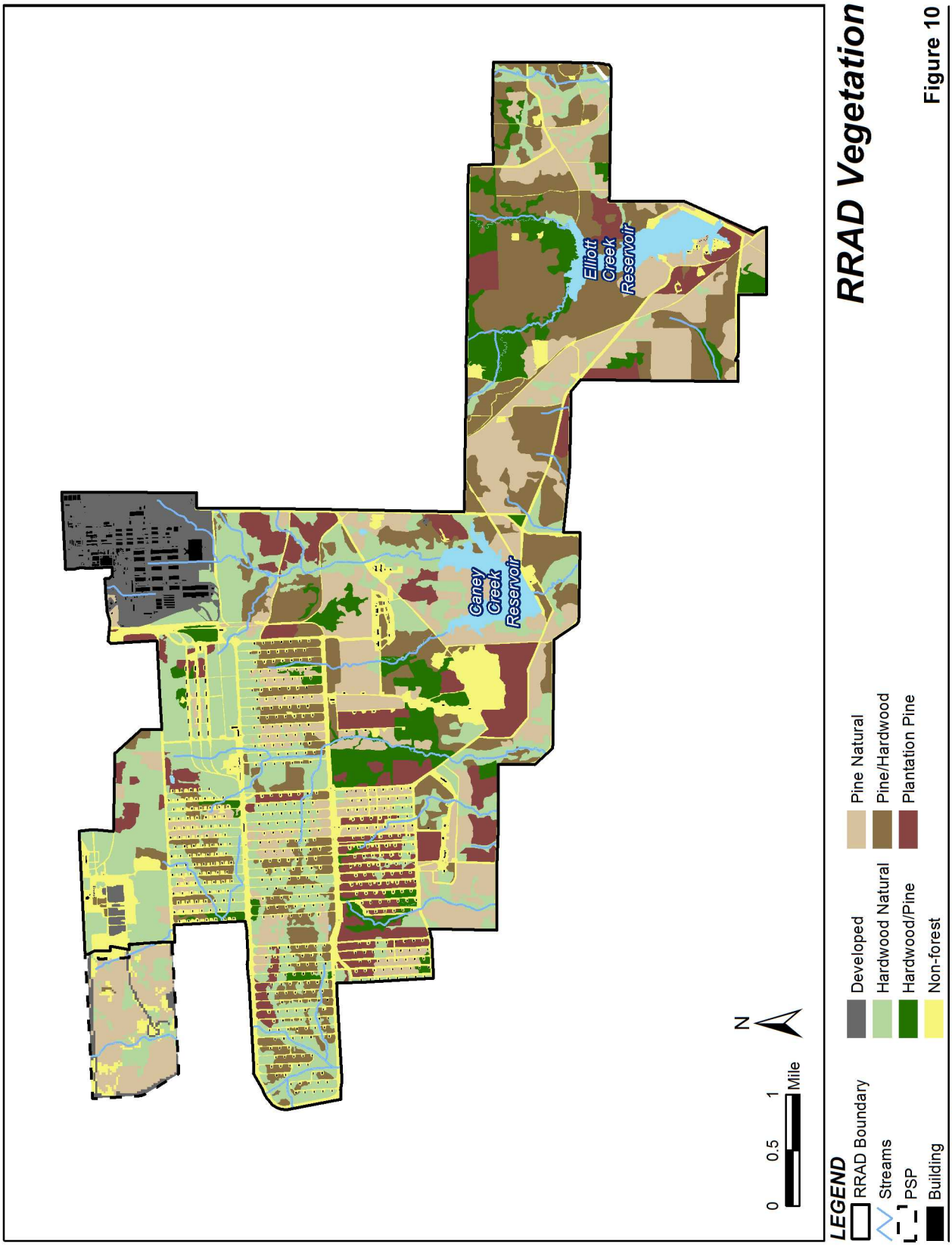

RRAD Land Cover
LEGEND
RRAD Boundary
PSP
Open Water
Developed, Open Space
Developed, Low Intensity
Developed, Medium Intensity
Developed, High Intensity
Barren Land
Deciduous Forest
Evergreen Forest
Mixed Forest
Shrub/Scrub
Herbaceous
Hay/Pasture
Cultivated Crops
Woody Wetlands
Emergent Herbaceous Wetlands
Source: NLCD 2014.

Figure 9


RRAD Vegetation
Figure 10
Elliott Creek Reservoir
Caney Creek Reservoir
N
0 0.5 1 Mile
LEGEND
RRAD Boundary
Streams
PSP
Building
Developed
Hardwood Natural
Hardwood/Pine
Non-forest
Pine Natural
Pine/Hardwood
Plantation Pine
Source: RRAD GIS 2016; NHD 2017; NLCD 2014.

One unique vegetative species has been identified on the installation (RRAD 2011). The former Texas state champion black cherry tree (*Prunus serotina*) was measured in December 1995 to be 78 feet tall with a trunk circumference of 118 inches.

Wetlands are a significant ecological habitat on RRAD. Other habitat types that occur on RRAD include ponds, lakes, streams, and forests. Elliott Creek and Caney Creek reservoirs are the largest floral habitat water resource areas. A survey of aquatic and riparian vegetation in Caney and Elliott Creek Reservoirs was conducted by ALL Consulting, LLC, of Tulsa, Oklahoma in June 2017 (ALL Consulting 2018a). Buttonbush (*Cephalanthus occidentalis*), American white waterlily (*Nymphaea odorata*), bladderwort (*Utricularia* sp.), and watershield (*Brasenia schreberi*) were found to be the dominant species in Caney Creek Reservoir. Caney Creek Reservoir was found to be approximately 58 percent covered by aquatic vegetation, with 17 species identified (some to genus only). American lotus (*Nelumbo lutea*), buttonbush, coontail (*Ceratophyllum demersum*), variable-leaf watermilfoil (*Myriophyllum heterophyllum*), and watershield were found to be the dominant species in Elliott Creek Reservoir. Elliott Creek Reservoir was found to be approximately 39 percent covered by aquatic vegetation, with 23 species identified (some to genus only). The report of the results of the survey, which includes separate AVMPs for the two reservoirs based on the survey, is on file in the RRAD natural resources office.

RRAD refers to Army and DoD guidances for landscaping practices and techniques on the installation.

Invasive species and pest management are addressed in detail in section 2.14, Invasive and Noxious Species, and 2.15, Pest Management Program, respectively. An Integrated Pest Management Plan is on file in the natural resources office.

4.3 INVASIVE AND NOXIOUS SPECIES

Invasive species are plants and animals that invade and quickly dominate natural habitats and are most often imported from outside North America. Following is a list of invasive plant species commonly found in east Texas:

- Callery pear (*Pyrus calleryana*)
- Chinaberry tree (*Melia azedarach*)
- Chinese privet (*Ligustrum sinense*)
- Chinese tallow (*Triadica sebifera*)
- Chinese wisteria (*Wisteria sinensis*)
- Giant reed (*Arundo donax*)
- Japanese dodder (*Cuscuta japonica*)
- Japanese honeysuckle (*Lonicera japonica*)
- Kudzu (*Pueraria* sp.)
- Mimosa (*Albizia julibrissin*)
- Tropical soda apple (*Solanum viarum*)

Noxious weeds are plant species known to be detrimental to agricultural crops and are regulated by state and federal government agencies. Three federally listed noxious weeds have been found on the installation, two of which are also invasive species. Japanese dodder is identified as a restricted state-listed noxious species. Japanese honeysuckle is a nuisance species often found in association with sweetgum, loblolly pine, and black willow in wetland

communities. BIO-WEST noted in 2012 that Japanese honeysuckle appeared to be the most widespread invasive plant species at RRAD (BIO-WEST 2012). Hydrilla (*Hydrilla verticillata*), the third noxious species found on RRAD and a federal- and state-listed noxious species, is found in various water bodies throughout the installation. ALL Consulting identified hydrilla in Elliott Creek Reservoir but noted that it is not a dominant species in the reservoir (ALL Consulting 2018a). Only a few floating strands were observed near a public beach area, and no rooted stands were observed. Only one noxious vegetative species, cattail (*Typha latifolia*), was found at Caney Creek Reservoir during the 2018 aquatic and riparian vegetation survey. Four aquatic vegetative invasive species—alligator weed (*Alternanthera philoxeroides*), hydrilla, parrotfeather (*Myriophyllum brasiliense*), and egeria (*Egeria densa*)—were identified at Elliott Creek Reservoir. Aquatic weeds are a continual problem in ditches and lakes at RRAD. Invasive and noxious plant control is conducted in accordance with the RRAD IPMP, and with the AVMP for aquatic invasive and noxious plants.

RRAD supports the U.S. Department of Agriculture Forest Service's National Strategy for Invasive Plant Management and its four goals—prevention, early detection and rapid response, control and management, and rehabilitation and restoration. When an invasive species is found on the Depot, controlling the species is a high priority and efforts to bring it under control are maximized to the greatest extent practicable. Invasive and noxious plant species are controlled in accordance with accepted methods that prevent their spread, control population size, and support eradication (if feasible).

Feral pigs or hogs (*Sus scrofa*) and red fire ants (*Solenopsis invicta*), which have both been observed on the installation, are considered invasive species because of their foreign origin and damaging effects. Control measures for all invasive and nuisance animals, insects, and plants are covered in greater detail in the RRAD IPMP (RRAD 2014a). RRAD follows the *Army Policy Guidance for Management and Control of Invasive Species* (U.S. Army 2001).

4.4 FAUNA

4.4.1 Mammals

Appendix B lists species of mammals that might occur in Bowie County, Texas, and, therefore, might occur on RRAD. A survey of mammals on RRAD and LSAAP was conducted in 2000, during which 24 species of small mammals and 14 species of large mammals were documented on the installations (Tetra Tech EM 2002). Another survey of mammals on RRAD was conducted in 2011 and 2012 (Tetra Tech 2013). Mammals identified on RRAD in surveys are noted on the list in Appendix B. Of the mammal species that occur on the Depot, the feral pig and white-tailed deer (*Odocoileus virginianus*) are two of the most important, the pig because of the destruction it causes to the land and vegetation on the Depot and the deer because of the recreational value of the species. The two species are discussed further in sections 4.4.x.

A qualitative and quantitative bat species survey was completed on RRAD in 2013, which included both mist nets and acoustical surveys (BIO-WEST 2013). Surveyors noted that RRAD has potential bat habitat. Forested areas for foliage-roosting bats were found to be plentiful on the Depot. Other natural features that bats might roost in such as tree hollows and dead snags did occur but were far less common. Mature hardwood bottomlands that could provide roosting habitat for the southeastern myotis (*Myotis austroriparius*) and Rafinesque's big-eared bat (*Corynorhinus rafinesquii*) are lacking on RRAD. Man-made structures that could be used for roost sites were located throughout the RRAD. A list of bats identified in that survey are listed in Table 5.

Table 5.
Bat species observed on RRAD in 2013 survey

Species		Verified by Mist Nets	Verified by Acoustic Call
Common Name	**Scientific Name**		
Myotis (undetermined)	*Myotis* sp.		X
Tricolored Bat	*Perimyotis subflavus*		X
Evening Bat	*Nycticeius humeralis*	X	X
Eastern Red Bat	*Lasiurus borealis*	X	X
Brazilian Free-Tailed Bat	*Tadarida brasiliensis*		X
Hoary Bat	*Lasiurus cinereus*		X
Silver-Haired Bat	*Lasionycteris noctivagans*		X
Big Brown Bat	*Eptesicus fuscus*		X

Source: Tetra Tech 2013.

4.4.2 Birds

Appendix B lists species of birds that might occur in Bowie County, Texas, and, therefore, might occur on RRAD. The 2002 and 2011–2012 fauna surveys noted above included surveys of birds on the Depot. Birds identified on RRAD in surveys are noted on the list in Appendix B. Species common to the region were observed on the Depot.

4.4.3 Amphibians and Reptiles

Appendix B list species of amphibians and reptiles that might occur in Bowie County, Texas, and, therefore, might occur on RRAD. The 2002 and 2011–2012 fauna surveys noted above included surveys of amphibians and reptiles on the Depot. The species identified on RRAD in the surveys are noted on the list in Appendix B. Common species of frogs, toads, snakes, turtles, and lizards were found on RRAD.

4.4.4 Insects

No data on insects occurring on RRAD exist. Species commonly found in the region, however, can reasonably be expected to be found on RRAD.

4.4.5 Fish

Fish have been surveyed in the streams on the Depot and at least 30 species representing 12 families have been identified. Several fishes were identified on the Depot in a 2011 survey that had not been identified in a survey in 2000 (Tetra Tech 2011, Tetra Tech EM 2002) (Table 6). Eleven species were captured in Caney Creek Reservoir and 13 species were captured in Elliott Creek Reservoir in the 2011 survey. Spotted gar (*Lepisosteus oculatus*) and golden shiner (*Notemigonus crysoleucas*) were unique to Caney Creek Reservoir, while lake chubsucker (*Erimyzon sucetta*), spotted sucker (*Minytrema melanops*), channel catfish, and spotted bass (*Micropterus punctulatus*) were found only in Elliott Creek Reservoir. Recreationally important species such largemouth bass and white and black crappie (*Pomoxis annularis* and *P. nigromaculatus*, respectively) were found in high abundance in both reservoirs; however, specimens captured in Caney Creek Reservoir were consistently larger and more robust than those in Elliott Lake. Channel catfish, another species important to anglers, was represented by

only two individuals in Elliott Creek Reservoir, the largest of which was approximately 22 inches long (Tetra Tech 2011).

Another fish survey was completed on RRAD in 2017. The 2017 fish survey at Caney Creek Reservoir indicated that there is a low abundance of sport fish within the reservoir, possibly due to low dissolved oxygen (DO) concentrations. Fewer species were observed during the 2017 survey than during the 2011 survey. Few largemouth bass, crappie, and sunfishes were caught, and no sport fish species of catfish were caught (Table 6). No largemouth bass were caught at harvestable lengths, and only two sunfish were large enough for harvest (longer than 7 inches). Black crappie that were caught were indicative of a healthy population based on average relative weight, but only 19 percent of the black crappie were large enough to exceed the RRAD length limits (longer than 9 inches). No white crappie were caught during the survey.

The 2017 fish survey indicated that Elliott Creek Reservoir generally supports a diverse fish assemblage with a healthy sport fish population (Table 6). A greater diversity of fish species was documented in Elliott Creek Reservoir during the 2017 survey than in the 2000 or 2011 surveys. The sport fish population in Elliott Creek Reservoir was generally good, with abundant largemouth bass, crappie, and sunfish. Catfish were not abundant, with flathead catfish being the only sport fish species present. Crappie, catfish, and sunfish were all considered healthy; however, no largemouth bass longer than 15 inches were captured and the average relative weight was low. The high population of largemouth bass, combined with low population length and relative weight, indicates that Elliott Creek Reservoir has an over-population of largemouth bass and few large bass.

Table 6. Fish species found in Caney Creek and Elliott Creek Reservoirs in 2000, 2011, and 2017.

Common Name	Scientific Name	2000 Survey	2011 Survey	2017 Survey
American pickerel	*Esox americanus*	- / E	- / -	C / -
Black bullhead	*Ameiurus melas*	- / -	- / -	C / -
Black crappie	*Pomoxis nigromaculatus*	- / E	C / E	C / E
Blackstripe topminnow	*Fundulus notatus*	C / E	- / -	- / E
Bluegill	*Lepomis macrochirus*	C / E	C / E	C / E
Brook silverside	*Labidesthes sicculus*	- / -	- / -	C / E
Channel catfish	*Ictalurus punctatus*	C / E	- / E	- / -
Flathead catfish	*Pylodictis olivarus*	- / -	- / -	- / E
Gizzard shad	*Dorosoma cepedianum*	- / -	C / E	C / E
Golden shiner	*Notemigonus crysoleucas*	- / -	C / -	C / E
Green sunfish	*Lepomis cyanellus*	- / -	- / -	- / E
Inland silverside	*Menidia beryllina*	- / E	C / E	- / -
Lake chubsucker	*Erimyzon sucetta*	- / -	- / E	- / E
Largemouth bass	*Micropterus salmoides*	C / E	C / E	C / E
Logperch	*Percina caprodes*	- / E	- / -	- / E
Mosquitofish	*Gambusia affinis*	- / E	- / -	- / -
Redear sunfish	*Lepomis microlophus*	- / E	C / E	C / E
Spotted bass	*Micropterus punctulatus*	- / -	- / E	- / -
Spotted gar	*Lepisosteus oculatus*	- / -	C / -	C / -
Spotted sucker	*Minytrema melanops*	- / -	- / E	- / -
Tadpole madhorn	*Noturus gyrinus*	- / -	- / -	- / E
Threadfiin shad	*Dorosoma pretense*	- / E	- / -	- / -
Warmouth	*Lepomis gulosus*	- / E	C / E	- / E
White crappie	*Pomoxis annularis*	- / E	C / E	- / E
Yellow bullhead	*Ameiurus natalis*	- / E	C / E	- / E

Source: ALL Consulting 2018b.
Note: - = not found in the reservoir, C = found in Caney Creek Reservoir, E = found in Elliot Creek Reservoir.

4.5 THREATENED, ENDANGERED, AND OTHER PROTECTED SPECIES

No federally listed T&E species or their habitats have been identified on the installation, and the Depot has no Endangered Species Management Plan (ESMP). The most recent T&E species survey was conducted as part of the PLSs completed in 2013, and no federally listed T&E species were identified in those surveys.

The interior least tern (*Sternula antillarum*) is the only federally listed species in Bowie County. It is known to occur along the Red River in north Texas and nest in colonies on bare-to-sparsely vegetated sandbars along rivers and streams from May through August. No critical habitat for the species has been identified in Bowie County.

The bald eagle (*Haliaeetus leucocephalus*) and golden eagle (*Aquila chrysaetos*) are protected under the BGEPA. The bald eagle is fairly common in the Texarkana area from September through May but generally absent from June through August (TPWD 2016a). The golden eagle is scarce in the area around RRAD and does not breed in the area (Kochert et al. 2002).

RRAD is within the Central Flyway, a major bird migration corridor that leads to the Texas coast and Central and South America. Most migratory birds are protected under the MBTA. RRAD coordinates with USFWS when a project has the potential to adversely affect a migratory bird.

One unique vegetation species was observed on the installation in the past. The Arkansas meadow rue (*Thalictrum arkansanum*) is the only state rare plant identified by TPWD to occur in Bowie County. It was not identified on RRAD in a 2002 survey.

Two state-listed species are known to occur on the installation: the alligator snapping turtle (*Macroclemys temminckii*)) and the creek chubsucker (*Erimyzon oblongus*). The American alligator (*Alligator mississippiensis*) has also been observed on RRAD in the past, but it is no longer listed on the T&E species list for Bowie County (RRAD 2011, TPWD 2017a).

The state-threatened creek chubsucker was found in moderate abundance in six streams on the Depot (Tetra Tech 2011). In Texas, the species occurs in the eastern part of the state, inhabiting streams from the Red River southward to the San Jacinto drainage (Hubbs et al. 1991). The species is sensitive to increased sedimentation (Wall and Gilbert 1980).

State-listed bird species that might migrate through the area include the threatened American peregrine falcon (*Falco peregrinus anatum*) and the delisted arctic peregrine falcon (*Falco peregrinus tundruis*) (RRAD 2011). The red-cockaded woodpecker is no longer a listed species for Bowie County and has not been observed on RRAD. The black bear (*Ursus americanus*) is state-listed, but only because it is similar in appearance to the state-listed Louisiana black bear (*Ursus americanus luteolus*) (TPWD 2017a).

Of the terrestrial species listed for Bowie County, the state-threatened timber rattlesnake (*Crotalus horridus*) is potentially present on RRAD because suitable upland woodland habitat adjacent to perennial, intermittent, and ephemeral streams occurs on areas of the installation. The timber rattlesnake is a rather docile species that would be slow to evacuate areas of disturbance because of its limited mobility. The northern scarlet snake (*Cemophora coccinea copei*) could also be present on areas with well-drained soils (TPWD 2016b).

The Depot coordinates with USFWS and conducts courtesy coordinations with TPWD to ensure that military mission requirements and natural resources management at the installation do not potentially interfere with T&E species. AR 200-1 does not require Army installations to make special provisions for the management of state-listed species; however, it stipulates that installations are to include state-listed species in the installation INRMP. Species that are candidates for federal listing or that are state-listed as threatened, endangered, or of special

concern are not protected under the ESA. For state-listed species, installations are encouraged to cooperate with state authorities in efforts to conserve these species. If a federally listed T&E species were observed on the installation, RRAD would prepare an ESMP for that species. A list of rare, threatened, and endangered species for Bowie County is provided in Appendix C.

4.6 SENSITIVE AREAS

Sensitive areas on RRAD are limited to wetlands (section 3.5.3) and surface waters (section 3.5.2). The Depot protects these resources in accordance with state and federal laws and regulations.

SECTION 5.0 NATURAL RESOURCES AND THE MILITARY MISSION

5.1 CURRENT MISSION IMPACTS ON NATURAL RESOURCES

5.1.1 Air Emissions

Bowie County, Texas is part of the EPA Shreveport-Texarkana-Tyler Intrastate Air Quality Control Region. Air quality in the county meets the National Ambient Air Quality Standards and is thus classified as being in attainment for carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulfur dioxide. RRAD operations are performed under a Prevention of Significant Deterioration permit for stationary sources, which is required for a major source of any regulated air pollutant if emissions of that pollutant exceed a threshold quantity (in tons per year), which varies depending on the type of pollutant.

5.1.2 Water Resources

Two waterbodies—the Lower Red River and Wright Patman Lake—receive runoff from RRAD. These waterbodies are designated in Title 30 Texas Administrative Code chapter 307, *Texas Surface Water Quality Standards*, as *classified waters*. Classified waters have designated uses such as recreation, aquatic life, and water supply and criteria associated with those uses such as dissolved minerals, dissolved oxygen, pH, fecal coliform, and temperature. Designated uses for both the Lower Red River and Wright Patman Lake are primary contact recreation, high aquatic life use, and public water supply.

RRAD samples Elliott Creek Reservoir each spring monthly for fecal coliform to ensure that the water is safe for swimming. The reservoir is not a classified water, and its designated use is high aquatic life.

5.1.3 Noise

Since demolition and burning operations at the OB/OD areas ceased in March 2011, RRAD has had no noise issues with surrounding lands. Noise generated by operations in the industrial area is not loud enough to be heard off-depot.

5.1.4 Hazardous Materials and Waste

Hazardous materials and waste management at RRAD relates primarily to the installation's combat and tactical systems maintenance mission. Hazardous materials used in industrial operations and hazardous wastes generated on RRAD are handled in accordance with the Depot's Hazardous Material and Waste Management Plan (HMWMP) and applicable state and federal laws and regulations. The HMWMP establishes procedures and policies and assigns responsibilities associated with the generation, handling, use, management, transportation, and disposal of hazardous materials and hazardous wastes at RRAD. The HMWMP details RRAD's procedures for the proper characterization and disposal of known and potential hazardous waste, including asbestos-containing material, lead-based paint, polychlorinated biphenyls, and pesticides/herbicides, among others.

RRAD Spill Prevention, Control, and Countermeasure Plan (SPCCP) describes measures employed to limit pollution (from spills of hazardous substances) from onsite activities (USAPHC 2012). The SPCCP identifies potential risks, preventative measures, required training, spill response procedures, and other elements necessary to minimize potential adverse effects on the environment, and to respond adequately and quickly to such events should they occur. It

also addresses the potential pollution sources at RRAD and the best management practices (BMPs) to be used to prevent or reduce pollutant discharge to storm water runoff.

5.1.5 Contaminated Site Restoration

Army Defense Environmental Restoration Program

The Army Defense Environmental Restoration Program at RRAD comprises the Installation Restoration Program (IRP), Military Munitions Response Program (MMRP), and Compliance-Related Cleanup (CC). Those programs address soil, surface water, and groundwater pollution through remediation and monitoring. The actions taken under these programs are coordinated under the Depot's IAP. The IAP discusses contaminants of concern at each contamination site, response actions taken, current site status, and planned future actions. It outlines the multiyear cleanup plan for the installation, identifies environmental cleanup requirements at each area of concern, and proposes a comprehensive, installationwide cleanup approach with associated costs and schedules for investigations and remedial actions (RRAD 2010b).

Although most of the Depot is forested and used for timber production and equipment storage, industrial uses that occur on the Depot include military vehicle maintenance and rebuilding, ordnance demilitarization, ammunition storage; tank track and road wheel rebuild; and rubber products maintenance. Areas of environmental concern had developed over time from spill sites, landfills, previous industrial activities, and disposal activities before enactment of the Resource Conservation and Recovery Act (RCRA).

Installation Restoration Program

The IRP focuses on identifying, investigating, and cleaning up Army lands contaminated before October 17, 1986, to eliminate unacceptable risks to human health and the environment. Installations can conduct only studies necessary to determine the need for remedial action, identify the remedial alternative, and implement the selected remedial action (U.S. Army 2004a).

IRP responses are carried out in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) as amended by Superfund Amendments and Reauthorization Act, using the process described in the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR part 300) and, if applicable, consistent with the substantive requirements of RCRA. The IRP also complies with state, regional, and local requirements identified as applicable. Under the IRP, RRAD investigates and, if necessary, remediates former disposal and test areas (U.S. Army 2004a).

RRAD has 48 sites under the IRP, 36 of which have been classified as "No Further Action" (NFA) needed and an additional 12 sites that remain active.

Military Munitions Response Program

Congress established the MMRP under the Defense Environmental Restoration Program on current and former defense sites to address unexploded ordnance (UXO), discarded military munitions (DMM), and munitions constituents (MC) at concentrations high enough to pose an explosive hazard and potential environmental contamination. Munitions response includes investigation, removal, and remedial actions that address explosives safety, human health, or environmental risks presented by UXO, DMM, and MC.

The *Program Management Manual* for MMRP, published in September 2009, provides information, resources, and tools to implement the MMRP at active U.S. Army installations. The guide creates a prioritization system for the sites, establishes a funding program element, and highlights requirements that deviate from the established IRP. Any necessary munitions

response actions will be conducted under the process outlined in the National Contingency Plan (42 U.S.C. 9605) and the National Oil and Hazardous Substances Pollution Contingency Plan as authorized by CERCLA.

During FY 2002, the U.S. Army's inventory of closed, transferring, and transferred military ranges and defense sites with UXO, DMM, or MC (also known as the Phase 3 Range/Site Inventory) identified 11 sites on RRAD eligible for action under the MMRP. The Phase 3 Range/Site Inventory of the installation marked the completion of the preliminary assessment and initiated MMRP site inventory.

The primary goal of the site inventory was to collect enough information to determine whether:

- A remedial investigation/feasibility study was required;
- An immediate response was necessary; or
- The site qualified for NFA.

Site inventories were conducted from FY 2002 to FY 2005 and, in May 2005, fieldwork determined the potential presence of munitions and explosives of concern. Six MMRP sites at RRAD were classified as "NFA," and five sites were classified as "active." RRAD received concurrence from TCEQ in 2006 on the Site Inventory Report submitted in November 2005.

Three of the five active MMRP sites are in the remedial investigation/feasibility study phase in FY 2016.

Compliance-Related Cleanup

In April 2003, environmental restoration and CC activities became unified under the Army Environmental Cleanup Strategy to create a unified cleanup program optimizing efficiency, accountability, and consistency by applying common objectives and requirements to all cleanup associated with past and current activities in support of installations and transforming the Army (U.S. Army 2004b).

The CC program includes actions to address contamination at overseas Army facilities; resulting from operations that have occurred since October 1986 at Army active, excess, and special installations and at Army National Guard federally owned facilities; and at non-federally owned, federally supported Army National Guard facilities. The CC mission is to perform appropriate, cost-effective cleanup to protect human health, safety, and the environment and to sustain operational readiness and training (U.S. Army 2004b).

The OB/OD (CC-002-RR) area was identified under the CC program, and operations in the area ceased in June 2011. Soil contamination is known or suspected from heavy metals, explosives, and perchlorate. Perchlorate also has been detected in stormwater and groundwater. Proposed restoration includes a UXO sweep and processing or removal of any potential remnants of UXO, followed by soil capping, fencing, and installation of warning signs. Long-term monitoring includes maintenance and long-term groundwater monitoring. Groundwater monitoring wells are installed in the areas but could require removal and reinstallation if a replacement cap for the area is approved and installed. The area was separated into four sites, and the following three CC sites have been transferred to the MMRP: RRAD-011-R-01, RRAD-011-R-02, and RRAD-011-R-03.

The RCRA investigation of the OB/OD began in 2012 and is partially complete. Preliminary soil field work at the former permitted OB/OD areas began in January 2012, and a field investigation in the surrounding unpermitted demolition areas began in December 2013.

5.2 NATURAL RESOURCES NEEDED TO SUPPORT THE MILITARY MISSION

The Army recognizes that healthy natural resources are required to support the military mission at RRAD. Ongoing mission-related activities are generally confined to existing facilities and roads, and natural areas are located outside the cantonment area. Natural resources support the mission at RRAD by providing adequate buffer zones around military activities, and the land provides the space the Depot needs for equipment storage and testing. Natural resources on RRAD also indirectly support the mission by providing an environment for recreational opportunities for authorized users.

5.2.1 Forested Land

Forested areas on RRAD support the mission both directly and indirectly in a number of ways. RRAD's forests are managed sustainably to support the maintenance and restoration of native ecosystems, helping to ensure responsible environmental compliance and the preservation of sensitive species. Forests provide recreation opportunity to authorized users, which helps maintain moral and facilitates community outreach activities for improved public perception. Timber revenues generated from the sale of forest products are returned to the Depot as Conservation Reimbursable Funding and are used for natural resource projects, salaries of natural resources personal, and to help protect the resource, which in turn helps protect the Depot and its assets. Forty percent of the net proceeds from the forestry program go to Bowie County as state entitlements, which helps improve county roads and schools.

5.2.2 Nonforested Land

Nonforested, nonpaved land at RRAD supports a wide variety of mission elements at RRAD, including equipment storage, recycling, and outdoor recreation (hunting and fishing). Open habitat complements the hunting program by providing habitat diversity that supports both the deer herd and nongame wildlife.

5.2.3 Developed Land

Undeveloped and semideveloped lands at RRAD are necessary for mission elements that take place on developed land, including industrial and maintenance activities, administrative functions, and tenant organization activities.

5.2.4 Streams and Impoundments

Streams and impoundments on RRAD provide consumptive and nonconsumptive recreational opportunities. They also provide passive stormwater management functions that benefit the entire installation.

5.3 NATURAL RESOURCES CONSTRAINTS ON MISSIONS AND MISSION PLANNING

Natural resources impose constraints on accomplishing the military mission if a mission element cannot be performed or must be modified because of a natural resources concern. Examples include not locating structures or performing activities in wetland areas and floodplains, near surface waters, or on steep slopes.

5.3.1 Migratory Birds

Migratory birds are protected under the MBTA. The primary constraint the MBTA places on the military mission at RRAD is the timing of activities that affect migratory birds. Migratory birds must be protected if an activity could disturb habitat where the birds could be nesting, which

could mean surveying an area to determine whether migratory birds are present and rescheduling the activity for a time when the birds are not present. RRAD coordinates with USFWS when a project has the potential to adversely affect a migratory bird species.

5.3.2 Erodible Soils

Three of the four dominant soil types on RRAD— the Annona loam, Ruston fine sandy loam, and Sawyer silt loam—are moderately erodible. Maintaining good vegetative cover on these soils is important for preventing erosion and sedimentation in streams and lakes. Where mission activities disturb erodible soils, RRAD implements best management practices in accordance with its SWPPP and the TDEC Stormwater General Permit for Construction Activities to minimize soil loss and sedimentation in surface waters (Appendix D).

5.3.3 Wetlands

As noted in section 3.5.3, wetlands in northeast Texas and on RRAD are located predominantly on floodplains along rivers and streams, along the margins of lakes and ponds, and in other low-lying areas. Wetland delineations are conducted as needed for construction or operational changes that might affect wetlands. If wetlands are present within or close to the footprint of a planned mission activity, the area is protected in accordance with federal, state, and local compliance requirements.

SECTION 6.0 NATURAL RESOURCES MANAGEMENT PROGRAM

6.1 NATURAL RESOURCES MANAGEMENT RESPONSIBILITIES

This section describes the natural resources management program at RRAD, including the organizations that participate in the program. It describes how natural resources on the installation are currently managed and identifies measures for new and continued management activities. Consistency and integration with other RRAD programs and plans are also addressed.

6.1.1 RRAD Organizations

The Environmental Division of RRAD's DPW is ultimately responsible for implementing this INRMP. The primary support for natural resources management comes from the Depot's Commanding Officer. The INRMP is implemented through RRAD's LMB and coordinated through other Depot organizations as their services and cooperation are needed or as their programs impact natural resources. It is incumbent upon other RRAD organizations and the personnel within those organizations to support and promote responsible natural resources management.

RRAD's LMB is responsible for implementing the programs and responsibilities associated with timber management, wildlife and fisheries management, pest control, grounds maintenance, cultural resources management, and wildland fire management.

6.1.2 Other Defense Organizations

U.S. Army Corps of Engineers (USACE), Mobile and Fort Worth Districts. The Mobile District provides contractor support for Depot plan preparation and revision for RRAD. The Fort Worth District is responsible for timber sale contract administration and other contract administration for forestry services as needed. The Fort Worth District also provides wetland permitting and administration services to the Depot.

6.1.3 Other Federal Agencies

In addition to DoD, a number of other federal agencies have an interest or role in managing natural resources at RRAD. The involvement of those agencies is based on signatory responsibilities, cooperative agreements, regulatory authority, and technical assistance as required by federal laws and regulations. This section discusses the agencies and their roles and responsibilities.

U.S. Department of the Interior, U.S. Fish and Wildlife Services (USFWS). USFWS provides signatory approval of the fish and wildlife aspects of the INRMP. It is the primary federal agency for issues regarding fish and wildlife management and the regulatory authority for the ESA and MBTA. RRAD and USFWS maintain a cooperative agreement regarding the fish and wildlife program.

U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS). RRAD coordinates with NRCS regarding erosion control, soil testing and analysis, and weed control.

USDA, Animal and Plant Health Inspection Service (APHIS). RRAD coordinates with APHIS in the removal of resident Canada geese when they are a nuisance at recreational facilities on the Depot (see Appendix E).

6.1.4 State Agencies

Texas Parks and Wildlife Department (TPWD). TPWD provides signatory approval of the fish and wildlife aspects of the INRMP and is the primary state agency coordinating issues regarding fish and wildlife management at RRAD.

Texas Forestry Service (TFS). RRAD LMB coordinates with TFS for prescribed fire notification and assistance as well as for technical assistance for forest pests and other technical information related to timber production (see Appendix F). TFS can provide fire suppression support to the Depot as needed. RRAD has partnered with TFS in developing a wildland fire training academy on the installation as well.

6.1.5 Universities

RRAD LMB offers internships in the natural resources field as opportunities arise.

6.1.6 Contractors

Contractors provide DPW with technical support for natural resources and environmental management projects. That support includes preparing the INRMP, National Environmental Policy Act (NEPA) analyses and documentation, cultural and biological resource surveys, and general natural resources management support.

6.2 Data Storage and Analysis

The goal of RRAD's data management program from a natural resources perspective is to maintain and use natural resources data to ensure management decisions are based on the most current and best available information. RRAD is in the process of consolidating geographic information system (GIS) data into a consistent format to ensure reliable data and mapping throughout the installation. U.S. Army Installation Geospatial Information and Services personnel are assisting the Depot in creating a central repository for all RRAD GIS data. That effort is expected to continue through and beyond the 5-year scope of this INRMP.

Under this INRMP, RRAD will implement the following management measures related to data storage and analysis:

- Use a global positioning system (GPS) to map and inventory natural resources.
- Update GIS coverages for all natural resource areas as additional data are obtained.

6.3 Fish and Wildlife Cooperative Plan

The Fish and Wildlife Cooperative Plan is the component of the INRMP that describes how the fish and wildlife resources at an installation will be managed. The following management methods and policies collectively constitute the Fish and Wildlife Cooperative Plan in accordance with AR 200-1 and 16 U.S.C. 670a.

6.4 Fish and Wildlife Management

RRAD has a Wildlife Management Plan and a separate Fisheries Management Plan. Both are on file in the natural resources office. Major aspects of wildlife and fisheries management on RRAD are presented in this section; detailed information on fish and wildlife management practices on RRAD is provided in the referenced plans.

The goal of fish and wildlife management activities at RRAD is to provide high-quality habitat for native fish and wildlife species that supports healthy and balanced wildlife populations and

enhances biodiversity. RRAD's fish and wildlife management objectives are to incorporate current baseline information into natural resources planning and decision-making, routinely monitor and evaluate the condition and health of the installation's fish and wildlife resources, assess the need to initiate routine monitoring of nongame species, enhance plantings along rights-of-way to provide additional wildlife forage and cover, and avoid mowing during the turkey nesting season (mid-March through early June). Natural resources staff also will evaluate increasing recreational fishing opportunities for sunfish and catfish at some of RRAD's ponds. Fishing is authorized throughout the year with a valid state fishing license and RRAD fishing permit on the Caney Creek and Elliott Creek reservoirs.

Active fish and wildlife management at RRAD began in the mid-1940s. A Fisheries Management Plan was developed and implemented in 2012, and a Wildlife Management Plan was developed in 2013, revised in 2016, and further revised in 2017. Fisheries management has been limited in recent years because of a lack of funding and available staff. Two officers received Conservation Law Enforcement Training to supplement their duties on a part-time basis, but RRAD currently (2018) has only one part-time Conservation Officer. Historical records of fish caught in the reservoirs have not been maintained, however, and fish stocking last occurred in 2010. Watershed management practices that protect water quality are incorporated into the fisheries management program.

In 1945 the installation in conjunction with TPWD began deer stocking. The population of deer on the installation began to thrive and soon afterward, a deer hunting program was established to control the population. TPWD also worked with the installation on a turkey release program; however, initial stocking efforts were unsuccessful. Turkey numbers are not high enough to support a hunting program, and surveys over multiple years would need to be conducted to determine turkey population dynamics before hunting could be considered.

The wildlife management program incorporates measures such as increasing mast production to support nongame animals and protecting riparian zones to improve the quality of forage and habitat for other wildlife species. Updated PLSs were completed in 2013 for birds, mammals, herpetofauna, and bats. The monitoring methods used to evaluate wildlife resources on RRAD are consistent among habitat types and from year to year, which allows data to be compared between similar areas of a similar habitat type and provides information on temporal status and trends.

Wildlife management measures that produce the desired results will be continued for as long as they successfully meet their objectives. Inventory and monitoring data are evaluated at regular intervals to ensure the continued successful management of wildlife resources at the ecosystem level. If LMB determines that measures are not producing the intended results, they reevaluate the measures and revise the approach to ensure success of the wildlife management program.

The Caney Creek and Elliott Creek reservoirs were constructed in the early 1940s, followed shortly by various fish stocking efforts. Species introduced to the reservoirs included largemouth bass, black crappie, channel catfish, threadfin shad (*Dorosoma petenense*), flathead catfish, and hybrid striped bass (RRAD 2011). Regular stocking at RRAD officially ended in 1991–1992, and management efforts have focused on promoting the use of catch and release by anglers. Elliott Creek Reservoir was stocked in 2010 with bass, crappie, sunfish, coppernose blue gill, and catfish as part of an outdoor recreation event. A total of 600 individuals of each species was released into the reservoir.

Increasing recreational fishing opportunities for sunfish and catfish would require determining the suitability of the ponds for the purpose. Pond H offers the best physical conditions of the sites sampled in 2011 based on size, morphology, and access. It supports three fish species

(western mosquitofish, green sunfish, and bluegill), but its size and excessive depth warrants more extensive sampling. Diurnal and seasonal monitoring of water quality conditions, particularly temperature and dissolved oxygen in deep-water portions of the pond, will provide insight into habitat availability and the ability to support fish. Continuous monitoring data loggers provide a low-cost, low-effort solution to address this need and might be implemented by RRAD staff (RRAD 2012).

A quantitative survey for fish was completed in 2017 for Elliott Creek Reservoir and Caney Creek Reservoir. The survey included sampling of each waterbody and considered all primary in-stream habitat types. The survey documents fish species present on RRAD and includes a complete list of fish occurring in the installation's waters. The Fisheries Management Plan implemented by RRAD in 2012 has been updated based on the 2017 quantitative fish survey report.

Under this INRMP, RRAD will implement the following measures related to fish and wildlife management:

- Improve habitat quality for wildlife through a variety of habitat management techniques such as prescribed fires, thinning and improvement of overstocked stands, and periodic timber harvesting using silvicultural systems appropriate for the region.
- Use appropriate native vegetation species and suitable genetic growing stock during reforestation and ecosystem restoration projects to improve diversity and quality of native forage for wildlife.
- Make installation natural resources available to agencies and conservation organizations to conduct trials and collect experimental data on forage that will benefit flora and fauna resources.
- Conduct spotlight and wildlife observation surveys annually to determine the harvest number each year for deer hunting season.
- Conduct a turkey population survey to establish baseline data on the size of the population and continue surveying at regular intervals to establish population trends.
- Conduct silt removal, bottom contouring, shoreline diversification, dam and spillway renovation, and riparian habitat management for waterbodies as necessary.
- Monitor aquatic weeds and implement necessary control measures.
- Develop databases from PLS information to track the status and trends of habitat quality.
- Evaluate the quantitative fish survey completed in 2017 and use it to update the Fisheries Management Plan. Incorporate it into future natural resources planning and decision-making.

6.5 SPECIAL STATUS SPECIES MANAGEMENT

The goal of managing special status species on RRAD is to protect and improve the habitats suitable for plant and animal species federally listed under the ESA as rare, threatened, or endangered or for species with the potential to be listed in the future. The objective of those activities is to assist USFWS in its efforts to increase the populations of federally protected species so they can be delisted and to prevent the populations of species considered for listing from declining to the point at which they require listing.

No federally listed T&E species or their habitats have been identified on the Depot and an ESMP has not been developed. The most recent T&E species survey occurred as part of the PLSs in 2011–2012, and no federally listed T&E species were identified on RRAD during that

survey. RRAD will continue to coordinate with USFWS regarding newly listed and protected species that could occur on RRAD and will periodically conduct targeted surveys for those species. If any federally protected species or their habitats are found on the installation, RRAD personnel will coordinate with USFWS regarding steps necessary to ensure their protection, including complying fully with the ESA and AR 200-1.

The alligator snapping turtle, a state-listed threatened species, was previously identified on the installation. The creek chubsucker, a state-listed threatened species, has been identified in several streams on the depot. The timber rattlesnake, a state-threatened species, is potentially on the installation because suitable riparian and upland woodland habitat occurs on RRAD. Additionally, based on habitat requirements and denning characteristics, species of greatest conservation need from the Bowie County list with potential to occur on the installation include the plains spotted skunk (*Spilogale putorius interrupta*), Arkansas oak (*Quercus arkansana*), and Arkansas meadow-rue (*Thalictrum arkansanum*). TPWD notes that Arkansas oak occurs on RRAD (TPWD 2016b). Though RRAD does not specifically manage for the protection of state-listed species, the Depot uses BMPs (including construction BMPs) for all activities occurring on the Depot and normally designs them with consideration for potential sensitive species.

Under this INRMP, RRAD will implement the following measures related to managing special status species:

- Coordinate with USFWS regarding steps to be taken to ensure the protection of any federally protected species should they be found on the Depot.
- Consider state-listed sensitive species in the design of projects that could potentially impact them.

6.6 WATER RESOURCE MANAGEMENT

The goal of managing water resources on RRAD is to maintain and protect aquatic and riparian habitats and water quality, restore degraded aquatic habitats, and reduce the recreational impacts associated with aquatic vegetation. RRAD's objectives for water resources management are to monitor water quality, repair and maintain aquatic resource infrastructure such as dams and spillways, evaluate the effectiveness of BMPs used to reduce stream sedimentation and erosion and improve upon their effectiveness as necessary, establish and maintain streambank and shoreline vegetation, and limit activities near surface waters to those having little-to-no effect on water quality and aquatic habitats.

Routine water quality assessment sampling does not occur on RRAD. To gain a thorough understanding of the state of water resources at RRAD and identify water quality issues, the Depot needs a comprehensive water quality monitoring program. The program should include routine water and sediment sampling across the installation and stream habitat and biological community assessment. RRAD LMB will coordinate with other branches of the Environmental Division to evaluate the feasibility of a water quality sampling program.

Continued groundwater monitoring in the OB/OD area is needed to provide additional information on groundwater quality. Runoff from the area drains to designated public water supplies, and routine groundwater sampling and monitoring is required under RRAD's IAP.

Under this INRMP, RRAD will implement the following measures related to water resources management:

- Maintain vegetative buffers along streams and lakes.

- Establish additional vegetation where buffers are insufficient to protect surface waters from sediment and pollution runoff.
- Continue to monitor groundwater in the OB/OD area.
- Remove aquatic vegetation from Caney Creek and Elliot Creek Reservoirs by mechanical and chemical methods to reach an overall vegetative cover in the reservoirs of 20 percent.

6.7 WETLANDS MANAGEMENT

The goal of managing wetlands on RRAD is to protect and preserve them in a manner consistent with DoD natural resources policy and that ensures no net loss of wetland habitat on the Depot. To the maximum extent feasible, RRAD avoids conducting activities in or adjacent to wetlands to minimize any adverse effects on them. Where impacts on wetlands are unavoidable, RRAD mitigates those effects in accordance with USACE requirements. The objectives of wetland protection on RRAD are to use appropriate BMPs for wetland protection Depotwide and during forest management operations; develop a Depotwide inventory of wetlands; develop and implement a wetland management plan, if deemed necessary; evaluate potential impacts of current mission activities on wetlands and waters of the United States to determine whether a need for permits exists; and expedite wetland permitting through a formal assistance agreement with USACE.

DoD natural resources policy requires that wetlands be protected to the greatest extent possible. Activities affecting wetlands require environmental analysis in accordance with AR 200-1 and compliance with applicable federal and state laws and regulations. USACE permits are required under section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. § 403) before beginning any work or building any structures in a navigable water of the United States, and under section 404 of the Clean Water Act (33 U.S.C. § 1251 *et seq.*) for the discharge of dredge or fill material into waters of the United States, including wetlands. Additionally, Executive Order 11990 (*Protection of Wetlands*) requires federal agencies to minimize any significant action contributing to the loss or degradation of wetlands and to initiate action to enhance their natural value.

Under this INRMP, RRAD will implement the following measures related to wetlands management:

- Conduct project-specific jurisdictional field delineations, consistent with current USACE protocols, before implementing activities that could affect wetlands.
- Use appropriate BMPs for wetland protection when conducting silvicultural activities in and near wetlands. Because forest harvesting is an ongoing practice at RRAD, the installation is exempt from obtaining a USACE section 404 permit for silvicultural activities under section 404 of the Clean Water Act.

6.8 SOILS MANAGEMENT

The goal of soils management and conservation on RRAD is to protect soil resources, water quality, and native habitats to support the military mission. The objectives of soils management on RRAD are to identify areas subject to erosion and in need of soil stabilization and restoration, minimize soil erosion resulting from mission-related activities, and evaluate areas on the Depot where soils have become degraded (e.g., borrow pit sites) and determine what restoration measures are needed in those areas (Figure 11).

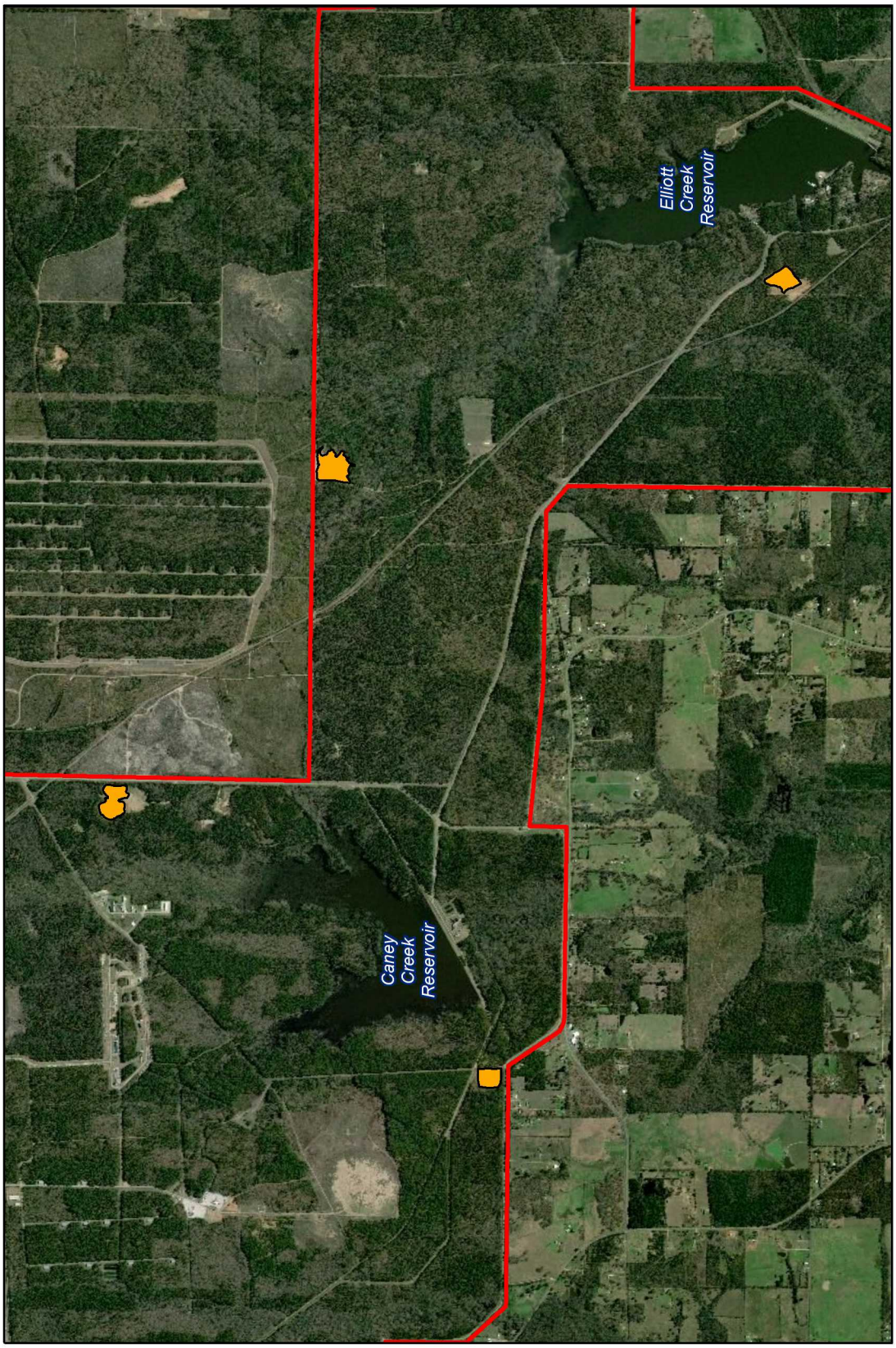

RRAD Borrow Pits
Elliott Creek Reservoir
Caney Creek Reservoir
LEGEND
RRAD Boundary
Borrow Pit

Figure 11

Approximately 85 percent of the soil series that occur on the installation are considered to have a moderate-to-severe potential for erosion. Problems associated with soil erosion generally occur in areas where vegetation has been removed or disturbed and that have not been appropriately revegetated or resurfaced. The installation is well vegetated and the topography is level enough that erosion from the natural forces of rain and wind is not a major concern. Ground-disturbing activities on the installation are the primary cause of soil erosion. Dominant soil types on the installation have very slow permeability and high silt and clay content, and most of the soils have a moderate-to-high potential for eroding.

Under this INRMP, RRAD will implement the following measures related to soils management:

- Implement erosion prevention or rehabilitation measures as needed on a case-by-case basis.
- Minimize areas of exposed soils. Use BMPs to minimize erosion when soil disturbance is necessary to support mission objectives.
- Require construction sites to implement BMPs to stabilize soils and minimize erosion.
- Reseed and revegetate cleared areas as appropriate to minimize erosion. Use fast-growing native species so that soil stabilization and revegetation can occur in a timely manner.
- Use Depot-generated organic matter (e.g., grass clippings, landscape trimmings, leaves, mulch, wood chips) to enhance soil quality and promote vegetative growth.

6.9 LANDSCAPE MANAGEMENT

The goal of landscape management at RRAD is to maintain landscaped areas and drainage easements and to establish approved vegetative cover as necessary in developed areas of the Depot. The objectives of landscape management on the Depot are to maintain attractive landscapes and other improved areas—drainageways, road shoulders, and dividers along minor roadways; maintain grassed areas outside the northern industrial and administrative areas; and maintain the health and vigor of trees and shrubs to minimize the danger they could pose to infrastructure, equipment, and people by falling if they were to become diseased, damaged, or aged.

Army Technical Manual 5-803-13, *Landscape Design and Planting*, provides specific guidance on practices and techniques for establishing and maintaining ornamental plants on installations (DoD 1988). Under this INRMP, RRAD will implement the following measures related to landscape management:

- Seed turf areas, cemeteries, new construction sites, and eroded areas with Bermuda grass (*Cynodon dactylon*).
- Seed road shoulders with Bermuda grass, dallisgrass (*Paspalum dilatum*), bahia grass (*Paspalum notatum*), and ryegrass (*Lolium multiflorum*).
- Maintain 10-foot-wide drainage easements vegetated with approved grasses and wildflowers along borders of primary roads.
- Seed and fertilize lawns, new construction sites, and eroded areas at a rate of 200–500 pounds per acre, based on a soil analysis. Apply fertilizer to shrubs at a rate of 0.25–1 pound per plant, depending on size.
- Annually evaluate areas under DPW management that require mowing to determine whether mowing is still required and to determine potential cost savings.
- Establish areas with wildflowers and low-maintenance grasses as funding permits.

- Evaluate the potential of using low-growing native plants and ground cover that do not present a conflict with safety or security concerns in areas that are currently mowed.
- Reduce the mowing frequency as feasible in areas where native grasses and wildflowers appear to be naturally seeding to further reduce grounds maintenance costs.
- Encourage volunteer youth groups to collect the seeds of native herbaceous species and redistribute them on the Depot to add acreage and increase the density of wildflowers.
- Mow areas established in wildflowers less frequently to reduce mowing costs.

6.10 FOREST MANAGEMENT

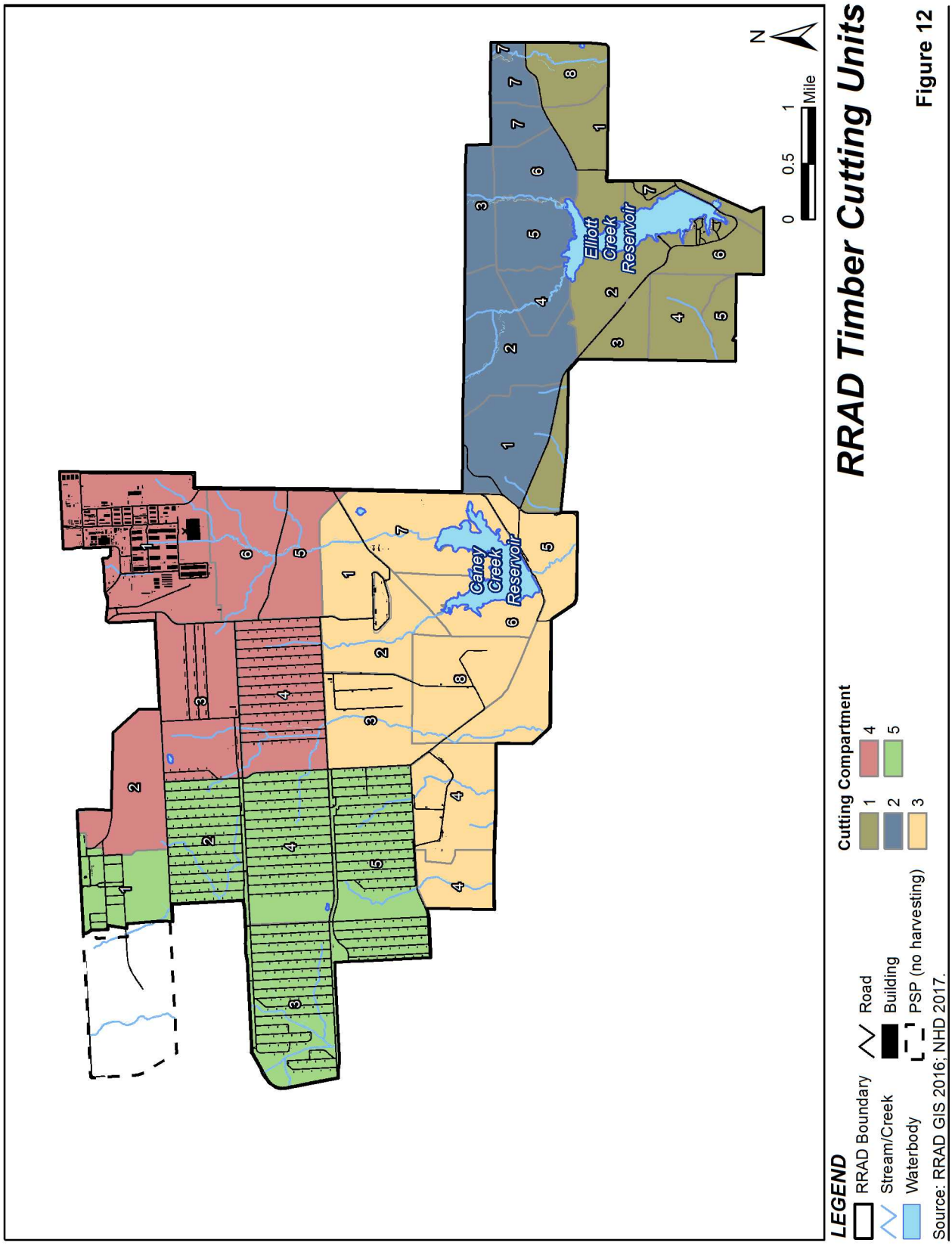
The goal of the forest management program at RRAD is to maintain and enhance the ecological integrity of forest habitats while supporting the military mission. The objectives of forest management on RRAD are to periodically conduct timber harvests and stand improvement activities; encourage and protect forest regeneration; protect the Depot forests against wildland fires, insects, and diseases; and minimize the conflict between forest management activities and the military mission through coordination of LMB with military support directorates.

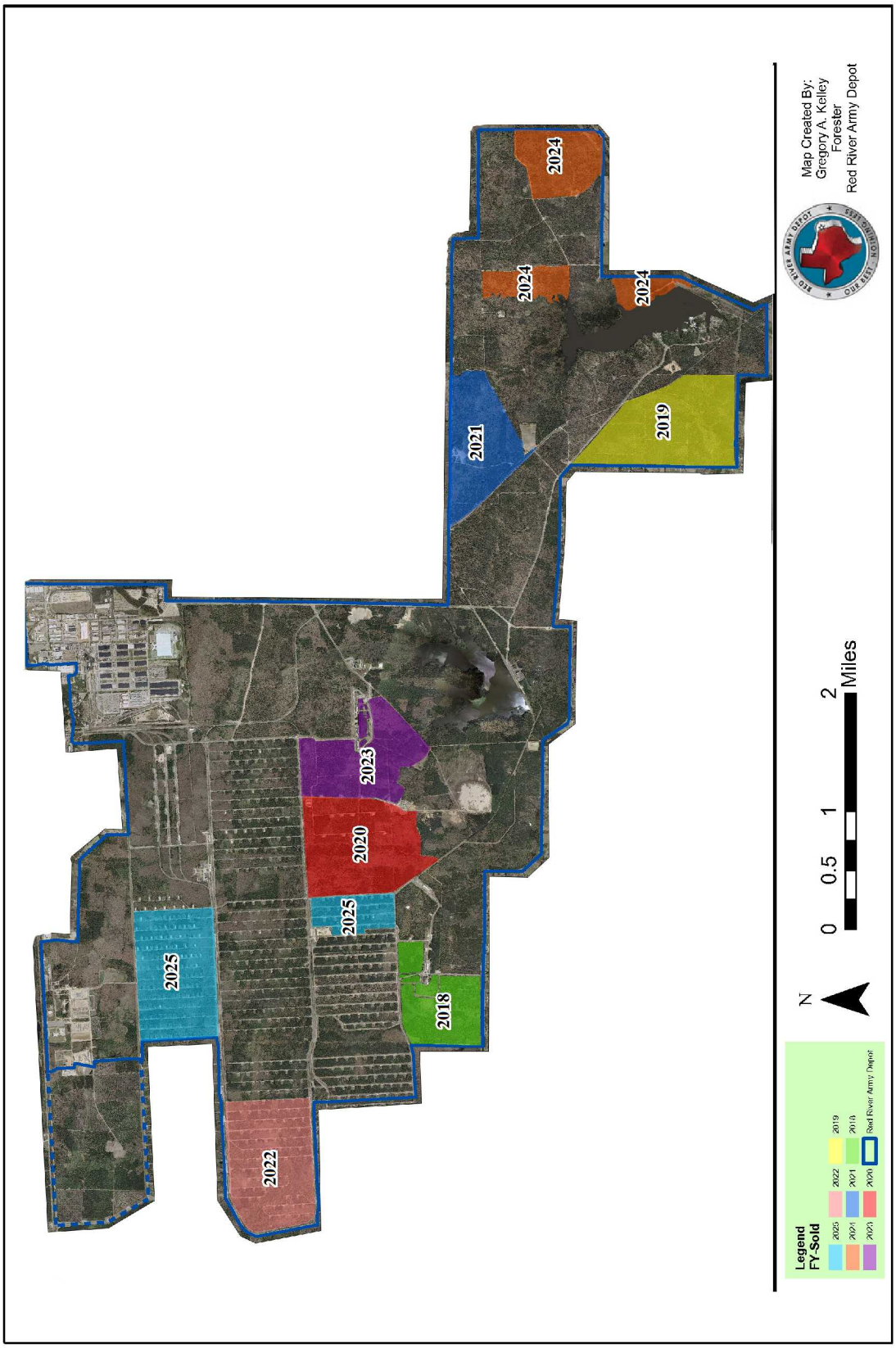
The RRAD forestry program was formally established in 1950 and recorded its first timber sale in 1952. Before that, timber was harvested and processed at the on-site sawmill, and public sales were limited to fire-damaged pulpwood (RRAD 2011). Each of RRAD's three forest community types—pine plantations, mixed pine-hardwood, and bottomland hardwood—is managed differently, but all forest management on RRAD focuses on uneven-aged management for sustainable forest growth. Forest management at RRAD is accomplished by implementing specific forest management practices, conducting periodic forest inventories, prescribed burning, and timber harvesting.

Forest stand inventories are conducted at least every 10 years to provide for sustained production of forest products. Forest inventories were conducted in 2000 and in 2010–2011 (see Appendix G). The inventories include GIS and GPS data on forest stands. The next forest inventory is scheduled to be completed in 2019 or 2020, but RRAD will conduct it sooner if possible because successive years of excessive mortality caused by drought, storms, and insects have altered the forest stands on the Depot. Information on ground cover, shrub layers, seedling regeneration, general stand environment, and stand location relative to various habitats and specific wildlife parameters is also collected. This provides information on the composition and structure of the stands as they relate to other habitat types and wildlife, and it is integrated into other natural resources management activities such as riparian, wetland, and water resource buffer zone protection and erodible soils management.

Timber compartments are generally scheduled to be thinned once every 20 years, or as needed to restore, maintain, or improve health and vigor of the stand. Unscheduled timber harvests can occur if an operation is deemed necessary to salvage damaged timber, such as by a storm or an insect or disease infestation, or to remove timber ahead of a construction project or other activity that requires timber removal. Figure 12 shows the current timber cutting units on RRAD. Figure 13 shows the 5-year harvest plan for 2018–2022. Table 7 lists forest harvest volumes for 2011–2015. Table 8 lists the volume of timber harvested per product from 2011–2017and the income generated.

***Western Excess Parcel*.** The Army and Red River Redevelopment Authority (RRRA) signed an economic development conveyance memorandum of agreement (MOA) on September 1, 2010 (U.S. Army 2010). The MOA distinguished between two parts of the WEP—the RRAD-WEP


RRAD Timber Cutting Units
Figure 12
N
0 0.5 1 Mile
Caney Creek Reservoir
Elliott Creek Reservoir
Cutting Compartment
1
2
3
4
5
LEGEND
RRAD Boundary
Stream/Creek
Waterbody
Road
Building
PSP (no harvesting)
Source: RRAD GIS 2016; NHD 2017.


RRAD 5-Year Harvest Plan
Map Created By:
Gregory A. Kelley
Forester
Red River Army Depot
N
0 0.5 1 2 Miles
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FY-Sold
2025
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2023
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Red River Army Depot
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2022

Figure 13

Table 7.
Forest harvest volume estimates of pine and hardwood timber 2011–2017

Year	Estimated acreage	Estimated volume (tons)
2011	528	13,969
2012	372	9,635
2013	513	12,800
2014	570	14,000
2015	632	15,000
2016	634	20,512
2017	637	18,200

Table 8.
RRAD volume and income of timber harvested for FY 2011–2017

Fiscal year	Pine sawtimber volume (tons)	Hardwood sawtimber volume (tons)	Pine pulpwood volume (tons)	Hardwood pulpwood volume (tons)	Pine CNS (Tons)	Income generated
2011	16,714.404	280.38	6,926.38	3,476.76	2,228.08	$568,911.00
2012	9,118.74	1,107.73	8,138.99	5,724.28	341.76	$372,362.00
2013	7,640.27	1,229.31	5,737.42	11,101.76	0	$501,518.57
2014	13,405.69	504.99	3,254.5	1,942.71	0	$481,562.99
2015	1,155	27	1,109	2,218	0	$450,100.00
2016	1,102.32	402.14	1,111.77	5,323.77	0	$416,048.49
2017	12,569.64	1,837.49	1,812.34	4,293.15	0	$315,077.12

Timber Parcel, approximately 2,859 acres in the WEP, consisting of all land in the WEP south of the line of North Patrol Road extended to the western boundary of the Depot, and the RRAD-WEP Public Sale Parcel, approximately 980 acres in the WEP north of the line of North Patrol Road. The MOA granted the Army the right to sell any part of the PSP within 9.5 years of RRAD's realignment (through March 14, 2021 at the latest). The Army could then sell any part of the PSP still retained to the RRRA through a separate sale. As of early 2018, the Army had sold the 311 acres of the PSP west of Walnut Road and still retained the portion east of Walnut Road.

The MOA provided that RRAD retain for a period of 6.5 years (through March 14, 2018 at the latest) (the *Timber Period*) all timber management, harvest, and property rights on the RRAD-WEP Timber Parcel, and all proceeds from timber harvests conducted during that time. Upon completion of timber harvests within definable areas on the Timber Parcel, the Army would release those areas to the RRRA.

RRAD retained all management and economic rights to the Public Sale Parcel until it or portions of it were sold. DoD documents address forest management and harvests on excess Army lands. The appendix to 32 CFR 190 (*Natural Resources Management Program*) requires that

planned forest products sales be continued on land reported as excess until actual disposal or transfer occurs (32 CFR 190 Appendix B.2.d.). DoDI 4715.03 (*Natural Resources Conservation Program*), Enclosure 3 (*Procedures*), part 4.a.(2)(a) states that DoD must continue conservation reimbursable programs (including forest management and harvests) on excess Army lands until transfer of title occurs. These documents require that the portion of proceeds from sales of land that is attributable to the value of standing timber on the land sold must be deposited in the Military Department's forestry account, just as proceeds from timber harvests on Army lands are. AR 200-1 (*Environmental Protection and Enhancement*, Chapter 4-3 d(1)(8)(e)) requires that all revenues from forest product sales be deposited into the Army Forestry Account). Approximately $400,246 in timber has been harvested since FY 2013 on the Public Sale Parcel. Approximately $3 million have been generated in timber revenues from all sales on the WEP and Public Sale Parcel (Kuykendall 2016).

Under this INRMP, RRAD will implement the following measures related to forest management:

- Implement an uneven-aged harvesting system to promote natural reforestation through individual tree selection and understory release.
- Conduct herbicide applications as necessary to improve stand quality and encourage desirable regeneration in pine stands. Coordinate applications with the pest management and fish and wildlife programs.
- Selectively harvest less desirable trees and trees of poor form and quality to allow for superior crop trees to regenerate and dominate the stands.
- Identify aesthetically sensitive resources during the early stages of planning for all timber sales to ensure that those resources are afforded adequate protection.
- Evaluate as necessary forested buffer zones and viewsheds in response to changes in traffic flows, development, and land-use patterns on the Depot and adjacent private lands.
- Conduct light to moderate cuttings along the edge or sight zone of scenic areas or viewsheds consistent with forest health goals and safety concerns. Maintain a closed canopy to the maximum extent feasible with light release cuts. Thin areas managed using this approach to a density of 90 stems per acre.
- Convert the remaining slash pine plantations to native conifer species (shortleaf and loblolly pine). Use prescribed fires to promote pine regeneration and manage hardwood competition on upland sites.
- Maintain a yearly contract for salvage operations to remove timber damaged from insects, storms, fire, or construction. Provide supervision, inspection, and harvest specifications for all field activities. Include in each contract provisions to ensure that each vendor takes appropriate steps to comply with applicable BMPs to protect soil and water quality.
- Thin mature or high-density stands that lack a desirable stand structure down to a residual basal area of 50–60 square feet to allow sunlight to hit the forest floor and encourage desirable regeneration. Follow up in successive years with prescribed burns to help establish regeneration and to facilitate the precommercial thinning of dense regeneration.

6.11 WILDLAND FIRE AND PRESCRIBED FIRE MANAGEMENT

RRAD's Integrated Wildland Fire Management Plan (IWFMP) covers FYs 2014–2019 and addresses prevention and control of wildland fires on the Depot. The IWFMP applies to RRAD

personnel and all cooperative agencies assisting in the management of wildland fires occurring on the installation. The IWFMP is on file in the natural resources office. Major aspects of wildland fire management on RRAD are presented in this section; detailed information on wildland fire management practices on RRAD is provided in the IWFMP.

The RRAD Fire Chief is responsible for the fire prevention and protection program. Wildland fire suppression at RRAD is the responsibility of the RRAD Fire Department in accordance with the installation's fire regulation, Installation Regulation 420-2. The LMB is responsible for prescribed burning, maintaining firebreaks, forestry roads, trail systems, and basic fire prevention measures per the IWFMP. The Depot Natural Resources Manager is the Wildland Fire Program Manager.

Cooperative agreements have been established with local volunteer fire departments that allow for reciprocal firefighting aid to be provided as authorized by the fire chiefs, assistant fire chiefs, and mayors of the adjacent municipalities. Agreements are in place with Hooks, Maud, Nash, New Boston, Red Lick, and Texarkana, Texas, and the Texas A&M Forest Service (the Texas Forest Service). The RRAD Fire Chief obtains and maintains documentation of those agreements.

RRAD firefighters receive annual training in brush, grass, and forest firefighting techniques. Employees of the Fire Department and LMB must have National Wildfire Coordinating Group (NWCG) standards incorporated into their training that meets their expected role on the fireline. All personnel serving on the wildland fire crew must maintain fitness conditions appropriate to their assigned roles.

Wildfires occurring on RRAD are controlled in accordance with a strict set of protocols that are detailed in the IWFMP. Prescribed burns are used as a forest management and protection tool. LMB ignites prescribed burns to meet specific objectives, including forest management, ecological enhancement, protection from destructive wildfires, and pest control. RRAD plans to burn 1,500–3,000 acres annually when weather conditions are optimal. This puts the Depot on a 3–5-year burn cycle. Table 9 lists the acres burned annually from 1985 to 2017.

Prescribed burns on RRAD are used to encourage seed germination and establishment of desirable timber species, reduce the stand density of young pine stands, improve understory establishment by top-killing vines, reduce understory overgrowth of brush and small hardwood, prevent wildfires from spreading, and reduce fuel accumulation (RRAD 2008a). Prescribed burns can help control disease and pests, promote biodiversity, and improve access to woodlands (RRAD 2008a, 2011e).

Many factors contribute to a relatively limited window of opportunity during which LMB can carry out prescribed burns. The factors are staffing limitations, unsuitable weather conditions, security restrictions on the use of aerial ignition of large burn units, off-post smoke management concerns, and fuel loading. In addition, many burns must be conducted to promote rapid consumption of fuels and minimum smoke production, which does not provide the same ecological benefits that slower moving fires can provide if allowed to burn over a wider area for a longer period of time.

The areas identified for prescribed burns for FY 2018 through FY 2022 are shown in Figure 14.

Under this INRMP, RRAD will implement the following measures related to wildland fire management:

- Continue to conduct prescribed burns during times and conditions when objectives are best met.

- Review the IWFMP annually to ensure it reflects actual conditions on the Depot.
- Review the IWFMP to ensure it is consistent with the requirements for T&E species protection if a T&E species or its habitat is identified on RRAD.

Table 9.
Annual prescribed burns

Year	Actual acres burned	Proposed acres for burns
1985	2,961	4,683
1986	772	5,104
1987	4,100	9,128
1988	2,586	8,406
1989	1,800	8,048
1990	1,600	8,637
1991	1,100	9,004
1992	0	6,213
1993	1,300	5,200
1994	1,287	4,277
1995	5,016	7,200
1996	500	5,737
1997	350	8,000
1998	400	8,000
1999	850	10,339
2000	1,000	9,250
2001	451	6,500
2002	914	6,239
2003	2,130	10,150
2004	500	2,000
2005	0	4,421
2006	0	5,771.2
2007	0	1,662
2008	Not Available	Not Available
2009	450	2,947
2010	1,600	5,233
2011	1,499	5,300
2012	2,494	7,210
2013	1,500	5,522
2014	250	4,838
2015	1,500	1,909
2016	1,875	2,239
2017	1,950	3,576

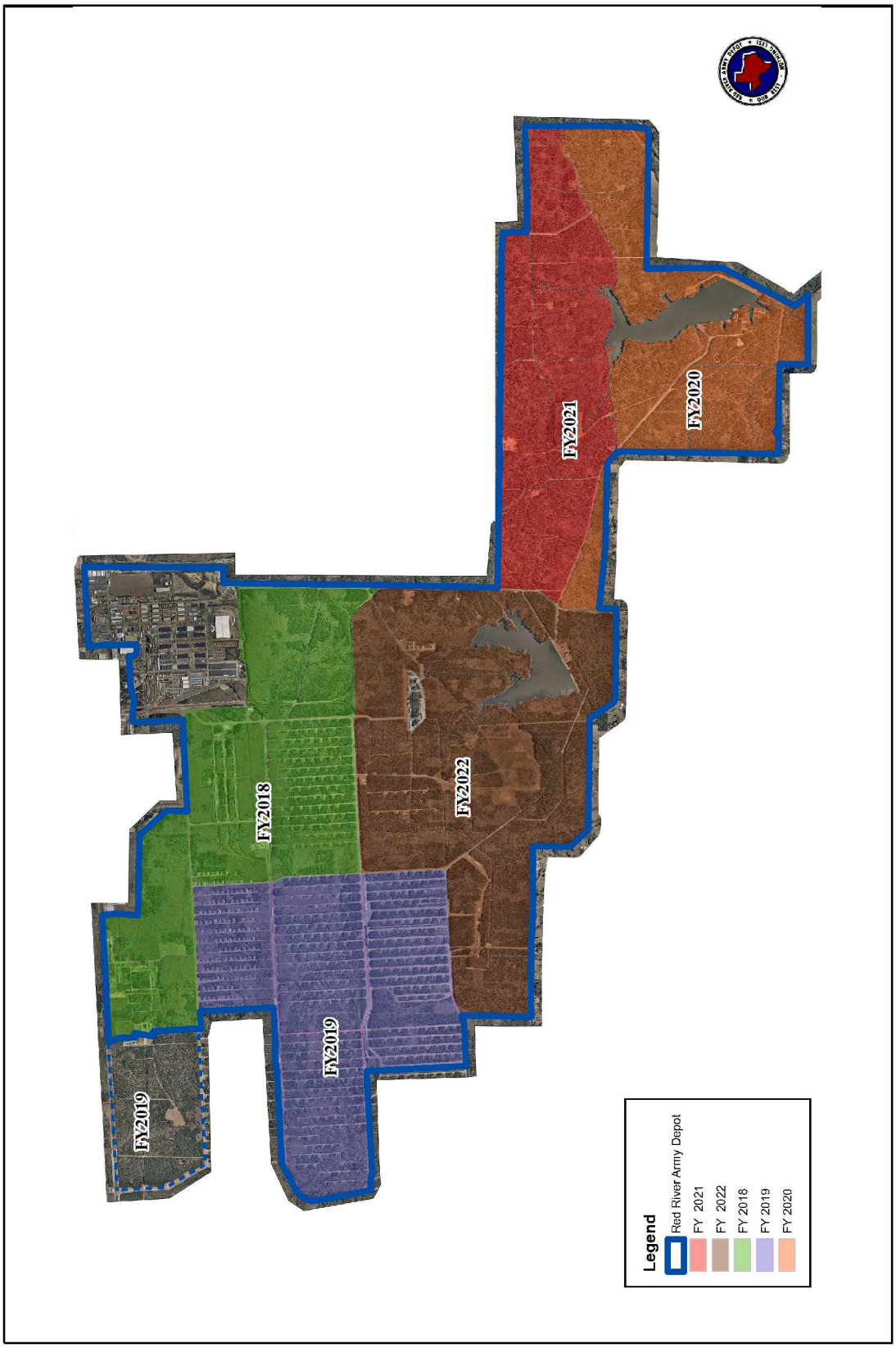

RRAD Prescribed Burn Areas
FY2021
FY2020
FY2022
FY2018
FY2019
FY2019
Legend
Red River Army Depot
FY 2021
FY 2022
FY 2018
FY 2019
FY 2020

Figure 14

6.12 INTEGRATED PEST MANAGEMENT PROGRAM

The IPMP for RRAD is a comprehensive document describing the pest control program. It is updated annually to ensure consistency with pesticide and herbicide application guidance and the Depot's requirements for pest management. The IPMP is on file in the natural resources office. Major aspects of pest management on RRAD are presented in this section; detailed information on pest management practices on RRAD is provided in the IPMP.

The pest management functions at RRAD are either performed or monitored by LMB. The IPMP embodies an Integrated Pest Management (IPM) approach. IPM controls used at RRAD range from live trapping to chemical control. Mechanical, physical, biological, chemical, cultural, and regulatory controls are prescribed as applicable to control specific pests. The goal of IPM on RRAD is to prevent or manage pest damage with as little adverse effect on natural resources as feasible. Pests interfere with the supply, maintenance, and ammunition missions of RRAD; adversely affect health; and damage property, structures, and materials. The IPMP contains policies, requirements, environmental documentation, and major actions applicable to the Pest Management Program, as well as provisions for the safety of personnel, equipment, materials, and facilities.

All certified pest applicators attend a training/recertification course once every 3 years. The training is provided at Ft. Sam Houston, Academy of Health Science, and Army Medical Center & School in San Antonio, Texas. In addition, the following workshops and conferences are attended on a funds/space available basis:

- Texas Mosquito Control Association Annual Conference
- Texas Agricultural Extension Service Training, when available
- American Society of Agronomists Conference

Pests identified at RRAD include medically important pests (i.e., mosquitoes), structural/wood-destroying pests, undesirable vegetation, ornamental plant and turf pests, animal pests, and household and nuisance pests. The IPMP details the management plan outline for each pest, including treatment and eradication methods. The emphasis in this section is on forest pests.

Bark beetles are the most destructive insect pests affecting the loblolly and shortleaf pine forests of the region. The southern pine beetle (*Dendroctonus frontalis*) and ips engraver beetle (*Ips avulsus*) cause the greatest amount of damage, and infestations can rapidly reach epidemic proportions if left unchecked (Barkbeetles 2006). The ips engraver beetle is the smallest of the engraver beetles and prefers the upper limbs and tops of pines. Thus, its activities are often unnoticed until the beetles have inflicted considerable damage.

The southern pine beetle and ips engraver beetle are commonly found together in infestations, with the ips engraver beetles attacking trees during the later stages of a southern pine beetle infestation. Many infestations occur in pine stands where tree growth has stagnated and vigor is low because of overcrowding or where external stresses (drought, flooding, or logging damage) have weakened individual trees. After pest populations quickly build up in weakened trees (southern pine beetles can produce three-to-seven generations per year), an infestation spreads to healthy trees that would normally resist an attack by fewer beetles. Under natural conditions, parasitic and predatory insects, woodpeckers and other insect-eating birds, and moderate weather conditions act to keep the insects under control.

The emerald ash borer (*Agrilus planipennis*) is a potential threat to ash trees on RRAD.

In addition to insect pests, various types of root and butt rot caused by fungi cause considerable damage in southern forests. Heart rot or white pocket rot (*Phellinus pini*) and Annosum root rot

(*Heterobasidion annosum*) cause the most damage to pine timber in the region. Hypoxylon canker is a serious disease that is common throughout the South on oaks and other hardwoods. It normally occurs on stressed hosts. The canker is caused by one or more species of fungi in the genus *Hypoxylon*.

Under this INRMP, RRAD will implement the following measures related to forest pest management:

- Monitor forest health on RRAD through routine visual surveys. Concentrate the surveys on areas at high risk of disease outbreak, insect attacks, or both.
- Upon discovery of active beetle infestation, remove all trees through a salvage contract. Clearcut a 100- to 200-foot buffer around the center of infestation. Check for possible reinfestation and monitor the infestation area periodically.
- Implement IPM as described in the Depot IPMP.

6.13 INVASIVE SPECIES MANAGEMENT

The goal of managing invasive species on RRAD is to control established invasive species on the Depot and to prevent other species from becoming established.

Invasive species are plants and animals that invade and quickly dominate natural habitats and are most often species not native to a region. An invasive plant species PLS was conducted in 2011–2012, and the PLS report was completed in 2013. An Invasive Species Management Plan (ISMP) for vegetation on RRAD was developed and implemented in 2013. Invasive plant species commonly found in east Texas include:

- Alligator weed (*Alternanthera philoxeroides*)
- Asian pear tree (*Pyrus pyrifolia)*
- Chinaberry tree (*Melia azedarach*)
- Chinese privet (*Ligustrum sinense*)
- Chinese tallow (*Triadica sebifera*)
- Chinese wisteria (*Wisteria sinensis*)
- Egeria (*Egeria densa*)
- Giant reed (*Arundo donax*)
- Hydrilla (*Hydrilla verticillata*)
- Japanese dodder (*Cuscuta japonica*)
- Japanese honeysuckle (*Lonicera japonica*)
- Kudzu (*Pueraria sp.)*
- Mimosa (*Albizia julibrissin*)
- Parrotfeather (*Myriophyllum aquaticum*)
- Tropical soda apple (*Solanum viarum*)

Hydrilla is found in various waterbodies throughout the Depot. Along with alligator weed, parrotfeather, and Egeria, it is found in Elliot Lake. Japanese honeysuckle is often found in association with sweetgum, loblolly pine, and black willow in wetland communities. The Asian pear tree is spread by birds and establishes quickly. Aquatic weeds are a problem in ditches and lakes at RRAD. Broadleaf weeds are a problem in and around most RRAD turf areas, warehouses, and railroad ballast. Occasionally the weeds are a problem around RRAD fence

lines and on igloos. Woody plants are a problem during early spring and summer months in and around the areas noted. Special care is taken around recreational areas and office buildings.

Feral hogs, imported red fire ants, and other insect pests are considered invasive species because of their foreign origin and damaging effects. Control measures for all nuisance animals and plants are covered in greater detail in the RRAD IPMP (RRAD 2010a). RRAD follows the *Army Policy Guidance for Management and Control of Invasive Species* (U.S. Army 2001).

Feral hogs are managed by trapping, hunting, and shooting to minimize overpopulation and destruction of the installation's habitats. Feral hogs carry parasites and disease such as brucellosis and pseudorabies, both communicable to humans, livestock, and other mammals. They also erode land and vegetation by digging and compete with native animals for food. RRAD Land Managers have implemented several methods to try and get a handle on the hog population. Methods have included trapping with different style traps, snaring, shooting on site, using dogs, implementing special hog hunting seasons, and educating hunters and encouraging them to take hogs during open deer season. Trapping is by far the most successful and efficient method, but a combination of proven methods is even better. RRAD LMB expects to obtain two wireless remote BoarBuster traps in 2018 which are expected to make the trapping more effective and efficient.

RRAD supports the U.S. Forest Service's *National Strategic Framework for Invasive Species Management* and its four goals—prevention, early detection and rapid response, control and management, and rehabilitation and restoration. Invasive plants found on the installation are a high priority for control and efforts to control them are maximized.

Under this INRMP, RRAD will implement the following measures related to managing invasive species:

- Apply herbicides as needed after timber harvests to control the establishment of invasive species and to encourage desirable regeneration.
- Plant harvested areas with native species.
- Trap and hunt feral hogs to minimize overpopulation and the destruction they cause to the Depot's habitats.
- Integrate invasive species management with managing wildlife, fish, pests, forests, water, and cultural resources on the Depot and with restoration activities.
- Use regulatory controls and public education to slow the spread of invasive species.

6.14 OUTDOOR RECREATION MANAGEMENT

The goal of managing the outdoor recreation component of natural resources management on RRAD is to support MWR's mission to develop a more robust outdoor recreation program. The objectives of supporting the program are to coordinate with MWR for managing and collecting fees for hunting, fishing, and trapping and to protect and enhance the natural resources on which those recreational activities rely.

MWR facilitates a wide variety of recreational opportunities and services on the installation, including hunting, fishing, camping, swimming, boating, hiking, and archery. Only authorized users in possession of valid recreation permits are granted access to RRAD and use of the recreational amenities. All recreational use of off-road vehicles by the public is prohibited on RRAD.

The following Army and Depot regulations are related to the management of recreational programs on RRAD. They contain all information regarding hunting and fishing on the installation, including the types of weapons that can be used and the type of game that can be hunted.

- AR 215-1, *Military Morale, Welfare and Recreation Programs and Non-appropriated Fund Instrumentalities*, establishes procedures for Military MWR Program operations, personnel, and fees.
- AR 200-1, *Environmental Protection and Enhancement*, establishes the policy for hunting, fishing, and natural resources conservation on RRAD.
- RRAD Regulation 215-10, *Wildlife Management Hunting and Fishing Programs*, of which DPW is the proponent.

6.14.1 Check-in and Check-out Procedures

All persons 16 and older who wish to conduct any recreational activity within RRAD boundaries must register for an MWR badge with the Visitor Control Center (VCC) in Building 455A. Any recreational user who wishes to use a privately owned vehicle on-depot must register with the VCC and provide current registration and insurance for the vehicle, and a valid driver's license. All weapons must be registered by providing the VCC with serial number, make, model, finish, and caliber/gauge information for each one. Weapons are to be unloaded and cased at all times, except in assigned hunting areas on the installation (Figure 15).

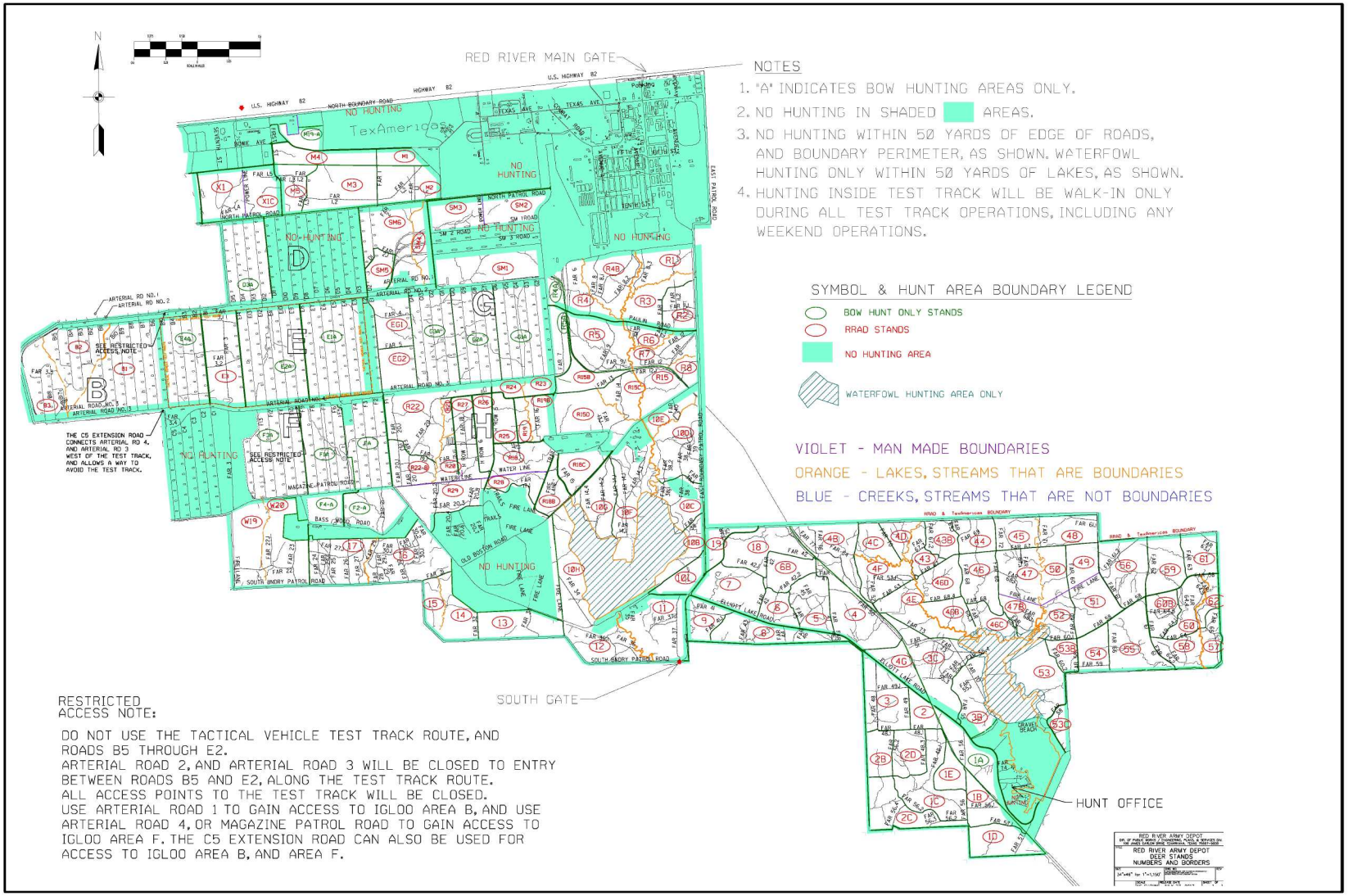
Military and DoD civilian personnel must use their military IDs or Common Access Cards to enter RRAD for recreational purposes. Temporary badges/passes are available to eligible personnel and guests of authorized users who have purchased a recreational permit from the MWR office. Passes are available for 30 days up to 1 year.

6.14.2 Elliott Lake Recreational Area

Elliott Lake Recreational Area is the major recreational and leisure area on RRAD. It offers a wide variety of facilities and activities to RRAD authorized user groups. Recreational activities available are camping, sailing, boating, sailboarding, canoe and kayaking, fishing, swimming, picnicking, volleyball, and basketball. The recreational area is equipped with a conference center, pavilion, picnic areas, boat dock, supply store, recreational vehicle/tent spaces, and log cabins.

6.14.3 Hunting Program

Hunting on RRAD is permitted using archery equipment, shotguns with slugs, and muzzleloaders during posted seasons and at other designated times. A valid RRAD hunting permit and a valid state hunting license are required to hunt or participate in a hunt on the installation, and hunters are required to check in and out at the RRAD Hunt Office. All game hunting (deer and small game) is managed by the Hunt Office on a controlled basis. The VCC issues all hunters an MWR badge upon presenting an RRAD hunting permit. Annual hunting permits are available for purchase at the MWR office (Building 1452) and Elliott Lake Country Store (Building 1433). Preauthorization is required and includes a background check, firearm registration, approval by the Installation Commander, and a compensatory one-half day of service at the hunt office desk for all hunters except active duty military personnel (RRAD 2010d). All harvested deer and turkey must be checked at the Elliott Lake Central Control Point.



RRAD Hunting Areas

Figure 15

Hunting privileges are extended to the following groups: active Federal employees from any U.S. Federal agency; active duty and retired U.S. military personnel; RRAD, Defense Distribution Red River Texas, and DoD civilian employees and retirees; RRAD and DoD labor contractors; non-appropriated fund employees; employees of other tenant activities at RRAD; and immediate family members of the above-listed eligible personnel. Immediate family members include spouse and unmarried children of a sponsor, including adopted children, stepchildren, foster children, and wards under certain conditions. Eligible personnel with a valid hunting permit may sponsor up to two sponsored hunters to participate in the program. They must be the same sponsored hunters all year, pass all applicable checks, and obtain their own hunting permit and badges before being allowed to hunt on the Depot.

Persons using RRAD's facilities are responsible for being familiar with the applicable statutes, regulations, and procedures for hunting safety, water safety, and proper conservation practices. In accordance with RRAD-R 215-10, as of September 1, 1999, any person hunting on a military installation must have completed an approved hunter safety course. It is recommended that all hunters wear safety orange.

RRAD participates in the TPWD Managed Lands Deer Permit (MLDP) Program. Under the program, the installation is enrolled in the Conservation Option, which authorizes the Depot to implement the state's most flexible seasons and bag limits. TPWD's annual harvest recommendation, which is based on current year deer population data, specifies the total number of permits allowed to be issued and establishes the maximum allowable harvest for RRAD (TPWD 2011) (Appendix H). Harvested deer need to be tagged with an MLDP.

Because of RRAD's enrollment in the MLDP program, county and statewide bag limits do not apply to individual hunters, and RRAD has flexibility in determining hunting seasons for antlerless deer, spikes, and buck deer within the MLDP-Conservation Option season dates. A Texas Hunting License and a valid Depot Hunting Permit are required for deer hunting.

TPWD determines RRAD's annual deer harvest limit based on three survey types conducted on the Depot. *Wildlife observation surveys* (incidental sightings) are conducted from June through August. *Spotlight surveys* are conducted at night in summer. *Trail camera surveys* are conducted in July and August. Trail cameras are set in key locations to count deer. Appendix I presents the 2017 deer population summary derived from these surveys. Census data collected for nine of the past 13 years for deer populations on a per-acre basis are presented in Table 10.

Hunting program changes for the 2017–2018 season (changes are determined on a season-by-season basis) included:

- The number of scouting days was increased to five total and Scouts are permitted to carry a shotgun while in the woods in case they encounter a feral hog. Scout days in 2017 were September 22, 23, 24, and 29, and November 3. Scout days are handled just like hunt days; the hunter must have a valid Depot hunting permit, check in at the Hunt Office, and declare if they will be carrying a shotgun while scouting.
- All hunters, except active duty military, are required to work one-half day at the Hunt Office desk.
- A new background check form (RRAD Form 9025) must be completed; it is available at the Elliott Lake Store and the LMB office. The form can also be found on the Depot intranet.
- Hunt areas are first-come, first-serve with reservations taken each Thursday morning from 7 to 9 a.m. for the following weekend.

Table 10.
Annual deer census, 2005–2017

Year	Census result
2005	1 deer/9.8 acres
2006	1 deer/11.4 acres
2007	1 deer/11.3 acres
2008	1 deer/10 acres
2009	1 deer/10.6 acres
2010	1 deer/4.9 acres[a]
2011	1 deer/12 acres
2016	1 deer/ 23.1 acres
2017	1 deer/15.8 acres

Note:
[a] Results inconsistent, predicted is 1/10 acres.

- Employed personnel from any U.S. federal agency are now eligible to hunt. Other eligible personnel include active duty and retired U.S. military, RRAD/DDRR/DOD civilian employees and retirees, any RRAD/DoD labor contractors, NAF employees, employees of other tenant activities at RRAD, and full-time employees of local law enforcement agencies. Immediate family members of those personnel are eligible as well. These eligible personnel can sponsor up to two hunters.

Deer season at RRAD normally runs October through mid-January. Hunters are allowed to hunt small game, feral hogs, varmints, and predators during the open season for deer and while the Hunt Office is open. RRAD hasn't had a turkey season for some time but as the turkey population continues to increase, RRAD will consult with TPWD biologists to determine when a viable population will allow hunting to resume.

6.14.4 Fishing Program

A valid RRAD fishing permit and a valid state fishing license are required for all persons aged 17 to 64 when fishing on the Depot. Both annual and temporary fishing permits are available for purchase at the MWR office (Building 1452).

Fishing privileges are extended to active duty U.S. military personnel; RRAD, Defense Logistics Agency, and Department of the Army civilian employees; RRAD contract employees; NAF employees; employees of other tenant activities at RRAD; retired US military personnel; retired RRAD and Department of the Army civilians; retired personnel of the Prime Operating Contractor; active and retired members of the Reserve and the National Guard; disabled veterans (100%), all US military ID card holders, and employees of all Federal agencies. Eligible persons can bring up to two guests and their family members. All guests and family members must possess all applicable licenses and permits to fish.

The Texas Department of State Health Services issues fish consumption advisories and consumption bans for waterbodies in the state. No fish consumption advisories or bans have been issued for waterbodies on RRAD.

6.15 AGRICULTURAL OUTLEASES

RRAD has no areas under agricultural outleases. The Depot has considered permitting grazing to reduce maintenance (mowing) costs. A study of the potential to allow grazing on the Depot was completed and showed that grazing might not be feasible due to concerns that it could impact the mission or create liability issues. At this time no grazing program is planned.

6.16 CLIMATE CHANGE MANAGEMENT

Climate change has the potential to affect natural resources and the military mission at RRAD. To prepare for and minimize its effects, the INRMP includes an assessment of climate trends predicted for the region, the potential impacts of the trends, and associated natural resources management measures.

Temperatures, precipitation, and the composition of the atmosphere have already been affected by climate change (NFWPCAP 2012). Average air temperatures have increased more than 2 °F in the United States over the last 50 years and are projected to increase further. Precipitation in the United States has increased on average approximately 5 percent in the last 50 years. The current level of CO_2 in the atmosphere of approximately 390 parts per million (ppm) is more than 30 percent above its highest level over at least the last 800,000 years.

Changes in atmospheric temperature and precipitation affect surface waters and the species in them (NFWPCAP 2012). Many rivers and streams in the United States have warmed by approximately 1 °F per decade over the past 50 to 100 years, and will continue to warm as air temperatures rise. Thermal stratification in rivers, lakes, and oceans will increase as a result and could cause seasonal oxygen depletion and increased contaminant toxicity, with adverse effects on coldwater fish and other species.

The changes in precipitation combined with increased temperatures are expected to increase the instance and severity of drought, which can increase the frequency and intensity of wildfires (NFWPCAP 2012). Climate change has already been linked to an increase in wildfire activity, including unprecedented wildfires in Texas during the extreme drought in the summer of 2011.

Climate change affects species' growth rates, alters patterns of food availability, and shift rates and patterns of decomposition and nutrient cycling. One or multiple climate-related factors can alter the distribution, abundance, phenology, physiology, and behavior of species, and the diversity, structure, and function of ecosystems (NFWPCAP 2012). The more rapidly the climate changes, the higher the probability is that natural systems will be substantially disrupted and experience unexpected events.

Species and populations with highly specialized habitat requirements; species already near temperature limits or that have other narrow environmental tolerances; currently isolated, rare, or declining populations with poor dispersal abilities; and groups especially sensitive to pathogens are likely to suffer more under climate change (NFWPCAP 2012). Species with small populations, a low reproductive rate, long generation times, low genetic diversity, or that are threatened by other factors will be even more vulnerable.

The effects of climate change on native species will be exacerbated by the changing landscape of invasive species under climate change (NFWPCAP 2012). Many invasive species in the United States stand to benefit from climate change. The ranges of some invasive species have already expanded, and the adverse effects of temperature and precipitation on native species will likely improve conditions for new invasive species. Climate change can shift the ranges of native and invasive species, create favorable conditions by which non-native species become invasive, and introduce and spread invasive species through severe weather events.

Similarly, many pathogens of terrestrial species are sensitive to temperature, rainfall, and humidity, making them sensitive to climate change (NFWPCAP 2012). Pathogen development and survival rates and host susceptibility could increase, along with incidents of disease transmission. Most host-parasite systems are predicted to experience more frequent or severe disease impacts under climate change.

The possibility of major surprises increases the importance of using an adaptive natural resources management approach—where actions and approaches are flexible enough to be adjusted in the face of changing conditions.

6.16.1 Projected Climate Change in the Great Plains

Present climate data for the RRAD area are presented in section 3.1. Climate trends that could affect RRAD's natural resources—and by extension, its military mission—are rising temperatures and changes in precipitation patterns, which are expected to lead to the types of natural resources management challenges discussed above. Predicted changes in the climate of the Great Plains area are discussed below.

***Temperature*.** Temperature change predictions through the end of the century have been calculated for the near-term (through 2040), mid-century (through 2070), and end of century (Table 11) (FHA 2017). In the Great Plains the temperature increase for each period is predicted to be 2 °F or more, with a total predicted average annual increase in temperature by the end of the century of 7 °F or more (FHA 2017, TPWD n.d.). The temperature increase is predicted to be greatest in the summer and fall, and less in spring and winter. The projected late-century increase in maximum temperatures is predicted to be greatest in the central and northern areas of the Great Plains, with average monthly maximum temperatures increasing by 5 to 9°F in Texas.

Table 11.
Predicted annual and seasonal temperature changes for the Great Plains region through the end-of-century

	***Temperature Change* (°F increase relative to 1961-1979)**		
Great Plains	***Near-term* (through 2040)**	***Mid-century* (2040–2070)**	***End-of-century* (2070–2100)**
Annual	2.5	4.3	7.1
Winter	2.4	4.0	6.8
Spring	2.1	3.7	6.4
Summer	2.8	5.0	8.2
Fall	2.5	4.3	7.6

Source: FHA 2017.

***Precipitation*.** Annual mean precipitation in the Great Plains has already increased by 4 percent relative to the years 1961-1979 (FHA 2017). By 2040, mean precipitation in the region is projected to increase in the winter and spring and to decrease in the summer. Fall precipitation could increase or decrease; different climate models offer diverging predictions on the magnitude and direction of changes in precipitation in the fall in the Great Plains. Similar trends in precipitation are projected for the Great Plains through the middle of the century. By the end of this century precipitation in the Great Plains region is predicted to increase in winter by about

6 percent, decrease in summer by the same amount, and increase moderately in spring and fall (Table 12).

Table 12.
Predicted seasonal precipitation percent changes for the Great Plains region

	Precipitation Change (percent change)		
Great Plains	**Near-term (through 2040)**	**Mid-century (2040–2070)**	**End-of-century (2070–2100)**
Winter	3	4	6
Spring	1	3	3
Summer	-2	-4	-6
Fall	0	-1	1

Source: FHA 2017.

RRAD's climate change management is guided by DoD Directive 4715.21, Enclosure 8, *Planning for Climate Change Impacts to Natural Resources* (DoD 2013); EO 13653, *Preparing the United States for the Impacts of Climate Change* (78 FR 66819, November 1, 2013); *Department of Defense 2014 Climate Change Adaptation Roadmap* (DoD 2014); and other applicable policy and science. An approach suggested in these documents to help identify future climate change priorities on installations involves developing vulnerability assessments. Climate change vulnerability assessments typically determine the sensitivity of a species or system to changes in the climate, the level of exposure to change, and the adaptive capacity of the species or system, in the context of existing threats. This information helps natural resources managers develop effective strategies to promote resilient and sustainable conservation targets, as well as manage for change when conditions exceed a species' or community's ability to recover (DoD 2011).

Climate trends that could affect RRAD's natural resources—and by extension, its military mission—are rising temperatures, changing precipitation patterns, and increasing frequency and intensity of severe weather events (FHA 2017). The potential effects of these trends include the following:

- Increase in the frequency and severity of high temperatures and droughts. Within the next 20 years, the annual mean temperature in the region is projected to increase by approximately 2 °F, approximately 3.2–4.0 °F by mid-century, and approximately 4.5–7.8 °F by the end of the century. The higher temperatures could lead to water shortages, increase the number of incidents of plant and animal disease and death, and ecosystem-level shifts in flora and fauna distributions, including those of invasive species. Flora and fauna with otherwise stable populations could become listed as T&E species, resulting in increased T&E species management requirements.
- Increase in the frequency and severity of storms. In the near-term, mean precipitation in the region does not exhibit a strong trend, but is generally projected to decrease in the summer and spring and increase in the fall. Combining less rainfall with rising temperatures could cause plants and animals increased stress in the summer. More severe storms could cause localized flooding and erosion. Additional land management actions could be needed to prepare for and minimize the effects of flooding and erosion and to restore natural resources if they are damaged by such events.

- Increase in the frequency and severity of wildfires as a direct result of increased temperature and reduced rainfall. Additional land management actions could be needed to prepare for and minimize the effects of wildfires such as additional firebreaks to protect infrastructure and property. RRAD's firefighting resources could be increasingly called upon to assist partner agencies in responding to off-depot fires.

The ecosystem effects of climate change will likely be incremental and challenging to distinguish and assess. RRAD will take a proactive, flexible approach to climate change assessment and analysis to respond to climate change trends as they are identified. As a first step in addressing the sustainability of the military mission in the face of climate change, RRAD will conduct a vulnerability assessment to assess the potential impacts of temperature and precipitation changes, and corresponding biological and ecological changes (e.g., altered distributions of invasive species), on each aspect of the installation's military mission. From this, RRAD will develop a strategy to address the vulnerabilities to ensure mission sustainability.

Under this INRMP, RRAD will implement the following management measures to assess and respond to the impacts of climate change:

- Conduct a vulnerability assessment addressing the impacts of climate change on natural resources of interest.[1] Determine how identified vulnerabilities might impact the military mission. Identify adaptive management strategies to mitigate the risks and potential impacts of climate change. Review and update the vulnerability assessment either as needed or approximately every 5 years.
- Identify and assess the effects of climate change on RRAD's natural resources, and identify ways to mitigate and adapt to these effects.
- Integrate climate change considerations into natural resources management actions.
- Collaborate with internal and external stakeholders on climate change challenges as opportunities arise.

6.17 CULTURAL RESOURCES PROTECTION

RRAD implements protective measures to ensure that natural resources management activities do not adversely affect known cultural resources sites on the Depot. The Depot has identified 33 sites that are avoided protected from disturbance until further testing can be completed to determine their eligibility for the National Register of Historic Places, as well as five cemeteries. Known sites and areas with the potential to contain sensitive cultural resources are avoided during forestry operations and BMPs are used to protect soils from excessive compaction or erosion to minimize indirect impacts on cultural resources. The *Integrated Cultural Resources Management Plan (ICRMP) for Red River Army Depot, Texas* provides a complete description of the history of the installation and the prehistoric and historical background for the land encompassed by the installation (RRAD 2013). The ICRMP is on file in the natural resources office.

6.18 PUBLIC AWARENESS AND OUTREACH

RRAD will continue to make the Depot's natural resources available to youth programs for ecology projects that jointly benefit natural resources management and youth educational objectives, to universities and other organizations for the study of ecosystems and wildlife, and

[1] A DoD screening-level survey assessment tool was piloted in fall 2013 and deployed in 2014 to assess current installation-specific vulnerability to climate impacts. Data from these screening-level assessments will be used to identify areas and installations at which more detailed vulnerability assessments might be needed (DoD 2014).

for other low-impact activities such as teambuilding retreats. RRAD will make a continual effort to identify local organizations and universities that show an interest in using Depot land. Local high schools, Girls Scouts, Boy Scouts, Boys and Girls Club of America, Future Farmers of America, and 4H clubs are organizations that might have an interest in conducting natural resources projects on RRAD. Projects that benefit RRAD's natural resources will be suggested to these groups, including the following:

- Assembling birdhouses
- Monitoring birdhouse occupancy
- Identifying native wildflowers and grasses, and redistributing seeds
- Manually clearing weedy areas, and restoring native vegetation
- Manually clearing areas of specific types of weeds such as Johnson grass and other invasive species

University-sponsored studies provide the installation with information about specific species or habitats and how the Depot's natural resources respond to management efforts. Projects proposed and funded by universities, the Agricultural Extension Service, The Nature Conservancy, and the Audubon Society supplement the Depot's expertise and staff.

6.19 CONSERVATION LAW ENFORCEMENT

The goal of conservation law enforcement at RRAD is the enforcement of natural resources laws and regulations. The objectives of conservation law enforcement on RRAD are to protect natural resources from criminal destruction and to enhance public safety by enforcing off-limit areas. Achieving these objectives requires RRAD to maintain staffing of trained and capable natural resources law enforcement personnel at levels sufficient to effectively monitor and enforce all natural resources laws and regulations and to ensure that all natural resources law enforcement personnel meet the requirements for training and weapons qualification for their experience and rank, and receive appropriate continuing education to enhance understanding of natural resources and ecosystem management.

RRAD adheres to all Texas hunting and fishing laws. The RRAD Provost Marshal is responsible for enforcing all hunting, fishing, and trapping laws and regulations. DPW establishes harvest quotas and organized hunts; issues special tags and permits; and maintains records of take, hours of fishing and hunting, and operation of check stations and game inventory.

Natural resources laws and regulations are enforced at RRAD by law enforcement personnel conducting patrols over the entire installation, prioritizing sensitive resources protection; educating military personnel and the public about natural resources protection and how to report violations; and filing reports for all known violations and law enforcement actions.

The training and qualifications of all law enforcement personnel are periodically reviewed (e.g., annually or semiannually) to ensure that training and performance meet current requirements.

Under this INRMP, RRAD will implement the following management measures related to conservation law enforcement:

- Maintain staffing of trained and capable natural resources law enforcement personnel at levels sufficient to effectively monitor and enforce all natural resources laws and regulations.
- Ensure that all natural resources law enforcement personnel meet the requirements for training and weapons qualification for their experience and rank, and receive appropriate

continuing education to enhance understanding of natural resources and ecosystem management.

6.20 SUMMARY OF MANAGEMENT MEASURES

A summary of resource-specific management measures is presented in Table 13. Selected measures that pertain to multiple resources (e.g., forestry, terrestrial habitat, small game) are presented in each resource section so that a complete set of resources management measures are presented for each section. General management measures that cut across all resources areas, as outlined in the section above, are also presented in the table. Table 13 also includes all resources management measures pertaining to inventorying and monitoring under each resource area, as appropriate. To facilitate an evaluation of inventorying and monitoring efforts, however, a separate list of inventorying and monitoring activities is included.

Table 13.
Summary of management measures

Resource Area: Data Storage and Analysis **Management Objective:** Maintain and use natural resources data to ensure management decisions are based on the most current and best available information.
Management Measures • Use GPS to map and inventory natural resources. • Update GIS coverages for all natural resource areas as additional data is obtained.
Resource Area: Operations and Activities **Management Objective:** Develop cost-effective maintenance budgets and decrease the number of vehicles stored on the Depot.
Management Measures • Continue to follow the Depot's plans and regulations for specific resource or program management activities when conducting its operations and activities. • Manage roads under the forestry program, and coordinate with DPW to maintain infrastructure elements.
Resource Area: Fish and Wildlife Management **Management Objectives:** Provide high-quality habitat for native fish and wildlife species that supports healthy and balanced wildlife populations and enhances biodiversity.
Management Measures • Improve habitat quality for wildlife through a variety of ecosystem management techniques such as prescribed fires, thinning, and improvement of overstocked stands and periodic timber harvesting using appropriate silvicultural systems for the region. • Use appropriate native vegetation species and suitable genetic growing stock during reforestation and ecosystem restoration projects to improve diversity and quality of native forage for wildlife. • Make installation natural resources available to agencies and conservation organizations to conduct trials and collect experimental data on forage that will benefit flora and fauna resources. • Conduct spotlight and wildlife observation surveys annually to determine the harvest number for deer hunting season each year. • Conduct a turkey population survey to establish baseline data on the turkey population size and continue surveying at regular intervals to establish population trends. • Conduct silt removal, bottom contouring, shoreline diversification, dam and spillway renovation, and riparian habitat management as necessary. • Monitor aquatic weeds and implement necessary control measures. • Develop databases from PLS information to track the status and trends of habitat quality.

- Evaluate the quantitative fish survey completed in 2017 and use it to update the Fisheries Management Plan. Incorporate it into future natural resources planning and decision-making.

Resource Area: Special Status Species Management

Management Objectives: Protect and improve habitats suitable for plant and animal species federally listed as rare, threatened, or endangered, or those species with the potential to be listed in the future.

Management Measures

- Coordinate with USFWS regarding steps to be taken to ensure the protection of any federally protected species, should they be found on the Depot.
- Coordinate with TPWD to ensure that appropriate procedures are followed and permits are obtained if handling or relocating state-listed species is required because of Depot operations and to avoid take.
- Use the minimum amount of night-time lighting needed for safety and security to light only the ground and reduce glare, and to use dark-sky friendly lighting that minimizes blue light emissions, and is on only when needed, down-shielded, and only as bright as necessary to minimize impacts on night-migrating birds.
- Inform employees and contractors of the potential for the state-listed threatened timber rattlesnake to occur in certain parts of the installation to avoid impacting this and other snakes.
- Translocate rare animal species that will not readily leave an area being disturbed (such as by construction) the minimum distance possible from the location where they are found but no greater than 1 mile, and preferably within 100-200 yards from the initial encounter location. For purposes of relocation, surveys, monitoring, and research, terrestrial state-listed species may only be handled by persons authorized through the TPWD Wildlife Permits Office.
- When trenching for installation of underground utilities, backfilling should occur as soon as possible after trenching to minimize the number of trenches left open. Trenches left open for more than two daylight hours should be inspected for the presence of trapped reptiles prior to backfilling. Any open trenches or excavation areas should be covered overnight and/or inspected every morning to ensure no reptiles or other wildlife species have been trapped. If trenches cannot be backfilled the day of initial trenching, then escape ramps should be installed at least every 90 meters consisting of short lateral trenches or wooden planks sloping to the surface at an angle of less than 45 degrees.
- Erosion and seed/mulch stabilization materials that avoid entanglement hazards to snakes and other wildlife species should be used. Because the mesh found in many erosion control blankets or mats pose an entanglement hazard to wildlife, use no-till drilling, hydromulching and/or hydroseeding instead of erosion control blankets or mats. If erosion control blankets or mats are used, they should contain no netting or should contain loosely woven, natural fiber netting in which the mesh design allows the threads to move, therefore allowing expansion of the mesh openings. Plastic mesh matting should be avoided.
- Report encounters of state-listed species to the Texas Natural Diversity Database according to the data submittal instructions found at http://tpwd.texas.gov/txndd.
- Inform installation personnel and contractors of the federal- and state-listed species and species of greatest conservation need with potential to occur on RRAD and precautions to take to avoid impacts to rare species if encountered. Wildlife observed during construction should be allowed to safely leave the site.

Resource Area: Water Resources Management

Management Objectives: Monitor water quality, repair and maintain aquatic resource infrastructure such as dams and spillways, establish and maintain streambank and shoreline vegetation, reduce recreational impacts associated with aquatic vegetation, and limit activities near surface waters to those having little to no effect on water quality and aquatic habitats.

Management Measures

- Maintain vegetative buffers along streams and lakes.
- Establish additional vegetation where buffers are insufficient to protect surface waters from sediment and pollution runoff.
- Maintain vegetative buffers along streams.
- Continue to monitor groundwater in the OB/OD area.
- Remove aquatic vegetation from Caney Creek and Elliot Creek Reservoirs by mechanical and chemical methods to reach an overall vegetative cover in the reservoirs of 20 percent.

Resource Area: Wetland Management

Management Objectives: Use appropriate BMPs for wetland protection Depotwide and during forest management operations; develop a Depotwide inventory of wetlands; use GIS to track wetlands and other environmentally sensitive areas; develop and implement a wetland management plan, if deemed necessary; evaluate potential impacts of current mission activities on wetlands and waters of the United States to determine the need for permits; and expedite wetland permitting through a formal assistance agreement with USACE.

Management Measures

- Conduct project-specific jurisdictional field delineations, consistent with current USACE protocols, before implementing activities that could affect wetlands.
- Use appropriate BMPs for wetland protection when conducting silvicultural activities in and near wetlands. This is an ongoing practice at RRAD, and RRAD is, therefore, exempt from obtaining a USACE section 404 permit for silvicultural activities.

Resource Area: Soil Management

Management Objectives: Identify areas subject to erosion and in need of soil stabilization and restoration, minimize soil erosion resulting from mission-related activities, and evaluate areas on the Depot where soils have become degraded (e.g., the old borrow pit site) and determine what restoration measures they require.

Management Measures

- Implement erosion prevention or rehabilitation measures as needed on a case-by-case basis.
- Minimize areas of exposed soils. Use BMPs to minimize erosion when soil disturbance is necessary to support mission objectives.
- Identify areas of high erosion and sediment input through routine inspections.
- Evaluate the effectiveness of BMPs used to reduce erosion and stream sedimentation, and improve upon their effectiveness as necessary.
- Require BMPs to be implemented at construction sites to stabilize soils and minimize erosion.
- Reseed and revegetate cleared areas as appropriate to minimize erosion. Use fast-growing native species so soil stabilization and revegetation can occur in a timely manner.
- Use Depot-generated organic matter (e.g., grass clippings, landscape trimmings, leaves, mulch, wood chips) to enhance soil quality and promote vegetative growth.

Resource Area: Landscape Management

Management Objectives: Maintain attractive landscapes in improved areas, maintain grassed areas outside the developed areas, and maintain the health and vigor of trees and shrubs.

Management Measures

- Seed turf areas, cemeteries, new construction sites, and eroded areas with Bermuda grass.
- Seed road shoulders with Bermuda grass, dallisgrass, Bahia grass, and ryegrass.
- Maintain 10-foot-wide drainage easements vegetated with approved grasses and wildflowers along borders of primary roads.
- Seed and fertilize lawns, shrubs, new construction sites, and eroded areas at product-specific application rates.
- Annually evaluate areas under DPW management that require mowing to determine whether mowing is still required and, if not, determine the potential cost savings of discontinuing it.
- Established areas with wildflowers and low-maintenance grasses as funding permits.
- Evaluate using low-growing native plants and ground cover that do not present a conflict with safety or security concerns in areas that are currently mowed.
- Reduce the mowing frequency as feasible to further reduce grounds maintenance costs in areas where native grasses and wildflowers appear to be naturally seeding.
- Encourage volunteer youth groups to collect seeds of native herbaceous species and redistribute them to add acreage and increase the density of wildflowers.
- Mow areas established in wildflowers less frequently to reduce mowing costs.

Resource Area: Forest Management

Management Objectives: Periodically conduct timber harvests and stand improvement activities; encourage and protect forest regeneration; protect the Depot forests against wildland fires, insects, and diseases; and minimize the conflict between forest management activities and the military mission through coordination between LMB and military support directorates.

Management Measures

- Implement an uneven-aged harvesting system to promote natural reforestation through individual tree selection and understory release.
- Conduct herbicide applications as necessary to improve stand quality and encourage desirable regeneration in pine stands. Coordinate applications with the pest management and fish and wildlife programs.
- Selectively harvest less desirable trees and trees of poor form and quality to allow for superior crop trees to regenerate and dominate the stands.
- Identify aesthetically sensitive resources during the early stages of planning for all timber sales to ensure that those resources are afforded adequate protection.
- Evaluate as necessary forested buffer zones and viewsheds in response to changes in traffic flows, development, and land-use patterns on the Depot and adjacent private lands.
- Conduct light to moderate cuttings along the edge or sight zone of scenic areas or viewsheds consistent with forest health goals and safety concerns.
- Maintain a closed canopy to the extent feasible with light release cuts. Thin areas managed using this approach to a density of 90 stems per acre.
- Convert the remaining slash pine plantations to native conifer species (shortleaf and loblolly pine). Use prescribed fires to promote pine regeneration, and manage hardwood competition on upland sites.
- Maintain a yearly contract for salvage operations to remove timber damaged from insects, storms, fire, or construction. Provide supervision, inspection, and harvest specifications for all field activities. Include in each contract provisions that ensure that each vendor takes appropriate steps to comply with applicable BMPs to protect soil and water quality.
- Thin mature or high-density stands that lack a desirable stand structure down to a residual basal area of 50–60 square feet to allow sunlight to hit the forest floor and encourage desirable regeneration. Follow up in successive years with prescribed burns to help establish regeneration and to facilitate the precommercial thinning of dense regeneration.

Resource Area: Wildland Fire and Prescribed Fire Management

Management Objectives: Prevent damage to natural resources from wildfires, and enhance wildlife habitat and forest regeneration through prescribed fires.

Management Measures

- Continue to conduct prescribed burns during times and conditions when objectives are best met.
- Review the IWFMP annually to ensure it reflects actual conditions on the Depot.
- Review the IWFMP to ensure it is consistent with the requirements for T&E species protection if a T&E species or its habitat is identified on RRAD.

Resource Area: Pest Management

Management Objectives: Prevent or manage pest damage with as little adverse effect on natural resources as feasible.

Management Measures

- Monitor forest health on RRAD through routine visual surveys. Concentrate the surveys on areas at high risk of disease outbreak, insect attacks, or both.
- Upon discovery of active beetle infestation, remove all trees through a salvage contract. Clear-cut a 100- to 200-foot buffer around the center of infestation. Check for possible re-infestation and monitor the infestation area periodically.
- Implement IPM as described in the Depot IPMP.

Resource Area: Invasive Species Management

Management Objectives: Control established invasive species on the Depot, and prevent other invasive species from becoming established.

Management Measures

- Apply herbicides as needed after timber harvests to control the establishment of invasive species and to encourage desirable regeneration.
- Plant harvested areas with native species.
- Trap and hunt feral hogs to minimize overpopulation and the destruction they cause to the Depot's habitats.
- Integrate invasive species management with wildlife, fish, pest, forest, water, and cultural resources management on the Depot and with restoration activities.
- Use regulatory controls and public education to slow the spread of invasive species.

Resource Area: Outdoor Recreation Management

Management Objectives: Support MWR's mission to develop a more robust outdoor recreation program.

Management Measures

- Coordinate with MWR for managing and collecting fees for hunting, fishing, and trapping.
- Protect and enhance the natural resources on which those recreational activities rely.

Resource Area: Climate Change Management

Management Objectives: Prepare for and minimize the effects of climate change on the natural resources on RRAD.

Management Measures

- Conduct a vulnerability assessment addressing the impacts of climate change on natural resources of interest. Determine how identified vulnerabilities might impact the military mission. Identify adaptive management strategies to mitigate the risks and potential impacts of climate change. Review and update the vulnerability assessment either as needed or approximately every 5 years.
- Identify and assess the effects of climate change on RRAD's natural resources, and identify ways to mitigate and adapt to those effects.
- Integrate climate change considerations into natural resources management actions.
- Collaborate with internal and external stakeholders on climate change challenges as opportunities arise.

Resource Area: Cultural Resources Management

Management Objectives: Integrate cultural resources management into natural resources management on the Depot.

Management Measures

- Coordinate natural resources management activities with cultural resources protection protocols.
- Implement cultural resources protection on RRAD as described in the Depot ICRMP.

Resource Area: Public Awareness and Outreach
Management Objectives: Continue to make the Depot's natural resources available to youth programs for ecology projects that jointly benefit natural resources management and youth educational objectives, to universities and other organizations for the study of ecosystems and wildlife, and for other low-impact activities.

Management Measures

- Identify local organizations and universities that show an interest in using Depot land.
- Encourage universities to engage in the study of ecosystems and wildlife on RRAD.

Resource Area: Law Enforcement

Management Objectives: Protect natural resources from criminal destruction and enhance public safety by enforcing off-limit areas.

Management Measures

- Maintain staffing of trained and capable natural resource law enforcement personnel at levels sufficient to effectively monitor and enforce all natural resources laws and regulations.
- Ensure that all natural resources law enforcement personnel meet the requirements for training and weapons qualification for their experience and rank, and receive appropriate continuing education to enhance understanding of natural resources and ecosystem management.

SECTION 7.0 MANAGEMENT GOALS, OBJECTIVES, AND PROJECTS

The emphasis of an INRMP is to achieve certain goals for maintaining and improving the natural environment at an installation. This section lists the goals and objectives for natural resources management on RRAD. Preparing these goals and objectives involved the review and analysis of the current conditions of the existing resources as detailed in section 5 and natural resource management practices as detailed in section 6. The review process included interviewing RRAD personnel, collecting and reviewing existing environmental documentation, and conducting a field reconnaissance at RRAD.

The relationship between natural resources management goals, objectives, and projects on RRAD is as follows:

Goals. Goals are the primary focal point for implementing the INRMP over the 5 years it covers (2018 to 2022). A goal reflects the values of the installation by expressing a vision of a desired condition for the installation's natural resources in the foreseeable future. Each goal is supported by one or more objectives.

Objectives. Each goal is supported by objectives that indicate a management initiative or strategy that will be used to achieve the stated goal. An objective specifically states what will be done and how it will be done.

Projects. Projects are the individual component actions required to achieve an objective. Project statements describe the specific methods and management measures that will be used to achieve the supported objective. Projects are actions that become line items in the proposed budgets for INRMP implementation. They are prioritized based on need, and need is based on the importance of a project in moving the natural resources management program toward successfully achieving its goals. Projects are not listed for all goals and objectives in the plan, but as circumstances or conditions that require natural resources protection arise on RRAD, supporting projects will be formulated to ensure that the goals and objectives are met.

Goals, objectives, and projects are not presented in order of importance. Objectives are listed below each goal, with the associated projects following the objectives.

GOAL 1: PROTECT AND IMPROVE THE HABITATS SUITABLE FOR PLANT AND ANIMAL SPECIES FEDERALLY LISTED UNDER THE ESA AS RARE, THREATENED, OR ENDANGERED OR FOR SPECIES WITH THE POTENTIAL TO BE LISTED IN THE FUTURE

OBJECTIVE 1.1: Manage federal threatened and endangered species in accordance with the Endangered Species Act.

PROJECT 1.1.1: Coordinate with USFWS regarding steps to be taken to ensure the conservation and recovery of any federally protected species if one is found on the Depot.

PROJECT 1.1.2: Conduct a bat survey.

GOAL 2: PROVIDE HIGH-QUALITY HABITAT FOR NATIVE FISH AND WILDLIFE SPECIES THAT SUPPORTS HEALTHY AND BALANCED WILDLIFE POPULATIONS AND ENHANCES BIODIVERSITY

OBJECTIVE 2.1: Manage natural resources on RRAD in accordance with DoD INRMP guidance.

PROJECT 2.1.1: Conduct annual reviews for operation and effect and prepare INRMP updates and revisions as necessary based on results of these reviews.

PROJECT 2.1.2: Conduct a bird and mammal survey.

PROJECT 2.1.3: Coordinate with TPWD to ensure that appropriate procedures are followed and permits are obtained if handling or relocating state-listed species is required because of Depot operations and to avoid take.

PROJECT 2.1.4: Report observations of state-listed species.

PROJECT 2.1.5: Monitor vehicle collisions with wildlife, installing cautionary wildlife crossing signage where appropriate.

PROJECT 2.1.6: Establish and/or maintain areas with wildflowers and low-maintenance grasses as funding permits.

PROJECT 2.1.7: Evaluate the potential of using low-growing native plants and ground cover that do not present a conflict with safety or security concerns in areas that are currently mowed.

PROJECT 2.1.8: Annually evaluate areas under DPW management that require mowing to determine whether mowing is still required and to determine potential cost savings.

PROJECT 2.1.9: Identify and remove abandoned or unnecessary fencing.

PROJECT 2.1.10: Use dark-sky friendly lighting.

PROJECT 2.1.11: Educate installation personnel and contractors of the federal- and state-listed species and species of greatest conservation need that occur or could occur on the installation and how best to avoid impacting these species.

PROJECT 2.1.12: Translocate rare animal species from areas of disturbance to nearby locations.

PROJECT 2.1.13: Ensure to the extent practicable that animals are not trapped in trenches created during construction, and if trapped, are safely removed.

PROJECT 2.1.14: Use erosion and seed/mulch stabilization materials that avoid entanglement hazards to snakes and other wildlife species.

GOAL 3: MANAGE GAME MAMMAL, BIRD, AND FISH SPECIES TO SUPPORT HEALTHY AND BALANCED POPULATIONS

OBJECTIVE 3.1: Provide consumptive recreational opportunities on RRAD to support natural resources management goals.

PROJECT 3.1.1: Conduct deer spotlight and observation surveys.

PROJECT 3.1.2: Conduct a turkey population survey.

PROJECT 3.1.3: Update the Fisheries Management Plan using information from the 2017 quantitative fish survey.

PROJECT 3.1.4: Investigate using iSportsman (or a similar application) for recreational activities and firewood permit sales.

PROJECT 3.1.5: Establish deer season dates and hunting regulations.

PROJECT 3.1.6: Provide hunter briefing for hunters on the installation as a key element in preventative law enforcement.

PROJECT 3.1.7: Provide TPWD with annual population and harvest data for game species annually.

PROJECT 3.1.8: Establish desired hunter and harvest quotas based on population recruitment and mortality estimates, desired hunter density in the field, and access restrictions due to mission activities.

PROJECT 3.1.9: Ensure that DES checks recreationists for licenses, bag and creel limits, and conduct special operations, such as check points and decoy deer.

GOAL 4: MAINTAIN AND PROTECT AQUATIC AND RIPARIAN HABITATS AND WATER QUALITY, RESTORE DEGRADED AQUATIC HABITATS, AND REDUCE THE RECREATIONAL IMPACTS ASSOCIATED WITH AQUATIC VEGETATION

OBJECTIVE 4.1: Monitor water quality, repair and maintain aquatic resource infrastructure such as dams and spillways, establish and maintain streambank and shoreline vegetation, and limit activities near surface waters to those having little to no effect on water quality and aquatic habitats.

PROJECT 4.1.1: Monitor aquatic weed growth in lakes.

PROJECT 4.1.2: Monitor water quality.

PROJECT 4.1.3: Repair and maintain aquatic resource infrastructure such as dams and spillways.

PROJECT 4.1.4: Initiate lake drawdowns to remove siltation, control nuisance vegetation and investigate the need for dam repairs.

PROJECT 4.1.5: Implement measures in waterbodies to correct fish populations, as needed.

PROJECT 4.1.6: Establish and maintain streambank and shoreline vegetation.

PROJECT 4.1.7: Continue to maintain vegetative buffers along streams and lakes.

PROJECT 4.1.8: Continue to establish vegetation where buffers are insufficient to protect surface waters from sediment and pollution runoff.

PROJECT 4.1.9: Limit activities near surface waters to those having little-to-no effect on water quality and aquatic habitats.

PROJECT 4.1.10: Stock channel catfish, fingerling largemouth bass, and threadfin shad, as needed.

PROJECT 4.1.11: Place discarded Christmas trees into lakes and ponds.

PROJECT 4.1.12: Remove aquatic vegetation from Caney Creek and Elliot Creek Reservoirs by mechanical and chemical methods to reach an overall vegetative cover in the reservoirs of 20 percent.

GOAL 5: PROTECT AND PRESERVE WETLANDS IN A MANNER CONSISTENT WITH DOD NATURAL RESOURCES POLICY AND THAT ENSURES NO NET LOSS OF WETLAND HABITAT ON THE DEPOT

OBJECTIVE 5.1: Manage wetlands on the Depot in accordance with the Clean Water Act and to support healthy ecosystems.

PROJECT 5.1.1: Conduct project-specific jurisdictional field delineations before implementing activities that could affect wetlands.

PROJECT 5.1.2: Continue to implement BMPs when conducting silvicultural activities in and near wetlands.

PROJECT 5.1.3: Address problem beavers in wetlands.

PROJECT 5.1.4: Plant native grasses adjacent to wetlands.

PROJECT 5.1.5: Monitor riparian health through annual photo-plots to identify improvements or degradation. Obtain a drone for use in monitoring habitats and establishing plots. Identify and implement restoration as needed.

GOAL 6: MAINTAIN AND ENHANCE THE ECOLOGICAL INTEGRITY OF FOREST HABITATS WHILE SUPPORTING THE MILITARY MISSION

OBJECTIVE 6.1: Periodically conduct timber harvests and stand improvement activities; encourage and protect forest regeneration; protect the Depot forests against wildland fires, insects, and diseases; and minimize the conflict between forest management activities and the military mission through coordination between LMB and military support directorates.

PROJECT 6.1.1: Conduct a forest inventory.

PROJECT 6.1.2: Continue to conduct annual timber harvesting.

PROJECT 6.1.3: Continue to thin and improve overstocked forest stands.

PROJECT 6.1.4: Maintain a yearly contract for salvage operations to remove timber damaged from insects, storms, fire, or construction. Provide supervision, inspection, and harvest specifications for all field activities.

PROJECT 6.1.5: Target less desirable species when thinning timber stands.

PROJECT 6.1.6: Develop and implement long-term reforestation/reclamation plans.

PROJECT 6.1.7: Retain snags and trees with cavities when thinning.

PROJECT 6.1.8: Evaluate the firewood program and develop firewood program guidelines.

PROJECT 6.1.9: Consider impacts of forestry operations on resources protected by federal law as well as state-listed species, state-protected vegetation communities, or communities that are declining. Manage timber sales to improve these communities.

PROJECT 6.1.10: Continue to monitor forest health on RRAD through routine visual surveys, concentrating on areas at high risk of disease outbreak, insect attacks, or both.

GOAL 7: CONTROL WILDLAND FIRE AND USE PRESCRIBED FIRE TO MAINTAIN AND ENHANCE THE ECOLOGICAL INTEGRITY OF FOREST HABITATS WHILE SUPPORTING THE MILITARY MISSION

OBJECTIVE 7.1: Prevent damage to natural resources from wildfires, and enhance wildlife habitat and forest regeneration through prescribed fires.

PROJECT 7.1.1: Continue to conduct prescribed fires.

PROJECT 7.1.2: Coordinate the Prescribed Burn Plan with Cultural Resources.

PROJECT 7.1.3: Assist DES with wildfire detection and prevention as appropriate to reduce wildland and facility damage and prevent injury.

PROJECT 7.1.4: Maintain firebreaks and Forestry Access Roads.

PROJECT 7.1.5: Ensure that Burn Crew training is in accordance with the Integrated Wildland Fire Management Plan.

PROJECT 7.1.6: Update the IWFMP annually or as necessary to ensure it reflects actual conditions on the Depot.

PROJECT 7.1.7: Assist DES with wildfire detection and prevention as appropriate to reduce wildland and facility damage and prevent injury.

GOAL 8: PROTECT SOIL RESOURCES, WATER QUALITY, AND NATIVE HABITATS TO SUPPORT THE MILITARY MISSION; MAINTAIN LANDSCAPED AREAS AND DRAINAGE EASEMENTS; AND ESTABLISH APPROVED VEGETATIVE COVER AS NECESSARY IN DEVELOPED AREAS OF THE DEPOT

OBJECTIVE 8.1: Identify areas subject to erosion and in need of soil stabilization and restoration, minimize soil erosion resulting from mission-related activities, and evaluate areas on the Depot where soils have become degraded (e.g., the old borrow pit site) and determine what restoration measures they require.

PROJECT 8.1.1: Evaluate the effectiveness of BMPs used to reduce stream sedimentation and erosion and improve upon their effectiveness as necessary.

PROJECT 8.1.2: Reseed and revegetate cleared and disturbed areas as appropriate to minimize erosion. Use fast-growing native species so that soil stabilization and revegetation can occur in a timely manner.

PROJECT 8.1.3: Repair gully erosion, as necessary.

PROJECT 8.1.4: Monitor silt transport during construction and disturbance actions.

PROJECT 8.1.5: Develop and implement a restoration plan on borrow areas.

GOAL 9: CONTROL ESTABLISHED NUISANCE, NOXIOUS, AND INVASIVE SPECIES ON THE DEPOT AND PREVENT SUCH SPECIES FROM BECOMING ESTABLISHED ON THE DEPOT

OBJECTIVE 9.1: Prevent or manage damage associated with nuisance, noxious, and invasive species with as little adverse effect on natural resources as feasible.

PROJECT 9.1.1: Obtain permits to deal with problem resident Canada Geese.

PROJECT 9.1.2: Obtain permits to take nests (depredation).

PROJECT 9.1.3: Continue to trap and hunt feral hogs.

PROJECT 9.1.4: Conduct an invasive plant species survey.

GOAL 10: ADAPT NATURAL RESOURCES MANAGEMENT ACTIVITIES TO LONG-TERM CHANGES IN CLIMATE.

OBJECTIVE 10.1: Prepare for and minimize the effects of climate change on the natural resources on RRAD.

PROJECT 10.1.1: Conduct a vulnerability assessment to assess the impacts of climate change on natural resources at RRAD.

PROJECT 10.1.2: Identify adaptive management strategies to mitigate the risks and potential impacts of climate change.

PROJECT 10.1.3: Review and update the vulnerability assessment either as needed or approximately every 5 years.

PROJECT 10.1.4: Initiate and implement a program to monitor climatic indicator species to track climate-influenced changes to vegetative communities.

GOAL 11: PROTECT CULTURAL RESOURCES IN ALL NATURAL RESOURCES MANAGEMENT ACTIVITIES

OBJECTIVE 11.1: Consider impacts on cultural resources in the conduct of all natural resouces management activities.

PROJECT 11.1.1: Coordinate with Cultural Resources on proposed timber sales.

PROJECT 11.1.2: Improve cultural and natural resources program coordination to identify and implement appropriate management activities that enhance inter-program protection and conservation while supporting sustainable operations and military mission.

GOAL 12: SUPPORT MWR'S MISSION TO DEVELOP A MORE ROBUST OUTDOOR RECREATION PROGRAM

OBJECTIVE 12.1: Conduct outreach activities that improve RRAD employee and public understanding and support of natural resouces management activities.

PROJECT 12.1.1: Encourage volunteer youth groups to collect the seeds of native herbaceous species and redistribute them on the Depot to add acreage and increase the density of wildflowers.

PROJECT 12.1.2: Investigate and implement methods to improve communication with RRAD users and the public that promotes environmental awareness (e.g., maintaining an informative website, creating pamphlets and standard operating procedures, developing informational posters).

PROJECT 12.1.3: Provide annual natural and cultural resources program briefings to DPW and DES.

PROJECT 12.1.4: Participate in Earth Day activities at RRAD, and, as requested, provide briefings to school-age class groups.

PROJECT 12.1.5: Submit news articles to local news outreaches.

PROJECT 12.1.6: Present talks to organizations and submit news articles to local news outreaches, as requested.

PROJECT 12.1.7: Support Children's Fishing Derbies.

GOAL 13: ENFORCE NATURAL RESOURCES LAWS AND REGULATIONS

OBJECTIVE 13.1: Ensure that natural resources management activities on RRAD are conducted in accordance with applicable state and federal regulations.

PROJECT 13.1.1: Support a full time CLEO to enforce the hunting and fishing regulations (DES).

PROJECT 13.1.2: Maintain trained government staff at the appropriate level to include cultural resources manager, natural resources manager, wildlife biologist, and forester to oversee, integrate, and coordinate natural and cultural resources.

PROJECT 13.1.3: Attend training and conferences as funding permits (natural and cultural resources staff). Examples include attending the annual conferences for National Military Fish and

Wildlife Association, and The Society of American Foresters National Convention; participating in webinars; and attending training courses.

GOAL 14: MAINTAIN AND USE NATURAL RESOURCES DATA TO ENSURE MANAGEMENT DECISIONS ARE BASED ON THE MOST CURRENT AND BEST AVAILABLE INFORMATION

OBJECTIVE 14.1: Ensure that available natural resources management data is readily available to natural resouces managers.

PROJECT 14.1.1: Develop databases from PLS information.

GOAL 15: SUPPORT AN AGRICULTURAL LEASE PROGRAM ON THE DEPOT TO THE EXTENT FEASIBLE

OBJECTIVE 15.1: Reduce natural resouces management costs while supporting healthy ecosystems and public use.

PROJECT 15.1.1: Investigate the possibility of implementing agricultural outlease for hay production on rights of way and open fields to reduce mowing cost.

SECTION 8.0 IMPLEMENTATION

The Office of the Secretary of Defense considers funding for preparing and implementing this INRMP, as required by the Sikes Act and the associated NEPA documentation, to be a high priority. The economic reality, however, is that not all the projects and programs identified in this INRMP will receive immediate funding. Table 17 (at the end of this section) lists the goals and projects identified in this INRMP. The projects have been organized into three priority-based categories: high priority, medium priority, and low priority. The prioritization of the projects is based on need, and need is based on the importance of a project in moving the natural resources management program toward successfully achieving its goal.

RRAD, AMC, USFWS, and TPWD recognize that year-to-year congressional appropriations for the implementation of the Army's mission change and might require changes in priorities and project implementation schedules. If these changes require deferral, redirection, or cancellation of high-priority projects, RRAD, in consultation with AMC, will determine which projects or plans should be implemented first. Projects that require funding will proceed only after funding is obtained. Nothing in this plan can be interpreted to violate the Anti-Deficiency Act. In every case, RRAD and AMC will ensure that constraints on the military mission are minimized and avoided wherever possible.

It is understood that congressional budget constraints will require increased use of in-house staff to implement the INRMP. Current government-wide goals of reducing the number of federal employees, however, indicate that the employment of additional permanent, full-time natural resources professionals and paraprofessionals will likely be limited during the life of this plan. It is, therefore, assumed that some of the professional work required by this plan will be accomplished by contract, through partnerships, or by limited-term or temporary employees.

The projects identified in this INRMP also have been classified into projects with recurring requirements and projects with nonrecurring requirements. Projects with nonrecurring requirements are further classified as current compliance, maintenance requirements, or enhancement actions beyond compliance. *Must-fund* requirements are projects and activities in the recurring and current compliance categories.

Detailed explanations of the funding categories are provided in Enclosure 4 to DoDI 4715.03. The following descriptively summarizes these categories:

- Recurring Natural Resources Conservation Management Requirements (*must-fund*):
  - Administrative, personnel, and other costs associated with managing the DoD Natural Resources Conservation Program that are necessary to meet applicable compliance requirements in federal and state laws, regulations, EOs, and DoD policies or in direct support of the military mission, with priority given to recurring natural resources conservation management requirements associated with the operation of facilities, installations, and deployed weapons systems.
- Nonrecurring Natural Resources Conservation Management Requirements:
  - *Current Compliance* (*must-fund*): Includes installation projects and activities to support (1) installations out of compliance (e.g., received an enforcement action from an authorized federal or state agency or local authority); (2) signed compliance agreement or consent order; (3) meeting requirements with applicable federal or state laws, regulations, standards, EOs, or DoD policies; (4) immediate and essential maintenance of operational integrity or military mission sustainment; and (5) projects or activities that will be out of compliance if not implemented in the program year.

- *Maintenance Requirements*: Includes projects and activities needed to meet an established deadline beyond the program year and maintain compliance. Examples include (1) compliance with future deadlines; (2) conservation, GIS mapping, and data management to comply with federal, state, and local regulations, EOs, and DoD policy; (3) efforts undertaken in accordance with nondeadline-specific compliance requirements of leadership initiatives; (4) wetlands enhancement to minimize wetlands loss and enhance existing degraded wetlands; and (5) conservation recommendations in biological opinions issued pursuant to the ESA.
- *Enhancement Actions beyond Compliance*: Includes projects and activities that enhance conservation resources or the integrity of the installation mission, or are needed to address overall environmental goals and objectives but are not specifically required by law, regulation, or EO, and are not of an immediate nature. Examples include (1) community outreach activities, (2) educational or public awareness projects, (3) restoration or enhancement of natural resources when no specific compliance requirement dictates a course or timing of action, and (4) management and execution of volunteer and partnership programs.

Must-fund projects and actions that include those required to (1) meet the USFWS special management criteria for T&E species management, (2) provide for qualified natural resources personnel, and (3) prevent resource loss or degradation (e.g., soil loss) that could affect military readiness. Not all projects listed in the INRMP are *must-funds*.

Successful implementation of this INRMP requires an organizational structure that identifies roles and responsibilities, human resources, prioritization of projects and program objectives, funding, command support, and constant review of the progress made in program implementation. This section describes those elements of the program.

8.1 FUNDING

The natural resources program at RRAD receives financial support from appropriated funds (e.g., operations and maintenance) and funded reimbursements (timber management and user fees). The use of funded reimbursements and user fees is restricted by federal law. For example, funded reimbursements may be used only for grazing and timber-related expenses, and user fees may be used only to fund projects related to hunting and fishing. Expenses not directly associated with timber management or with hunting, fishing, trapping, and outdoor recreation must be funded from appropriated funds.

The following paragraphs describe the funding options expected to be available to support the natural resources program at RRAD from 2018 to 2022 and their criteria.

Annual Work Plan. The annual work plan outlines the budget for the LMB for the upcoming fiscal year (FY) including salaries, training, equipment, and supplies needed for natural resources management.

The average costs for implementing this INRMP are presented in Table 14 by program category through which funding is requested. The total annual costs represent an estimate of the cost of implementation; however, some variability from year to year can be expected. Variables that have the potential to affect overall implementation costs include changes in labor and contract costs, the availability of funds, and changes in mission activities.

Table 14.
Projected expenditures for LMB programs FY 2018–2022

	Estimated costs per FY				
Program	**2018**	**2019**	**2020**	**2021**	**2022**
Environmental Conservation—Recurring Costs					
Labor	$377,560	$385,111	$392,813	$400,669	$408,682
Education and Training	$20,000	$20,000	$20,000	$20,000	$20,000
Other Recurring FIFRA – Pest Management Costs	$146,038	$148,958	$151,937	$154,975	$158, 075
Other Recurring Costs	$251,480	$251,480	$251,480	$251,480	$251,480
Environmental Conservation—Nonrecurring Costs					
Threatened and Endangered Species	$0	$50,000	$0	$0	$85,000
Wetlands	$0	$0	$40,000	$0	$0
Other Natural Resources	$76,000	$75,000	$75,000	$150,000	$75,000
Historic and Cultural Resources	$200,000	$0	$0	$0	$0
FIFRA–Pest Management	$0	$0	$0	$0	$0
Total	**$1,071,078**	**$930,549**	**$931,230**	**$977,124**	**$998,237**

Additional project and program funding criteria, outlined in chapter 4, section 4-3 of AR 200-1, are described below.

Fish and Wildlife Conservation Funds. Pursuant to 16 U.S.C. 670a-f, and as described in AR 200-1, chapter 1-6, the Assistant Secretary of the Army will issue planning, programming, budgeting, execution system policy, and guidance for Fish and Wildlife Conservation Fund apportionments. Those fees are solely for defraying costs incurred for fisheries and wildlife management on the installation and are not for the construction of recreational structures such as blinds, deer stands, and fishing piers. Fees are deposited into the Army Fish and Wildlife Conservation Fund account no. 21X5095. Table 15 shows program revenue from 2012 to 2017.

Table 15.
Conservation Reimbursable Program collections FY 2012–2017

	Revenue					
	2012	**2013**	**2014**	**2015**	**2016**	**2017**
Fishing and Hunting Permits	$0	$0	$78,137	$18,873	$3,069	$6,296
Timber Sale Income	$372,362	$501,519	$481,563	$450,100	$416,048	$315,077

Agricultural/Grazing Outleasing and Forestry Programs. All revenue from agriculture and grazing outleases, forest product sales, and sale of equipment procured with Conservation Reimbursable funds is to be deposited into the Army Agricultural/Grazing account or Army Forestry account in accordance with *Defense Finance and Accounting Service (DFAS-IN) Manual 37-100*. Revenues generated from the reimbursable programs are to be used to maintain, improve, or rehabilitate previously degraded ecosystems on the installation. Revenues from agricultural/outleases are to be used only for reimbursement of administrative costs of outleasing and other expenses incurred in support of multiple-land-use management of natural resources. Revenues from forest product sales are to be used only for managing forests and

natural resources that support forest stewardship on land affected by Conservation Reimbursable forestry programs.

8.2 NATURAL RESOURCES MANAGEMENT STAFFING

8.2.1 RRAD Staff

Natural resources management personnel at RRAD oversee the programs and projects identified in this INRMP and their implementation. They are part of the LMB, a branch of the Environmental Division. The RRAD natural resources management staff will require active outside assistance to implement some of the projects discussed in the INRMP.

The personnel who currently constitute the natural resources management staff at RRAD are listed in Table 16.

Table 16.
RRAD Land Management Branch staff

Number of positions (full time)	Position
1	Natural Resources Manager
1	Forester
1	Agronomist
2	Equipment Operator
1	Biologist
1	Pest Controller

8.2.2 Outside Assistance

Implementing some of the projects discussed in this INRMP will require active outside assistance from state and federal agencies, private consortiums and organizations, universities, and/or contractors. Using these resources is the most efficient and cost-effective method for acquiring expertise on a temporary basis. Some parties will be reimbursed for their assistance as agreed upon in a memorandum of understanding and contractual agreements, whereas others will supply assistance in accordance with cooperative agreements.

8.3 ANNUAL REVIEW AND MANAGEMENT PERFORMANCE EVALUATION

Section 101(b)(2) of the Sikes Act [16 U.S.C 670a(b)(2)] states that each INRMP "must be reviewed as to operation and effect by the parties thereto on a regular basis, but not less often than every 5 years." Per DoD policy, the requirement to "review" the INRMP does not entail a revision of every INRMP. The Sikes Act specifically directs that the INRMPs be reviewed "as to operation and effect," emphasizing that the review is intended to determine whether existing INRMPs are being implemented to meet the requirements of the Sikes Act and contribute to the conservation and rehabilitation of natural resources on military installations.

DoD policy requires installations to review INRMPs annually in cooperation with the other parties to the INRMP. Annual reviews facilitate "adaptive management" by providing an opportunity for the parties to review the goals and objectives of the plan, and to establish a realistic schedule for undertaking proposed actions. Updates to the INRMP are included in Appendix J.

DoDI 4715.03 outlines the metrics for natural resources conservation management and the requirements to provide effective annual reviews of the INRMP. These metrics are used to assess the overall health and trends of each installation's natural resources program and to identify and correct potential funding and other resource shortfalls. The Sikes Act requires each installation with significant natural resources to report annually on the status of its INRMP implementation.

The installation reports progress toward meeting natural resources conservation program measures of merit to Deputy Undersecretary of Defense (Installations and Environment) at each environmental management review and to Congress in the *Defense Environmental Programs Annual Report to Congress*. RRAD reports the following:

- The installation name and location
- If the installation meets Sikes Act requirements
- If annual feedback has been received from USFWS
- If annual feedback has been received from TPWD
- Funding requirements in reporting per fiscal year to implement the INRMP
  - Amount required for recurring projects
  - Amount required for nonrecurring projects

RRAD uses Natural Resources Conservation metrics to assess INRMP implementation, measure conservation efforts, ensure no net loss of military testing and training lands across the installation, understand the LMB's installation mission support, and indicate the success of partnerships with USFWS and TPWD.

As outlined in DoDI 4715.03, each installation may define the seven focus areas it uses to assess its specific program requirements, goals, and objectives. The Depot assesses requirements, goals, and objectives of the Sikes Act annually in the following seven focus areas:

- INRMP Project Implementation
  - Are INRMP projects, including follow-up inventorying and monitoring work, properly identified, developed, and submitted for funding?
  - Has project funding been received, obligated, and expended?
  - Have projects been completed, and do they meet expected objectives?
- Federally Listed Species and Designated Critical Habitat
  - Are conservation efforts effective?
  - Does the INRMP provide conservation benefits necessary to preclude critical habitat designation?
  - Are species at risk identified, and are steps being undertaken to preclude listing?
- Partnerships and Effectiveness
  - Has the INRMP review team (i.e., DoD, USFWS, NMFS, and TPWD) been effective in ensuring the INRMP's implementation?
  - Are other partnerships needed to meet INRMP goals?
  - Have other partnerships been effectively used to meet INRMP goals?
- Fish and Wildlife Management and Public Use
  - Are public recreational opportunities such as hunting, fishing, and wildlife viewing available to base residents and employees?

  - Are public recreational opportunities such as hunting, fishing, and wildlife viewing available to the public?
- Team Adequacy
  - Is the installation's natural resources team adequately resourced to fully implement the INRMP?
  - Is the installation's natural resources team adequately trained to fully implement the INRMP?
  - Does the installation encourage retaining existing natural resources personnel to maintain corporate knowledge and manage resources with the most qualified professionals to support the military mission?
- Ecosystem Integrity
  - To what extent are the installation's native ecological systems currently intact?
  - In what ways are the installation's various habitats susceptible to change or damage from different stressors?
  - What stressors affect each habitat type?
- INRMP Impact on the Installation Mission
  - To what degree (i.e., high, medium, or low) are the INRMP and its associated actions supporting the installation's ability to sustain the current and potential future military mission?

8.4 ANNUAL COORDINATION REQUIREMENTS

Section 101(a)(2) of the Sikes Act states that the INRMP must reflect the mutual agreement of USFWS and the state agency "concerning conservation, protection, and management of fish and wildlife resources." To fulfill this requirement, DoDI 4715.03 and DoDM 4715.03 state that all installations with an active INRMP must conduct internal natural resources self-assessments annually and invite USFWS and the state fish and wildlife agency to comment on annual updates as applicable. According to DoDM 4715.03, "installation representatives will, at a minimum, communicate annually with USFWS and State fish and wildlife agency personnel regarding INRMP implementation progress, potential areas of improvement, and expected projects for the coming year" (DoD 2013).

In accordance with DoDI 4715.03, annual reviews "shall use Natural Resources Conservation metrics to assess INRMP implementation, measure conservation efforts, ensure no net loss of military testing and training lands across the various installations, understand the conservation program's installation mission support, and indicate the success of partnerships with the USFWS, State fish and wildlife agencies, and, when applicable, with National Marine Fisheries Service" (DoD 2013).

The purpose of this coordination is to facilitate annual review by USFWS and TPWD. In accordance with DoD guidance, these annual reviews must verify the following:

- Current information on all conservation metrics is available.
- All must-fund projects and activities have been budgeted for and implementation is on schedule.
- All required trained natural resources positions are filled or are in the process of being filled.
- Projects and activities for the upcoming year have been identified and included in the INRMP. An updated project list does not necessitate revising the INRMP.

- All required coordination has occurred.
- All significant changes to the installation's mission requirements or its natural resources have been identified.

Appendix K contains correspondence from coordinating agencies regarding this iteration of the INRMP.

8.5 MONITORING INRMP IMPLEMENTATION

According to DoD guidance, implementation anticipates the execution of all must-fund projects and activities in accordance with specific timeframes identified in the INRMP.

An INRMP is considered to be implemented if an installation:

- Actively requests, receives, and uses funds for *must-fund* projects and activities;
- Ensures that sufficient numbers of professionally trained natural resources management personnel are available to perform the tasks required by the INRMP;
- Coordinates annually with all cooperating offices; and
- Documents specific INRMP actions accomplished each year.

Table 17.
Summary of INRMP Projects

GOAL AND PROJECT NAME	PRIORITY	PROJECTED COST	IMPLEMENTATION	RESPONSIBLE OFFICE
GOAL 1: PROTECT AND IMPROVE THE HABITATS SUITABLE FOR PLANT AND ANIMAL SPECIES FEDERALLY LISTED UNDER THE ESA AS RARE, THREATENED, OR ENDANGERED OR FOR SPECIES WITH THE POTENTIAL TO BE LISTED IN THE FUTURE				
Coordinate with USFWS regarding steps to be taken to ensure the conservation and recovery of any federally protected species if one is found on the Depot	High	$0	Ongoing	LMB + USFWS
Conduct a bat survey	High	$75,000	2022	LMB + Contractor
GOAL 2: PROVIDE HIGH-QUALITY HABITAT FOR NATIVE FISH AND WILDLIFE SPECIES THAT SUPPORTS HEALTHY AND BALANCED WILDLIFE POPULATIONS AND ENHANCES BIODIVERSITY				
Conduct annual reviews for operation and effect and prepare INRMP updates and revisions as necessary based on results of these reviews	High	$0	Ongoing	LMB
Conduct a bird and mammal survey	Medium	$75,000	2022	LMB + Contractor
Coordinate with TPWD to ensure that appropriate procedures are followed and permits are obtained if handling or relocating state-listed species is required because of Depot operations and to avoid take	Medium	$0	2018–2022	LMB + TPWD
Report observations of state-listed species	High	$0	Ongoing	LMB

GOAL AND PROJECT NAME	PRIORITY	PROJECTED COST	IMPLEMENTATION	RESPONSIBLE OFFICE
Monitor vehicle collisions with wildlife, installing cautionary wildlife crossing signage where appropriate	High	$1,000	Ongoing	LMB + DES
Establish and/or maintain areas with wildflowers and low-maintenance grasses as funding permits	Low	$5,000 per acre	Ongoing	LMB
Evaluate the potential of using low-growing native plants and ground cover that do not present a conflict with safety or security concerns in areas that are currently mowed	Low	$10,000	2018–2022	LMB
Annually evaluate areas under DPW management that require mowing to determine whether mowing is still required and to determine potential cost savings	Low	$10,000 per year	Ongoing	LMB
Identify and remove abandoned or unnecessary fencing	Low	$5,000 per year	Ongoing	LMB + DPW
Use dark-sky friendly lighting	Low	$0	New construction	LMB + DPW + Contractor
Educate installation personnel and contractors of the federal- and state-listed species and species of greatest conservation need that occur or could occur on the installation and how best to avoid impacting these species	Low	$0	Ongoing	LMB
Translocate rare animal species from areas of disturbance to nearby locations	Low	$0	Ongoing	LMB + DPW
Ensure to the extent practicable that animals are not trapped in trenches created during construction, and if trapped, are safely removed	Low	$0	Ongoing	LMB + DPW + Contractor
Use erosion and seed/mulch stabilization materials that avoid entanglement hazards to snakes and other wildlife species	Low	$0	Ongoing	LMB + DPW + Contractor
GOAL 3: MANAGE GAME MAMMAL, BIRD, AND FISH SPECIES TO SUPPORT HEALTHY AND BALANCED POPULATIONS				
Conduct deer spotlight and observation surveys	High	$10,000 per year	Ongoing	LMB + DPW
Conduct a turkey population survey	Low	$75,000	2022	LMB + Contractor
Update the Fisheries Management Plan using information from the 2017 quantitative fish survey	High	$0	2018	LMB
Investigate using iSportsman (or a similar application) for recreational activities and firewood permit sales	Low	$0	2019	LMB

GOAL AND PROJECT NAME	PRIORITY	PROJECTED COST	IMPLEMENTATION	RESPONSIBLE OFFICE
Establish deer season dates and hunting regulations	High	$0	2018–2022	LMB + TPWD
Provide hunter briefing for hunters on the installation as a key element in preventative law enforcement	High	$0	2018–2022	LMB
Provide TPWD with annual population and harvest data for game species annually	High	$0	Ongoing	LMB
Establish desired hunter and harvest quotas based on population recruitment and mortality estimates, desired hunter density in the field, and access restrictions due to mission activities	High	$0	2018–2022	LMB
Ensure that DES checks recreationists for licenses, bag and creel limits, and conduct special operations, such as check points and decoy deer	High	$0	Ongoing	DES
GOAL 4: MAINTAIN AND PROTECT AQUATIC AND RIPARIAN HABITATS AND WATER QUALITY, RESTORE DEGRADED AQUATIC HABITATS, AND REDUCE THE RECREATIONAL IMPACTS ASSOCIATED WITH AQUATIC VEGETATION				
Monitor aquatic weed growth in lakes	Medium	$0	Ongoing	LMB
Monitor water quality	Medium	$0	Ongoing	DPW
Repair and maintain aquatic resource infrastructure such as dams and spillways	High	$10,000 per year	Ongoing	LMB + DPW
Initiate lake drawdowns to remove siltation, control nuisance vegetation and investigate the need for dam repairs	High	$0	2020	LMB
Implement measures in waterbodies to correct fish populations, as needed	High	$0	Ongoing	LMB
Establish and maintain streambank and shoreline vegetation	Medium	$0	Ongoing	LMB + DPW
Continue to maintain vegetative buffers along streams and lakes	Medium	$0	Ongoing	LMB + DPW
Continue to establish vegetation where buffers are insufficient to protect surface waters from sediment and pollution runoff	Medium	$25,000 per year	Ongoing	LMB + DPW
Limit activities near surface waters to those having little-to-no effect on water quality and aquatic habitats	Low	$0	Ongoing	LMB

GOAL AND PROJECT NAME	PRIORITY	PROJECTED COST	IMPLEMENTATION	RESPONSIBLE OFFICE
Stock channel catfish, fingerling largemouth bass, and threadfin shad, as needed	High	$30,000 per year	2018–2022	LMB
Place discarded Christmas trees into lakes and ponds	Low	$0	2018–2020	LMB
Remove aquatic vegetation from Caney Creek and Elliot Creek Reservoirs by mechanical and chemical methods to reach an overall vegetative cover in the reservoirs of 20 percent	Medium	$60,000 per year	2018–2022	LMB + Contractor
GOAL 5: PROTECT AND PRESERVE WETLANDS IN A MANNER CONSISTENT WITH DOD NATURAL RESOURCES POLICY AND THAT ENSURES NO NET LOSS OF WETLAND HABITAT ON THE DEPOT				
Conduct project-specific jurisdictional field delineations before implementing activities that could affect wetlands	Low	$30,000 per year	Ongoing	LMB + Contractor
Continue to implement BMPs when conducting silvicultural activities in and near wetlands	Low	$0	Ongoing	LMB + Contractor
Address problem beavers in wetlands	Medium	$0	Ongoing	LMB
Plant native grasses adjacent to wetlands	Low	$10,000	2022	LMB
Monitor riparian health through annual photo-plots to identify improvements or degradation. Obtain a drone for use in monitoring habitats and establishing plots. Identify and implement restoration as needed.	High	$30,000	2022	LMB
GOAL 6: MAINTAIN AND ENHANCE THE ECOLOGICAL INTEGRITY OF FOREST HABITATS WHILE SUPPORTING THE MILITARY MISSION				
Conduct a forest inventory	High	$150,000	2019	LMB + Contractor
Continue to conduct annual timber harvesting	High	$20,000 per year	Ongoing	LMB + USACE
Continue to thin and improve overstocked forest stands	Medium	$20,000 per year	Ongoing	LMB + USACE
Maintain a yearly contract for salvage operations to remove timber damaged from insects, storms, fire, or construction. Provide supervision, inspection, and harvest specifications for all field activities.	Medium	$20,000 per year	Ongoing	LMB + USACE
Target less desirable species when thinning timber stands	High	$0	Ongoing	LMB
Develop and implement long-term reforestation/reclamation plans	High	$0	2022	LMB

GOAL AND PROJECT NAME	PRIORITY	PROJECTED COST	IMPLEMENTATION	RESPONSIBLE OFFICE
Retain snags and trees with cavities when thinning	High	$0	Ongoing	LMB
Evaluate the firewood program and develop firewood program guidelines	Medium	$0	2020	LMB
Consider impacts of forestry operations on resources protected by federal law as well as state-listed species, state-protected vegetation communities, or communities that are declining. Manage timber sales to improve these communities.	High	$0	Ongoing	LMB
Continue to monitor forest health on RRAD through routine visual surveys, concentrating on areas at high risk of disease outbreak, insect attacks, or both	Medium	$0	Ongoing	LMB
GOAL 7: CONTROL WILDLAND FIRE AND USE PRESCRIBED FIRE TO MAINTAIN AND ENHANCE THE ECOLOGICAL INTEGRITY OF FOREST HABITATS WHILE SUPPORTING THE MILITARY MISSION				
Continue to conduct prescribed fires	High	$10,000 per year	Ongoing	LMB + Contractor
Coordinate the Prescribed Burn Plan with Cultural Resources	High	$0	Ongoing	LMB
Assist DES with wildfire detection and prevention as appropriate to reduce wildland and facility damage and prevent injury	High	$0	Ongoing	LMB + DES
Maintain firebreaks and Forestry Access Roads	High	$50,000 per year	Ongoing	LMB
Ensure that Burn Crew training is in accordance with the Integrated Wildland Fire Management Plan	High	$0	Ongoing	LMB
Update the Annual Prescribed Burn Plan to ensure it adequately reflects burn objectives as outlined in the INRMP	Low	$0	Ongoing	LMB
Assist DES with wildfire detection and prevention as appropriate to reduce wildland and facility damage and prevent injury	High	$0	Ongoing	LMB + DES
GOAL 8: PROTECT SOIL RESOURCES, WATER QUALITY, AND NATIVE HABITATS TO SUPPORT THE MILITARY MISSION; MAINTAIN LANDSCAPED AREAS AND DRAINAGE EASEMENTS; AND ESTABLISH APPROVED VEGETATIVE COVER AS NECESSARY IN DEVELOPED AREAS OF THE DEPOT				
Evaluate the effectiveness of BMPs used to reduce stream sedimentation and erosion and improve upon their effectiveness as necessary	Low	$0	Ongoing	LMB

GOAL AND PROJECT NAME	PRIORITY	PROJECTED COST	IMPLEMENTATION	RESPONSIBLE OFFICE
Reseed and revegetate cleared and disturbed areas as appropriate to minimize erosion. Use fast-growing native species so that soil stabilization and revegetation can occur in a timely manner.	Medium	$10,000 per year	Ongoing	LMB + DPW
Repair gully erosion, as necessary	Medium	$5,000 per year	Ongoing	LMB + DPW
Monitor silt transport during construction and disturbance actions	Medium	$0	Ongoing	LMB + DPW
Develop and implement a restoration plan on borrow areas	Medium	$0	2022	LMB
GOAL 9: CONTROL ESTABLISHED NUISANCE, NOXIOUS, AND INVASIVE SPECIES ON THE DEPOT AND PREVENT SUCH SPECIES FROM BECOMING ESTABLISHED ON THE DEPOT				
Obtain permits to deal with problem resident Canada Geese	Medium	$0	2020	LMB
Obtain permits to take nests (depredation)	Medium	$0	2020	LMB
Continue to trap and hunt feral hogs	High	$10,000 per year	Ongoing	LMB
Conduct an invasive plant species survey	Medium	$35,000	2022	LMB + Contractor
GOAL 10: ADAPT NATURAL RESOURCES MANAGEMENT ACTIVITIES TO LONG-TERM CHANGES IN CLIMATE				
Conduct a vulnerability assessment to assess the impacts of climate change on natural resources at RRAD	Low	$40,000	2020	LMB + Contractor
Identify adaptive management strategies to mitigate the risks and potential impacts of climate change	Low	$20,000	2020–2022	LMB + Contractor
Review and update the vulnerability assessment either as needed or approximately every 5 years	Low	$10,000	2022	LMB + Contractor
Initiate and implement a program to monitor climatic indicator species to track climate-influenced changes to vegetative communities	Low	$10,000	2022	LMB + Contractor
GOAL 11: PROTECT CULTURAL RESOURCES IN ALL NATURAL RESOURCES MANAGEMENT ACTIVITIES				
Coordinate with Cultural Resources on proposed timber sales	High	$0	Ongoing	LMB
Improve cultural and natural resources program coordination to identify and implement appropriate management activities that enhance inter-program protection and	High	$0	Ongoing	LMB

GOAL AND PROJECT NAME	PRIORITY	PROJECTED COST	IMPLEMENTATION	RESPONSIBLE OFFICE
conservation while supporting sustainable operations and military mission				
GOAL 12: SUPPORT MWR'S MISSION TO DEVELOP A MORE ROBUST OUTDOOR RECREATION PROGRAM				
Encourage volunteer youth groups to collect the seeds of native herbaceous species and redistribute them on the Depot to add acreage and increase the density of wildflowers	Low	$0	Ongoing	LMB
Investigate and implement methods to improve communication with RRAD users and the public that promotes environmental awareness (e.g., maintaining an informative website, creating pamphlets and standard operating procedures, developing informational posters).	Low	$0	Ongoing	LMB + Contractor
Provide annual natural and cultural resources program briefings to DPW and DES	Medium	$0	Ongoing	LMB
Participate in Earth Day activities at RRAD, and, as requested, provide briefings to school-age class groups	Low	$0	Ongoing	LMB
Submit news articles to local news outreaches	Low	$0	Ongoing	LMB
Present talks to organizations and submit news articles to local news outreaches, as requested	Low	$0	Ongoing	LMB
Support Children's Fishing Derbies	Low	$0	2018–2020	LMB
GOAL 13: ENFORCE NATURAL RESOURCES LAWS AND REGULATIONS				
Support a full time CLEO to enforce the hunting and fishing regulations (DES)	High	$80,000	Ongoing	LMP + DES
Maintain trained government staff at the appropriate level to include cultural resources manager, natural resources manager, wildlife biologist, and forester to oversee, integrate, and coordinate natural and cultural resources	High	$350,000 per year	Ongoing	LMB
Attend training and conferences as funding permits (natural and cultural resources staff). Examples include attending the annual conferences for National Military Fish and Wildlife Association, and The Society of American Foresters National Convention; participating in	High	$20,000 per year	Ongoing	LMB

GOAL AND PROJECT NAME	PRIORITY	PROJECTED COST	IMPLEMENTATION	RESPONSIBLE OFFICE
webinars; and attending training courses.				
GOAL 14: MAINTAIN AND USE NATURAL RESOURCES DATA TO ENSURE MANAGEMENT DECISIONS ARE BASED ON THE MOST CURRENT AND BEST AVAILABLE INFORMATION				
Develop databases from PLS information	Medium	$50,000	Ongoing	LMB
GOAL 15: SUPPORT AN AGRICULTURAL LEASE PROGRAM ON THE DEPOT TO THE EXTENT FEASIBLE				
Investigate the possibility of implementing agricultural outlease for hay production on rights of way and open fields to reduce mowing cost	Low	$0	2022	LMB + USACE

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Appendix A. Soil Maps of RRAD

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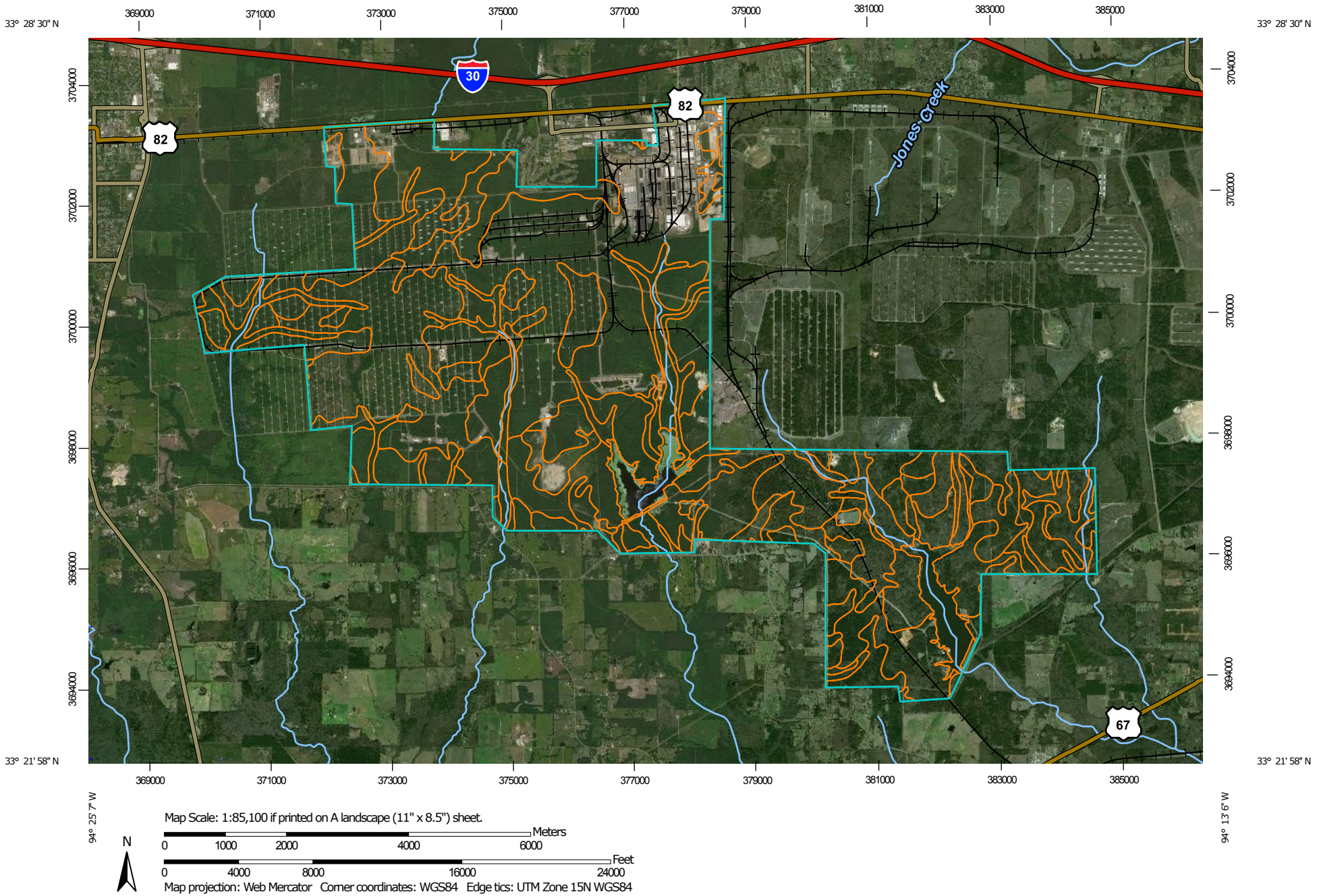
Soil Map—Bowie County, Texas
(RRAD)



Map Scale: 1:85,100 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 1000 2000 4000 6000

Feet
0 4000 8000 16000 24000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Bowie County, Texas
Survey Area Data: Version 13, Sep 29, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

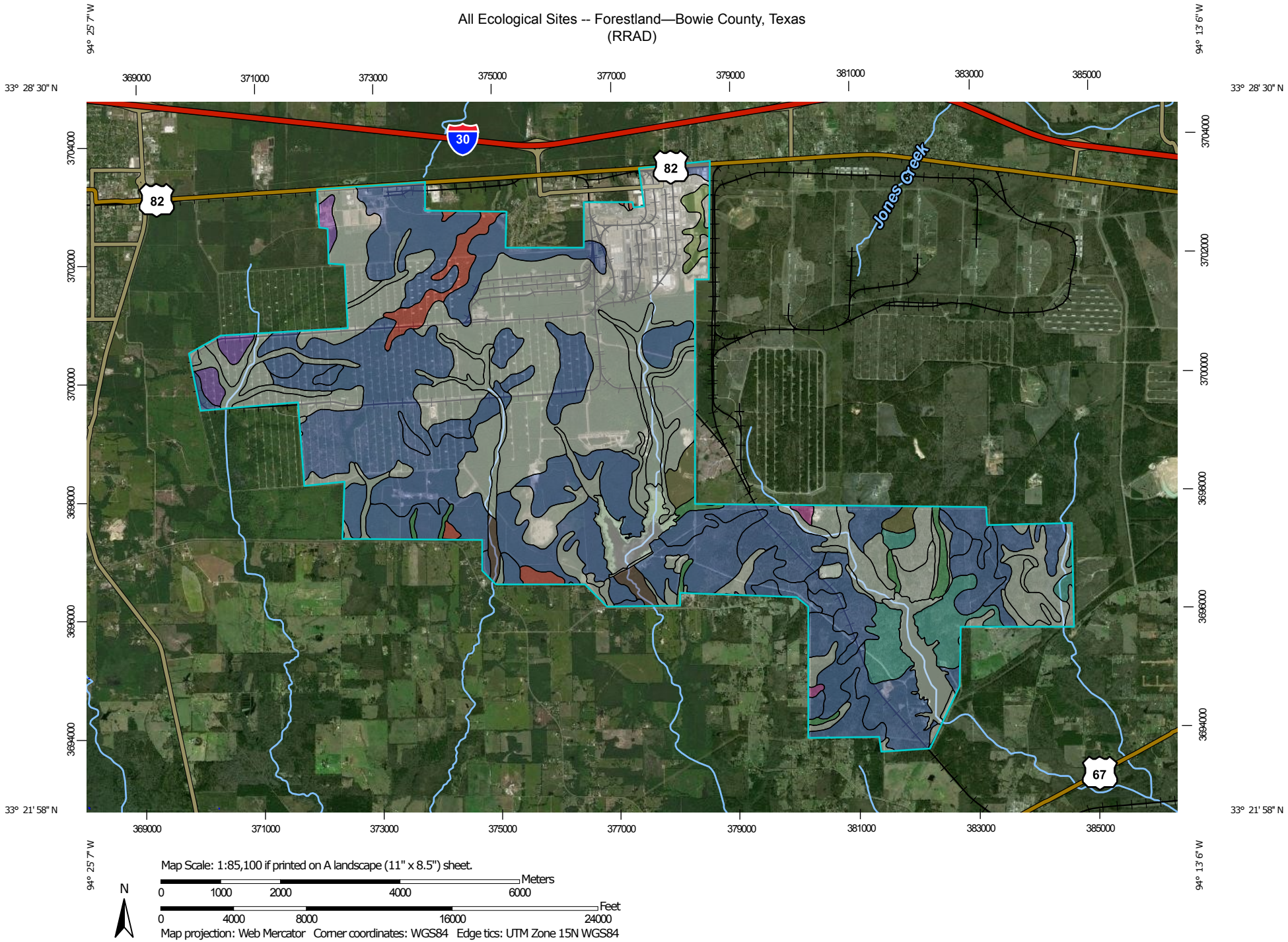
Date(s) aerial images were photographed: May 12, 2016—Feb 15, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Adaton-Muskogee complex	261.9	1.8%
2	Alusa loam	146.2	1.0%
3	Amy silt loam, frequently flooded	100.9	0.7%
4	Annona loam, 1 to 3 percent slopes	4,282.2	29.2%
8	Blevins silt loam, 1 to 3 percent slopes	150.8	1.0%
12	Darden loamy fine sand, 8 to 12 percent slopes	134.8	0.9%
13	Eylau very fine sandy loam, 0 to 3 percent slopes	671.3	4.6%
18	McKamie loam, 1 to 5 percent slopes	480.9	3.3%
25	Rosalie loamy fine sand, 2 to 5 percent slopes	30.0	0.2%
26	Ruston loamy fine sand, 2 to 5 percent slopes	0.2	0.0%
27	Ruston fine sandy loam, 1 to 3 percent slopes	44.5	0.3%
28	Ruston fine sandy loam, 3 to 8 percent slopes	1,376.9	9.4%
35	Sardis silt loam, 0 to 1 percent slopes, frequently flooded	1,016.8	6.9%
36	Sawyer silt loam, 0 to 3 percent slopes	4,208.3	28.7%
42	Thenas fine sandy loam, frequently flooded	151.2	1.0%
43	Udorthents, Loamy, and Clayey	218.2	1.5%
46	Woodtell very fine sandy loam, 5 to 12 percent slopes	338.5	2.3%
47	Woodtell gravelly sandy loam, 3 to 8 percent slopes	497.3	3.4%
48	Wrightsville-Rodessa complex	86.5	0.6%
DAM	Dams	8.0	0.1%
W	Water	450.3	3.1%
Totals for Area of Interest		**14,655.7**	**100.0%**

All Ecological Sites -- Forestland—Bowie County, Texas
(RRAD)



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

F133BY001TX
F133BY002TX
F133BY005TX
F133BY006TX
F133BY010TX
F133BY012TX
F133BY013TX
F133BY014TX
F133BY017TX
Not rated or not available

Soil Rating Lines

F133BY001TX
F133BY002TX
F133BY005TX
F133BY006TX
F133BY010TX
F133BY012TX
F133BY013TX
F133BY014TX
F133BY017TX
Not rated or not available

Soil Rating Points

F133BY001TX
F133BY002TX
F133BY005TX
F133BY006TX
F133BY010TX
F133BY012TX
F133BY013TX
F133BY014TX
F133BY017TX
Not rated or not available

Water Features

Streams and Canals

Transportation

Rails
Interstate Highways
US Routes
Major Roads
Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Bowie County, Texas
Survey Area Data: Version 13, Sep 29, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 12, 2016—Feb 15, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

All Ecological Sites — Forestland

Map unit symbol	Map unit name	Component name (percent)	Ecological site	Acres in AOI	Percent of AOI
1	Adaton-Muskogee complex	Adaton (70%)	F133BY001TX — Depression	261.9	1.8%
		Muskogee (20%)			
		Unnamed, hydric (5%)			
		Wrightsville (5%)	F133BY012TX — Wet Terrace		
2	Alusa loam	Alusa (75%)	F133BY002TX — Seasonally Wet Upland	146.2	1.0%
		Unnamed (25%)			
3	Amy silt loam, frequently flooded	Amy (75%)	F133BY017TX — Loamy Bottomland	100.9	0.7%
		Unnamed (25%)			
4	Annona loam, 1 to 3 percent slopes	Annona (85%)		4,282.2	29.2%
		Alusa (10%)			
		Unnamed (5%)			
8	Blevins silt loam, 1 to 3 percent slopes	Blevins (80%)	F133BY005TX — Loamy Upland	150.8	1.0%
		Unnamed (20%)			
12	Darden loamy fine sand, 8 to 12 percent slopes	Darden (80%)	F133BY010TX — Very Deep Sandy Upland	134.8	0.9%
		Unnamed (20%)			
13	Eylau very fine sandy loam, 0 to 3 percent slopes	Eylau (80%)	F133BY005TX — Loamy Upland	671.3	4.6%
		Adaton (10%)	F133BY001TX — Depression		
		Unnamed (10%)			
18	McKamie loam, 1 to 5 percent slopes	McKamie, AFFR 25-30 (80%)	F133BY013TX — Terrace	480.9	3.3%
		Unnamed (20%)			
25	Rosalie loamy fine sand, 2 to 5 percent slopes	Rosalie, AFFR 25-30 (80%)	F133BY006TX — Northern Sandy/ Loamy Upland	30.0	0.2%
		Unnamed (20%)			
26	Ruston loamy fine sand, 2 to 5 percent slopes	Ruston, AFFR 25-30 (80%)	F133BY005TX — Loamy Upland	0.2	0.0%
		Unnamed (20%)			

Map unit symbol	Map unit name	Component name (percent)	Ecological site	Acres in AOI	Percent of AOI
27	Ruston fine sandy loam, 1 to 3 percent slopes	Ruston (85%)	F133BY005TX — Loamy Upland	44.5	0.3%
		Smithdale (9%)	F133BY005TX — Loamy Upland		
		Malbis (5%)	F133BY007TX — Southern Sandy/ Loamy Upland		
		Unnamed, hydric (1%)			
28	Ruston fine sandy loam, 3 to 8 percent slopes	Ruston (85%)	F133BY005TX — Loamy Upland	1,376.9	9.4%
		Savannah (8%)			
		Smithdale (5%)			
		Malbis (2%)			
35	Sardis silt loam, 0 to 1 percent slopes, frequently flooded	Sardis (75%)		1,016.8	6.9%
		Guyton (10%)			
		Una (10%)			
		Urbo (5%)			
36	Sawyer silt loam, 0 to 3 percent slopes	Sawyer, AFFR 25-30 (80%)	F133BY005TX — Loamy Upland	4,208.3	28.7%
		Adaton (10%)	F133BY001TX — Depression		
		Unnamed (10%)			
42	Thenas fine sandy loam, frequently flooded	Thenas (80%)	F133BY014TX — Stream Bottomland	151.2	1.0%
		Unnamed (20%)			
43	Udorthents, Loamy, and Clayey	Udorthents (90%)		218.2	1.5%
		Unnamed (10%)			
46	Woodtell very fine sandy loam, 5 to 12 percent slopes	Woodtell (85%)		338.5	2.3%
		Unnamed (10%)			
		Amy (2%)			
		Gladewater (2%)			
		Texark (1%)			
47	Woodtell gravelly sandy loam, 3 to 8 percent slopes	Woodtell (85%)		497.3	3.4%
		Unnamed (15%)			
48	Wrightsville-Rodessa complex	Wrightsville, AFFR 30-42 (75%)	F133BY012TX — Wet Terrace	86.5	0.6%
		Rodessa (15%)	F133BY012TX — Wet Terrace		
		Unnamed (10%)			
DAM	Dams	Dams (100%)		8.0	0.1%

Map unit symbol	Map unit name	Component name (percent)	Ecological site	Acres in AOI	Percent of AOI
W	Water	Water (100%)		450.3	3.1%
Totals for Area of Interest				**14,655.7**	**100.0%**

Appendix B. Species likely to occur in Bowie County, Texas

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Table 1
AMPHIBIAN SPECIES THAT MAY BE PRESENT IN BOWIE COUNTY, TEXAS

COMMON NAME*	SCIENTIFIC NAME
American Toad*	*Bufo americanus*
Blanchard's Cricket Frog*	*Acris crepitans blanchardi*
Bronze Frog*	*Rana clamitans clamitans*
Bullfrog*	*Rana catesbeiana*
Central Newt	*Notophthalmus viridescens louisianensis*
Crawfish Frog*	*Rana areolata*
Cricket Frog*	*Acris crepitans*
Dwarf American Toad*	*Bufo americanus charlesmithi*
Dwarf Salamander	*Eurycea quadridigitata*
Eastern (Hurter's) Spadefoot	*Scaphiopus holbrooki/hurteri*
Eastern Narrowmouth Toad*	*Gastrophryne carolinensis*
East Texas Toad	*Bufo velatus*
Fowler's Toad*	*Bufo fowleri*
Gray Tree Frog*	*Hyla cinerea and versicolor*
Green Frog	*Rana clamitans*
Green Tree Frog*	*Hyla cinera*
Great Plains Narrowmouth Toad	*Gastrophryne olivacea*
Lesser Siren (Salamander)	*Siren intermedia*
Marbled Salamander	*Ambystoma opacum*
Pickerel Frog	*Rana palustris*
Red-spotted Newt	*Notophthalmus viridescens*
Smallmouth Salamander	*Ambystoma texanum*
Southern Leopard Frog*	*Rana sphenocephala*
Spotted Chorus Frog*	*Pseudacris clarkii*
Spotted Salamander	*Ambystoma maculatum*
Spring Peeper*	*Pseudacris crucifer*
Striped Chorus Frog	*Pseudacris triseriata*
Three-toed Amphiuma	*Amphiuma tridactylum*
Upland Chorus Frog*	*Pseudacris triseriata feriarum*
Woodhouse's Toad*	*Bufo woodhousii*

* Identified on RRAD during 2002 and/or 2011–2012 surveys.

Table 2
REPTILE SPECIES THAT MAY BE PRESENT IN BOWIE COUNTY, TEXAS

COMMON NAME*	SCIENTIFIC NAME
Alligator Snapping Turtle*	*Macroclemys temminickii*
American Alligator*	*Aliigator mississippiensis*
Broadhead Skink	*Eumeces laticeps*
Brown Snake	*Storeria dekayi*
Coachwhip	*Mastocophis flagellum*
Coal Skink	*Eumeces anthracinus*
Common Garter Snake*	*Thamnophis sirtalis*
Common Kingsnake	*Lampropeltis getula*
Common Map Turtle*	*Graptemys geographica*
Common Musk Turtle*	*Sternotherus odoratus*
Copperhead*	*Agkistrodon contortrix*
Cottonmouth*	*Agkistrodon piscivorus*
Diamondback Water Snake*	*Nerodia rhombifer*
Eastern Box Turtle*	*Terrapene carolina*
Eastern Hognose Snake	*Heterodon platirhinos*
Eastern Mud Turtle	*Kinosternon subrubrum*
Eastern Racer*	*Coluber constrictor*
Eastern Rat Snake	*Elaphe obsoleta*
Eastern Worm Snake	*Carphophis amoenus*
False Map Turtle	*Graptemys pseudogeographica*
Fence Lizard*	*Sceloporus undulatus*
Five-lined Skink*	*Eumeces fasciatus*
Flathead Snake	*Tantilla gracilis*
Graham's Crayfish Snake	*Regina grahami*
Glossy Crayfish Snake	*Regina rigida*
Green Anole*	*Anolis carolinensis*

COMMON NAME*	SCIENTIFIC NAME
Green Water Snake*	*Nerodia cyclopean*
Ground Skink*	*Scinella lateralis*
Gulf Crayfish Snake	*Regina regina sinicola*
Lined Snake	*Tropidoclonion lineatum*
Milk Snake	*Lampropeltis triangulum*
Mississippi Map Turtle*	*Graptemys kohnii*
Mud Snake	*Farancia abacura*
Northern Prairie Skink	*Eumeces septentionalis*
Oachita Map Turtle*	*Graptemys ouachitensis*
Plainbelly Water Snake	*Nerodia erythrogaster*
Prairie Kingsnake	*Lampropeltis calligaster*
Pygmy Rattlesnake	*Sistrurus miliarius*
Razorback Musk Turtle	*Kinosternon carinatum*
Redbelly Snake	*Storeria occipitomaculata*
Ringneck Snake*	*Diadophis punctatus*
River Cooter (Eastern)	*Pseudemys concinna*
Rough Earth Snake	*Virginia striatula*
Rough Green Snake*	*Opheodrys aestivus*
Six-lined Racerunner	*Cnemidophorus sexlineatus*
Slender Glass Lizard	*Ophisaurus cornutum*
Slider*	*Trachemys scripta*
Snapping Turtle*	*Chelydra serpentina*
Southern Coal Skink	*Eumeces anthracinus pluvialis*
Southern Prairie Skink	*Eumeces septentrionalis obtusirostris*
Southern Water Snake*	*Nerodia fasciata*
Stinkpot (Turtle)	*Konosternon odoratum*
Texas Horned Lizard	*Phrynosoma cornutum*
Texas River Cooter*	*Pseudemys texana*
Timber Rattlesnake	*Crotalus horridus*
Western Chicken Turtle*	*Deirochelys reticularia*
Western Hognose Snake	*Heterodon nasicus*
Western Ribbon Snake	*Thamnophis proximus*
Western Worm Snake	*Carphophis vermis*

* Identified on RRAD during 2002 and/or 2011–2012 surveys.

TABLE 3
BIRD SPECIES THAT MAY BE PRESENT IN BOWIE COUNTY, TEXAS

COMMON NAME*	SCIENTIFIC NAME
Acadian Flycatcher	*Empidonax virescens*
American Bittern	*Botaurus lentiginosus*
American Black Duck	*Anas rubripes*
American Coot	*Fulica americana*
American Crow*	*Corvus brachyrhynchos*
American Golden-Plover	*Pluvialis dominicus*
American Goldfinch*	*Carduelis tristis*
American Kestrel*	*Falco sparverius*
American Pipit	*Anthus rubescens*
American Redstart	*Setophaga ruticilla*
American Robin*	*Turdus migratorius*
American Tree Sparrow	*Spizella arborea*
American White Pelican	*Pelecanus erythrorhynchos*
American Widgeon	*Anas americana*
American Woodcock	*Scolopax minor*
Anhinga	*Anhinga anhinga*
Audubon's Warbler	*Dendroica auduboni*
Bachman's Sparrow	*Aimophila aestivalis*
Baird's Sandpiper	*Calidris bairdii*
Bald Eagle	*Haliaeetus leucocephalus*
Baltimore Oriole	*Icterus galbula*
Bank Swallow	*Riparia riparia*

COMMON NAME*	SCIENTIFIC NAME
Barn Swallow*	*Hirundo rustica*
Barred Owl*	*Strix varia*
Bay-breasted Warbler	*Dendroica castanea*
Bell's Vireo	*Vireo bellii*
Belted Kingfisher*	*Ceryle alcyon*
Bewick's Wren*	*Thryomanes bewickii*
Black Rail	*Laterallus jamaicensis*
Black Tern	*Chlidonias niger*
Black Vulture*	*Coragyps atratus*
Black-and-White Warbler	*Mniotilta varia*
Black-and-white Warbler*	*Mniotilta varia*
Black-billed Cuckoo	*Coccyzus erythrophthalmus*
Blackburnian Warbler	*Dendroica fusca*
Black-crowned Night Heron*	*Nycticorax nycticorax*
Black-headed Grosbeak	*Pheucricus melanocephalus*
Black-headed Gull	*Larus ridibundus*
Black-necked Stilt	*Himantopus mexicanus*
Blackpoll Warbler	*Dendroica striata*
Black-throated Blue Warbler	*Dendroica caerulescens*
Black-throated Green Warbler	*Dendroica virens*
Black-throated Sparrow	*Amphispiza bilineata*
Blue Grosbeak*	*Guiraca caerulea*
Blue Jay*	*Cyanocitta cristata*
Blue-gray Gnatcatcher*	*Polioptila caerulea*
Blue-winged Teal*	*Anas discors*
Blue-winged Warbler	*Vermivora pinus*
Bobolink	*Dolichonyx oryzivorus*
Bonaparte's Gull	*Larus philadelphia*
Brewer's Blackbird	*Euphagus cyanocephalus*
Broad-winged Hawk	*Buteo platypterus*
Brown Creeper	*Certhia americana*
Brown Thrasher*	*Toxostoma rufum*
Brown-headed Cowbird*	*Molothrus ater*
Brown-headed Nuthatch*	*Sitta pusilla*
Bufflehead	*Bucephala albeola*
Bullock's Oriole	*Icterus bullockii*
Burrowing Owl	*Athene cunicularia*
California Gull	*Larus californicus*
Canada Goose*	*Branta canadensis*
Canada Warbler	*Wilsonia canadensis*
Canvasback	*Aythya valisineria*
Cape May Warbler	*Dendroica tigrina*
Carolina Chickadee*	*Parus carolinensis*
Carolina Wren*	*Thryothorus ludovicianus*
Caspian Tern	*Sterna caspia*
Cattle Egret*	*Bubulcus ibis*
Cedar Waxwing*	*Bombycilla cedrorum*
Cerulean Warbler	*Dendroica cerulea*
Chestnut-collared Longspur	*Calcarius ornatus*
Chimney Swift*	*Chaetura pelagica*
Chipping Sparrow*	*Spizella passerina*
Chuck-will's-widow*	*Caprimulgus carolinensis*
Cinnamon Teal	*Anas cyanoptera*
Clay-colored Sparrow	*Spizella pallida*
Cliff Swallow*	*Petrochelidon pyrrhonota*
Common Goldeneye	*Bucephala clangula*
Common Grackle*	*Quiscalus quiscula*
Common Loon	*Gavia immer*
Common Merganser	*Mergus merganser*
Common Moorhen	*Gallinula chloropus*
Common Snipe	*Gallinago gallinago*

COMMON NAME*	SCIENTIFIC NAME
Common Tern	*Sterna hirundo*
Common Yellowthroat*	*Geothypis trichas*
Connecticut Warbler	*Oporornis agilis*
Cooper's Hawk*	*Accipiter cooperii*
Dark-eyed Junco (includes the Slate-colored, Oregon, and Gray-headed)	*Junco hyemalis*
Dickcissel	*Spiza americana*
Double-crested Cormorant*	*Phalacrocorax auritus*
Downy Woodpecker*	*Picoides pubescens*
Dunlin	*Calidris aplina*
Eared Grebe	*Podiceps nigricollis*
Eastern Bluebird*	*Sialia sialis*
Eastern Kingbird*	*Tyrannus tyrannus*
Eastern Meadowlark	*Sturnella magna*
Eastern Phoebe*	*Sayornis phoebe*
Eastern Screech Owl	*Otus asio*
Eastern Screech Owl*	*Megascops asio*
Eastern Towhee	*Pipilo erythrophthalmus*
Eastern Wood-pewee*	*Contopus virens*
European Starling*	*Sturnus vulgaris*
Evening Grosbeak	*Coccothraustes vespertinus*
Ferruginous Hawk	*Buteo regalis*
Field Sparrow	*Spizella pusilla*
Forster's Tern	*Sterna forsteri*
Fox Sparrow	*Passerella iliaca*
Franklin's Gull	*Larus pipixcan*
Gadwall	*Anas strepera*
Glacous Gull	*Larus hyperoreus*
Golden Eagle	*Aquila chrysaetos*
Golden-winged Warbler	*Vermivora chrysoptera*
Grasshopper Sparrow	*Ammodramus savannarum*
Gray Catbird*	*Dumetella carolinensis*
Great Blue Heron*	*Ardea herodias*
Great Crested Flycatcher	*Myiarchus crinitus*
Great Egret*	*Ardea alba*
Great Horned Owl*	*Bubo virginianus*
Greater Roadrunner*	*Geococcyx californianus*
Greater Scaup	*Aythya marila*
Greater White-fronted Goose	*Anser albifrons*
Greater Yellowlegs	*Tringa melanoleuca*
Great-tailed Grackle	*Quiscalus mexicanus*
Green Heron*	*Butorides virescens*
Green-backed Heron*	*Butorides striatus*
Green-tailed Towhee	*Pipilo chlorurus*
Green-winged Teal	*Anas crecca*
Hairy Woodpecker*	*Picoides villosus*
Harris's Sparrow	*Zonotrichia querula*
Henslow's Sparrow	*Ammodramus henslowii*
Hermit Thrush*	*Catharus guttatus*
Herring Gull	*Larus argentatus*
Hooded Merganser	*Lophodytes cucullatus*
Hooded Warbler*	*Wilsonia citrina*
Horned Grebe	*Podiceps auritus*
Horned Lark	*Eremophila alpestris*
House Finch	*Carpodacus mexicanus*
House Sparrow*	*Passer domesticus*
House Wren*	*Troglodytes aedon*
Hudsonian Godwit	*Limosa haemastica*
Indigo Bunting*	*Passerina cyanea*
Kentucky Warbler*	*Oporornis formosus*
Killdeer*	*Charadrius vociferous*

COMMON NAME*	SCIENTIFIC NAME
King Rail	*Rallus elegans*
Lapland Longspur	*Calcarius lapponicus*
Lark Bunting	*Calomospiza melanocorys*
Lark Sparrow	*Chondestes grammacus*
Laughing Gull	*Larus atricilla*
Least Bittern	*Ixobrychus exilis*
Least Flycatcher	*Empidonax minimus*
Least Sandpiper	*Calidris minutilla*
Least Tern	*Sterna antillarum*
LeConte's Sparrow	*Ammodramus nelsoni*
Lesser Scaup	*Aythya affinis*
Lesser Yellowlegs	*Tringa flavipes*
Lincoln's Sparrow	*Melospiza lincolnii*
Little Blue Heron	*Egretta caerulea*
Little Gull	*Larus minutus*
Loggerhead Shrike*	*Lanius ludovicianus*
Long-billed Dowitcher	*Limnodromus scolopaceus*
Louisiana Waterthrush	*Seirus motacilla*
Magnolia Warbler	*Dendroica magnolia*
Mallard*	*Anas platyrhynchos*
Marbled Godwit	*Limosa fedoa*
Merlin*	*Falco columbarius*
Mississippi Kite	*Ictinia mississippiensis*
Mottled Duck	*Anas fulvigula*
Mourning Dove*	*Zenaida macroura*
Mourning Warbler	*Oporornis philadelphia*
Myrtle Warbler	*Dendroica coronata*
Nashville Warbler*	*Vermivora ruficapilla*
Nelson's Sharp-tailed Sparrow	*Ammodramus nelsoni*
Northern Bobwhite	*Colinus virginianus*
Northern Cardinal*	*Cardinalis cardinalis*
Northern Flicker*	*Colaptes auratus*
Northern Harrier	*Circus cyaneus*
Northern Mockingbird*	*Mimus polyglottos*
Northern Parula	*Parula americana*
Northern Pintail	*Anas acuta*
Northern Rough-winged Swallow*	*Stelgidopteryx serripennis*
Northern Shoveler	*Anas clypeata*
Northern Waterthrush	*Seirus novaboracensis*
Oldsquaw	*Clangula hyemalis*
Olive-sided Flycatcher	*Contopus cooperi*
Orange-crowned Warbler	*Vermivora celata*
Orchard Oriole	*Icterus spurius*
Osprey*	*Pandion haliaetus*
Ovenbird	*Seirus aurocapllus*
Pacific Loon	*Gavia pacifica*
Painted Bunting*	*Passerina ciris*
Palm Warbler	*Dendroica palmarum*
Pectoral Sandpiper	*Calidris melanotos*
Peregrine Falcon	*Falco peregrinus*
Philadelphia Vireo	*Vireo philadelphica*
Pied-billed Grebe*	*Podilymbus podiceps*
Pileated Woodpecker*	*Dryocopus pileatus*
Pine Siskin	*Carduelis pinus*
Pine Warbler*	*Dendroica pinus*
Piping Plover	*Charadrius melodus*
Prairie Warbler	*Dendroica discolor*
Prothonotary Warbler*	*Protonotaria citrea*
Purple Finch	*Carpodacus purpureus*
Purple Gallinule	*Porpyrula martinica*
Purple Martin*	*Progne subis*

COMMON NAME*	SCIENTIFIC NAME
Red Crossbill	*Loxia curvirostra*
Red Phalarope	*Phalaropus fulicaria*
Red-bellied Woodpecker*	*Melanerpes carolinus*
Red-breasted Merganser	*Mergus serrator*
Red-breasted Nuthatch*	*Sitta canadensis*
Red-cockaded Woodpecker	*Picoides borealis*
Red-eyed Vireo*	*Vireo olivaceus*
Redhead	*Aythya americana*
Red-headed Woodpecker*	*Melanerpes erythrocephalus*
Red-necked Grebe	*Podiceps grisgena*
Red-necked Phalarope	*Phalaropus lobatus*
Red-shouldered Hawk*	*Buteo lineatus*
Red-tailed Hawk*	*Buteo jamaicensis*
Red-throated Loon	*Gavia stellata*
Red-winged Blackbird*	*Agelaius phoeniceus*
Ring-billed Gull	*Larus delawarensis*
Ringnecked Duck	*Aythya collaris*
Rock Dove*	*Columba livia*
Roseate Spoonbill	*Ajaia ajaja*
Rose-breasted Grosbeak	*Pheucticus ludovicianus*
Ross's Goose	*Chen rossii*
Rough-legged Hawk	*Buteo lagopus*
Ruby-crowned Kinglet*	*Regulus calendula*
Ruby-throated Hummingbird*	*Archilochus colibris*
Ruddy Duck	*Oxyura jamaicensis*
Ruddy Turnstone	*Arenaria interpres*
Rufous Hummingbird	*Selasphorus rufus*
Rufous-crowned Sparrow	*Aimophila ruficeps*
Rusty Blackbird	*Euphagus carolinus*
Sabine's Gull	*Xema sabini*
Sanderling	*Calidris alba*
Savannah Sparrow	*Passerculus sandwichensis*
Say's Phoebe	*Sayornis saya*
Scarlet Tanager	*Piranga olivacea*
Scissor-tailed Flycatcher*	*Tyrannus forficatus*
Semipalmated Plover	*Charadrius semipalmatus*
Semipalmated Sandpiper	*Calidris alba*
Sharp-shinned Hawk*	*Accipiter striatus*
Short-billed Dowitcher	*Limnodromus griseus*
Snow Goose	*Chen caerulescens*
Snowy Egret*	*Egretta thula*
Snowy Plover	*Charadrius alexandrinus*
Solitary (Blue-headed) Vireo	*Vireo solitarius*
Solitary Sandpiper	*Tringa solitaria*
Song Sparrow	*Melospiza melodia*
Sora*	*Porzana carolina*
Spotted Sandpiper*	*Actitis macularia*
Spotted Towhee	*Pipilo maculatus*
Stilt Sandpiper	*Calidris himantopus*
Summer Tanager*	*Piranga rubra*
Surf Scoter	*Melanita perspicillata*
Swainson's Hawk	*Buteo swainsoni*
Swainson's Thrush*	*Catharus ustulatus*
Swainson's Warbler	*Limnothlypis swainsonii*
Swallow-tailed Kite	*Elanoides forficatus*
Swamp Sparrow	*Melospiza georgiana*
Tennessee Warbler	*Vermivora peregrina*
Townsend's Warbler	*Dendroica townsendi*
Tree Swallow*	*Tachycineta bicolor*
Tufted Titmouse*	*Baeolophus bicolor*
Tundra Swan	*Cygnus columbianus*

COMMON NAME*	SCIENTIFIC NAME
Turkey Vulture*	*Cathartes aura*
Upland Sandpiper	*Bartramia longicauda*
Varied Thrush	*Ixoreus naevius*
Veery	*Catharus fuscescens*
Vermilion Flycatcher	*Pyrocephalus rubinus*
Vesper Sparrow	*Pooecetes gramineus*
Violet-green Swallow	*Tachycineta thalassina*
Virginia Rail	*Rallus limicola*
Warbling Vireo	*Vireo gilvus*
Western Grebe	*Aechmophorus occidentalis*
Western Kingbird*	*Tyrannus verticalis*
Western Meadowlark	*Sturnella neglecta*
Western Sandpiper	*Calidris mauri*
Western Tanager	*Piranga ludoviciana*
Whimbrel	*Numenius phaeopus*
Whip-poor-will	*Caprimulgus vociferus*
White-breasted Nuthatch*	*Sitta carolinensis*
White-crowned Sparrow	*Zonotrichia leucophrys*
White-eyed Vireo*	*Vireo griseus*
White-rumped Sandpiper	*Calidris fusciollis*
White-throated Sparrow*	*Zonotrichia albicollis*
White-winged Scoter	*Melanitta fusca*
Wild Turkey*	*Meleagris gallopavo*
Willett	*Catoptrophorus semipalmatus*
Willow Flycatcher*	*Empodonax traillii*
Wilson's Phalarope	*Phalaropus tricolor*
Wilson's Plover	*Charadrius wilsonia*
Wilson's Warbler	*Wilsonia pusilla*
Winter Wren	*Troglodytes troglodytes*
Wood Duck*	*Aix sponsa*
Wood Thrush	*Hylocichla mustelina*
Worm-eating Warbler	*Helmitheros vermivorus*
Yellow Rail	*Coturnicops noveboracensis*
Yellow Warbler*	*Dendroica petechia*
Yellow-bellied Flycatcher	*Empidonax flaviventris*
Yellow-bellied Sapsucker	*Sphyrapicus varius*
Yellow-billed Cuckoo	*Coccyzus americanus*
Yellow-breasted Chat	*Icteria virens*
Yellow-crowned Night Heron	*Nyctanassa violacea*
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*
Yellow-rumped Warbler*	*Dendroica coronata*
Yellow-throated Vireo	*Vireo flavifrons*
Yellow-throated Warbler*	*Dendroica dominica*

* Identified on RRAD during 2002 and/or 2011–2012 surveys.

TABLE 4
MAMMAL SPECIES THAT MAY BE PRESENT IN BOWIE COUNTY, TEXAS

COMMON NAME*	SCIENTIFIC NAME
Attwater's Pocker Gopher	*Geomys attwateri*
Baird's Pocket Gopher	*Geomys breviceps*
Beaver*	*Castor canadensis*
Big Brown Bat	*Eptesicus fuscus*
Black-tailed Jackrabbit	*Lepus californicus*
Bobcat*	*Lynx rufus*
Brazilian Free-tailed Bat	*Tadarida brasiliensis*
Common Gray Fox	*Urocyon cinereoargenteus*
Common Muskrat*	*Ondatra zibethicus*
Common Raccoon*	*Procyon lotor*
Cotton Mouse	*Peromyscus gossypinus*

COMMON NAME*	SCIENTIFIC NAME
Coyote*	*Canis latrans*
Deer Mouse*	*Peromyscus maniculatus*
Dog*	*Canis lupus familiaris*
Eastern Cottontail*	*Sylvilagus floridanus*
Eastern Flying Squirrel	*Glaucomys volans*
Eastern Fox Squirrel*	*Sciurus niger*
Eastern Gray Squirrel*	*Sciurus carolinensis*
Eastern Harvest Mouse*	*Reithrodontomys humulis*
Eastern Mole*	*Scalopus aquaticus*
Eastern Pipistrelle Bat	*Pipistrellus subflavus*
Eastern Red Bat	*Lasiurus borealis*
Eastern Spotted Skunk	*Spilogale putorius*
Eastern Woodrat	*Neotoma floridana*
Elliot's Short-tailed Shrew	*Blarina hylophaga*
Evening Bat	*Nycticeius humeralis*
Feral Pig*	*Sus scrofa*
Fulvous Harvest Mouse*	*Reithrodontomys fulvescens*
Golden Mouse*	*Ochrotomys nuttali*
Hispid Cotton Rat*	*Sigmodon hispidus*
Hispid Pocker Mouse	*Chaetodipus hispidus*
Hoary Bat (migratory species)	*Lasiurus cinereus*
House Mouse	*Mus musculus*
Least Shrew*	*Cryptotis parva*
Long-tailed Weasel	*Mustela frenata*
Marsh Rice Rat*	*Oryzomys palustris*
Mink*	*Mustela vison*
Nine-banded Armadillo*	*Dasypus novemcinctus*
Norway Rat	*Rattus norvegicus*
Nutria	*Myocasster coypus*
Prairie Vole*	*Microtus ochrogaster*
Rafinesque's Big-eared Bat	*Plecotus rafinesquii*
Red Fox	*Vulpes vulpes*
Ringtail	*Bassariscus astutus*
River Otter	*Lutra canadensis*
Roof Rat	*Rattus rattus*
Silver-haired Bat	*Lasionycteris noctivagans*
Southeastern Myotis Bat	*Myotis austroriparius*
Southern Short-tailed Shrew*	*Blarina carolinensis*
Striped Skunk*	*Mephitis mephitis*
Swamp Rabbit*	*Sylvilagus aquaticus*
Texas Pocket Gopher	*Geomys personatus*
Virginia Opossum*	*Didelphis virginiana*
White-footed Mouse*	*Peromyscus leucopus*
White-tailed Deer*	*Odocoileus virginianus*
Woodland Vole*	*Microtus pinetorum*

* Identified on RRAD during 2002 and/or 2012 surveys.

Appendix C. Rare, threatened, and endangered species for Bowie County

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BOWIE COUNTY

BIRDS

		Federal Status	State Status
American Peregrine Falcon	*Falco peregrinus anatum*	DL	T

year-round resident and local breeder in west Texas, nests in tall cliff eyries; also, migrant across state from more northern breeding areas in US and Canada, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.

Arctic Peregrine Falcon	*Falco peregrinus tundrius*	DL	

migrant throughout state from subspecies' far northern breeding range, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.

Bachman's Sparrow	*Aimophila aestivalis*		T

open pine woods with scattered bushes and grassy understory in Pineywoods region, brushy or overgrown grassy hillsides, overgrown fields with thickets and brambles, grassy orchards; remnant grasslands in Post Oak Savannah region; nests on ground against grass tuft or under low shrub

Bald Eagle	*Haliaeetus leucocephalus*	DL	T

found primarily near rivers and large lakes; nests in tall trees or on cliffs near water; communally roosts, especially in winter; hunts live prey, scavenges, and pirates food from other birds

Cerulean Warbler	*Dendroica cerulea*		

treetops of riverbank woodlands, swamps, and bottomlands; mainly insectivorous

Henslow's Sparrow	*Ammodramus henslowii*		

wintering individuals (not flocks) found in weedy fields or cut-over areas where lots of bunch grasses occur along with vines and brambles; a key component is bare ground for running/walking

Interior Least Tern	*Sterna antillarum athalassos*	LE	E

subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams, rivers; also know to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc); eats small fish and crustaceans, when breeding forages within a few hundred feet of colony

Peregrine Falcon	*Falco peregrinus*	DL	T

both subspecies migrate across the state from more northern breeding areas in US and Canada to winter along coast and farther south; subspecies (F. p. anatum) is also a resident breeder in west Texas; the two subspecies' listing statuses differ, F.p. tundrius is no longer listed in Texas; but because the subspecies are not easily distinguishable at a distance, reference is generally made only to the species level; see subspecies for habitat.

Piping Plover	*Charadrius melodus*	LT	T

wintering migrant along the Texas Gulf Coast; beaches and bayside mud or salt flats

BOWIE COUNTY

BIRDS

Federal Status State Status

Sprague's Pipit *Anthus spragueii*

only in Texas during migration and winter, mid September to early April; short to medium distance, diurnal migrant; strongly tied to native upland prairie, can be locally common in coastal grasslands, uncommon to rare further west; sensitive to patch size and avoids edges.

Wood Stork *Mycteria americana* T

forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including salt-water; usually roosts communally in tall snags, sometimes in association with other wading birds (i.e. active heronries); breeds in Mexico and birds move into Gulf States in search of mud flats and other wetlands, even those associated with forested areas; formerly nested in Texas, but no breeding records since 1960

FISHES

Federal Status State Status

Blackside darter *Percina maculata* T

Red, Sulfur and Cypress River basins; clear, gravelly streams; prefers pools with some current, or even quiet pools, to swift riffles

Creek chubsucker *Erimyzon oblongus* T

tributaries of the Red, Sabine, Neches, Trinity, and San Jacinto rivers; small rivers and creeks of various types; seldom in impoundments; prefers headwaters, but seldom occurs in springs; young typically in headwater rivulets or marshes; spawns in river mouths or pools, riffles, lake outlets, upstream creeks

Goldeye *Hiodon alosoides*

Red River basin below reservoir; spawns spring to July in shallow firm-bottomed backwaters or gravel shoals in tributaries, eggs semibuoyant drift downstream or to quiet water; adults in quiet turbid water of medium to large lowland rivers, small lakes, marshes and muddy shallows connected to them; young feed on microcrustaceans and other inverts; adults on surface water insects, also frogs, fishes, and small mammals

Orangebelly darter *Etheostoma radiosum*

Red through Angelina River basins; just headwaters ranging from high gradient streams to more sluggish lowland streams, gravel and rubble riffles preferred; eggs buried in gravel and riffle raceways, post-larvae live in quiet water, move into progressively faster water as they mature, young feed mostly on copepods and cladocerans, adults on mayfly and fly larvae, spawn late February through mid-April in eastern Texas

Paddlefish *Polyodon spathula* T

prefers large, free-flowing rivers, but will frequent impoundments with access to spawning sites; spawns in fast, shallow water over gravel bars; larvae may drift from reservoir to reservoir

Shovelnose sturgeon *Scaphirhynchus platorynchus* T

open, flowing channels with bottoms of sand or gravel; spawns over gravel or rocks in an area with a fast current; Red River below reservoir and rare occurrence in Rio Grande

BOWIE COUNTY

FISHES		Federal Status	State Status
Taillight shiner	*Notropis maculatus*		

Sulfur River and Big Cypress Bayou; mostly headwaters, typically large sluggish, mud-bottomed small to large streams and lakes, usually with some aquatic vegetation; spawns March-October in backwaters and pools; feeds mainly on insect larva and cladocerans, also algae

Western sand darter	*Ammocrypta clara*		

Red and Sabine River basins; clear to slightly turbid water of medium to large rivers that have moderate to swift currents, primarily over extensive areas of sandy substrate

INSECTS		Federal Status	State Status
American burying beetle	*Nicrophorus americanus*	LE	

varies widely from oak-hickory and coniferous forest ridges tops or hillsides to riparian corridors and valley floor pastures; extremely xeric, saturated, or loose sandy soils unsuitable; adults primarily above ground, eggs in soil adjacent to buried carcass, teneral adults overwinter in soil

MAMMALS		Federal Status	State Status
Black bear	*Ursus americanus*		T

bottomland hardwoods and large tracts of inaccessible forested areas

Plains spotted skunk	*Spilogale putorius interrupta*		

catholic; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie

Rafinesque's big-eared bat	*Corynorhinus rafinesquii*		T

roosts in cavity trees of bottomland hardwoods, concrete culverts, and abandoned man-made structures

Red wolf	*Canis rufus*	LE	E

extirpated; formerly known throughout eastern half of Texas in brushy and forested areas, as well as coastal prairies

Southeastern myotis bat	*Myotis austroriparius*		

roosts in cavity trees of bottomland hardwoods, concrete culverts, and abandoned man-made structures

MOLLUSKS		Federal Status	State Status
Louisiana pigtoe	*Pleurobema riddellii*		T

streams and moderate-size rivers, usually flowing water on substrates of mud, sand, and gravel; not generally known from impoundments; Sabine, Neches, and Trinity (historic) River basins

Southern hickorynut	*Obovaria jacksoniana*		T

medium sized gravel substrates with low to moderate current; Neches, Sabine, and Cypress river basins

BOWIE COUNTY

MOLLUSKS		Federal Status	State Status
Texas pigtoe	*Fusconaia askewi*		T

rivers with mixed mud, sand, and fine gravel in protected areas associated with fallen trees or other structures; east Texas River basins, Sulphur River, Cypress Creek, Sabine through Trinity rivers as well as San Jacinto River

REPTILES		Federal Status	State Status
Alligator snapping turtle	*Macrochelys temminckii*		T

perennial water bodies; deep water of rivers, canals, lakes, and oxbows; also swamps, bayous, and ponds near deep running water; sometimes enters brackish coastal waters; usually in water with mud bottom and abundant aquatic vegetation; may migrate several miles along rivers; active March-October; breeds April-October

Northern scarlet snake	*Cemophora coccinea copei*		T

mixed hardwood scrub on sandy soils; feeds on reptile eggs; semi-fossorial; active April-September

Timber rattlesnake	*Crotalus horridus*		T

swamps, floodplains, upland pine and deciduous woodlands, riparian zones, abandoned farmland; limestone bluffs, sandy soil or black clay; prefers dense ground cover, i.e. grapevines or palmetto

PLANTS		Federal Status	State Status
Arkansas meadow-rue	*Thalictrum arkansanum*		

mostly deciduous forests on alluvial terraces and upper drainages of hardwood slope forests at contacts with calcareous prairies; flowering March-April, withering by midsummer

Arkansas oak	*Quercus arkansana*		

GLOBAL RANK: G3; At the Cass County location, it occurs with Quercus stellata, Q. marilandica and Q. incana in a young pine plantation on deep sandy soils; Perennial; Flowering spring

Appendix D. General Permit to Discharge under the Texas Pollutant Discharge Elimination System

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Texas Commission on Environmental Quality

P.O. Box 13087, Austin, Texas 78711-3087

GENERAL PERMIT TO DISCHARGE UNDER THE

TEXAS POLLUTANT DISCHARGE ELIMINATION SYSTEM

under provisions of
Section 402 of the Clean Water Act
and Chapter 26 of the Texas Water Code

This permit supersedes and replaces
TPDES General Permit No. TXR150000, issued March 5, 2008

Construction sites that discharge stormwater associated with construction activity

located in the state of Texas

may discharge to surface water in the state

only according to monitoring requirements and other conditions set forth in this general permit, as well as the rules of the Texas Commission on Environmental Quality (TCEQ or Commission), the laws of the State of Texas, and other orders of the Commission of the TCEQ. The issuance of this general permit does not grant to the permittee the right to use private or public property for conveyance of stormwater and certain non-stormwater discharges along the discharge route. This includes property belonging to but not limited to any individual, partnership, corporation or other entity. Neither does this general permit authorize any invasion of personal rights nor any violation of federal, state, or local laws or regulations. It is the responsibility of the permittee to acquire property rights as may be necessary to use the discharge route.

This general permit and the authorization contained herein shall expire at midnight, five years from the permit effective date.

EFFECTIVE DATE: March 5, 2013

ISSUED DATE: FEB 19 2013

Bryan W. Shaw

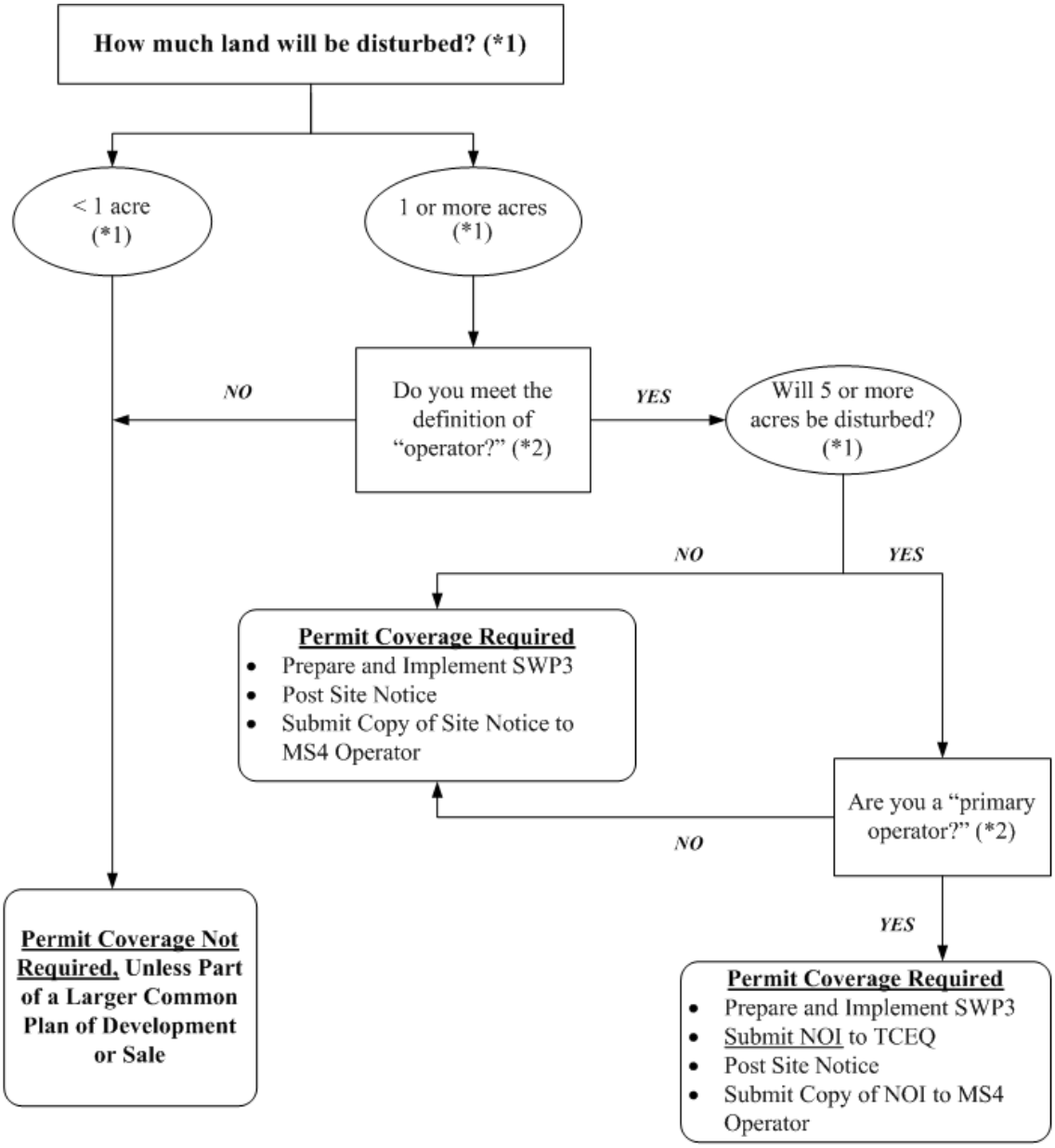
For the Commission

TPDES GENERAL PERMIT NUMBER TXR150000 RELATING TO STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES

Table of Contents

Part I. Flow Chart and Definitions

Section A. Flow Chart to Determine Whether Coverage is Required



(*1) To determine the size of the construction project, use the size of the entire area to be disturbed, and include the size of the larger common plan of development or sale, if the project is part of a larger project (refer to Part I.B., "Definitions," for an explanation of "common plan of development or sale").

(*2) Refer to the definitions for "operator," "primary operator," and "secondary operator" in Part I., Section B. of this permit.

Section B. Definitions

Arid Areas - Areas with an average annual rainfall of 0 to 10 inches.

Best Management Practices (BMPs) - Schedules of activities, prohibitions of practices, maintenance procedures, structural controls, local ordinances, and other management practices to prevent or reduce the discharge of pollutants. BMPs also include treatment requirements, operating procedures, and practices to control construction site runoff, spills or leaks, waste disposal, or drainage from raw material storage areas.

Commencement of Construction - The initial disturbance of soils associated with clearing, grading, or excavation activities, as well as other construction-related activities (e.g., stockpiling of fill material, demolition).

Common Plan of Development - A construction activity that is completed in separate stages, separate phases, or in combination with other construction activities. A common plan of development (also known as a "common plan of development or sale") is identified by the documentation for the construction project that identifies the scope of the project, and may include plats, blueprints, marketing plans, contracts, building permits, a public notice or hearing, zoning requests, or other similar documentation and activities. A common plan of development does not necessarily include all construction projects within the jurisdiction of a public entity (e.g., a city or university). Construction of roads or buildings in different parts of the jurisdiction would be considered separate "common plans," with only the interconnected parts of a project being considered part of a "common plan" (e.g., a building and its associated parking lot and driveways, airport runway and associated taxiways, a building complex, etc.). Where discrete construction projects occur within a larger common plan of development or sale but are located ¼ mile or more apart, and the area between the projects is not being disturbed, each individual project can be treated as a separate plan of development or sale, provided that any interconnecting road, pipeline or utility project that is part of the same "common plan" is not included in the area to be disturbed.

Construction Activity - Includes soil disturbance activities, including clearing, grading, and excavating; and does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site (e.g., the routine grading of existing dirt roads, asphalt overlays of existing roads, the routine clearing of existing right-of-ways, and similar maintenance activities). Regulated construction activity is defined in terms of small and large construction activity.

Dewatering – The act of draining rainwater or groundwater from building foundations, vaults, and trenches.

Discharge – For the purposes of this permit, the drainage, release, or disposal of pollutants in stormwater and certain non-stormwater from areas where soil disturbing activities (e.g., clearing, grading, excavation, stockpiling of fill material, and demolition), construction materials or equipment storage or maintenance (e.g., fill piles, borrow area, concrete truck wash out, fueling), or other industrial stormwater directly related to the construction process (e.g., concrete or asphalt batch plants) are located.

Drought-Stricken Area – For the purposes of this permit, an area in which the National Oceanic and Atmospheric Administration's U.S. Seasonal Drought Outlook indicates for the period during which the construction will occur that any of the following conditions are likely: (1) "Drought to persist or intensify", (2) "Drought ongoing, some improvement", (3) "Drought likely to improve, impacts ease", or (4) "Drought development likely". See http://www.cpc.ncep.noaa.gov/products/expert_assessment/seasonal_drought.html.

Edwards Aquifer - As defined under Texas Administrative Code (TAC) § 213.3 of this title (relating to the Edwards Aquifer), that portion of an arcuate belt of porous, water-bearing, predominantly carbonate rocks known as the Edwards and Associated Limestones in the Balcones Fault Zone trending from west to east to northeast in Kinney, Uvalde, Medina, Bexar, Comal, Hays, Travis, and Williamson Counties; and composed of the Salmon Peak

Limestone, McKnight Formation, West Nueces Formation, Devil's River Limestone, Person Formation, Kainer Formation, Edwards Formation, and Georgetown Formation. The permeable aquifer units generally overlie the less-permeable Glen Rose Formation to the south, overlie the less-permeable Comanche Peak and Walnut Formations north of the Colorado River, and underlie the less-permeable Del Rio Clay regionally.

Edwards Aquifer Recharge Zone - Generally, that area where the stratigraphic units constituting the Edwards Aquifer crop out, including the outcrops of other geologic formations in proximity to the Edwards Aquifer, where caves, sinkholes, faults, fractures, or other permeable features would create a potential for recharge of surface waters into the Edwards Aquifer. The recharge zone is identified as that area designated as such on official maps located in the offices of the Texas Commission on Environmental Quality (TCEQ) and the appropriate regional office. The Edwards Aquifer Map Viewer, located at http://www.tceq.texas.gov/compliance/field_ops/eapp/mapdisclaimer.html, can be used to determine where the recharge zone is located.

Edwards Aquifer Contributing Zone - The area or watershed where runoff from precipitation flows downgradient to the recharge zone of the Edwards Aquifer. The contributing zone is located upstream (upgradient) and generally north and northwest of the recharge zone for the following counties: all areas within Kinney County, except the area within the watershed draining to Segment No. 2304 of the Rio Grande Basin; all areas within Uvalde, Medina, Bexar, and Comal Counties; all areas within Hays and Travis Counties, except the area within the watersheds draining to the Colorado River above a point 1.3 miles upstream from Tom Miller Dam, Lake Austin at the confluence of Barrow Brook Cove, Segment No. 1403 of the Colorado River Basin; and all areas within Williamson County, except the area within the watersheds draining to the Lampasas River above the dam at Stillhouse Hollow reservoir, Segment No. 1216 of the Brazos River Basin. The contributing zone is illustrated on the Edwards Aquifer map viewer at http://www.tceq.texas.gov/compliance/field_ops/eapp/mapdisclaimer.html.

Effluent Limitations Guideline (ELG) – Defined in 40 Code of Federal Regulations (CFR) § 122.2 as a regulation published by the Administrator under § 304(b) of the Clean Water Act (CWA) to adopt or revise effluent limitations.

Facility or Activity – For the purpose of this permit, a construction site or construction support activity that is regulated under this general permit, including all contiguous land and fixtures (for example, ponds and materials stockpiles), structures, or appurtances used at a construction site or industrial site described by this general permit.

Final Stabilization - A construction site status where any of the following conditions are met:

A. All soil disturbing activities at the site have been completed and a uniform (that is, evenly distributed, without large bare areas) perennial vegetative cover with a density of at least 70% of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.

B. For individual lots in a residential construction site by either:

   (1) the homebuilder completing final stabilization as specified in condition (a) above; or

   (2) the homebuilder establishing temporary stabilization for an individual lot prior to the time of transfer of the ownership of the home to the buyer and after informing the homeowner of the need for, and benefits of, final stabilization. If temporary stabilization is not feasible, then the homebuilder may fulfill this requirement by retaining perimeter controls or BMPs, and informing the homeowner of the need for removal of temporary controls and the establishment of final stabilization.

Fullfillment of this requirement must be documented in the homebuilder's stormwater pollution prevention plan (SWP3).

C. For construction activities on land used for agricultural purposes (such as pipelines across crop or range land), final stabilization may be accomplished by returning the disturbed land to its preconstruction agricultural use. Areas disturbed that were not previously used for agricultural activities, such as buffer strips immediately adjacent to surface water and areas that are not being returned to their preconstruction agricultural use must meet the final stabilization conditions of condition (a) above.

D. In arid, semi-arid, and drought-stricken areas only, all soil disturbing activities at the site have been completed and both of the following criteria have been met:

(1) Temporary erosion control measures (for example, degradable rolled erosion control product) are selected, designed, and installed along with an appropriate seed base to provide erosion control for at least three years without active maintenance by the operator, and

(2) The temporary erosion control measures are selected, designed, and installed to achieve 70% of the native background vegetative coverage within three years.

Hyperchlorination of Waterlines – Treatment of potable water lines or tanks with chlorine for disinfection purposes, typically following repair or partial replacement of the waterline or tank, and subsequently flushing the contents.

Impaired Water - A surface water body that is identified on the latest approved CWA §303(d) List as not meeting applicable state water quality standards. Impaired waters include waters with approved or established total maximum daily loads (TMDLs), and those where a TMDL has been proposed by TCEQ but has not yet been approved or established.

Indian Country Land – (from 40 CFR §122.2) (1) all land within the limits of any Indian reservation under the jurisdiction of the United States government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation; (2) all dependent Indian communities with the borders of the United States whether within the originally or subsequently acquired territory thereof, and whether within or without the limits of a state; and (3) all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same.

Indian Tribe - (from 40 CFR §122.2) any Indian Tribe, band, group, or community recognized by the Secretary of the Interior and exercising governmental authority over a Federal Indian Reservation.

Large Construction Activity - Construction activities including clearing, grading, and excavating that result in land disturbance of equal to or greater than five (5) acres of land. Large construction activity also includes the disturbance of less than five (5) acres of total land area that is part of a larger common plan of development or sale if the larger common plan will ultimately disturb equal to or greater than five (5) acres of land. Large construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site (for example, the routine grading of existing dirt roads, asphalt overlays of existing roads, the routine clearing of existing right-of-ways, and similar maintenance activities.)

Linear Project – Includes the construction of roads, bridges, conduits, substructures, pipelines, sewer lines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment and associated ancillary facilities in a long, narrow area.

Minimize - To reduce or eliminate to the extent achievable using stormwater controls that are technologically available and economically practicable and achievable in light of best industry practices.

Municipal Separate Storm Sewer System (MS4) - A separate storm sewer system owned or operated by the United States, a state, city, town, county, district, association, or other public body (created by or pursuant to state law) having jurisdiction over the disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under state law such as a sewer district, flood control or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, that discharges to surface water in the state.

Notice of Change (NOC) – Written notification to the executive director from a discharger authorized under this permit, providing changes to information that was previously provided to the agency in a notice of intent form.

Notice of Intent (NOI) - A written submission to the executive director from an applicant requesting coverage under this general permit.

Notice of Termination (NOT) - A written submission to the executive director from a discharger authorized under a general permit requesting termination of coverage.

Operator - The person or persons associated with a large or small construction activity that is either a primary or secondary operator as defined below:

Primary Operator – the person or persons associated with a large or small construction activity that meets either of the following two criteria:

(a) the person or persons have on-site operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or

(b) the person or persons have day-to-day operational control of those activities at a construction site that are necessary to ensure compliance with a Storm Water Pollution Prevention Plan (SWP3) for the site or other permit conditions (for example, they are authorized to direct workers at a site to carry out activities required by the SWP3 or comply with other permit conditions).

Secondary Operator – The person or entity, often the property owner, whose operational control is limited to:

(a) the employment of other operators, such as a general contractor, to perform or supervise construction activities; or

(b) the ability to approve or disapprove changes to construction plans and specifications, but who does not have day-to-day on-site operational control over construction activities at the site.

Secondary operators must either prepare their own SWP3 or participate in a shared SWP3 that covers the areas of the construction site where they have control over the plans and specifications.

If there is not a primary operator at the construction site, then the secondary operator is defined as the primary operator and must comply with the requirements for primary operators.

Outfall - For the purpose of this permit, a point source at the point where stormwater runoff associated with construction activity discharges to surface water in the state and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels, or other conveyances that connect segments of the same stream or other water of the U.S. and are used to convey waters of the U.S.

Permittee - An operator authorized under this general permit. The authorization may be gained through submission of a notice of intent, by waiver, or by meeting the requirements for automatic coverage to discharge stormwater runoff and certain non-stormwater discharges.

Point Source – (from 40 CFR §122.2) Any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are, or may be, discharged. This term does not include return flows from irrigated agriculture or agricultural stormwater runoff.

Pollutant - Dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, filter backwash, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste discharged into any surface water in the state. The term "pollutant" does not include tail water or runoff water from irrigation or rainwater runoff from cultivated or uncultivated rangeland, pastureland, and farmland. For the purpose of this permit, the term "pollutant" includes sediment.

Pollution - (from Texas Water Code (TWC) §26.001(14)) The alteration of the physical, thermal, chemical, or biological quality of, or the contamination of, any surface water in the state that renders the water harmful, detrimental, or injurious to humans, animal life, vegetation, or property or to public health, safety, or welfare, or impairs the usefulness or the public enjoyment of the water for any lawful or reasonable purpose.

Rainfall Erosivity Factor (R factor) - the total annual erosive potential that is due to climatic effects, and is part of the Revised Universal Soil Loss Equation (RUSLE).

Receiving Water - A "Water of the United States" as defined in 40 CFR §122.2 into which the regulated stormwater discharges.

Semiarid Areas - areas with an average annual rainfall of 10 to 20 inches

Separate Storm Sewer System - A conveyance or system of conveyances (including roads with drainage systems, streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains), designed or used for collecting or conveying stormwater; that is not a combined sewer, and that is not part of a publicly owned treatment works (POTW).

Small Construction Activity - Construction activities including clearing, grading, and excavating that result in land disturbance of equal to or greater than one (1) acre and less than five (5) acres of land. Small construction activity also includes the disturbance of less than one (1) acre of total land area that is part of a larger common plan of development or sale if the larger common plan will ultimately disturb equal to or greater than one (1) and less than five (5) acres of land. Small construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site (for example, the routine grading of existing dirt roads, asphalt overlays of existing roads, the routine clearing of existing right-of-ways, and similar maintenance activities.)

Steep Slopes – Where a state, Tribe, local government, or industry technical manual (e.g. stormwater BMP manual) has defined what is to be considered a "steep slope", this permit's definition automatically adopts that definition. Where no such definition exists, steep slopes are automatically defined as those that are 15 percent or greater in grade.

Stormwater (or Stormwater Runoff) - Rainfall runoff, snow melt runoff, and surface runoff and drainage.

Stormwater Associated with Construction Activity - Stormwater runoff from a construction activity where soil disturbing activities (including clearing, grading, excavating) result in the disturbance of one (1) or more acres of total land area, or are part of a larger common plan of development or sale that will result in disturbance of one (1) or more acres of total land area.

Structural Control (or Practice) - A pollution prevention practice that requires the construction of a device, or the use of a device, to reduce or prevent pollution in stormwater

runoff. Structural controls and practices may include but are not limited to: silt fences, earthen dikes, drainage swales, sediment traps, check dams, subsurface drains, storm drain inlet protection, rock outlet protection, reinforced soil retaining systems, gabions, and temporary or permanent sediment basins.

Surface Water in the State - Lakes, bays, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, wetlands, marshes, inlets, canals, the Gulf of Mexico inside the territorial limits of the state (from the mean high water mark (MHWM) out 10.36 miles into the Gulf), and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, navigable or nonnavigable, and including the beds and banks of all water-courses and bodies of surface water, that are wholly or partially inside or bordering the state or subject to the jurisdiction of the state; except that waters in treatment systems which are authorized by state or federal law, regulation, or permit, and which are created for the purpose of waste treatment are not considered to be water in the state.

Temporary Stabilization - A condition where exposed soils or disturbed areas are provided a protective cover or other structural control to prevent the migration of pollutants. Temporary stabilization may include temporary seeding, geotextiles, mulches, and other techniques to reduce or eliminate erosion until either permanent stabilization can be achieved or until further construction activities take place.

Total Maximum Daily Load (TMDL) - The total amount of a pollutant that a water body can assimilate and still meet the Texas Surface Water Quality Standards.

Turbidity – A condition of water quality characterized by the presence of suspended solids and/or organic material.

Waters of the United States - (from 40 CFR §122.2) Waters of the United States or waters of the U.S. means:

(a) all waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

(b) all interstate waters, including interstate wetlands;

(c) all other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds that the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:

(1) which are or could be used by interstate or foreign travelers for recreational or other purposes;

(2) from which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or

(3) which are used or could be used for industrial purposes by industries in interstate commerce;

(d) all impoundments of waters otherwise defined as waters of the United States under this definition;

(e) tributaries of waters identified in paragraphs (a) through (d) of this definition;

(f) the territorial sea; and

(g) wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR §423.11(m) which also meet the criteria of this definition) are not waters of the U.S. This exclusion applies only to manmade bodies of water which neither were originally created in waters of the U.S. (such as

disposal area in wetlands) nor resulted from the impoundment of waters of the U.S. Waters of the U.S. do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the CWA, the final authority regarding CWA jurisdiction remains with EPA.

Part II. Permit Applicability and Coverage

Section A. Discharges Eligible for Authorization

1. Stormwater Associated with Construction Activity

Discharges of stormwater runoff from small and large construction activities may be authorized under this general permit.

2. Discharges of Stormwater Associated with Construction Support Activities

Examples of construction support activities include, but are not limited to, concrete batch plants, rock crushers, asphalt batch plants, equipment staging areas, material storage yards, material borrow areas, and excavated material disposal areas. Construction support activities authorized under this general permit are not commercial operations, and do not serve multiple unrelated construction projects. Discharges of stormwater runoff from construction support activities may be authorized under this general permit, provided that the following conditions are met:

(a) the activities are located within one (1) mile from the boundary of the permitted construction site and directly support the construction activity;

(b) an SWP3 is developed for the permitted construction site according to the provisions of this general permit, and includes appropriate controls and measures to reduce erosion and discharge of pollutants in stormwater runoff from the construction support activities; and

(c) the construction support activities either do not operate beyond the completion date of the construction activity or, at the time that they do, are authorized under separate Texas Pollutant Discharge Elimination System (TPDES) authorization. Separate TPDES authorization may include the TPDES Multi Sector General Permit (MSGP), TXR050000 (related to stormwater discharges associated with industrial activity), separate authorization under this general permit if applicable, coverage under an alternative general permit if available, or authorization under an individual water quality permit.

3. Non-Stormwater Discharges

The following non-stormwater discharges from sites authorized under this general permit are also eligible for authorization under this general permit:

(a) discharges from fire fighting activities (fire fighting activities do not include washing of trucks, run-off water from training activities, test water from fire suppression systems, or similar activities);

(b) uncontaminated fire hydrant flushings (excluding discharges of hyperchlorinated water, unless the water is first dechlorinated and discharges are not expected to adversely affect aquatic life), which include flushings from systems that utilize potable water, surface water, or groundwater that does not contain additional pollutants (uncontaminated fire hydrant flushings do not include systems utilizing reclaimed wastewater as a source water);

(c) water from the routine external washing of vehicles, the external portion of buildings or structures, and pavement, where detergents and soaps are not used, where spills or leaks of toxic or hazardous materials have not occurred (unless spilled materials

have been removed; and if local state, or federal regulations are applicable, the materials are removed according to those regulations), and where the purpose is to remove mud, dirt, or dust;

(d) uncontaminated water used to control dust;

(e) potable water sources, including waterline flushings, but excluding discharges of hyperchlorinated water, unless the water is first dechlorinated and discharges are not expected to adversely affect aquatic life;

(f) uncontaminated air conditioning condensate;

(g) uncontaminated ground water or spring water, including foundation or footing drains where flows are not contaminated with industrial materials such as solvents; and

(h) lawn watering and similar irrigation drainage.

4. Other Permitted Discharges

Any discharge authorized under a separate National Pollutant Discharge Elimination System (NPDES), TPDES, or TCEQ permit may be combined with discharges authorized by this general permit, provided those discharges comply with the associated permit.

Section B. Concrete Truck Wash Out

The wash out of concrete trucks at regulated construction sites must be performed in accordance with the requirements of Part V of this general permit.

Section C. Limitations on Permit Coverage

1. Post Construction Discharges

Discharges that occur after construction activities have been completed, and after the construction site and any supporting activity site have undergone final stabilization, are not eligible for coverage under this general permit. Discharges originating from the sites are not authorized under this general permit following the submission of the notice of termination (NOT) or removal of the appropriate site notice, as applicable, for the regulated construction activity.

2. Prohibition of Non-Stormwater Discharges

Except as otherwise provided in Part II.A. of this general permit, only discharges that are composed entirely of stormwater associated with construction activity may be authorized under this general permit.

3. Compliance With Water Quality Standards

Discharges to surface water in the state that would cause, have the reasonable potential to cause, or contribute to a violation of water quality standards or that would fail to protect and maintain existing designated uses are not eligible for coverage under this general permit. The executive director may require an application for an individual permit or alternative general permit (see Parts II.H.2. and 3.) to authorize discharges to surface water in the state if the executive director determines that any activity will cause, has the reasonable potential to cause, or contribute to a violation of water quality standards or is found to cause, has the reasonable potential to cause, or contribute to, the impairment of a designated use. The executive director may also require an application for an individual permit considering factors described in Part II.H.2. of this general permit.

4. Impaired Receiving Waters and Total Maximum Daily Load (TMDL) Requirements

New sources or new discharges of the pollutants of concern to impaired waters are not authorized by this permit unless otherwise allowable under 30 TAC Chapter 305 and applicable state law. Impaired waters are those that do not meet applicable water quality standards and are listed on the EPA approved CWA §303(d) List. Pollutants of concern are those for which the water body is listed as impaired.

Discharges of the pollutants of concern to impaired water bodies for which there is a TMDL are not eligible for this general permit unless they are consistent with the approved TMDL. Permittees must incorporate the conditions and requirements applicable to their discharges into their SWP3, in order to be eligible for coverage under this general permit. For consistency with the construction stormwater-related items in an approved TMDL, the SWP3 must be consistent with any applicable condition, goal, or requirement in the TMDL, TMDL Implementation Plan (I-Plan), or as otherwise directed by the executive director.

5. Discharges to the Edwards Aquifer Recharge or Contributing Zone

Discharges cannot be authorized by this general permit where prohibited by 30 TAC Chapter 213 (relating to Edwards Aquifer). In addition, commencement of construction (i.e., the initial disturbance of soils associated with clearing, grading, or excavating activities, as well as other construction-related activities such as stockpiling of fill material and demolition) at a site regulated under 30 TAC Chapter 213, may not begin until the appropriate Edwards Aquifer Protection Plan (EAPP) has been approved by the TCEQ's Edwards Aquifer Protection Program.

(a) For new discharges located within the Edwards Aquifer Recharge Zone, or within that area upstream from the recharge zone and defined as the Contributing Zone (CZ), operators must meet all applicable requirements of, and operate according to, 30 TAC Chapter 213 (Edwards Aquifer Rule) in addition to the provisions and requirements of this general permit.

(b) For existing discharges located within the Edwards Aquifer Recharge Zone, the requirements of the agency-approved Water Pollution Abatement Plan (WPAP) under the Edwards Aquifer Rule is in addition to the requirements of this general permit. BMPs and maintenance schedules for structural stormwater controls, for example, may be required as a provision of the rule. All applicable requirements of the Edwards Aquifer Rule for reductions of suspended solids in stormwater runoff are in addition to the requirements in this general permit for this pollutant.

6. Discharges to Specific Watersheds and Water Quality Areas

Discharges otherwise eligible for coverage cannot be authorized by this general permit where prohibited by 30 TAC Chapter 311 (relating to Watershed Protection) for water quality areas and watersheds.

7. Protection of Streams and Watersheds by Other Governmental Entities

This general permit does not limit the authority or ability of federal, other state, or local governmental entities from placing additional or more stringent requirements on construction activities or discharges from construction activities. For example, this permit does not limit the authority of a home-rule municipality provided by Texas Local Government Code §401.002.

8. Indian Country Lands

Stormwater runoff from construction activities occurring on Indian Country lands are not under the authority of the TCEQ and are not eligible for coverage under this general permit. If discharges of stormwater require authorization under federal NPDES

regulations, authority for these discharges must be obtained from the U.S. Environmental Protection Agency (EPA).

9. Oil and Gas Production

Stormwater runoff from construction activities associated with the exploration, development, or production of oil or gas or geothermal resources, including transportation of crude oil or natural gas by pipeline, are not under the authority of the TCEQ and are not eligible for coverage under this general permit. If discharges of stormwater require authorization under federal NPDES regulations, authority for these discharges must be obtained from the EPA.

10. Stormwater Discharges from Agricultural Activities

Stormwater discharges from agricultural activities that are not point source discharges of stormwater are not subject to TPDES permit requirements. These activities may include clearing and cultivating ground for crops, construction of fences to contain livestock, construction of stock ponds, and other similar agricultural activities. Discharges of stormwater runoff associated with the construction of facilities that are subject to TPDES regulations, such as the construction of concentrated animal feeding operations, would be point sources regulated under this general permit.

11. Endangered Species Act

Discharges that would adversely affect a listed endangered or threatened aquatic or aquatic-dependent species or its critical habitat are not authorized by this permit, unless the requirements of the Endangered Species Act are satisfied. Federal requirements related to endangered species apply to all TPDES permitted discharges and site-specific controls may be required to ensure that protection of endangered or threatened species is achieved. If a permittee has concerns over potential impacts to listed species, the permittee may contact TCEQ for additional information.

12. Other

Nothing in Part II of the general permit is intended to negate any person's ability to assert the force majeure (act of God, war, strike, riot, or other catastrophe) defenses found in 30 TAC §70.7.

Section D. Deadlines for Obtaining Authorization to Discharge

1. Large Construction Activities

(a) New Construction - Discharges from sites where the commencement of construction occurs on or after the effective date of this general permit must be authorized, either under this general permit or a separate TPDES permit, prior to the commencement of those construction activities.

(b) Ongoing Construction - Operators of large construction activities continuing to operate after the effective date of this permit, and authorized under TPDES general permit TXR150000 (effective on March 5, 2008), must submit an NOI to renew authorization or a NOT to terminate coverage under this general permit within 90 days of the effective date of this general permit. During this interim period, as a requirement of this TPDES permit, the operator must continue to meet the conditions and requirements of the previous TPDES permit.

2. Small Construction Activities

(a) New Construction - Discharges from sites where the commencement of construction occurs on or after the effective date of this general permit must be authorized, either

under this general permit or a separate TPDES permit, prior to the commencement of those construction activities.

(b) Ongoing Construction - Discharges from ongoing small construction activities that commenced prior to the effective date of this general permit, and that would not meet the conditions to qualify for termination of this permit as described in Part II.E. of this general permit, must meet the requirements to be authorized, either under this general permit or a separate TPDES permit, within 90 days of the effective date of this general permit. During this interim period, as a requirement of this TPDES permit, the operator must continue to meet the conditions and requirements of the previous TPDES permit.

Section E. Obtaining Authorization to Discharge

1. Automatic Authorization for Small Construction Activities With Low Potential for Erosion:

If all of the following conditions are met, then a small construction activity is determined to occur during periods of low potential for erosion, and a site operator may be automatically authorized under this general permit without being required to develop an SWP3 or submit an NOI:

(a) the construction activity occurs in a county listed in Appendix A;

(b) the construction activity is initiated and completed, including either final or temporary stabilization of all disturbed areas, within the time frame identified in Appendix A for the location of the construction site;

(c) all temporary stabilization is adequately maintained to effectively reduce or prohibit erosion, permanent stabilization activities have been initiated, and a condition of final stabilization is completed no later than 30 days following the end date of the time frame identified in Appendix A for the location of the construction site;

(d) the permittee signs a completed TCEQ construction site notice, including the certification statement;

(e) a signed copy of the construction site notice is posted at the construction site in a location where it is readily available for viewing by the general public, local, state, and federal authorities prior to commencing construction activities, and maintained in that location until completion of the construction activity;

(f) a copy of the signed and certified construction site notice is provided to the operator of any MS4 receiving the discharge at least two days prior to commencement of construction activities;

(g) any supporting concrete batch plant or asphalt batch plant is separately authorized for discharges of stormwater runoff or other non-stormwater discharges under an individual TPDES permit, another TPDES general permit, or under an individual TCEQ permit where stormwater and non-stormwater is disposed of by evaporation or irrigation (discharges are adjacent to water in the state); and

(h) any non-stormwater discharges are either authorized under a separate permit or authorization, or are not considered to be a wastewater.

Part II.G. of this general permit describes how an operator may apply for and obtain a waiver from permitting, for certain small construction activities that occur during a period with a low potential for erosion, where automatic authorization under this section is not available.

2. Automatic Authorization For All Other Small Construction Activities:

Operators of small construction activities not described in Part II.E.1. above may be automatically authorized under this general permit, and operators of these sites shall not be required to submit an NOI, provided that they meet all of the following conditions:

(a) develop a SWP3 according to the provisions of this general permit, that covers either the entire site or all portions of the site for which the applicant is the operator, and implement that plan prior to commencing construction activities;

(b) sign and certify a completed TCEQ small construction site notice, post the notice at the construction site in a location where it is safely and readily available for viewing by the general public, local, state, and federal authorities, prior to commencing construction, and maintain the notice in that location until completion of the construction activity (for linear construction activities, e.g. pipeline or highway, the site notice must be placed in a publicly accessible location near where construction is actively underway; notice for these linear sites may be relocated, as necessary, along the length of the project, and the notice must be safely and readily available for viewing by the general public; local, state, and federal authorities); and

(c) provide a copy of the signed and certified construction site notice to the operator of any municipal separate storm sewer system receiving the discharge prior to commencement of construction activities.

Operators of small construction activities as defined in Part I.B of this general permit shall not submit an NOI for coverage unless otherwise required by the executive director.

As described in Part I (Definitions) of this general permit, large construction activities include those that will disturb less than five (5) acres of land, but that are part of a larger common plan of development or sale that will ultimately disturb five (5) or more acres of land, and must meet the requirements of Part II.E.3. below.

3. Authorization for Large Construction Activities:

Operators of large construction activities that qualify for coverage under this general permit must meet all of the following conditions:

(a) develop a SWP3 according to the provisions of this general permit that covers either the entire site or all portions of the site for which the applicant is the operator, and implement that plan prior to commencing construction activities;

(b) primary operators must submit an NOI, using a form provided by the executive director, at least seven (7) days prior to commencing construction activities, or if utilizing electronic submittal, prior to commencing construction activities. If an additional primary operator is added after the initial NOI is submitted, the new primary operator must submit an NOI at least seven (7) days before assuming operational control, or if utilizing electronic NOI submittal, prior to assuming operational control. If the primary operator changes after the initial NOI is submitted, the new primary operator must submit a paper NOI or an electronic NOI at least ten (10) days before assuming operational control;

(c) all operators of large construction activities must post a site notice in accordance with Part III.D.2. of this permit. The site notice must be located where it is safely and readily available for viewing by the general public, local, state, and federal authorities prior to commencing construction, and must be maintained in that location until completion of the construction activity (for linear construction activities, e.g. pipeline or highway, the site notice must be placed in a publicly accessible location near where construction is actively underway; notice for these linear sites may be relocated, as necessary, along the length of the project, and the notice must be safely and readily available for viewing by the general public; local, state, and federal authorities);

(d) prior to commencing construction activities, all primary operators must (1) provide a copy of the signed NOI to the operator of any MS4 receiving the discharge and to any secondary construction operator, and (2) list in the SWP3 the names and addresses of all MS4 operators receiving a copy;

(e) all persons meeting the definition of "secondary operator" in Part I of this permit are hereby notified that they are regulated under this general permit, but are not required to submit an NOI, provided that a primary operator at the site has submitted an NOI, or is required to submit an NOI, and the secondary operator has provided notification to the operator(s) of the need to obtain coverage (with records of notification available upon request). Any secondary operator notified under this provision may alternatively submit an NOI under this general permit, may seek coverage under an alternative TPDES individual permit, or may seek coverage under an alternative TPDES general permit if available; and

(f) all secondary operators must provide a copy of the signed and certified Secondary Operator construction site notice to the operator of any MS4 receiving the discharge prior to commencement of construction activities.

4. Waivers for Small Construction Activities:

Part II.G. describes how operators of certain small construction activities may obtain a waiver from coverage.

5. Effective Date of Coverage

(a) Operators of small construction activities as described in either Part II.E.1. or II.E.2. above are authorized immediately following compliance with the applicable conditions of Part II.E.1. or II.E.2. Secondary operators of large construction activities as described in Part II.E.3. above are authorized immediately following compliance with the applicable conditions in Part II.E.3. For activities located in areas regulated by 30 TAC Chapter 213, related to the Edwards Aquifer, this authorization to discharge is separate from the requirements of the operator's responsibilities under that rule. Construction may not commence for sites regulated under 30 TAC Chapter 213 until all applicable requirements of that rule are met.

(b) Primary operators of large construction activities as described in Part II.E.3. above are provisionally authorized seven (7) days from the date that a completed NOI is postmarked for delivery to the TCEQ, unless otherwise notified by the executive director. If electronic submission of the NOI is provided, and unless otherwise notified by the executive director, primary operators are authorized immediately following confirmation of receipt of the NOI by the TCEQ. Authorization is non-provisional when the executive director finds the NOI is administratively complete and an authorization number is issued for the activity. For activities located in areas regulated by 30 TAC Chapter 213, related to the Edwards Aquifer, this authorization to discharge is separate from the requirements of the operator's responsibilities under that rule. Construction may not commence for sites regulated under 30 TAC Chapter 213 until all applicable requirements of that rule are met.

(c) Operators are not prohibited from submitting late NOIs or posting late notices to obtain authorization under this general permit. The TCEQ reserves the right to take appropriate enforcement actions for any unpermitted activities that may have occurred between the time construction commenced and authorization was obtained.

6. Notice of Change (NOC)

If relevant information provided in the NOI changes, an NOC must be submitted at least 14 days before the change occurs, if possible. Where 14-day advance notice is not possible, the operator must submit an NOC within 14 days of discovery of the change. If

the operator becomes aware that it failed to submit any relevant facts or submitted incorrect information in an NOI, the correct information must be provided to the executive director in an NOC within 14 days after discovery. The NOC shall be submitted on a form provided by the executive director, or by letter if an NOC form is not available. A copy of the NOC must also be provided to the operator of any MS4 receiving the discharge, and a list must be included in the SWP3 that includes the names and addresses of all MS4 operators receiving a copy.

Information that may be included on an NOC includes, but is not limited to, the following: the description of the construction project, an increase in the number of acres disturbed (for increases of one or more acres), or the operator name. A transfer of operational control from one operator to another, including a transfer of the ownership of a company, may not be included in an NOC.

A transfer of ownership of a company includes changes to the structure of a company, such as changing from a partnership to a corporation or changing corporation types, so that the filing number (or charter number) that is on record with the Texas Secretary of State must be changed.

An NOC is not required for notifying TCEQ of a decrease in the number of acres disturbed. This information must be included in the SWP3 and retained on site.

7. Signatory Requirement for NOI Forms, Notice of Termination (NOT) Forms, NOC Letters, and Construction Site Notices

NOI forms, NOT forms, NOC letters, and Construction Site Notices that require a signature must be signed according to 30 TAC § 305.44 (relating to Signatories for Applications).

8. Contents of the NOI

The NOI form shall require, at a minimum, the following information:

(a) the TPDES CGP authorization number for existing authorizations under this general permit, where the operator submits an NOI to renew coverage within 90 days of the effective date of this general permit;

(b) the name, address, and telephone number of the operator filing the NOI for permit coverage;

(c) the name (or other identifier), address, county, and latitude/longitude of the construction project or site;

(d) the number of acres that will be disturbed by the applicant;

(e) confirmation that the project or site will not be located on Indian Country lands;

(f) confirmation that a SWP3 has been developed in accordance with this general permit, that it will be implemented prior to construction, and that it is compliant with any applicable local sediment and erosion control plans; for multiple operators who prepare a shared SWP3, the confirmation for an operator may be limited to its obligations under the SWP3 provided all obligations are confirmed by at least one operator;

(g) name of the receiving water(s);

(h) the classified segment number for each classified segment that receives discharges from the regulated construction activity (if the discharge is not directly to a classified segment, then the classified segment number of the first classified segment that those discharges reach); and

(i) the name of all surface waters receiving discharges from the regulated construction activity that are on the latest EPA-approved CWA § 303(d) List of impaired waters.

Section F. Terminating Coverage

1. Notice of Termination (NOT) Required

Each operator that has submitted an NOI for authorization under this general permit must apply to terminate that authorization following the conditions described in this section of the general permit. Authorization must be terminated by submitting an NOT on a form supplied by the executive director. Authorization to discharge under this general permit terminates at midnight on the day the NOT is postmarked for delivery to the TCEQ. If electronic submission of the NOT is provided, authorization to discharge under this permit terminates immediately following confirmation of receipt of the NOT by the TCEQ. Compliance with the conditions and requirements of this permit is required until an NOT is submitted.

The NOT must be submitted to TCEQ, and a copy of the NOT provided to the operator of any MS4 receiving the discharge (with a list in the SWP3 of the names and addresses of all MS4 operators receiving a copy), within 30 days after any of the following conditions are met:

(a) final stabilization has been achieved on all portions of the site that are the responsibility of the permittee;

(b) a transfer of operational control has occurred (See Section II.F.4. below); or

(c) the operator has obtained alternative authorization under an individual TPDES permit or alternative TPDES general permit.

2. Minimum Contents of the NOT

The NOT form shall require, at a minimum, the following information:

(a) if authorization was granted following submission of an NOI, the permittee's site-specific TPDES authorization number for the construction site;

(b) an indication of whether the construction activity is completed or if the permittee is simply no longer an operator at the site;

(c) the name, address, and telephone number of the permittee submitting the NOT;

(d) the name (or other identifier), address, county, and location (latitude/longitude) of the construction project or site; and

(e) a signed certification that either all stormwater discharges requiring authorization under this general permit will no longer occur, or that the applicant is no longer the operator of the facility or construction site, and that all temporary structural erosion controls have either been removed, will be removed on a schedule defined in the SWP3, or have been transferred to a new operator if the new operator has applied for permit coverage. Erosion controls that are designed to remain in place for an indefinite period, such as mulches and fiber mats, are not required to be removed or scheduled for removal.

3. Termination of Coverage for Small Construction Sites and for Secondary Operators at Large Construction Sites

Each operator that has obtained automatic authorization and has not been required to submit an NOI must remove the site notice upon meeting any of the conditions listed below, complete the applicable portion of the site notice related to removal of the site notice, and submit a copy of the completed site notice to the operator of any MS4 receiving the discharge (or provide alternative notification as allowed by the MS4 operator, with documentation of such notification included in the SWP3), within 30 days of meeting any of the following conditions:

(a) final stabilization has been achieved on all portions of the site that are the responsibility of the permittee;

(b) a transfer of operational control has occurred (See Section II.F.4. below); or

(c) the operator has obtained alternative authorization under an individual or general TPDES permit.

Authorization to discharge under this general permit terminates immediately upon removal of the applicable site notice. Compliance with the conditions and requirements of this permit is required until the site notice is removed.

4. Transfer of Operational Control

Coverage under this general permit is not transferable. A transfer of operational control includes changes to the structure of a company, such as changing from a partnership to a corporation, or changing to a different corporation type such that a different filing (or charter) number is established with the Texas Secretary of State.

When the primary operator of a large construction activity changes or operational control is transferred, the original operator must submit an NOT within ten (10) days prior to the date that responsibility for operations terminates, and the new operator must submit an NOI at least ten (10) days prior to the transfer of operational control, in accordance with condition (a) or (b) below. A copy of the NOT must be provided to the operator of any MS4 receiving the discharge in accordance with Section II.F.1. above.

Operators of regulated construction activities who are not required to submit an NOI must remove the original site notice, and the new operator must post the required site notice prior to the transfer of operational control, in accordance with condition (a) or (b) below. A copy of the completed site notice must be provided to the operator of any MS4 receiving the discharge, in accordance with Section II.F.3. above.

A transfer of operational control occurs when either of the following criteria is met:

(a) Another operator has assumed control over all areas of the site that have not been finally stabilized; and all silt fences and other temporary erosion controls have either been removed, scheduled for removal as defined in the SWP3, or transferred to a new operator, provided that the permitted operator has attempted to notify the new operator in writing of the requirement to obtain permit coverage. Record of this notification (or attempt at notification) shall be retained by the operator in accordance with Part VI of this permit. Erosion controls that are designed to remain in place for an indefinite period, such as mulches and fiber mats, are not required to be removed or scheduled for removal.

(b) A homebuilder has purchased one or more lots from an operator who obtained coverage under this general permit for a common plan of development or sale. The homebuilder is considered a new operator and shall comply with the requirements listed above, including the development of a SWP3 if necessary. Under these circumstances, the homebuilder is only responsible for compliance with the general permit requirements as they apply to lot(s) it has operational control over, and the original operator remains responsible for common controls or discharges, and must amend its SWP3 to remove the lot(s) transferred to the homebuilder.

Section G. Waivers from Coverage

The executive director may waive the otherwise applicable requirements of this general permit for stormwater discharges from small construction activities under the terms and conditions described in this section.

1. Waiver Applicability and Coverage

Operators of small construction activities may apply for and receive a waiver from the requirements to obtain authorization under this general permit, where all of the following conditions are met. This waiver from coverage does not apply to non-stormwater discharges. The operator must insure that any non-stormwater discharges are either authorized under a separate permit or authorization, or are not considered to be a wastewater.

(a) the calculated rainfall erosivity (R) factor for the entire period of the construction project is less than five (5);

(b) the operator submits to the TCEQ a signed waiver certification form, supplied by the executive director, certifying that the construction activity will commence and be completed within a period when the value of the calculated R factor is less than five (5); and

(c) the waiver certification form is postmarked for delivery to the TCEQ at least seven (7) days before construction activity begins or, if electronic filing is available, then any time following the receipt of written confirmation from TCEQ that a complete electronic application was submitted and acknowledged.

2. Steps to Obtaining a Waiver

The construction site operator may calculate the R factor to request a waiver using the following steps:

(a) Estimate the construction start date and the construction end date. The construction end date is the date that final stabilization will be achieved.

(b) Find the appropriate Erosivity Index (EI) zone in Appendix B of this permit.

(c) Find the EI percentage for the project period by adding the results for each period of the project using the table provided in Appendix D of this permit, in EPA Fact Sheet 2.1, or in USDA Handbook 703, by subtracting the start value from the end value to find the percent EI for the site.

(d) Refer to the Isoerodent Map (Appendix C of this permit) and interpolate the annual isoerodent value for the proposed construction location.

(e) Multiply the percent value obtained in Step (c) above by the annual isoerodent value obtained in Step (d). This is the R factor for the proposed project. If the value is less than 5, then a waiver may be obtained. If the value is five (5) or more, then a waiver may not be obtained, and the operator must obtain coverage under Part II.E.2. of this permit.

Alternatively, the operator may calculate a site-specific R factor utilizing the following online calculator: http://ei.tamu.edu/index.html, or using another available resource.

The waiver certification form is not required to be posted at the small construction site.

3. Effective Date of Waiver

Operators of small construction activities are provisionally waived from the otherwise applicable requirements of this general permit seven (7) days from the date that a completed waiver certification form is postmarked for delivery to TCEQ, or immediately upon receiving confirmation of approval of an electronic submittal, if electronic form submittals are available.

4. Activities Extending Beyond the Waiver Period

If a construction activity extends beyond the approved waiver period due to circumstances beyond the control of the operator, the operator must either:

(a) recalculate the R factor using the original start date and a new projected ending date, and if the R factor is still under five (5), submit a new waiver certification form at least two (2) days before the end of the original waiver period; or

(b) obtain authorization under this general permit according to the requirements delineated in either Part II.E.2. or Part II.E.3. before the end of the approved waiver period.

Section H. Alternative TPDES Permit Coverage

1. Individual Permit Alternative

Any discharge eligible for coverage under this general permit may alternatively be authorized under an individual TPDES permit according to 30 TAC §305 (relating to Consolidated Permits). Applications for individual permit coverage should be submitted at least three hundred and thirty (330) days prior to commencement of construction activities to ensure timely authorization.

2. Individual Permit Required

The executive director may suspend an authorization or deny an NOI in accordance with the procedures set forth in 30 TAC §205 (relating to General Permits for Waste Discharges), including the requirement that the executive director provide written notice to the permittee. The executive director may require an operator of a construction site, otherwise eligible for authorization under this general permit, to apply for an individual TPDES permit in the following circumstances:

(a) the conditions of an approved TMDL or TMDL I-Plan on the receiving water;

(b) the activity being determined to cause a violation of water quality standards or being found to cause, or contribute to, the loss of a designated use of surface water in the state: and

(c) any other consideration defined in 30 TAC Chapter 205 (relating to General Permits for Waste Discharges) including 30 TAC Chapter 205.4(c)(3)(D), which allows the commission to deny authorization under the general permit and require an individual permit if a discharger “has been determined by the executive director to have been out of compliance with any rule, order, or permit of the commission, including non-payment of fees assessed by the executive director.”

Additionally, the executive director may cancel, revoke, or suspend authorization to discharge under this general permit based on a finding of historical and significant noncompliance with the provisions of this general permit, relating to 30 TAC §60.3 (Use of Compliance History). Denial of authorization to discharge under this general permit or suspension of a permittee’s authorization under this general permit shall be done according to commission rules in 30 TAC Chapter 205 (relating to General Permits for Waste Discharges).

3. Alternative Discharge Authorization

Any discharge eligible for authorization under this general permit may alternatively be authorized under a separate general permit according to 30 TAC Chapter 205 (relating to General Permits for Waste Discharges), if applicable.

Section I. Permit Expiration

1. This general permit is effective for a term not to exceed five (5) years. All active discharge authorizations expire on the date provided on page one (1) of this permit. Following public notice and comment, as provided by 30 TAC §205.3 (relating to

Public Notice, Public Meetings, and Public Comment), the commission may amend, revoke, cancel, or renew this general permit.

2. If the executive director publishes a notice of the intent to renew or amend this general permit before the expiration date, the permit will remain in effect for existing, authorized discharges until the commission takes final action on the permit. Upon issuance of a renewed or amended permit, permittees may be required to submit an NOI within 90 days following the effective date of the renewed or amended permit, unless that permit provides for an alternative method for obtaining authorization.
3. If the commission does not propose to reissue this general permit within 90 days before the expiration date, permittees shall apply for authorization under an individual permit or an alternative general permit. If the application for an individual permit is submitted before the expiration date, authorization under this expiring general permit remains in effect until the issuance or denial of an individual permit. No new NOIs will be accepted nor new authorizations honored under the general permit after the expiration date.

Part III. Stormwater Pollution Prevention Plans (SWP3)

All regulated construction site operators shall prepare an SWP3, prior to submittal of an NOI, to address discharges authorized under Parts II.E.2. and II.E.3. of this general permit that will reach Waters of the U.S., including discharges to MS4s and privately owned separate storm sewer systems that drain to Waters of the U.S., to identify and address potential sources of pollution that are reasonably expected to affect the quality of discharges from the construction site, including off-site material storage areas, overburden and stockpiles of dirt, borrow areas, equipment staging areas, vehicle repair areas, fueling areas, etc., used solely by the permitted project. The SWP3 must describe the implementation of practices that will be used to minimize to the extent practicable the discharge of pollutants in stormwater associated with construction activity and non-stormwater discharges described in Part II.A.3., in compliance with the terms and conditions of this permit.

Individual operators at a site may develop separate SWP3s that cover only their portion of the project, provided reference is made to the other operators at the site. Where there is more than one SWP3 for a site, permittees must coordinate to ensure that BMPs and controls are consistent and do not negate or impair the effectiveness of each other. Regardless of whether a single comprehensive SWP3 is developed or separate SWP3s are developed for each operator, it is the responsibility of each operator to ensure compliance with the terms and conditions of this general permit in the areas of the construction site where that operator has control over construction plans and specifications or day-to-day operations.

Section A. Shared SWP3 Development

For more effective coordination of BMPs and opportunities for cost sharing, a cooperative effort by the different operators at a site is encouraged. Operators must independently obtain authorization, but may work together to prepare and implement a single, comprehensive SWP3 for the entire construction site.

1. The SWP3 must clearly list the name and, for large construction activities, the general permit authorization numbers, for each operator that participates in the shared SWP3. Until the TCEQ responds to receipt of the NOI with a general permit authorization number, the SWP3 must specify the date that the NOI was submitted to TCEQ by each operator. Each operator participating in the shared plan must also sign the SWP3.

2. The SWP3 must clearly indicate which operator is responsible for satisfying each shared requirement of the SWP3. If the responsibility for satisfying a requirement is not described in the plan, then each permittee is entirely responsible for meeting the requirement within the boundaries of the construction site where they perform construction activities. The SWP3 must clearly describe responsibilities for meeting each requirement in shared or common areas.
3. The SWP3 may provide that one operator is responsible for preparation of a SWP3 in compliance with the CGP, and another operator is responsible for implementation of the SWP3 at the project site.

Section B. Responsibilities of Operators

1. Secondary Operators and Primary Operators with Control Over Construction Plans and Specifications

All secondary operators and primary operators with control over construction plans and specifications shall:

(a) ensure the project specifications allow or provide that adequate BMPs are developed to meet the requirements of Part III of this general permit;

(b) ensure that the SWP3 indicates the areas of the project where they have control over project specifications, including the ability to make modifications in specifications;

(c) ensure that all other operators affected by modifications in project specifications are notified in a timely manner so that those operators may modify their BMP s as necessary to remain compliant with the conditions of this general permit; and

(d) ensure that the SWP3 for portions of the project where they are operators indicates the name and site-specific TPDES authorization number(s) for operators with the day-to-day operational control over those activities necessary to ensure compliance with the SWP3 and other permit conditions. If the party with day-to-day operational control has not been authorized or has abandoned the site, the person with control over project specifications is considered to be the responsible party until the authority is transferred to another party and the SWP3 is updated.

2. Primary Operators with Day-to-Day Operational Control

Primary operators with day-to-day operational control of those activities at a project that are necessary to ensure compliance with an SWP3 and other permit conditions must ensure that the SWP3 accomplishes the following requirements:

(a) meets the requirements of this general permit for those portions of the project where they are operators;

(b) identifies the parties responsible for implementation of BMPs described in the SWP3;

(c) indicates areas of the project where they have operational control over day-to-day activities; and

(d) includes, for areas where they have operational control over day-to-day activities, the name and site-specific TPDES authorization number of the parties with control over project specifications, including the ability to make modifications in specifications.

Section C. Deadlines for SWP3 Preparation, Implementation, and Compliance

The SWP3 must be prepared prior to obtaining authorization under this general permit, and implemented prior to commencing construction activities that result in soil

disturbance. The SWP3 must be prepared so that it provides for compliance with the terms and conditions of this general permit.

Section D. Plan Review and Making Plans Available

1. The SWP3 must be retained on-site at the construction site or, if the site is inactive or does not have an on-site location to store the plan, a notice must be posted describing the location of the SWP3. The SWP3 must be made readily available at the time of an on-site inspection to: the executive director; a federal, state, or local agency approving sediment and erosion plans, grading plans, or stormwater management plans; local government officials; and the operator of a municipal separate storm sewer receiving discharges from the site. If the SWP3 is retained off-site, then it shall be made available as soon as reasonably possible. In most instances, it is reasonable that the SWP3 shall be made available within 24 hours of the request.
2. A primary operator of a large construction activity must post the TCEQ site notice near the main entrance of the construction site. An operator of a small construction activity seeking authorization under this general permit and a secondary operator of a large construction activity must post the TCEQ site notice required in Part II.E.1., 2., or 3. of this general permit in order to obtain authorization. If the construction project is a linear construction project, such as a pipeline or highway, the notices must be placed in a publicly accessible location near where construction is actively underway. Notices for these linear sites may be relocated, as necessary, along the length of the project. The notices must be readily available for viewing by the general public; local, state, and federal authorities; and contain the following information:
   (a) the site-specific TPDES authorization number for the project if assigned;
   (b) the operator name, contact name, and contact phone number;
   (c) a brief description of the project; and
   (d) the location of the SWP3.
3. This permit does not provide the general public with any right to trespass on a construction site for any reason, including inspection of a site; nor does this permit require that permittees allow members of the general public access to a construction site.

Section E. Revisions and Updates to SWP3s

The permittee must revise or update the SWP3 whenever the following occurs:

1. a change in design, construction, operation, or maintenance that has a significant effect on the discharge of pollutants and that has not been previously addressed in the SWP3;
2. changing site conditions based on updated plans and specifications, new operators, new areas of responsibility, and changes in BMPs; or
3. results of inspections or investigations by site operators, operators of a municipal separate storm sewer system receiving the discharge, authorized TCEQ personnel, or a federal, state or local agency approving sediment and erosion plans indicate the SWP3 is proving ineffective in eliminating or significantly minimizing pollutants in discharges authorized under this general permit.

Section F. Contents of SWP3

The SWP3 must include, at a minimum, the information described in this section and must comply with the construction and development effluent guidelines in Part III, Section G of the general permit.

1. A site or project description, which includes the following information:
   (a) a description of the nature of the construction activity;
   (b) a list of potential pollutants and their sources;
   (c) a description of the intended schedule or sequence of activities that will disturb soils for major portions of the site, including estimated start dates and duration of activities;
   (d) the total number of acres of the entire property and the total number of acres where construction activities will occur, including off-site material storage areas, overburden and stockpiles of dirt, and borrow areas that are authorized under the permittee's NOI;
   (e) data describing the soil or the quality of any discharge from the site;
   (f) a map showing the general location of the site (e.g. a portion of a city or county map);
   (g) a detailed site map (or maps) indicating the following:
      (i) drainage patterns and approximate slopes anticipated after major grading activities;
      (ii) areas where soil disturbance will occur;
      (iii) locations of all controls and buffers, either planned or in place;
      (iv) locations where temporary or permanent stabilization practices are expected to be used;
      (v) locations of construction support activities, including off-site activities, that are authorized under the permittee's NOI, including material, waste, borrow, fill, or equipment or chemical storage areas;
      (vi) surface waters (including wetlands) either at, adjacent, or in close proximity to the site, and also indicating those that are impaired waters;
      (vii) locations where stormwater discharges from the site directly to a surface water body or a municipal separate storm sewer system;
      (viii) vehicle wash areas; and
      (ix) designated points on the site where vehicles will exit onto paved roads (for instance, this applies to construction transition from unstable dirt areas to exterior paved roads).

      Where the amount of information required to be included on the map would result in a single map being difficult to read and interpret, the operator shall develop a series of maps that collectively include the required information.
   (h) the location and description of support activities authorized under the permittee's NOI, including asphalt plants, concrete plants, and other activities providing support to the construction site that is authorized under this general permit;
   (i) the name of receiving waters at or near the site that may be disturbed or that may receive discharges from disturbed areas of the project;
   (j) a copy of this TPDES general permit;
   (k) the NOI and acknowledgement certificate for primary operators of large construction sites, and the site notice for small construction sites and for secondary operators of large construction sites;
   (l) stormwater and allowable non-stormwater discharge locations, including storm drain inlets on site and in the immediate vicinity of the construction site; and

(m) locations of all pollutant-generating activities, such as paving operations; concrete, paint and stucco washout and water disposal; solid waste storage and disposal; and dewatering operations.

2. A description of the BMPs that will be used to minimize pollution in runoff.

The description must identify the general timing or sequence for implementation. At a minimum, the description must include the following components:

(a) General Requirements

(i) Erosion and sediment controls must be designed to retain sediment on-site to the extent practicable with consideration for local topography, soil type, and rainfall.

(ii) Control measures must be properly selected, installed, and maintained according to the manufacturer's or designer's specifications.

(iii) Controls must be developed to minimize the offsite transport of litter, construction debris, and construction materials.

(b) Erosion Control and Stabilization Practices

The SWP3 must include a description of temporary and permanent erosion control and stabilization practices for the site, compliant with the requirements of Part III.G.1 and G.2 of this general permit, including a schedule of when the practices will be implemented. Site plans should ensure that existing vegetation is preserved where it is possible.

(i) Erosion control and stabilization practices may include but are not limited to: establishment of temporary or permanent vegetation, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of existing trees and vegetation, slope texturing, temporary velocity dissipation devices, flow diversion mechanisms, and other similar measures.

(ii) The following records must be maintained and either attached to or referenced in the SWP3, and made readily available upon request to the parties listed in Part III.D.1 of this general permit:

(A) the dates when major grading activities occur;

(B) the dates when construction activities temporarily or permanently cease on a portion of the site; and

(C) the dates when stabilization measures are initiated.

(iii) Erosion control and stabilization measures must be initiated immediately in portions of the site where construction activities have temporarily ceased and will not resume for a period exceeding 14 calendar days. Stabilization measures that provide a protective cover must be initiated immediately in portions of the site where construction activities have permanently ceased. The term "immediately" is used to define the deadline for initiating stabilization measures. In the context of this requirement, "immediately" means as soon as practicable, but no later than the end of the next work day, following the day when the earth-disturbing activities have temporarily or permanently ceased. Except as provided in (A) through (D) below, these measures must be completed as soon as practicable, but no more than 14 calendar days after the initiation of soil stabilization measures:

(A) Where the immediate initiation of stabilization measures after construction activity temporarily or permanently ceased is precluded

by snow cover or frozen ground conditions, stabilization measures must be initiated as soon as practicable.

(B) In arid areas, semi-arid areas, or drought-stricken areas where the immediate initiation of stabilization measures after construction activity has temporarily or permanently ceased or is precluded by arid conditions, erosion control and stabilization measures must be initiated as soon as practicable. Where vegetative controls are not feasible due to arid conditions, the operator shall immediately install, and within 14 calendar days of a temporary or permanent cessation of work in any portion of the site complete, non-vegetative erosion controls. If non-vegetative controls are not feasible, the operator shall install temporary sediment controls as required in Paragraph (C) below.

(C) In areas where temporary stabilization measures are infeasible, the operator may alternatively utilize temporary perimeter controls. The operator must document in the SWP3 the reason why stabilization measures are not feasible, and must demonstrate that the perimeter controls will retain sediment on site to the extent practicable. The operator must continue to inspect the BMPs at the frequency established in Section III.F.7.(a) for unstabilized sites.

(D) If the initiation or completion of vegetative stabilization is affected by circumstances beyond the control of the permittee, vegetative stabilization must be initiated or completed as soon as conditions or circumstances allow it on the site. The requirement to initiate stabilization is triggered as soon as it is known with reasonable certainty that work will be stopped for 14 or more additional calendar days.

(iv) Final stabilization must be achieved prior to termination of permit coverage.

(v) TCEQ does not expect that temporary or permanent stabilization measures to be applied to areas that are intended to be left un-vegetated or un-stabilized following construction (e.g., dirt access roads, utility pole pads, areas being used for storage of vehicles, equipment, or materials).

(c) Sediment Control Practices

The SWP3 must include a description of any sediment control practices used to remove eroded soils from stormwater runoff, including the general timing or sequence for implementation of controls.

(i) Sites With Drainage Areas of Ten or More Acres

(A) Sedimentation Basin(s)

(1) A sedimentation basin is required, where feasible, for a common drainage location that serves an area with ten (10) or more acres disturbed at one time. A sedimentation basin may be temporary or permanent, and must provide sufficient storage to contain a calculated volume of runoff from a 2-year, 24-hour storm from each disturbed acre drained. When calculating the volume of runoff from a 2-year, 24-hour storm event, it is not required to include the flows from offsite areas and flow from onsite areas that are either undisturbed or have already undergone permanent stabilization, if these flows are diverted around both the disturbed areas of the site and the sediment basin. Capacity calculations shall be included in the SWP3.

(2) Where rainfall data is not available or a calculation cannot be performed, the sedimentation basin must provide at least 3,600 cubic feet of storage per acre drained until final stabilization of the site.

(3) If a sedimentation basin is not feasible, then the permittee shall provide equivalent control measures until final stabilization of the site. In determining whether installing a sediment basin is feasible, the permittee may consider factors such as site soils, slope, available area, public safety, precipitation patterns, site geometry, site vegetation, infiltration capacity, geotechnical factors, depth to groundwater, and other similar considerations. The permittee shall document the reason that the sediment basins are not feasible, and shall utilize equivalent control measures, which may include a series of smaller sediment basins.

(4) Unless infeasible, when discharging from sedimentation basins and impoundments, the permittee shall utilize outlet structures that withdraw water from the surface.

(B) Perimeter Controls: At a minimum, silt fences, vegetative buffer strips, or equivalent sediment controls are required for all down slope boundaries of the construction area, and for those side slope boundaries deemed appropriate as dictated by individual site conditions.

(ii) Controls for Sites With Drainage Areas Less than Ten Acres:

(A) Sediment traps and sediment basins may be used to control solids in stormwater runoff for drainage locations serving less than ten (10) acres. At a minimum, silt fences, vegetative buffer strips, or equivalent sediment controls are required for all down slope boundaries of the construction area, and for those side slope boundaries deemed appropriate as dictated by individual site conditions.

(B) Alternatively, a sediment basin that provides storage for a calculated volume of runoff from a 2-year, 24-hour storm from each disturbed acre drained may be utilized. Where rainfall data is not available or a calculation cannot be performed, a temporary or permanent sediment basin providing 3,600 cubic feet of storage per acre drained may be provided. If a calculation is performed, then the calculation shall be included in the SWP3.

(C) If sedimentation basins or impoundments are used, the permittee shall comply with the requirements in Part III.G.6 of this general permit.

3. Description of Permanent Stormwater Controls

A description of any measures that will be installed during the construction process to control pollutants in stormwater discharges that may occur after construction operations have been completed must be included in the SWP3. Permittees are only responsible for the installation and maintenance of stormwater management measures prior to final stabilization of the site or prior to submission of an NOT.

4. Other Required Controls and BMPs

(a) Permittees shall minimize, to the extent practicable, the off-site vehicle tracking of sediments and the generation of dust. The SWP3 shall include a description of controls utilized to accomplish this requirement.

(b) The SWP3 must include a description of construction and waste materials expected to be stored on-site and a description of controls to minimize pollutants from these materials.

(c) The SWP3 must include a description of potential pollutant sources from areas other than construction (such as stormwater discharges from dedicated asphalt plants and dedicated concrete batch plants), and a description of controls and measures that will be implemented at those sites to minimize pollutant discharges.

(d) Permittees shall place velocity dissipation devices at discharge locations and along the length of any outfall channel (i.e., runoff conveyance) to provide a non-erosive flow velocity from the structure to a water course, so that the natural physical and biological characteristics and functions are maintained and protected.

(e) Permittees shall design and utilize appropriate controls to minimize the offsite transport of suspended sediments and other pollutants if it is necessary to pump or channel standing water from the site.

(f) Permittees shall ensure that all other required controls and BMPs comply with all of the requirements of Part III.G of this general permit.

5. Documentation of Compliance with Approved State and Local Plans

(a) Permittees must ensure that the SWP3 is consistent with requirements specified in applicable sediment and erosion site plans or site permits, or stormwater management site plans or site permits approved by federal, state, or local officials.

(b) SWP3s must be updated as necessary to remain consistent with any changes applicable to protecting surface water resources in sediment erosion site plans or site permits, or stormwater management site plans or site permits approved by state or local official for which the permittee receives written notice.

(c) If the permittee is required to prepare a separate management plan, including but not limited to a WPAP or Contributing Zone Plan in accordance with 30 TAC Chapter 213 (related to the Edwards Aquifer), then a copy of that plan must be either included in the SWP3 or made readily available upon request to authorized personnel of the TCEQ. The permittee shall maintain a copy of the approval letter for the plan in its SWP3.

6. Maintenance Requirements

(a) All protective measures identified in the SWP3 must be maintained in effective operating condition. If, through inspections or other means, the permittee determines that BMPs are not operating effectively, then the permittee shall perform maintenance as necessary to maintain the continued effectiveness of stormwater controls, and prior to the next rain event if feasible. If maintenance prior to the next anticipated storm event is impracticable, the reason shall be documented in the SWP3 and maintenance must be scheduled and accomplished as soon as practicable. Erosion and sediment controls that have been intentionally disabled, run-over, removed, or otherwise rendered ineffective must be replaced or corrected immediately upon discovery.

(b) If periodic inspections or other information indicates a control has been used incorrectly, is performing inadequately, or is damaged, then the operator shall replace or modify the control as soon as practicable after making the discovery.

(c) Sediment must be removed from sediment traps and sedimentation ponds no later than the time that design capacity has been reduced by 50%. For perimeter

controls such as silt fences, berms, etc., the trapped sediment must be removed before it reaches 50% of the above-ground height.

(d) If sediment escapes the site, accumulations must be removed at a frequency that minimizes off-site impacts, and prior to the next rain event, if feasible. If the permittee does not own or operate the off-site conveyance, then the permittee shall work with the owner or operator of the property to remove the sediment.

7. Inspections of Controls

(a) Personnel provided by the permittee must inspect disturbed areas of the construction site that have not been finally stabilized, areas used for storage of materials that are exposed to precipitation, discharge locations, and structural controls for evidence of, or the potential for, pollutants entering the drainage system. Personnel conducting these inspections must be knowledgeable of this general permit, familiar with the construction site, and knowledgeable of the SWP3 for the site. Sediment and erosion control measures identified in the SWP3 must be inspected to ensure that they are operating correctly. Locations where vehicles enter or exit the site must be inspected for evidence of off-site sediment tracking. Inspections must be conducted at least once every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater.

Where sites have been finally or temporarily stabilized or where runoff is unlikely due to winter conditions (e.g. site is covered with snow, ice, or frozen ground exists), inspections must be conducted at least once every month. In arid, semi-arid, or drought-stricken areas, inspections must be conducted at least once every month and within 24 hours after the end of a storm event of 0.5 inches or greater. The SWP3 must also contain a record of the total rainfall measured, as well as the approximate beginning and ending dates of winter or drought conditions resulting in monthly frequency of inspections.

As an alternative to the above-described inspection schedule of once every 14 calendar days and within 24 hours of a storm event of 0.5 inches or greater, the SWP3 may be developed to require that these inspections will occur at least once every seven (7) calendar days. If this alternative schedule is developed, then the inspection must occur regardless of whether or not there has been a rainfall event since the previous inspection.

The inspections may occur on either schedule provided that the SWP3 reflects the current schedule and that any changes to the schedule are conducted in accordance with the following provisions: the schedule may be changed a maximum of one time each month, the schedule change must be implemented at the beginning of a calendar month, and the reason for the schedule change must be documented in the SWP3 (e.g., end of “dry” season and beginning of “wet” season).

(b) Utility line installation, pipeline construction, and other examples of long, narrow, linear construction activities may provide inspection personnel with limited access to the areas described in Part III.F.7.(a) above. Inspection of these areas could require that vehicles compromise temporarily or even permanently stabilized areas, cause additional disturbance of soils, and increase the potential for erosion. In these circumstances, controls must be inspected at least once every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater, but representative inspections may be performed. For representative inspections, personnel must inspect controls along the construction site for 0.25 mile above and below each access point where a roadway, undisturbed right-of-way, or other similar feature intersects the construction site and allows access to the areas described in Part III.F.7.(a)

above. The conditions of the controls along each inspected 0.25 mile portion may be considered as representative of the condition of controls along that reach extending from the end of the 0.25 mile portion to either the end of the next 0.25 mile inspected portion, or to the end of the project, whichever occurs first.

As an alternative to the above-described inspection schedule of once every 14 calendar days and within 24 hours of a storm event of 0.5 inches or greater, the SWP3 may be developed to require that these inspections will occur at least once every seven (7) calendar days. If this alternative schedule is developed, the inspection must occur regardless of whether or not there has been a rainfall event since the previous inspection. The inspections may occur on either schedule provided that the SWP3 reflects the current schedule and that any changes to the schedule are conducted in accordance with the following provisions: the schedule may be changed a maximum of one time each month, the schedule change must be implemented at the beginning of a calendar month, and the reason for the schedule change must be documented in the SWP3 (e.g., end of "dry" season and beginning of "wet" season).

(c) In the event of flooding or other uncontrollable situations which prohibit access to the inspection sites, inspections must be conducted as soon as access is practicable.

(d) The SWP3 must be modified based on the results of inspections, as necessary, to better control pollutants in runoff. Revisions to the SWP3 must be completed within seven (7) calendar days following the inspection. If existing BMPs are modified or if additional BMPs are necessary, an implementation schedule must be described in the SWP3 and wherever possible those changes implemented before the next storm event. If implementation before the next anticipated storm event is impracticable, these changes must be implemented as soon as practicable.

(e) A report summarizing the scope of the inspection, the date(s) of the inspection, and major observations relating to the implementation of the SWP3 must be made and retained as part of the SWP3. Major observations should include: The locations of discharges of sediment or other pollutants from the site; locations of BMPs that need to be maintained; locations of BMPs that failed to operate as designed or proved inadequate for a particular location; and locations where additional BMPs are needed.

Actions taken as a result of inspections must be described within, and retained as a part of, the SWP3. Reports must identify any incidents of non-compliance. Where a report does not identify any incidents of non-compliance, the report must contain a certification that the facility or site is in compliance with the SWP3 and this permit. The report must be signed by the person and in the manner required by 30 TAC §305.128 (relating to Signatories to Reports).

The names and qualifications of personnel making the inspections for the permittee may be documented once in the SWP3 rather than being included in each report.

8. The SWP3 must identify and ensure the implementation of appropriate pollution prevention measures for all eligible non-stormwater components of the discharge, as listed in Part II.A.3. of this permit.
9. The SWP3 must include the information required in Part III.B. of this general permit.
10. The SWP3 must include pollution prevention procedures that comply with Part III.G.4 of this general permit.

Section G. Erosion and Sediment Control Requirements Applicable to All Sites

Except as provided in 40 CFR §§125.30-125.32, any discharge regulated under this general permit, with the exception of sites that obtained waivers based on low rainfall erosivity, must achieve, at a minimum, the following effluent limitations representing the degree of effluent reduction attainable by application of the best practicable control technology currently available (BPT).

1. *Erosion and sediment controls*. Design, install, and maintain effective erosion controls and sediment controls to minimize the discharge of pollutants. At a minimum, such controls must be designed, installed, and maintained to:

   (a) Control stormwater volume and velocity within the site to minimize soil erosion;

   (b) If any stormwater flow will be channelized at the site, stormwater controls must be designed to control both peak flowrates and total stormwater volume to minimize erosion at outlets and to minimize downstream channel and streambank erosion;

   (c) Minimize the amount of soil exposed during construction activity;

   (d) Minimize the disturbance of steep slopes;

   (e) Minimize sediment discharges from the site. The design, installation, and maintenance of erosion and sediment controls must address factors such as the amount, frequency, intensity and duration of precipitation, the nature of resulting stormwater runoff, and soil characteristics, including the range of soil particle sizes expected to be present on the site;

   (f) If earth disturbance activities are located in close proximity to a surface water, provide and maintain appropriate natural buffers if feasible and as necessary, around surface waters, depending on site-specific topography, sensitivity, and proximity to water bodies. Direct stormwater to vegetated areas to increase sediment removal and maximize stormwater infiltration. If providing buffers is infeasible, the permittee shall document the reason that natural buffers are not feasible, and shall implement additional erosion and sediment controls to reduce sediment load;

   (g) Preserve native topsoil at the site, unless infeasible; and

   (h) Minimize soil compaction in post-construction pervious areas. In areas of the construction site where final vegetative stabilization will occur or where infiltration practices will be installed, either:

      (1) restrict vehicle and equipment use to avoid soil compaction; or

      (2) prior to seeding or planting areas of exposed soil that have been compacted, use techniques that condition the soils to support vegetative growth, if necessary and feasible;

   (i) TCEQ does not consider stormwater control features (e.g., stormwater conveyance channels, storm drain inlets, sediment basins) to constitute “surface waters” for the purposes of triggering the buffer requirement in Part III.G.(f) above.

2. *Soil stabilization*. Stabilization of disturbed areas must, at a minimum, be initiated immediately whenever any clearing, grading, excavating, or other earth disturbing activities have permanently ceased on any portion of the site, or temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days. In the context of this requirement, “immediately” means as soon as practicable, but no later than the end of the next work day, following the day when the earth-disturbing activities have temporarily or permanently ceased. Temporary

stabilization must be completed no more than 14 calendar days after initiation of soil stabilization measures, and final stabilization must be achieved prior to termination of permit coverage. In arid, semi-arid, and drought-stricken areas where initiating vegetative stabilization measures immediately is infeasible, alternative non-vegetative stabilization measures must be employed as soon as practicable. Refer to Part III.F.2.(b) for complete erosion control and stabilization practice requirements.

3. *Dewatering*. Discharges from dewatering activities, including discharges from dewatering of trenches and excavations, are prohibited, unless managed by appropriate controls.
4. *Pollution prevention measures*. Design, install, implement, and maintain effective pollution prevention measures to minimize the discharge of pollutants. At a minimum, such measures must be designed, installed, implemented, and maintained to:
   (a) Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge;
   (b) Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste, and other materials present on the site to precipitation and to stormwater; and
   (c) Minimize the discharge of pollutants from spills and leaks, and implement chemical spill and leak prevention and response procedures.
5. *Prohibited discharges*. The following discharges are prohibited:
   (a) Wastewater from wash out of concrete trucks, unless managed by an appropriate control (see Part V of the general permit);
   (b) Wastewater from wash out and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;
   (c) Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance; and
   (d) Soaps or solvents used in vehicle and equipment washing.
6. *Surface outlets*. When discharging from basins and impoundments, utilize outlet structures that withdraw water from the surface, unless infeasible.

Part IV. Stormwater Runoff from Concrete Batch Plants

Discharges of stormwater runoff from concrete batch plants at regulated construction sites may be authorized under the provisions of this general permit provided that the following requirements are met for concrete batch plant(s) authorized under this permit. If discharges of stormwater runoff from concrete batch plants are not covered under this general permit, then discharges must be authorized under an alternative general permit or individual permit. This permit does not authorize the discharge or land disposal of any wastewater from concrete batch plants at regulated construction sites. Authorization for these wastes must be obtained under an individual permit or an alternative general permit.

Section A. Benchmark Sampling Requirements

1. Operators of concrete batch plants authorized under this general permit shall sample the stormwater runoff from the concrete batch plants according to the requirements

of this section of this general permit, and must conduct evaluations on the effectiveness of the SWP3 based on the following benchmark monitoring values:

Table 1. Benchmark Parameters

Benchmark Parameter	Benchmark Value	Sampling Frequency	Sample Type
Oil and Grease	15 mg/L	1/quarter (*1) (*2)	Grab (*3)
Total Suspended Solids	100 mg/L	1/quarter (*1) (*2)	Grab (*3)
pH	6.0 – 9.0 Standard Units	1/quarter (*1) (*2)	Grab (*3)
Total Iron	1.3 mg/L	1/quarter (*1) (*2)	Grab (*3)

(*1) When discharge occurs. Sampling is required within the first 30 minutes of discharge. If it is not practicable to take the sample, or to complete the sampling, within the first 30 minutes, sampling must be completed within the first hour of discharge. If sampling is not completed within the first 30 minutes of discharge, the reason must be documented and attached to all required reports and records of the sampling activity.

(*2) Sampling must be conducted at least once during each of the following periods. The first sample must be collected during the first full quarter that a stormwater discharge occurs from a concrete batch plant authorized under this general permit.

January through March

April through June

July through September

October through December

For projects lasting less than one full quarter, a minimum of one sample shall be collected, provided that a stormwater discharge occurred at least once following submission of the NOI or following the date that automatic authorization was obtained under Section II.E.2., and prior to terminating coverage.

(*3) A grab sample shall be collected from the stormwater discharge resulting from a storm event that is at least 0.1 inches of measured precipitation that occurs at least 72 hours from the previously measurable storm event. The sample shall be collected downstream of the concrete batch plant, and where the discharge exits any BMPs utilized to handle the runoff from the batch plant, prior to commingling with any other water authorized under this general permit.

2. The permittee must compare the results of sample analyses to the benchmark values above, and must include this comparison in the overall assessment of the SWP3's effectiveness. Analytical results that exceed a benchmark value are not a violation of this permit, as these values are not numeric effluent limitations. Results of analyses are indicators that modifications of the SWP3 should be assessed and may be necessary to protect water quality. The operator must investigate the cause for each exceedance and must document the results of this investigation in the SWP3 by the end of the quarter following the sampling event.

The operator's investigation must identify the following:

(a) any additional potential sources of pollution, such as spills that might have occurred,

(b) necessary revisions to good housekeeping measures that are part of the SWP3,

(c) additional BMPs, including a schedule to install or implement the BMPs, and

(d) other parts of the SWP3 that may require revisions in order to meet the goal of the benchmark values.

Background concentrations of specific pollutants may also be considered during the investigation. If the operator is able to relate the cause of the exceedance to background concentrations, then subsequent exceedances of benchmark values for that pollutant may be resolved by referencing earlier findings in the SWP3. Background concentrations may be identified by laboratory analyses of samples of stormwater runon to the permitted facility, by laboratory analyses of samples of stormwater run-off from adjacent non-industrial areas, or by identifying the pollutant is a naturally occurring material in soils at the site.

Section B. Best Management Practices (BMPs) and SWP3 Requirements

Minimum SWP3 Requirements – The following are required in addition to other SWP3 requirements listed in this general permit (including, but not limited to Part III.F.7. of this permit):

1. Description of Potential Pollutant Sources - The SWP3 must provide a description of potential sources (activities and materials) that may reasonably be expected to affect the quality of stormwater discharges associated with concrete batch plants authorized under this permit. The SWP3 must describe practices that that will be used to reduce the pollutants in these discharges to assure compliance with this general permit, including the protection of water quality, and must ensure the implementation of these practices.

   The following must be developed, at a minimum, in support of developing this description:

   (a) Drainage – The site map must include the following information:

      (1) the location of all outfalls for stormwater discharges associated with concrete batch plants that are authorized under this permit;

      (2) a depiction of the drainage area and the direction of flow to the outfall(s);

      (3) structural controls used within the drainage area(s);

      (4) the locations of the following areas associated with concrete batch plants that are exposed to precipitation: vehicle and equipment maintenance activities (including fueling, repair, and storage areas for vehicles and equipment scheduled for maintenance); areas used for the treatment, storage, or disposal of wastes; liquid storage tanks; material processing and storage areas; and loading and unloading areas; and

      (5) the locations of the following: any bag house or other dust control device(s); recycle/sedimentation pond, clarifier or other device used for the treatment of facility wastewater (including the areas that drain to the treatment device); areas with significant materials; and areas where major spills or leaks have occurred.

   (b) Inventory of Exposed Materials – A list of materials handled at the concrete batch plant that may be exposed to stormwater and that have a potential to

affect the quality of stormwater discharges associated with concrete batch plants that are authorized under this general permit.

(c) Spills and Leaks - A list of significant spills and leaks of toxic or hazardous pollutants that occurred in areas exposed to stormwater and that drain to stormwater outfalls associated with concrete batch plants authorized under this general permit must be developed, maintained, and updated as needed.

(d) Sampling Data - A summary of existing stormwater discharge sampling data must be maintained, if available.

2. Measures and Controls - The SWP3 must include a description of management controls to regulate pollutants identified in the SWP3's "Description of Potential Pollutant Sources" from Part IV.B.1.(a) of this permit, and a schedule for implementation of the measures and controls. This must include, at a minimum:

(a) Good Housekeeping - Good housekeeping measures must be developed and implemented in the area(s) associated with concrete batch plants.

(1) Operators must prevent or minimize the discharge of spilled cement, aggregate (including sand or gravel), settled dust, or other significant materials from paved portions of the site that are exposed to stormwater. Measures used to minimize the presence of these materials may include regular sweeping or other equivalent practices. These practices must be conducted at a frequency that is determined based on consideration of the amount of industrial activity occurring in the area and frequency of precipitation, and shall occur at least once per week when cement or aggregate is being handled or otherwise processed in the area.

(2) Operators must prevent the exposure of fine granular solids, such as cement, to stormwater. Where practicable, these materials must be stored in enclosed silos, hoppers or buildings, in covered areas, or under covering.

(b) Spill Prevention and Response Procedures - Areas where potential spills that can contribute pollutants to stormwater runoff, and the drainage areas from these locations, must be identified in the SWP3. Where appropriate, the SWP3 must specify material handling procedures, storage requirements, and use of equipment. Procedures for cleaning up spills must be identified in the SWP3 and made available to the appropriate personnel.

(c) Inspections - Qualified facility personnel (i.e., a person or persons with knowledge of this general permit, the concrete batch plant, and the SWP3 related to the concrete batch plant(s) for the site) must be identified to inspect designated equipment and areas of the facility specified in the SWP3. The inspection frequency must be specified in the SWP3 based upon a consideration of the level of concrete production at the facility, but must be a minimum of once per month while the facility is in operation. The inspection must take place while the facility is in operation and must, at a minimum, include all areas that are exposed to stormwater at the site, including material handling areas, above ground storage tanks, hoppers or silos, dust collection/containment systems, truck wash down and equipment cleaning areas. Follow-up procedures must be used to ensure that appropriate actions are taken in response to the inspections. Records of inspections must be maintained and be made readily available for inspection upon request.

(d) Employee Training - An employee training program must be developed to educate personnel responsible for implementing any component of the SWP3, or personnel otherwise responsible for stormwater pollution prevention, with the provisions of the SWP3. The frequency of training must be documented in

the SWP3, and at a minimum, must consist of one training prior to the initiation of operation of the concrete batch plant.

(e) Record Keeping and Internal Reporting Procedures - A description of spills and similar incidents, plus additional information that is obtained regarding the quality and quantity of stormwater discharges, must be included in the SWP3. Inspection and maintenance activities must be documented and records of those inspection and maintenance activities must be incorporated in the SWP3.

(f) Management of Runoff - The SWP3 shall contain a narrative consideration for reducing the volume of runoff from concrete batch plants by diverting runoff or otherwise managing runoff, including use of infiltration, detention ponds, retention ponds, or reusing of runoff.

3. Comprehensive Compliance Evaluation – At least once per year, one or more qualified personnel (i.e., a person or persons with knowledge of this general permit, the concrete batch plant, and the SWP3 related to the concrete batch plant(s) for the site) shall conduct a compliance evaluation of the plant. The evaluation must include the following.

(a) Visual examination of all areas draining stormwater associated with regulated concrete batch plants for evidence of, or the potential for, pollutants entering the drainage system. These include but are not limited to: cleaning areas, material handling areas, above ground storage tanks, hoppers or silos, dust collection/containment systems, and truck wash down and equipment cleaning areas. Measures implemented to reduce pollutants in runoff (including structural controls and implementation of management practices) must be evaluated to determine if they are effective and if they are implemented in accordance with the terms of this permit and with the permittee's SWP3. The operator shall conduct a visual inspection of equipment needed to implement the SWP3, such as spill response equipment.

(b) Based on the results of the evaluation, the following must be revised as appropriate within two weeks of the evaluation: the description of potential pollutant sources identified in the SWP3 (as required in Part IV.B.1., "Description of Potential Pollutant Sources"); and pollution prevention measures and controls identified in the SWP3 (as required in Part IV.B.2., "Measures and Controls"). The revisions may include a schedule for implementing the necessary changes.

(c) The permittee shall prepare and include in the SWP3 a report summarizing the scope of the evaluation, the personnel making the evaluation, the date(s) of the evaluation, major observations relating to the implementation of the SWP3, and actions taken in response to the findings of the evaluation. The report must identify any incidents of noncompliance. Where the report does not identify incidences of noncompliance, the report must contain a statement that the evaluation did not identify any incidence(s), and the report must be signed according to 30 TAC §305.128, relating to Signatories to Reports.

(d) The Comprehensive Compliance Evaluation may substitute for one of the required inspections delineated in Part IV.B.2.(c) of this general permit.

Section C. Prohibition of Wastewater Discharges

Wastewater discharges associated with concrete production including wastewater disposal by land application are not authorized under this general permit. These wastewater discharges must be authorized under an alternative TCEQ water quality permit or otherwise disposed of in an authorized manner. Discharges of concrete truck wash out at construction sites may be authorized if conducted in accordance with the requirements of Part V of this general permit.

Part V. Concrete Truck Wash Out Requirements

This general permit authorizes the wash out of concrete trucks at construction sites regulated under Sections II.E.1., 2., and 3. of this general permit, provided the following requirements are met. Authorization is limited to the land disposal of wash out water from concrete trucks. Any other direct discharge of concrete production waste water must be authorized under a separate TCEQ general permit or individual permit.

1. Direct discharge of concrete truck wash out water to surface water in the state, including discharge to storm sewers, is prohibited by this general permit.
2. Concrete truck wash out water shall be discharged to areas at the construction site where structural controls have been established to prevent direct discharge to surface waters, or to areas that have a minimal slope that allow infiltration and filtering of wash out water to prevent direct discharge to surface waters. Structural controls may consist of temporary berms, temporary shallow pits, temporary storage tanks with slow rate release, or other reasonable measures to prevent runoff from the construction site.
3. Wash out of concrete trucks during rainfall events shall be minimized. The direct discharge of concrete truck wash out water is prohibited at all times, and the operator shall insure that its BMPs are sufficient to prevent the discharge of concrete truck wash out as the result of rainfall or stormwater runoff.
4. The discharge of wash out water must not cause or contribute to groundwater contamination.
5. If a SWP3 is required to be implemented, the SWP3 shall include concrete wash out areas on the associated site map.

Part VI. Retention of Records

The permittee must retain the following records for a minimum period of three (3) years from the date that a NOT is submitted as required by Part II.E.3. For activities in which an NOT is not required, records shall be retained for a minimum period of three (3) years from the date that the operator terminates coverage under Section II.F.3. of this permit. Records include:

1. A copy of the SWP3;
2. All reports and actions required by this permit, including a copy of the construction site notice;
3. All data used to complete the NOI, if an NOI is required for coverage under this general permit; and
4. All records of submittal of forms submitted to the operator of any MS4 receiving the discharge and to the secondary operator of a large construction site, if applicable.

Part VII. Standard Permit Conditions

1. The permittee has a duty to comply with all permit conditions. Failure to comply with any permit condition is a violation of the permit and statutes under which it was issued, and is grounds for enforcement action, for terminating, revoking, or denying coverage under this general permit, or for requiring a discharger to apply for and obtain an individual TPDES permit.
2. Authorization under this general permit may be suspended or revoked for cause. Filing a notice of planned changes or anticipated non-compliance by the permittee does not stay any permit condition. The permittee must furnish to the executive director, upon request and within a reasonable time, any information necessary for the executive director to determine whether cause exists for revoking, suspending, or

terminating authorization under this permit. Additionally, the permittee must provide to the executive director, upon request, copies of all records that the permittee is required to maintain as a condition of this general permit.

3. It is not a defense for a discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity to maintain compliance with the permit conditions.
4. Inspection and entry shall be allowed under TWC Chapters 26-28, Texas Health and Safety Code §§361.032-361.033 and 361.037, and 40 CFR §122.41(i). The statement in TWC §26.014 that commission entry of a facility shall occur according to an establishment's rules and regulations concerning safety, internal security, and fire protection is not grounds for denial or restriction of entry to any part of the facility or site, but merely describes the commission's duty to observe appropriate rules and regulations during an inspection.
5. The discharger is subject to administrative, civil, and criminal penalties, as applicable, under TWC Chapter 7 for violations including but not limited to the following:
   (a) negligently or knowingly violating the federal CWA §§301, 302, 306, 307, 308, 318, or 405, or any condition or limitation implementing any sections in a permit issued under CWA §402, or any requirement imposed in a pretreatment program approved under CWA §§402(a)(3) or 402(b)(8);
   (b) knowingly making any false statement, representation, or certification in any record or other document submitted or required to be maintained under a permit, including monitoring reports or reports of compliance or noncompliance; and
   (c) knowingly violating §303 of the federal CWA, and placing another person in imminent danger of death or serious bodily injury.
6. All reports and other information requested by the executive director must be signed by the person and in the manner required by 30 TAC §305.128 (relating to Signatories to Reports).
7. Authorization under this general permit does not convey property or water rights of any sort and does not grant any exclusive privilege.
8. The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.
9. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.
10. The permittee shall comply with the reporting requirements in 40 CFR §122.41(l), as applicable.

Part VIII. Fees

1. A fee of must be submitted along with the NOI:
   (a) $325 if submitting a paper NOI, or
   (b) $225 if submitting an NOI electronically.

2. Fees are due upon submission of the NOI. An NOI will not be declared administratively complete unless the associated fee has been paid in full.
3. No separate annual fees will be assessed for this general permit. The Water Quality Annual Fee has been incorporated into the NOI fees as described above.

Appendix A: Automatic Authorization

Periods of Low Erosion Potential by County – Eligible Date Ranges

Andrews: Nov. 15 - Apr. 30

Archer: Dec. 15 - Feb. 14

Armstrong: Nov. 15 - Apr. 30

Bailey: Nov. 1 - Apr. 30, or Nov. 15 - May 14

Baylor: Dec. 15 - Feb. 14

Borden: Nov. 15 - Apr. 30

Brewster: Nov. 15 - Apr. 30

Briscoe: Nov. 15 - Apr. 30

Brown: Dec. 15 - Feb. 14

Callahan: Dec. 15 - Feb. 14

Carson: Nov. 15 - Apr. 30

Castro: Nov. 15 - Apr. 30

Childress: Dec. 15 - Feb. 14

Cochran: Nov. 1 - Apr. 30, or Nov. 15 - May 14

Coke: Dec. 15 - Feb. 14

Coleman: Dec. 15 - Feb. 14

Collingsworth: Jan. 1 - Mar. 30, or Dec. 1 - Feb. 28

Concho: Dec. 15 - Feb. 14

Cottle: Dec. 15 - Feb. 14

Crane: Nov. 15 - Apr. 30

Crockett: Nov. 15 - Jan. 14, or Feb. 1 - Mar. 30

Crosby: Nov. 15 - Apr. 30

Culberson: Nov. 1 - May 14

Dallam: Nov. 1 - Apr. 14, or Nov. 15 - Apr. 30

Dawson: Nov. 15 - Apr. 30

Deaf Smith: Nov. 15 - Apr. 30

Dickens: Nov. 15 - Jan. 14, or Feb. 1 - Mar. 30

Dimmit: Dec. 15 - Feb. 14

Donley: Jan. 1 - Mar. 30, or Dec. 1 - Feb. 28

Eastland: Dec. 15 - Feb. 14

Ector: Nov. 15 - Apr. 30

Edwards: Dec. 15 - Feb. 14

El Paso: Jan. 1 - Jul. 14, or May 15 - Jul. 31, or Jun. 1 - Aug. 14, or Jun. 15 - Sept. 14, or Jul. 1 - Oct. 14, or Jul. 15 - Oct. 31, or Aug. 1 - Apr. 30, or Aug. 15 - May 14, or Sept. 1 - May 30, or Oct. 1 - Jun. 14, or Nov. 1 - Jun. 30, or Nov. 15 - Jul. 14

Fisher: Dec. 15 - Feb. 14

Floyd: Nov. 15 - Apr. 30

Foard: Dec. 15 - Feb. 14

Gaines: Nov. 15 - Apr. 30

Garza: Nov. 15 - Apr. 30

Glasscock: Nov. 15 - Apr. 30

Hale: Nov. 15 - Apr. 30

Hall: Feb. 1 - Mar. 30

Hansford: Nov. 15 - Apr. 30

Hardeman: Dec. 15 - Feb. 14

Hartley: Nov. 15 - Apr. 30

Haskell: Dec. 15 - Feb. 14

Hockley: Nov. 1 - Apr. 14, or Nov. 15 - Apr. 30

Howard: Nov. 15 - Apr. 30

Hudspeth: Nov. 1 - May 14

Hutchinson: Nov. 15 - Apr. 30

Irion: Dec. 15 - Feb. 14

Jeff Davis: Nov. 1 - Apr. 30 or Nov. 15 - May 14

Jones: Dec. 15 - Feb. 14

Kent: Nov. 15 - Jan. 14 or Feb. 1 - Mar. 30

Kerr: Dec. 15 - Feb. 14

Kimble: Dec. 15 - Feb. 14

King: Dec. 15 - Feb. 14

Kinney: Dec. 15 - Feb. 14

Knox: Dec. 15 - Feb. 14

Lamb: Nov. 1 - Apr. 14, or Nov. 15 - Apr. 30

Loving: Nov. 1 - Apr. 30, or Nov. 15 - May 14

Lubbock: Nov. 15 - Apr. 30

Lynn: Nov. 15 - Apr. 30

Martin: Nov. 15 - Apr. 30

Mason: Dec. 15 - Feb. 14

Maverick: Dec. 15 - Feb. 14

McCulloch: Dec. 15 - Feb. 14

Menard: Dec. 15 - Feb. 14

Midland: Nov. 15 - Apr. 30

Mitchell: Nov. 15 - Apr. 30

Moore: Nov. 15 - Apr. 30

Motley: Nov. 15 - Jan. 14, or Feb. 1 - Mar. 30

Nolan: Dec. 15 - Feb. 14

Oldham: Nov. 15 - Apr. 30

Parmer: Nov. 1 - Apr. 14, or Nov. 15 - Apr. 30

Pecos: Nov. 15 - Apr. 30

Potter: Nov. 15 - Apr. 30

Presidio: Nov. 1 - Apr. 30, or Nov. 15 - May 14

Randall: Nov. 15 - Apr. 30

Reagan: Nov. 15 - Apr. 30

Real: Dec. 15 - Feb. 14

Reeves: Nov. 1 - Apr. 30, or Nov. 15 - May 14

Runnels: Dec. 15 - Feb. 14

Schleicher: Dec. 15 - Feb. 14

Scurry: Nov. 15 - Apr. 30

Shackelford: Dec. 15 - Feb. 14

Sherman: Nov. 15 - Apr. 30

Stephens: Dec. 15 - Feb. 14

Sterling: Nov. 15 - Apr. 30

Stonewall: Dec. 15 - Feb. 14

Sutton: Dec. 15 - Feb. 14

Swisher: Nov. 15 - Apr. 30

Taylor: Dec. 15 - Feb. 14

Terrell: Nov. 15 - Apr. 30

Terry: Nov. 15 - Apr. 30

Throckmorton: Dec. 15 - Feb. 14

Tom Green: Dec. 15 - Feb. 14

Upton: Nov. 15 - Apr. 30

Uvalde: Dec. 15 - Feb. 14

Val Verde: Nov. 15 - Jan. 14, or Feb. 1 - Mar. 30

Ward: Nov. 1 - Apr. 14, or Nov. 15 - Apr. 30

Wichita: Dec. 15 - Feb. 14

Wilbarger: Dec. 15 - Feb. 14

Winkler: Nov. 1 - Apr. 30, or Nov. 15 - May 14

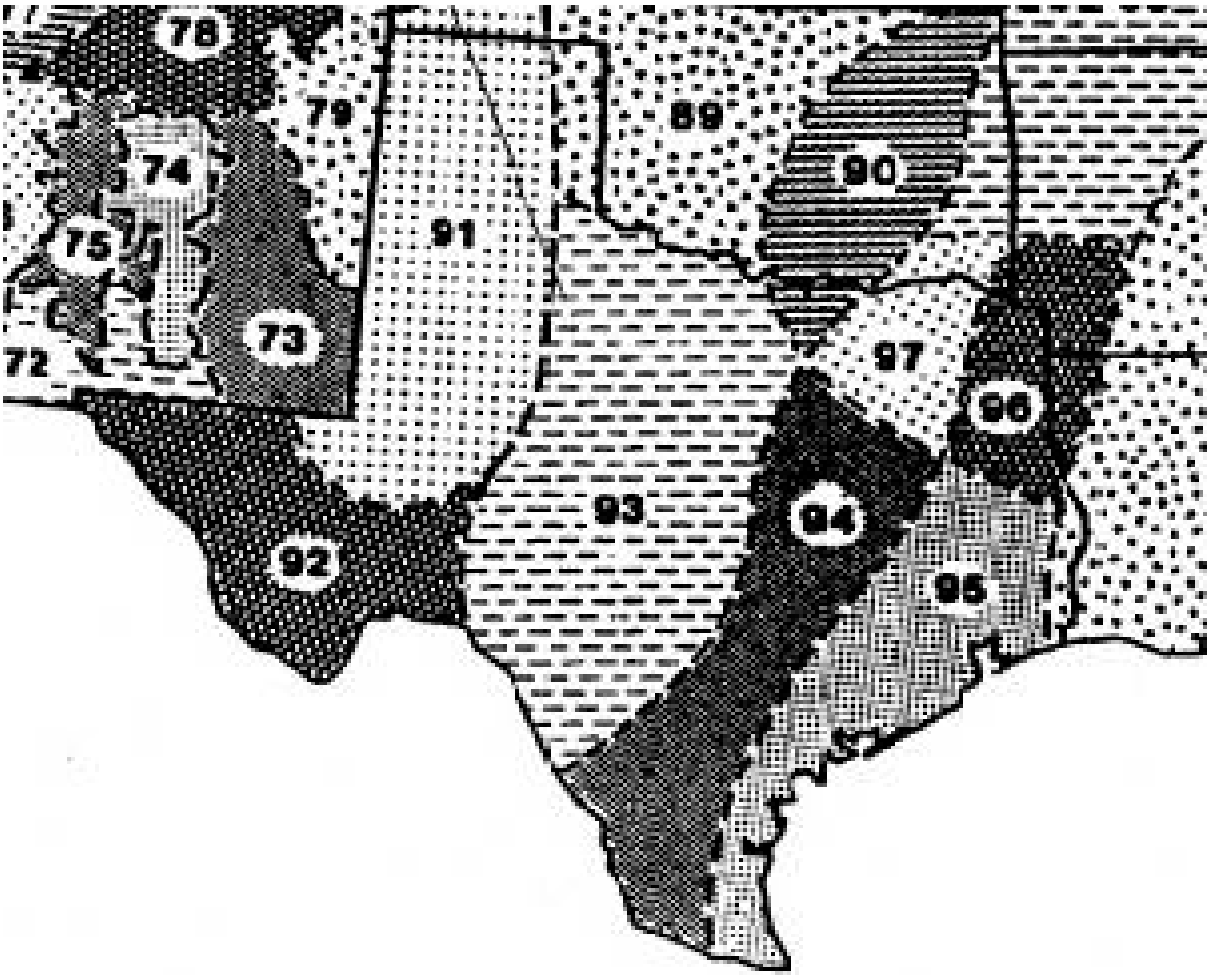
Yoakum: Nov. 1 - Apr. 30, or Nov. 15 - May 14

Young: Dec. 15 - Feb. 14

Wheeler: Jan. 1 - Mar. 30, or Dec. 1 - Feb. 28

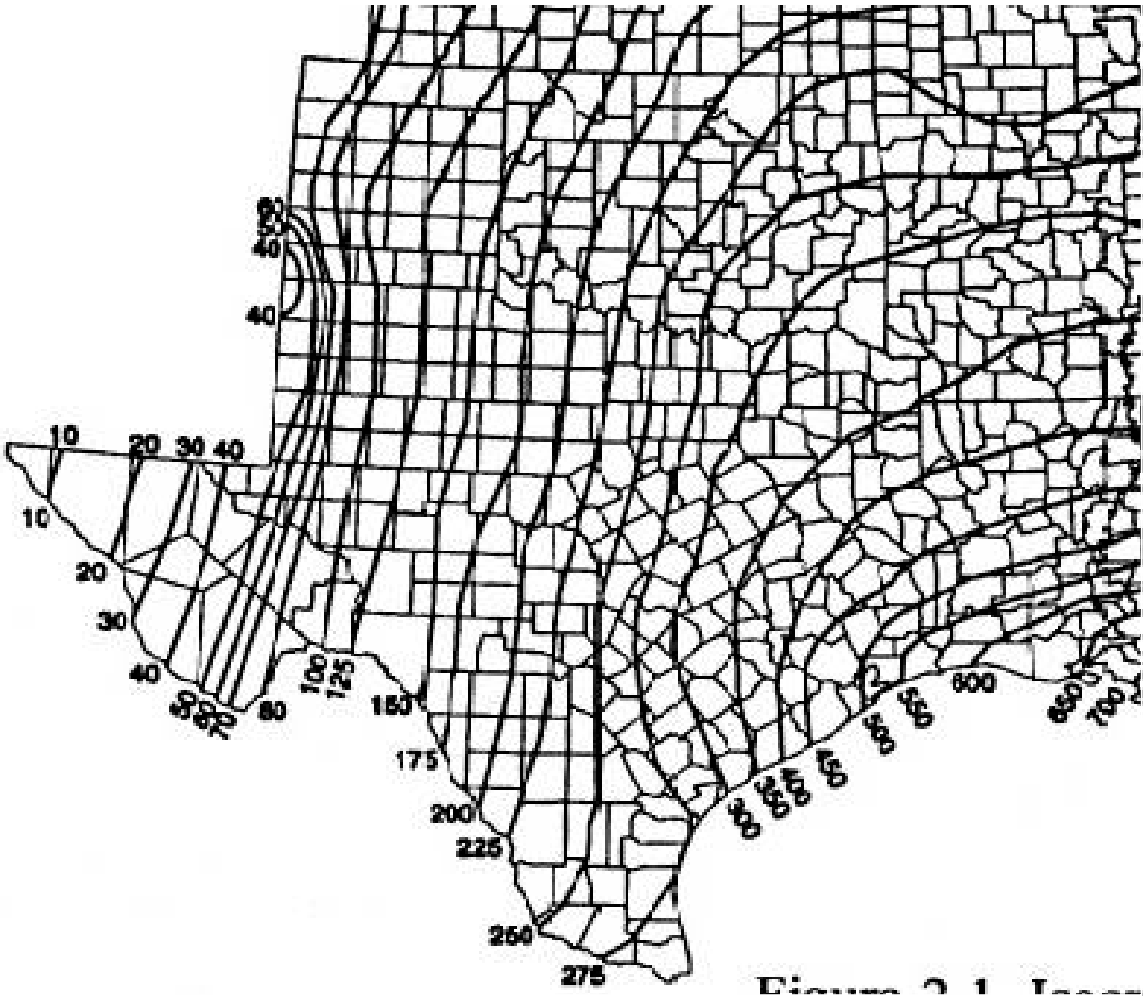
Zavala: Dec. 15 - Feb. 14

Appendix B: Erosivity Index (EI) Zones in Texas



Adapted from Chapter 2 of USDA Agriculture Handbook 703: "Predicting Soil Erosion by Water: A Guide to Conservation Planning With the Revised Universal Soil Loss Equation (RUSLE)," U.S. Department of Agriculture, Agricultural Research Service

Appendix C: Isoerodent Map



Adapted from Chapter 2 of USDA Agriculture Handbook 703: "Predicting Soil Erosion by Water: A Guide to Conservation Planning With the Revised Universal Soil Loss Equation (RUSLE)," U.S. Department of Agriculture, Agricultural Research Service

Appendix D: Erosivity Indices for EI Zones in Texas

Periods:

EI #	1/1	1/16	1/31	2/15	3/1	3/16	3/31	4/15	4/30	5/15	5/30	6/14	6/29	7/14	7/29	8/13	8/28	9/12	9/27	10/12	10/27	11/11	11/26	12/11	12/31
89	0	1	1	2	3	4	7	2	8	27	38	48	55	62	69	76	83	90	94	97	98	99	100	100	100
90	0	1	2	3	4	6	8	13	21	29	37	46	54	60	65	69	74	81	87	92	95	97	98	99	100
91	0	0	0	0	1	1	1	2	6	16	29	39	46	53	60	67	74	81	88	95	99	99	100	100	100
92	0	0	0	0	1	1	1	2	6	16	29	39	46	53	60	67	74	81	88	95	99	99	100	100	100
93	0	1	1	2	3	4	6	8	13	25	40	49	56	62	67	72	76	80	85	91	97	98	99	99	100
94	0	1	2	4	6	8	10	15	21	29	38	47	53	57	61	65	70	76	83	88	91	94	96	98	100
95	0	1	3	5	7	9	11	14	18	27	35	41	46	51	57	62	68	73	79	84	89	93	96	98	100
96	0	2	4	6	9	12	17	23	30	37	43	49	54	58	62	66	70	74	78	82	86	90	94	97	100
97	0	1	3	5	7	10	14	20	28	37	48	56	61	64	68	72	77	81	86	89	92	95	98	99	100
106	0	3	6	9	13	17	21	27	33	38	44	49	55	61	67	71	75	78	81	84	86	90	94	97	100

* Each period begins on the date listed in the table above and lasts until the day before the following period. The final period begins on December 11 and ends on December 31.

Table adapted from Chapter 2 of USDA Agriculture Handbook 703: "Predicting Soil Erosion by Water: A Guide to Conservation Planning With the Revised Universal Soil Loss Equation (RUSLE)," U.S. Department of Agriculture, Agricultural Research Service

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Appendix E. Agreement for Control of Animal Damage on Private Property

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UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
WILDLIFE SERVICES

Agreement [ ]

AGREEMENT FOR CONTROL OF ANIMAL DAMAGE ON PRIVATE PROPERTY

Date [ ] MM DD YY

TYPE OF AGREEMENT -" /" ALL THAT APPLY

- [ ] 1. Temporary Agreement
- [ ] 2. Urban Agreement
- [ ] 3. Continuation Form
- [ ] 4. Amendment of an Existing Agreement
- [ ] 5. Addendum to a Private Agreement
- [X] 6. Supplement is not Required
- [ ] 7. Special Considerations in Section 6

SECTION 1

Cooperator's Name _____ (Last / First / Middle Initial)

Cooperator's Address _____ (Street / City)

Business/Farm/Ranch Name: Red River Army Depot — State [ ] Zip [ ]

Owner's Name _____ (If different from Cooperator's) — Area Code [ ] Cooperator Telephone Number [ ] - [ ]

Owner's Address: 100 James Carlo drive (Street) Texarkana (City) TX (State) 75507 (Zip)

SECTION 2

A. WS Employee Name, WS Code, State Code, and County Code

S. Bley
WS Employee Name

WS Code: 771

State: TX

County: Bowie

B. List each Land Class with its Corresponding Acreage

	LAND CLASS	ACRES
1st	01	10498
2nd		
3rd		
4th		
Total Acreage Protected		

C. If this is an Adjoining Property Agreement, List the Properties Protected

D. List all Species to be Targeted During Damage Control Activities

SPECIES	CODE
Canada Geese	

SECTION 3

In consideration of the benefits to be derived from the proper control of damage caused by those species listed in Section 2(D) of the agreement, I the undersigned cooperator, do hereby give my consent, and concurrence, to the Animal and Plant Health Inspection Service (APHIS), (to include its officials, employees, and agents) to use, upon lands owned, leased, or otherwise controlled by me, and identified by this agreement, the following methods and devices:

METHOD	CODE	METHOD	CODE	METHOD	CODE	METHOD	CODE
Pyrotechnics		Cagetraps					
Lazers							

SECTION 4

I, the cooperator, have been informed of the methods and the manner in which the control materials and devices listed in Section 3 will be used, and of the possible hazards associated with their use. I understand that APHIS, again to include its officers, employees, and agents will: exercise reasonable precautions to safeguard all persons and to prevent injury to animal life other than those listed in Section 2(D) above; guard against the mishandling of control devices and materials; and exercise due caution and proper judgment in all control operations. I understand that WS will maintain restricted use pesticide application records on applications made under this agreement, and that WS will provide copies of the records or record information promptly upon the property owner's or cooperator's request.

SECTION 5

In consideration of these understandings and of the benefits to be derived, I, the cooperator, agree to: take reasonable precautions to prevent injury to livestock and other domestic animals; assume responsibility for injury to my property or to property under my control, when said injury is not the result of negligence on the part of APHIS; assist in maintaining such warning signs as APHIS may place out for the purpose of notifying persons entering onto such lands of the possible hazards associated with animal control measures in use thereon; and to give adequate warning to persons I authorize to enter onto such lands, of these possible hazards.

In recognition of the benefits to be derived from the use of the specified methods and devices authorized by this agreement, I, the cooperator, agree not to concurrently use or allow to be used upon lands covered by this agreement, any toxic material that might reasonably be expected to take a species listed in the above Section 2(D) unless such use of said toxicant is agreed to by APHIS in writing.

This agreement may be revoked by either party by a 30-day written notice.

SECTION 6

Special Considerations:

X SIGNATURE AND TITLE (Landowner, Lessee, or Administrator)	ADDRESS		DATE
SIGNATURE AND TITLE (APHIS Representative)	TELEPHONE	ADDRESS	DATE

WS FORM 12A (NOV 99)

PART 1 - STATE OFFICE

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Appendix F. Texas Forest Service: Performing Services on Public Lands

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TEXAS A&M FOREST SERVICE

PERFORMING SERVICES ON PUBLIC LANDS

THIS AGREEMENT is between the Texas A&M Forest Service, which is a member of The Texas A&M University System and an agency of the State of Texas ("TFS"), and the Red River Army Depot, ("RRAD").

WHEREAS, RRAD's land is located in Bowie County Texas and is depicted on the attached maps, ("Subject Property"), is identified as an area of interest for public protection; and

WHEREAS, RRAD has requested that TFS assist RRAD by providing, on an as-needed basis, fire break construction and maintenance, Rx burn preparation, personnel and equipment to support RRAD personnel in completing Rx burns for training RRAD and TFS personnel, and to provide fuel reduction and reduce fire risk to RRAD and the surrounding community, (collectively, "Service").

NOW THEREFORE, TFS and RRAD hereby agree:

1. **Purpose:** In response to RRAD'S request for assistance, TFS will, as part of its Mitigation and Prevention Program, perform Service on Subject Property.
   - Work will be performed on a day and time mutually agreed upon by TFS and RRAD.
   - Work will be performed in accordance with a work plan developed by RRAD and approved by TFS. TFS shall perform a support role. RRAD shall provide burn plans and provide the burn boss on all Rx burn activities.

2. **Term of Agreement:** The term of this agreement shall commence on February 18, 2016 and terminate on February 17, 2020.

3. **Consideration:** Compensation for performance of the services described in this agreement will not be monetary. TFS will benefit by furthering progress toward its mission of providing wildfire community protection and by obtaining valuable training for TFS personnel.

4. **Agreement Terms and Conditions:**

   4.1 RRAD shall post signs advising the general public of the days and times that the Service will be performed at least three days in advance of the Service. Signs shall be placed in conspicuous areas adjacent to the work area, to give reasonable warning to the general public of dangerous conditions, and shall remain in place for the duration of the work.

   4.2 There are inherent risks involved with Service, including but not limited to bodily injury, death, and property damage, and RRAD chooses to voluntarily have its employees witness the Service with full knowledge that Service may be hazardous to people and property.

   4.3 ***RRAD HEREBY RELEASES AND AGREES TO HOLD HARMLESS TFS AND ITS OFFICERS, EMPLOYEES, AGENTS, AND REPRESENTATIVES,*** **FROM ANY AND ALL LIABILITIES, CLAIMS, DEMANDS, PERSONAL INJURIES (INCLUDING DEATH), AND DAMAGES, INCLUDING COURT COSTS AND ATTORNEY'S FEES AND EXPENSES, WHICH MAY OCCUR TO RRAD AND ITS OFFICERS, EMPLOYEES,**

AGENTS, AND REPRESENTATIVES, AS A RESULT OF THE PERFORMANCE OF THIS AGREEMENT , *INCLUDING INJURIES SUSTAINED AS A RESULT OF THE SOLE, JOINT, OR CONCURRENT NEGLIGENCE, NEGLIGENCE PER SE, STATUTORY FAULT, OR STRICT LIABILITY OF TFS AND ITS OFFICERS, EMPLOYEES, AGENTS, AND REPRESENTATIVES.*

In addition, RRAD makes the following representations and acknowledgements upon which TFS shall rely:
(1) RRAD and its agents, servants and employees are not agents, servants, or employees of TFS or the State of Texas, and are not covered by TFS or the State for workers' compensation, death, or disability benefits;
(2) RRAD agrees that RRAD's agents, servants and employees will not be under the influence of any substance that may impair mental and physical faculties while present for any part of the Service;
(3) In signing this agreement the undersigned representative of RRAD acknowledges and represents that s/he has read it, understands it, and signs it voluntarily as an authorized representative of RRAD;
(4) TFS has not made, and RRAD has not relied on, any oral representations, statements, or inducements apart from the express written statements contained in this agreement; and
(5) RRAD executes this agreement for full, adequate and complete consideration fully intending to be bound by the same, now and in the future.

4.4 This Agreement may only be amended or modified in writing with express mutual consent of both parties.

4.5 All notices, consents, approvals, demands, requests, or other communications provided for, required of, or permitted to be given under any of the provisions of this Agreement shall be in writing and shall be deemed to have been duly given or served when delivered by hand delivery, delivered by an express delivery service, or when deposited in the U.S. mail by registered or certified mail, return receipt requested, postage prepaid, and addressed as follows:

TFS	RRAD
Texas A&M Forest Service	Red River Army Depot
P.O. Box 1000	100 James Carlow Drive
Pittsburg, TX 75686	Texarkana, TX 75507
ATTN: Nathan Carroll	ATTN: Dennis Kuykendall
Telephone: 936-546-1918	Telephone: 903-334-3738

IN WITNESS WHEREOF, TFS and RRAD have executed and delivered this agreement to be effective as of the effective date outlined in paragraph 2.

TEXAS A&M FOREST SERVICE

By Tom S. Boyd
Director

Date: 2-19-16

RRAD

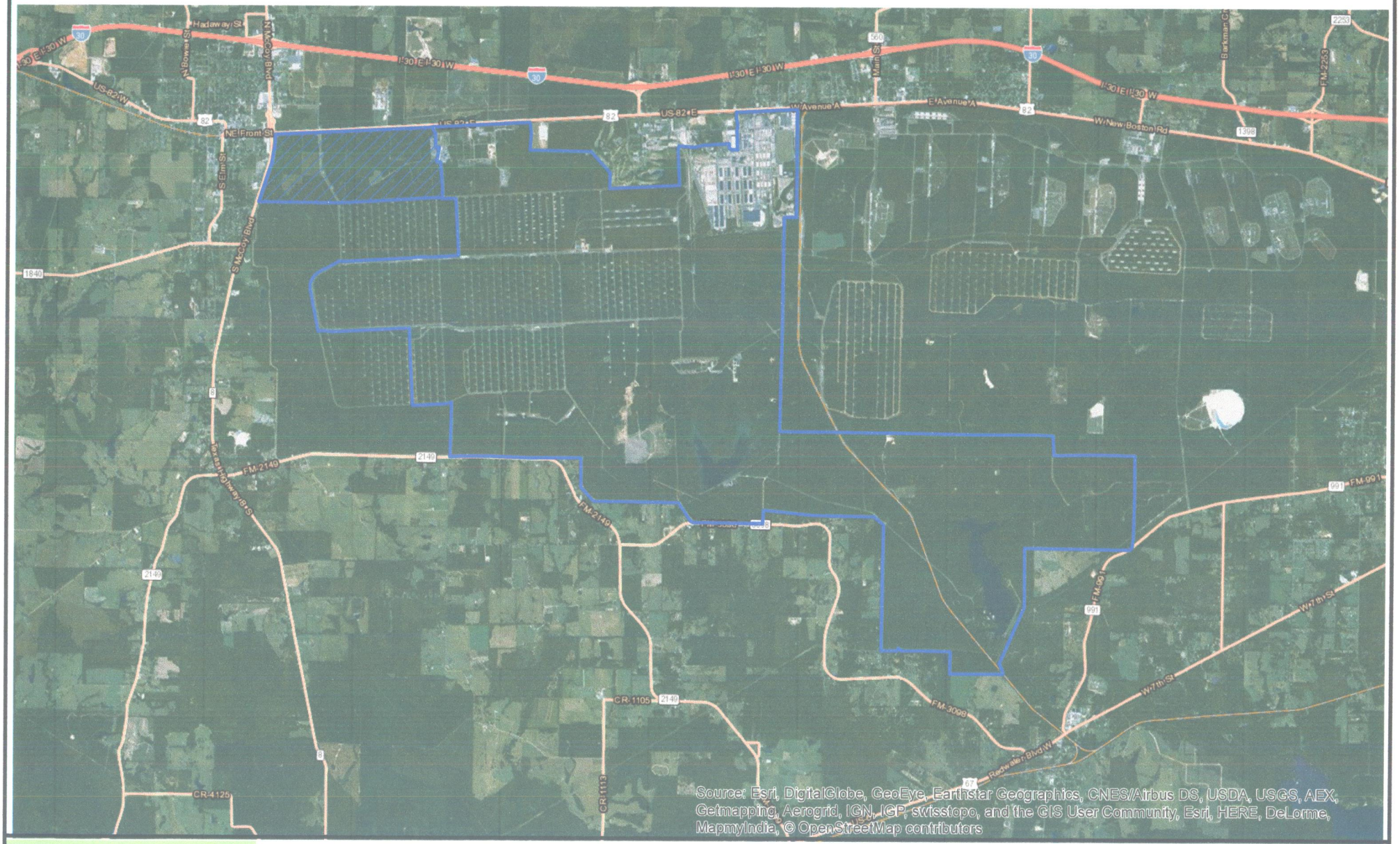
Signature: Dennis W. Kuykendall

Printed Name: Dennis W. Kuykendall

Title: Wildland Fire Program Mgr.

Date: 3-9-16

Red River Army Depot, Bowie County, Texas



Legend

- Red River Army Depot
- Public Sale Parcel

N

0 1.25 2.5 5 Miles

Map Created By:
Gregory A. Kelley
Forester
Red River Army Depot

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Appendix G. 2011 Overall Forest Inventory for RRAD

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Red River Army Depot Resource Mapping Summary

Feb 25th, 2011
by LandMark Systems

Acres by Broad Forest Type

BType	Ac	Percent
Developed	862.3	5.90%
Hardwood Natural	3036.5	20.76%
Hardwood/Pine	1052.0	7.19%
Non-forest	2393.2	16.36%
Pine Natural	2533.4	17.32%
Pine/Hardwood	2894.2	19.79%
Plantation Pine	1368.0	9.35%
Transmission Line/ROW	4.9	0.03%
Water	479.9	3.28%
Total	**14624.3**	100.00%
Forested	**10884.0**	
Non-Forested	**3740.3**	

Acres by SAF Forest Cover Type

SAF_No	Ac	Percent
No Type	5246.3	35.87%
Loblolly Pine	1032.3	7.06%
Loblolly Pine/Hardwood	3413.4	23.34%
Loblolly, Shortleaf Pine	2044.4	13.98%
Post Oak/Blackjack Oak	1646.4	11.26%
Red Maple	4.8	0.03%
Shortleaf Pine/Oak	416.9	2.85%
Slash Pine	54.6	0.37%
Sweetgum/Willow Oak	275.7	1.89%
Sycamore/Sweetgum/Elm	365.3	2.50%
White, Black, N. Red Oak	66.6	0.46%
Willow, Water, Laurel Oak	57.8	0.40%
Total	**14624.3**	100.00%

Stand Development Summary

Description	Ac	Percent
Seedlings/Saplings <5.6" DBH	215.6	1.47%
Pole/pulpwood 5.6-11.5" DBH	2686.3	18.37%
Sawwood >= 11.6" DBH	7982.1	54.58%
Non Forest	3740.3	25.58%
Total	**14624.3**	100.00%

Stand Density Summary

Description	Ac	Percent
BasalArea <45 sq.ft.	483.6	3.31%
BasalArea 64.9-45 sq.ft.	904.8	6.19%
BasalArea 99.9-65 sq.ft.	5115.0	34.98%
BasalArea >=100 sq.ft.	4380.5	29.95%
Non Forest	3740.3	25.58%
Total	**14624.3**	100.00%

Inventory Acreage Summary

Inventory Yr	Ac	Percent
	5246.3	35.87%
2010	9378.1	64.13%
Total	**14624.3**	100.00%

Stand and Stock Report

Unit ID: All
Unit Age: 53
Unit Acres: 14624.3
Forest Type Acres: DV: 862.3,HN: 3036.5,HP: 1052,NF: 2393.2,PH: 2894.2,PN: 2533.4,PP: 1368,TL: 4.9,WA: 479.9
Cruise Date: 12/22/2010
 # Plots: 2247
Annual % Growth: Pine: 0.9%, HWD: 0.8%
Annual % Mortality: 0.5%
CV Tons: 45
SE Tons: 0.84
SI: LOP: 83.3 (67), SHP: 84.7 (11), SLP: 88.2 (5)

Red River Army Depot

RptAll All

Row Labels	Trees	Pulp Tons EXP	CNS Tons EXP	Saw Tons EXP	Total Tons EXP	Pulp Cords EXP	CNS Cords EXP	Scribner EXP
Pine								
Lobloly Pine								
6	103398	10884	0	0	10884	4353.6	0	0
8	70746	19591.2	0	0	19591.2	7618.8	0	0
10	45712.8	3265.2	18502.8	0	22856.4	0	6530.4	0
12	39182.4	0	1088.4	25033.2	31563.6	0	1088.4	3300028.8
14	40270.8	0	0	43536	48978	0	0	6372582
16	44624.4	0	0	71834.4	77276.4	0	0	10948215.6
18	38094	0	0	82718.4	85983.6	0	0	13083656.4
20	27210	0	0	74011.2	78364.8	0	0	12394699.2
22	14149.2	0	0	46801.2	48978	0	0	8191298.4
24	6530.4	0	0	26121.6	27210	0	0	4550600.4
26	2176.8	0	0	10884	10884	0	0	1865517.6
28	0	0	0	4353.6	4353.6	0	0	909902.4
30	0	0	0	1088.4	1088.4	0	0	206796
32	0	0	0	1088.4	1088.4	0	0	168702
34	0	0	0	0	0	0	0	81630
36	0	0	0	0	0	0	0	13060.8
46	0	0	0	0	0	0	0	0
Lobloly Pine Total	**432094.8**	**33740.4**	**19591.2**	**387470.4**	**469100.4**	**11972.4**	**7618.8**	**62086689.6**
Shortleaf Pine								
6	4353.6	0	0	0	0	0	0	0
8	6530.4	2176.8	0	0	2176.8	0	0	0
10	6530.4	0	2176.8	0	2176.8	0	0	0
12	8707.2	0	0	5442	7618.8	0	0	881604
14	11972.4	0	0	15237.6	16326	0	0	2355297.6
16	13060.8	0	0	23944.8	23944.8	0	0	3831168
18	9795.6	0	0	23944.8	23944.8	0	0	3966129.6
20	5442	0	0	16326	16326	0	0	2835282
22	2176.8	0	0	9795.6	9795.6	0	0	1581445.2
24	0	0	0	4353.6	4353.6	0	0	580117.2
26	0	0	0	0	0	0	0	83806.8
28	0	0	0	0	0	0	0	106663.2
30	0	0	0	0	0	0	0	17414.4
Shortleaf Pine Total	**68569.2**	**2176.8**	**2176.8**	**99044.4**	**106663.2**	**0**	**0**	**16238928**
Slash Pine								
6	3265.2	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0
10	1088.4	0	0	0	0	0	0	0
12	1088.4	0	0	0	0	0	0	113193.6
14	2176.8	0	0	2176.8	2176.8	0	0	338492.4
16	2176.8	0	0	4353.6	4353.6	0	0	560526
18	1088.4	0	0	4353.6	4353.6	0	0	525697.2
20	1088.4	0	0	3265.2	3265.2	0	0	461481.6
22	0	0	0	0	0	0	0	152376
24	0	0	0	0	0	0	0	20679.6
Slash Pine Total	**11972.4**	**0**	**0**	**14149.2**	**14149.2**	**0**	**0**	**2172446.4**
Pine Total	**512636.4**	**35917.2**	**21768**	**500664**	**589912.8**	**11972.4**	**7618.8**	**80498064**
Oak								
Black Oak								
8	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	2176.8
14	0	0	0	0	0	0	0	4353.6
16	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	7618.8
20	0	0	0	0	0	0	0	7618.8

RptAll All

Row Labels	Trees	Pulp Tons EXP	CNS Tons EXP	Saw Tons EXP	Total Tons EXP	Pulp Cords EXP	CNS Cords EXP	Scribner EXP
22	0	0	0	0	0	0	0	15237.6
24	0	0	0	0	0	0	0	16326
26	0	0	0	0	0	0	0	8707.2
28	0	0	0	0	0	0	0	8707.2
34	0	0	0	0	0	0	0	10884
Black Oak Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**81630**
Blackjack Oak								
6	2176.8	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0
10	1088.4	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	6530.4
14	0	0	0	0	0	0	0	13060.8
16	0	0	0	0	0	0	0	8707.2
18	0	0	0	0	0	0	0	0
Blackjack Oak Total	**3265.2**	**0**	**0**	**0**	**0**	**0**	**0**	**28298.4**
Misc Red Oak								
6	4353.6	0	0	0	0	0	0	0
8	2176.8	0	0	0	0	0	0	0
10	1088.4	1088.4	0	0	1088.4	0	0	0
12	1088.4	0	0	0	0	0	0	42447.6
14	1088.4	0	0	0	0	0	0	74011.2
16	1088.4	0	0	1088.4	1088.4	0	0	151287.6
18	0	0	0	0	0	0	0	130608
20	0	0	0	0	0	0	0	95779.2
22	0	0	0	0	0	0	0	97956
24	0	0	0	0	1088.4	0	0	102309.6
26	0	0	0	0	0	0	0	52243.2
28	0	0	0	0	0	0	0	42447.6
30	0	0	0	0	0	0	0	22856.4
32	0	0	0	0	0	0	0	8707.2
40	0	0	0	0	0	0	0	8707.2
Misc Red Oak Total	**10884**	**1088.4**	**0**	**1088.4**	**3265.2**	**0**	**0**	**829360.8**
Nuttall Oak								
10	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	4353.6
16	0	0	0	0	0	0	0	5442
20	0	0	0	0	0	0	0	6530.4
24	0	0	0	0	0	0	0	6530.4
Nuttall Oak Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**22856.4**
Overcup Oak								
24	0	0	0	0	0	0	0	0
Overcup Oak Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Post Oak								
6	41359.2	4353.6	0	0	4353.6	2176.8	0	0
8	38094	9795.6	0	0	9795.6	4353.6	0	0
10	34828.8	15237.6	0	0	15237.6	5442	0	0
12	25033.2	4353.6	0	8707.2	13060.8	1088.4	0	1131936
14	16326	2176.8	0	10884	15237.6	1088.4	0	1557500.4
16	13060.8	2176.8	0	13060.8	15237.6	1088.4	0	1608655.2
18	7618.8	3265.2	0	9795.6	11972.4	1088.4	0	1491108
20	5442	2176.8	0	8707.2	10884	1088.4	0	1211389.2
22	2176.8	2176.8	0	5442	8707.2	1088.4	0	688957.2
24	1088.4	1088.4	0	1088.4	4353.6	0	0	275365.2
26	0	0	0	1088.4	2176.8	0	0	205707.6
28	0	0	0	0	1088.4	0	0	89248.8
30	0	0	0	0	0	0	0	54420
32	0	0	0	0	0	0	0	15237.6
34	0	0	0	0	0	0	0	0
38	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
42	0	0	0	0	0	0	0	0
46	0	0	0	0	0	0	0	0
Post Oak Total	**185028**	**46801.2**	**0**	**58773.6**	**112105.2**	**18502.8**	**0**	**8329525.2**
Shumard Oak								
6	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	20679.6
14	0	0	0	0	0	0	0	22856.4
16	0	0	0	0	0	0	0	77276.4
18	0	0	0	0	0	0	0	39182.4
20	0	0	0	0	0	0	0	33740.4

RptAll All

Row Labels	Trees	Pulp Tons EXP	CNS Tons EXP	Saw Tons EXP	Total Tons EXP	Pulp Cords EXP	CNS Cords EXP	Scribner EXP
22	0	0	0	0	0	0	0	30475.2
24	0	0	0	0	0	0	0	22856.4
26	0	0	0	0	0	0	0	14149.2
28	0	0	0	0	0	0	0	39182.4
30	0	0	0	0	0	0	0	9795.6
32	0	0	0	0	0	0	0	16326
34	0	0	0	0	0	0	0	6530.4
Shumard Oak Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**333050.4**
Southern Red Oak								
6	9795.6	1088.4	0	0	1088.4	0	0	0
8	7618.8	2176.8	0	0	2176.8	0	0	0
10	5442	2176.8	0	0	2176.8	0	0	0
12	4353.6	1088.4	0	2176.8	2176.8	0	0	166525.2
14	4353.6	1088.4	0	2176.8	4353.6	0	0	388558.8
16	5442	0	0	5442	5442	0	0	619299.6
18	2176.8	0	0	4353.6	4353.6	0	0	565968
20	2176.8	0	0	4353.6	4353.6	0	0	527874
22	1088.4	1088.4	0	3265.2	3265.2	0	0	437536.8
24	1088.4	0	0	2176.8	2176.8	0	0	348288
26	0	0	0	2176.8	2176.8	0	0	256862.4
28	0	0	0	0	1088.4	0	0	119724
30	0	0	0	0	0	0	0	37005.6
32	0	0	0	0	0	0	0	40270.8
34	0	0	0	0	0	0	0	14149.2
36	0	0	0	0	0	0	0	17414.4
38	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	17414.4
50	0	0	0	0	0	0	0	0
Southern Red Oak Total	**43536**	**8707.2**	**0**	**26121.6**	**34828.8**	**0**	**0**	**3556891.2**
Swamp Chestnut Oak								
12	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	3265.2
22	0	0	0	0	0	0	0	7618.8
28	0	0	0	0	0	0	0	7618.8
Swamp Chestnut Oak Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**18502.8**
Water Oak								
6	16326	2176.8	0	0	2176.8	0	0	0
8	8707.2	2176.8	0	0	2176.8	0	0	0
10	6530.4	2176.8	0	0	2176.8	0	0	0
12	5442	1088.4	0	1088.4	2176.8	0	0	152376
14	3265.2	1088.4	0	2176.8	3265.2	0	0	310194
16	2176.8	1088.4	0	2176.8	3265.2	0	0	306928.8
18	1088.4	0	0	2176.8	3265.2	0	0	303663.6
20	1088.4	0	0	2176.8	2176.8	0	0	287337.6
22	0	0	0	2176.8	2176.8	0	0	189381.6
24	0	0	0	1088.4	1088.4	0	0	130608
26	0	0	0	1088.4	1088.4	0	0	148022.4
28	0	0	0	0	0	0	0	82718.4
30	0	0	0	0	0	0	0	15237.6
32	0	0	0	0	0	0	0	30475.2
34	0	0	0	0	0	0	0	6530.4
36	0	0	0	0	0	0	0	0
Water Oak Total	**44624.4**	**9795.6**	**0**	**14149.2**	**25033.2**	**0**	**0**	**1963473.6**
White Oak								
6	5442	0	0	0	0	0	0	0
8	3265.2	0	0	0	0	0	0	0
10	2176.8	2176.8	0	0	2176.8	0	0	0
12	2176.8	0	0	0	1088.4	0	0	114282
14	1088.4	0	0	1088.4	1088.4	0	0	166525.2
16	1088.4	0	0	1088.4	1088.4	0	0	168702
18	0	0	0	2176.8	2176.8	0	0	180674.4
20	0	0	0	1088.4	1088.4	0	0	163260
22	0	0	0	2176.8	2176.8	0	0	228564
24	0	0	0	0	1088.4	0	0	150199.2
26	0	0	0	0	1088.4	0	0	108840
28	0	0	0	0	0	0	0	65304
30	0	0	0	0	0	0	0	39182.4
32	0	0	0	0	0	0	0	16326
34	0	0	0	0	0	0	0	19591.2
36	0	0	0	0	0	0	0	9795.6
38	0	0	0	0	0	0	0	7618.8
42	0	0	0	0	0	0	0	0

RptAll All

Row Labels	Trees	Pulp Tons EXP	CNS Tons EXP	Saw Tons EXP	Total Tons EXP	Pulp Cords EXP	CNS Cords EXP	Scribner EXP
White Oak Total	**15237.6**	**2176.8**	**0**	**7618.8**	**13060.8**	**0**	**0**	**1438864.8**
Willow Oak								
6	7618.8	0	0	0	0	0	0	0
8	4353.6	1088.4	0	0	1088.4	0	0	0
10	3265.2	1088.4	0	0	1088.4	0	0	0
12	2176.8	0	0	0	2176.8	0	0	90337.2
14	2176.8	0	0	1088.4	2176.8	0	0	148022.4
16	2176.8	0	0	1088.4	2176.8	0	0	176320.8
18	1088.4	0	0	1088.4	1088.4	0	0	158906.4
20	0	0	0	2176.8	2176.8	0	0	189381.6
22	0	0	0	0	1088.4	0	0	92514
24	0	0	0	1088.4	1088.4	0	0	150199.2
26	0	0	0	0	0	0	0	29386.8
28	0	0	0	0	0	0	0	46801.2
30	0	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0	8707.2
34	0	0	0	0	0	0	0	0
36	0	0	0	0	0	0	0	0
Willow Oak Total	**22856.4**	**2176.8**	**0**	**6530.4**	**14149.2**	**0**	**0**	**1090576.8**
Oak Total	**325431.6**	**70746**	**0**	**114282**	**202442.4**	**18502.8**	**0**	**17693030.4**
Misc. Hardwood								
Ash								
6	6530.4	0	0	0	0	0	0	0
8	2176.8	0	0	0	0	0	0	0
10	3265.2	0	0	0	0	0	0	0
12	2176.8	0	0	0	1088.4	0	0	62038.8
14	1088.4	0	0	0	1088.4	0	0	76188
16	0	0	0	0	0	0	0	66392.4
18	0	0	0	0	0	0	0	17414.4
20	0	0	0	0	0	0	0	18502.8
22	0	0	0	0	0	0	0	11972.4
Ash Total	**15237.6**	**0**	**0**	**0**	**2176.8**	**0**	**0**	**252508.8**
Basswood								
6	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	2176.8
14	0	0	0	0	0	0	0	13060.8
18	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
Basswood Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**15237.6**
Beech								
6	0	0	0	0	0	0	0	0
Beech Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Black Cherry								
6	1088.4	0	0	0	0	0	0	0
8	1088.4	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	4353.6
16	0	0	0	0	0	0	0	13060.8
Black Cherry Total	**2176.8**	**0**	**0**	**0**	**0**	**0**	**0**	**17414.4**
Black Locust								
6	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0
Black Locust Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Black Walnut								
6	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	3265.2
Black Walnut Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3265.2**
Blackgum								
6	2176.8	0	0	0	0	0	0	0
8	2176.8	0	0	0	0	0	0	0
10	2176.8	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	21768
14	0	0	0	0	0	0	0	52243.2
16	0	0	0	0	0	0	0	28298.4
18	0	0	0	0	0	0	0	44624.4
20	0	0	0	0	0	0	0	8707.2
22	0	0	0	0	0	0	0	45712.8
24	0	0	0	0	0	0	0	0

RptAll All

Row Labels	Trees	Pulp Tons EXP	CNS Tons EXP	Saw Tons EXP	Total Tons EXP	Pulp Cords EXP	CNS Cords EXP	Scribner EXP
26	0	0	0	0	0	0	0	27210
36	0	0	0	0	0	0	0	0
Blackgum Total	**6530.4**	**0**	**0**	**0**	**0**	**0**	**0**	**228564**
Dogwood								
6	4353.6	0	0	0	0	0	0	0
8	1088.4	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0
Dogwood Total	**5442**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Eastern Red Cedar								
6	6530.4	0	0	0	0	0	0	0
8	3265.2	0	0	0	0	0	0	0
10	2176.8	0	0	0	0	0	0	0
12	1088.4	0	0	0	0	0	0	82718.4
14	0	0	0	0	0	0	0	66392.4
16	0	0	0	0	0	0	0	29386.8
18	0	0	0	0	0	0	0	21768
20	0	0	0	0	0	0	0	0
Eastern Red Cedar Total	**13060.8**	**0**	**0**	**0**	**0**	**0**	**0**	**200265.6**
Elm								
6	59862	5442	0	0	5442	2176.8	0	0
8	31563.6	6530.4	0	0	6530.4	2176.8	0	0
10	13060.8	4353.6	0	0	4353.6	1088.4	0	0
12	6530.4	2176.8	0	0	2176.8	0	0	140403.6
14	3265.2	1088.4	0	0	2176.8	0	0	97956
16	1088.4	1088.4	0	0	1088.4	0	0	53331.6
18	0	0	0	0	0	0	0	37005.6
20	0	0	0	0	0	0	0	18502.8
22	0	0	0	0	0	0	0	14149.2
24	0	0	0	0	0	0	0	18502.8
30	0	0	0	0	0	0	0	0
Elm Total	**115370.4**	**20679.6**	**0**	**0**	**21768**	**5442**	**0**	**379851.6**
Hickory/Pecan								
6	16326	2176.8	0	0	2176.8	0	0	0
8	9795.6	2176.8	0	0	2176.8	0	0	0
10	7618.8	3265.2	0	0	3265.2	1088.4	0	0
12	7618.8	2176.8	0	2176.8	3265.2	0	0	192646.8
14	4353.6	1088.4	0	2176.8	4353.6	0	0	315636
16	4353.6	1088.4	0	2176.8	4353.6	0	0	373321.2
18	1088.4	1088.4	0	2176.8	2176.8	0	0	252508.8
20	0	0	0	1088.4	1088.4	0	0	155641.2
22	0	0	0	0	0	0	0	70746
24	0	0	0	0	0	0	0	33740.4
26	0	0	0	0	0	0	0	16326
28	0	0	0	0	0	0	0	22856.4
32	0	0	0	0	0	0	0	0
Hickory/Pecan Total	**51154.8**	**13060.8**	**0**	**9795.6**	**22856.4**	**1088.4**	**0**	**1433422.8**
Honey Locust								
18	0	0	0	0	0	0	0	8707.2
20	0	0	0	0	0	0	0	7618.8
Honey Locust Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**16326**
Miscellaneous								
6	7618.8	0	0	0	0	0	0	0
8	3265.2	0	0	0	0	0	0	0
10	1088.4	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	11972.4
14	0	0	0	0	0	0	0	28298.4
16	0	0	0	0	0	0	0	10884
18	0	0	0	0	0	0	0	10884
20	0	0	0	0	0	0	0	5442
22	0	0	0	0	0	0	0	14149.2
24	0	0	0	0	0	0	0	6530.4
26	0	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0	0
Miscellaneous Total	**11972.4**	**0**	**0**	**0**	**0**	**0**	**0**	**88160.4**
Persimmon								
6	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0
Persimmon Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Red Maple								
6	5442	0	0	0	0	0	0	0
8	5442	1088.4	0	0	1088.4	0	0	0

RptAll All

Row Labels	Trees	Pulp Tons EXP	CNS Tons EXP	Saw Tons EXP	Total Tons EXP	Pulp Cords EXP	CNS Cords EXP	Scribner EXP
10	3265.2	1088.4	0	0	1088.4	0	0	0
12	1088.4	0	0	0	0	0	0	10884
14	0	0	0	0	0	0	0	8707.2
16	0	0	0	0	0	0	0	9795.6
18	0	0	0	0	0	0	0	9795.6
20	0	0	0	0	0	0	0	0
Red Maple Total	**15237.6**	**2176.8**	**0**	**0**	**2176.8**	**0**	**0**	**39182.4**
Redbud								
6	0	0	0	0	0	0	0	0
Redbud Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
River Birch								
6	1088.4	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	3265.2
14	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	5442
River Birch Total	**1088.4**	**0**	**0**	**0**	**0**	**0**	**0**	**8707.2**
Sweetgum								
6	58773.6	5442	0	0	5442	2176.8	0	0
8	40270.8	9795.6	0	0	9795.6	2176.8	0	0
10	27210	11972.4	0	0	11972.4	3265.2	0	0
12	17414.4	3265.2	0	4353.6	8707.2	1088.4	0	616034.4
14	10884	2176.8	0	7618.8	9795.6	0	0	902283.6
16	5442	1088.4	0	4353.6	5442	0	0	713990.4
18	2176.8	0	0	4353.6	4353.6	0	0	548553.6
20	1088.4	0	0	3265.2	3265.2	0	0	384205.2
22	0	0	0	1088.4	1088.4	0	0	167613.6
24	0	0	0	0	0	0	0	55508.4
26	0	0	0	0	0	0	0	15237.6
28	0	0	0	0	0	0	0	20679.6
30	0	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0	21768
34	0	0	0	0	0	0	0	0
Sweetgum Total	**163260**	**33740.4**	**0**	**25033.2**	**59862**	**8707.2**	**0**	**3445874.4**
Sycamore								
8	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	2176.8
14	0	0	0	0	0	0	0	7618.8
16	0	0	0	0	0	0	0	11972.4
18	0	0	0	0	0	0	0	21768
20	0	0	0	0	0	0	0	11972.4
22	0	0	0	0	0	0	0	5442
24	0	0	0	0	0	0	0	5442
Sycamore Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**66392.4**
Misc. Hardwood Total	**400531.2**	**69657.6**	**0**	**34828.8**	**108840**	**15237.6**	**0**	**6195172.8**
Grand Total	**1238599.2**	**176320.8**	**21768**	**649774.8**	**901195.2**	**45712.8**	**7618.8**	**104386267.2**

Stand and Stock Report

Unit ID: All
Unit Age: 53
Unit Acres: 14624
Forest Type Acres: DV: 862.3,HN: 3036.5,HP: 1052,NF: 2393.2,PH: 2894.2,PN: 2533.4,PP: 1368,TL: 4.9,WA: 479.9
Cruise Date: 12/22/2010
 # Plots: 2247
Annual % Growth: Pine: 0.9%, HWD: 0.8%
Annual % Mortality: 0.5%
CV Tons: 45
SE Tons: 0.84
SI: LOP: 83.3 (67), SHP: 84.7 (11), SLP: 88.2 (5)

Red River Army Depot

RptAll All

Row Labels	BA/Ac.	Trees/Ac.	Pulp Tons/Ac.	CNS Tons/Ac.	Saw Tons/Ac.	Total Tons/Ac.	Pulp Cords/Ac.	CNS Cords/Ac.	Scribner/Ac.
Pine									
Lobloly Pine									
6	2.1	9.5	1	0	0	1	0.4	0	0
8	2.5	6.5	1.8	0	0	1.8	0.7	0	0
10	2.4	4.2	0.3	1.7	0	2.1	0	0.6	0
12	3	3.6	0	0.1	2.3	2.9	0	0.1	303.2
14	4.2	3.7	0	0	4	4.5	0	0	585.5
16	5.9	4.1	0	0	6.6	7.1	0	0	1005.9
18	6.4	3.5	0	0	7.6	7.9	0	0	1202.1
20	5.6	2.5	0	0	6.8	7.2	0	0	1138.8
22	3.5	1.3	0	0	4.3	4.5	0	0	752.6
24	1.8	0.6	0	0	2.4	2.5	0	0	418.1
26	0.8	0.2	0	0	1	1	0	0	171.4
28	0.4	0	0	0	0.4	0.4	0	0	83.6
30	0	0	0	0	0.1	0.1	0	0	19
32	0	0	0	0	0.1	0.1	0	0	15.5
34	0	0	0	0	0	0	0	0	7.5
36	0	0	0	0	0	0	0	0	1.2
46	0	0	0	0	0	0	0	0	0
Lobloly Pine Total	**38.6**	**39.7**	**3.1**	**1.8**	**35.6**	**43.1**	**1.1**	**0.7**	**5704.4**
Shortleaf Pine									
6	0.1	0.4	0	0	0	0	0	0	0
8	0.2	0.6	0.2	0	0	0.2	0	0	0
10	0.3	0.6	0	0.2	0	0.2	0	0	0
12	0.6	0.8	0	0	0.5	0.7	0	0	81
14	1.3	1.1	0	0	1.4	1.5	0	0	216.4
16	1.8	1.2	0	0	2.2	2.2	0	0	352
18	1.6	0.9	0	0	2.2	2.2	0	0	364.4
20	1	0.5	0	0	1.5	1.5	0	0	260.5
22	0.5	0.2	0	0	0.9	0.9	0	0	145.3
24	0.1	0	0	0	0.4	0.4	0	0	53.3
26	0	0	0	0	0	0	0	0	7.7
28	0	0	0	0	0	0	0	0	9.8
30	0	0	0	0	0	0	0	0	1.6
Shortleaf Pine Total	**7.5**	**6.3**	**0.2**	**0.2**	**9.1**	**9.8**	**0**	**0**	**1492**
Slash Pine									
6	0	0.3	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0
10	0	0.1	0	0	0	0	0	0	0
12	0	0.1	0	0	0	0	0	0	10.4
14	0.2	0.2	0	0	0.2	0.2	0	0	31.1
16	0.4	0.2	0	0	0.4	0.4	0	0	51.5
18	0.3	0.1	0	0	0.4	0.4	0	0	48.3
20	0.2	0.1	0	0	0.3	0.3	0	0	42.4
22	0	0	0	0	0	0	0	0	14
24	0	0	0	0	0	0	0	0	1.9
Slash Pine Total	**1.1**	**1.1**	**0**	**0**	**1.3**	**1.3**	**0**	**0**	**199.6**
Pine Total	**47.2**	**47.1**	**3.3**	**2**	**46**	**54.2**	**1.1**	**0.7**	**7396**
Oak									
Black Oak									

RptAll All

Row Labels	BA/Ac.	Trees/Ac.	Pulp Tons/Ac.	CNS Tons/Ac.	Saw Tons/Ac.	Total Tons/Ac.	Pulp Cords/Ac.	CNS Cords/Ac.	Scribner/Ac.
8	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0.2
14	0	0	0	0	0	0	0	0	0.4
16	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0.7
20	0	0	0	0	0	0	0	0	0.7
22	0	0	0	0	0	0	0	0	1.4
24	0	0	0	0	0	0	0	0	1.5
26	0	0	0	0	0	0	0	0	0.8
28	0	0	0	0	0	0	0	0	0.8
34	0	0	0	0	0	0	0	0	1
Black Oak Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**7.5**
Blackjack Oak									
6	0	0.2	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0
10	0	0.1	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0.6
14	0	0	0	0	0	0	0	0	1.2
16	0	0	0	0	0	0	0	0	0.8
18	0	0	0	0	0	0	0	0	0
Blackjack Oak Total	**0**	**0.3**	**0**	**0**	**0**	**0**	**0**	**0**	**2.6**
Misc Red Oak									
6	0.1	0.4	0	0	0	0	0	0	0
8	0	0.2	0	0	0	0	0	0	0
10	0.1	0.1	0.1	0	0	0.1	0	0	0
12	0.1	0.1	0	0	0	0	0	0	3.9
14	0.1	0.1	0	0	0	0	0	0	6.8
16	0.1	0.1	0	0	0.1	0.1	0	0	13.9
18	0	0	0	0	0	0	0	0	12
20	0	0	0	0	0	0	0	0	8.8
22	0	0	0	0	0	0	0	0	9
24	0	0	0	0	0	0.1	0	0	9.4
26	0	0	0	0	0	0	0	0	4.8
28	0	0	0	0	0	0	0	0	3.9
30	0	0	0	0	0	0	0	0	2.1
32	0	0	0	0	0	0	0	0	0.8
40	0	0	0	0	0	0	0	0	0.8
Misc Red Oak Total	**0.5**	**1**	**0.1**	**0**	**0.1**	**0.3**	**0**	**0**	**76.2**
Nuttall Oak									
10	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0.4
16	0	0	0	0	0	0	0	0	0.5
20	0	0	0	0	0	0	0	0	0.6
24	0	0	0	0	0	0	0	0	0.6
Nuttall Oak Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2.1**
Overcup Oak									
24	0	0	0	0	0	0	0	0	0
Overcup Oak Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Post Oak									
6	0.9	3.8	0.4	0	0	0.4	0.2	0	0
8	1.4	3.5	0.9	0	0	0.9	0.4	0	0
10	1.9	3.2	1.4	0	0	1.4	0.5	0	0
12	2	2.3	0.4	0	0.8	1.2	0.1	0	104
14	1.8	1.5	0.2	0	1	1.4	0.1	0	143.1
16	1.6	1.2	0.2	0	1.2	1.4	0.1	0	147.8
18	1.4	0.7	0.3	0	0.9	1.1	0.1	0	137
20	1	0.5	0.2	0	0.8	1	0.1	0	111.3
22	0.8	0.2	0.2	0	0.5	0.8	0.1	0	63.3
24	0.4	0.1	0.1	0	0.1	0.4	0	0	25.3
26	0.3	0	0	0	0.1	0.2	0	0	18.9
28	0.2	0	0	0	0	0.1	0	0	8.2
30	0	0	0	0	0	0	0	0	5
32	0	0	0	0	0	0	0	0	1.4
34	0	0	0	0	0	0	0	0	0
38	0	0	0	0	0	0	0	0	0

RptAll All

Row Labels	BA/Ac.	Trees/Ac.	Pulp Tons/Ac.	CNS Tons/Ac.	Saw Tons/Ac.	Total Tons/Ac.	Pulp Cords/Ac.	CNS Cords/Ac.	Scribner/Ac.
40	0	0	0	0	0	0	0	0	0
42	0	0	0	0	0	0	0	0	0
46	0	0	0	0	0	0	0	0	0
Post Oak Total	**13.7**	**17**	**4.3**	**0**	**5.4**	**10.3**	**1.7**	**0**	**765.3**
Shumard Oak									
6	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	1.9
14	0	0	0	0	0	0	0	0	2.1
16	0	0	0	0	0	0	0	0	7.1
18	0	0	0	0	0	0	0	0	3.6
20	0	0	0	0	0	0	0	0	3.1
22	0	0	0	0	0	0	0	0	2.8
24	0	0	0	0	0	0	0	0	2.1
26	0	0	0	0	0	0	0	0	1.3
28	0	0	0	0	0	0	0	0	3.6
30	0	0	0	0	0	0	0	0	0.9
32	0	0	0	0	0	0	0	0	1.5
34	0	0	0	0	0	0	0	0	0.6
Shumard Oak Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**30.6**
Southern Red Oak									
6	0.3	0.9	0.1	0	0	0.1	0	0	0
8	0.2	0.7	0.2	0	0	0.2	0	0	0
10	0.2	0.5	0.2	0	0	0.2	0	0	0
12	0.3	0.4	0.1	0	0.2	0.2	0	0	15.3
14	0.5	0.4	0.1	0	0.2	0.4	0	0	35.7
16	0.7	0.5	0	0	0.5	0.5	0	0	56.9
18	0.5	0.2	0	0	0.4	0.4	0	0	52
20	0.5	0.2	0	0	0.4	0.4	0	0	48.5
22	0.3	0.1	0.1	0	0.3	0.3	0	0	40.2
24	0.3	0.1	0	0	0.2	0.2	0	0	32
26	0.2	0	0	0	0.2	0.2	0	0	23.6
28	0.1	0	0	0	0	0.1	0	0	11
30	0	0	0	0	0	0	0	0	3.4
32	0	0	0	0	0	0	0	0	3.7
34	0	0	0	0	0	0	0	0	1.3
36	0	0	0	0	0	0	0	0	1.6
38	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	1.6
50	0	0	0	0	0	0	0	0	0
Southern Red Oak Total	**4.1**	**4**	**0.8**	**0**	**2.4**	**3.2**	**0**	**0**	**326.8**
Swamp Chestnut Oak									
12	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0.3
22	0	0	0	0	0	0	0	0	0.7
28	0	0	0	0	0	0	0	0	0.7
Swamp Chestnut Oak Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1.7**
Water Oak									
6	0.3	1.5	0.2	0	0	0.2	0	0	0
8	0.3	0.8	0.2	0	0	0.2	0	0	0
10	0.4	0.6	0.2	0	0	0.2	0	0	0
12	0.3	0.5	0.1	0	0.1	0.2	0	0	14
14	0.4	0.3	0.1	0	0.2	0.3	0	0	28.5
16	0.4	0.2	0.1	0	0.2	0.3	0	0	28.2
18	0.3	0.1	0	0	0.2	0.3	0	0	27.9
20	0.2	0.1	0	0	0.2	0.2	0	0	26.4
22	0.2	0	0	0	0.2	0.2	0	0	17.4
24	0.1	0	0	0	0.1	0.1	0	0	12
26	0.1	0	0	0	0.1	0.1	0	0	13.6
28	0	0	0	0	0	0	0	0	7.6
30	0	0	0	0	0	0	0	0	1.4
32	0	0	0	0	0	0	0	0	2.8
34	0	0	0	0	0	0	0	0	0.6
36	0	0	0	0	0	0	0	0	0
Water Oak Total	**3**	**4.1**	**0.9**	**0**	**1.3**	**2.3**	**0**	**0**	**180.4**

RptAll All

Row Labels	BA/Ac.	Trees/Ac.	Pulp Tons/Ac.	CNS Tons/Ac.	Saw Tons/Ac.	Total Tons/Ac.	Pulp Cords/Ac.	CNS Cords/Ac.	Scribner/Ac.
White Oak									
6	0.1	0.5	0	0	0	0	0	0	0
8	0	0.3	0	0	0	0	0	0	0
10	0.2	0.2	0.2	0	0	0.2	0	0	0
12	0.2	0.2	0	0	0	0.1	0	0	10.5
14	0.1	0.1	0	0	0.1	0.1	0	0	15.3
16	0.1	0.1	0	0	0.1	0.1	0	0	15.5
18	0.2	0	0	0	0.2	0.2	0	0	16.6
20	0.1	0	0	0	0.1	0.1	0	0	15
22	0.2	0	0	0	0.2	0.2	0	0	21
24	0	0	0	0	0	0.1	0	0	13.8
26	0	0	0	0	0	0.1	0	0	10
28	0	0	0	0	0	0	0	0	6
30	0	0	0	0	0	0	0	0	3.6
32	0	0	0	0	0	0	0	0	1.5
34	0	0	0	0	0	0	0	0	1.8
36	0	0	0	0	0	0	0	0	0.9
38	0	0	0	0	0	0	0	0	0.7
42	0	0	0	0	0	0	0	0	0
White Oak Total	**1.2**	**1.4**	**0.2**	**0**	**0.7**	**1.2**	**0**	**0**	**132.2**
Willow Oak									
6	0.1	0.7	0	0	0	0	0	0	0
8	0.1	0.4	0.1	0	0	0.1	0	0	0
10	0.1	0.3	0.1	0	0	0.1	0	0	0
12	0.2	0.2	0	0	0	0.2	0	0	8.3
14	0.2	0.2	0	0	0.1	0.2	0	0	13.6
16	0.2	0.2	0	0	0.1	0.2	0	0	16.2
18	0.2	0.1	0	0	0.1	0.1	0	0	14.6
20	0.2	0	0	0	0.2	0.2	0	0	17.4
22	0.1	0	0	0	0	0.1	0	0	8.5
24	0.2	0	0	0	0.1	0.1	0	0	13.8
26	0	0	0	0	0	0	0	0	2.7
28	0	0	0	0	0	0	0	0	4.3
30	0	0	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0	0	0.8
34	0	0	0	0	0	0	0	0	0
36	0	0	0	0	0	0	0	0	0
Willow Oak Total	**1.6**	**2.1**	**0.2**	**0**	**0.6**	**1.3**	**0**	**0**	**100.2**
Oak Total	**24.1**	**29.9**	**6.5**	**0**	**10.5**	**18.6**	**1.7**	**0**	**1625.6**
Misc. Hardwood									
Ash									
6	0.2	0.6	0	0	0	0	0	0	0
8	0.1	0.2	0	0	0	0	0	0	0
10	0	0.3	0	0	0	0	0	0	0
12	0.2	0.2	0	0	0	0.1	0	0	5.7
14	0.1	0.1	0	0	0	0.1	0	0	7
16	0	0	0	0	0	0	0	0	6.1
18	0	0	0	0	0	0	0	0	1.6
20	0	0	0	0	0	0	0	0	1.7
22	0	0	0	0	0	0	0	0	1.1
Ash Total	**0.6**	**1.4**	**0**	**0**	**0**	**0.2**	**0**	**0**	**23.2**
Basswood									
6	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0.2
14	0	0	0	0	0	0	0	0	1.2
18	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0
Basswood Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1.4**
Beech									
6	0	0	0	0	0	0	0	0	0
Beech Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Black Cherry									
6	0	0.1	0	0	0	0	0	0	0
8	0	0.1	0	0	0	0	0	0	0

RptAll All

Row Labels	BA/Ac.	Trees/Ac.	Pulp Tons/Ac.	CNS Tons/Ac.	Saw Tons/Ac.	Total Tons/Ac.	Pulp Cords/Ac.	CNS Cords/Ac.	Scribner/Ac.
10	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0.4
16	0	0	0	0	0	0	0	0	1.2
Black Cherry Total	**0**	**0.2**	**0**	**0**	**0**	**0**	**0**	**0**	**1.6**
Black Locust									
6	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0
Black Locust Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Black Walnut									
6	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0.3
Black Walnut Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.3**
Blackgum									
6	0	0.2	0	0	0	0	0	0	0
8	0	0.2	0	0	0	0	0	0	0
10	0	0.2	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	2
14	0	0	0	0	0	0	0	0	4.8
16	0.1	0	0	0	0	0	0	0	2.6
18	0	0	0	0	0	0	0	0	4.1
20	0	0	0	0	0	0	0	0	0.8
22	0	0	0	0	0	0	0	0	4.2
24	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	2.5
36	0	0	0	0	0	0	0	0	0
Blackgum Total	**0.1**	**0.6**	**0**	**0**	**0**	**0**	**0**	**0**	**21**
Dogwood									
6	0.1	0.4	0	0	0	0	0	0	0
8	0	0.1	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0
Dogwood Total	**0.1**	**0.5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Eastern Red Cedar									
6	0.2	0.6	0	0	0	0	0	0	0
8	0.2	0.3	0	0	0	0	0	0	0
10	0.1	0.2	0	0	0	0	0	0	0
12	0.1	0.1	0	0	0	0	0	0	7.6
14	0	0	0	0	0	0	0	0	6.1
16	0	0	0	0	0	0	0	0	2.7
18	0	0	0	0	0	0	0	0	2
20	0	0	0	0	0	0	0	0	0
Eastern Red Cedar Total	**0.6**	**1.2**	**0**	**0**	**0**	**0**	**0**	**0**	**18.4**
Elm									
6	1.2	5.5	0.5	0	0	0.5	0.2	0	0
8	1	2.9	0.6	0	0	0.6	0.2	0	0
10	0.7	1.2	0.4	0	0	0.4	0.1	0	0
12	0.5	0.6	0.2	0	0	0.2	0	0	12.9
14	0.3	0.3	0.1	0	0	0.2	0	0	9
16	0.1	0.1	0.1	0	0	0.1	0	0	4.9
18	0	0	0	0	0	0	0	0	3.4
20	0	0	0	0	0	0	0	0	1.7
22	0	0	0	0	0	0	0	0	1.3
24	0	0	0	0	0	0	0	0	1.7
30	0	0	0	0	0	0	0	0	0
Elm Total	**3.8**	**10.6**	**1.9**	**0**	**0**	**2**	**0.5**	**0**	**34.9**
Hickory/Pecan									
6	0.3	1.5	0.2	0	0	0.2	0	0	0
8	0.4	0.9	0.2	0	0	0.2	0	0	0
10	0.5	0.7	0.3	0	0	0.3	0.1	0	0
12	0.5	0.7	0.2	0	0.2	0.3	0	0	17.7
14	0.5	0.4	0.1	0	0.2	0.4	0	0	29
16	0.5	0.4	0.1	0	0.2	0.4	0	0	34.3
18	0.3	0.1	0.1	0	0.2	0.2	0	0	23.2
20	0.1	0	0	0	0.1	0.1	0	0	14.3
22	0	0	0	0	0	0	0	0	6.5

RptAll All

Row Labels	BA/Ac.	Trees/Ac.	Pulp Tons/Ac.	CNS Tons/Ac.	Saw Tons/Ac.	Total Tons/Ac.	Pulp Cords/Ac.	CNS Cords/Ac.	Scribner/Ac.
24	0	0	0	0	0	0	0	0	3.1
26	0	0	0	0	0	0	0	0	1.5
28	0	0	0	0	0	0	0	0	2.1
32	0	0	0	0	0	0	0	0	0
Hickory/Pecan Total	**3.1**	**4.7**	**1.2**	**0**	**0.9**	**2.1**	**0.1**	**0**	**131.7**
Honey Locust									
18	0	0	0	0	0	0	0	0	0.8
20	0	0	0	0	0	0	0	0	0.7
Honey Locust Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1.5**
Miscellaneous									
6	0.2	0.7	0	0	0	0	0	0	0
8	0.2	0.3	0	0	0	0	0	0	0
10	0.1	0.1	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	1.1
14	0	0	0	0	0	0	0	0	2.6
16	0	0	0	0	0	0	0	0	1
18	0	0	0	0	0	0	0	0	1
20	0	0	0	0	0	0	0	0	0.5
22	0	0	0	0	0	0	0	0	1.3
24	0	0	0	0	0	0	0	0	0.6
26	0	0	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0	0	0
Miscellaneous Total	**0.5**	**1.1**	**0**	**0**	**0**	**0**	**0**	**0**	**8.1**
Persimmon									
6	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0
Persimmon Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Red Maple									
6	0.2	0.5	0	0	0	0	0	0	0
8	0.2	0.5	0.1	0	0	0.1	0	0	0
10	0.1	0.3	0.1	0	0	0.1	0	0	0
12	0	0.1	0	0	0	0	0	0	1
14	0	0	0	0	0	0	0	0	0.8
16	0	0	0	0	0	0	0	0	0.9
18	0	0	0	0	0	0	0	0	0.9
20	0	0	0	0	0	0	0	0	0
Red Maple Total	**0.5**	**1.4**	**0.2**	**0**	**0**	**0.2**	**0**	**0**	**3.6**
Redbud									
6	0	0	0	0	0	0	0	0	0
Redbud Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
River Birch									
6	0	0.1	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0.3
14	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0.5
River Birch Total	**0**	**0.1**	**0**	**0**	**0**	**0**	**0**	**0**	**0.8**
Sweetgum									
6	1.3	5.4	0.5	0	0	0.5	0.2	0	0
8	1.4	3.7	0.9	0	0	0.9	0.2	0	0
10	1.4	2.5	1.1	0	0	1.1	0.3	0	0
12	1.3	1.6	0.3	0	0.4	0.8	0.1	0	56.6
14	1.1	1	0.2	0	0.7	0.9	0	0	82.9
16	0.6	0.5	0.1	0	0.4	0.5	0	0	65.6
18	0.5	0.2	0	0	0.4	0.4	0	0	50.4
20	0.3	0.1	0	0	0.3	0.3	0	0	35.3
22	0.1	0	0	0	0.1	0.1	0	0	15.4
24	0	0	0	0	0	0	0	0	5.1
26	0	0	0	0	0	0	0	0	1.4
28	0	0	0	0	0	0	0	0	1.9
30	0	0	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0	0	2
34	0	0	0	0	0	0	0	0	0
Sweetgum Total	**8**	**15**	**3.1**	**0**	**2.3**	**5.5**	**0.8**	**0**	**316.6**

RptAll All

Row Labels	BA/Ac.	Trees/Ac.	Pulp Tons/Ac.	CNS Tons/Ac.	Saw Tons/Ac.	Total Tons/Ac.	Pulp Cords/Ac.	CNS Cords/Ac.	Scribner/Ac.
Sycamore									
8	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0.2
14	0	0	0	0	0	0	0	0	0.7
16	0	0	0	0	0	0	0	0	1.1
18	0	0	0	0	0	0	0	0	2
20	0	0	0	0	0	0	0	0	1.1
22	0	0	0	0	0	0	0	0	0.5
24	0	0	0	0	0	0	0	0	0.5
Sycamore Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6.1**
Misc. Hardwood Total	**17.3**	**36.8**	**6.4**	**0**	**3.2**	**10**	**1.4**	**0**	**569.2**
Grand Total	**88.6**	**113.8**	**16.2**	**2**	**59.7**	**82.8**	**4.2**	**0.7**	**9590.8**

Stand and Stock Report

Unit ID: 11
Unit Age: 63
Unit Acres: 287.6
Forest Type Acres: HN: 38.8,HP: 10,PH: 86.6,PN: 98.8,PP: 53.3
Cruise Date: 6/1/2009
 # Plots: 56
Annual % Growth: Pine: 0.6%, HWD: 0.7%
Annual % Mortality: 0.3%
CV Tons: 31
SE Tons: 4.02
SI: LOP: 80.5 (1), SHP: 78.7 (1), SLP: ()

Red River Army Depot

CutUnit 11

Row Labels	Trees	Pulp Tons EXP	CNS Tons EXP	Saw Tons EXP	Total Tons EXP	Pulp Cords EXP	CNS Cords EXP	Scribner EXP
Pine								
Loblolly Pine								
6	2013.2	201.4	0	0	201.4	57.5	0	0
8	1092.9	287.6	0	0	287.6	115	0	0
10	489	0	230.1	0	230.1	0	86.3	0
12	891.5	0	57.5	604	747.7	0	28.8	81218.3
14	891.5	0	0	1035.3	1121.6	0	0	145755.8
16	1581.8	0	0	2703.4	2847.2	0	0	412360.8
18	1064.2	0	0	2243.2	2329.6	0	0	351591
20	690.2	0	0	1927	1955.7	0	0	317568
22	431.4	0	0	1581.8	1639.3	0	0	268704.7
24	57.6	0	0	287.6	287.6	0	0	48230.5
26	115.1	0	0	488.9	488.9	0	0	85215.9
28	57.6	0	0	373.9	373.9	0	0	70145.6
30	0	0	0	86.3	86.3	0	0	13546
32	0	0	0	143.8	143.8	0	0	25107.5
34	0	0	0	86.3	86.3	0	0	15357.8
Loblolly Pine Total	**9376**	**489**	**287.6**	**11561.5**	**12827**	**172.5**	**115.1**	**1834801.9**
Shortleaf Pine								
6	373.9	57.5	0	0	57.5	28.8	0	0
10	230.1	0	143.8	0	143.8	0	57.6	0
12	316.3	0	57.5	230	287.5	0	28.8	30543.2
14	1121.6	0	0	1409.2	1495.5	0	0	216534.1
16	719	0	0	1294.2	1351.7	0	0	206640.6
18	834	0	0	2013.2	2042	0	0	336693.2
20	230.1	0	0	719	719	0	0	128298.4
22	28.8	0	0	86.3	86.3	0	0	14121.2
24	57.6	0	0	172.6	172.6	0	0	30687
28	0	0	0	86.3	86.3	0	0	16968.4
Shortleaf Pine Total	**3911.4**	**57.5**	**201.3**	**6010.8**	**6442.2**	**28.8**	**86.4**	**980486.1**
Slash Pine								
12	143.8	0	28.8	28.8	86.3	0	28.8	5435.6
16	86.4	0	0	172.5	172.5	0	0	24877.4
18	115.1	0	0	230	230	0	0	37992
20	201.3	0	0	488.9	488.9	0	0	81131.9
22	57.6	0	0	172.5	201.3	0	0	32556.3
24	28.8	0	0	86.3	86.3	0	0	12510.6
Slash Pine Total	**633**	**0**	**28.8**	**1179**	**1265.3**	**0**	**28.8**	**194503.8**
Pine Total	**13920.4**	**546.5**	**517.7**	**18751.3**	**20534.5**	**201.3**	**230.3**	**3009791.8**
Oak								
Misc Red Oak								
18	28.8	0	0	28.8	28.8	0	0	3767.6
26	28.8	57.5	0	0	57.5	28.8	0	0
Misc Red Oak Total	**57.6**	**57.5**	**0**	**28.8**	**86.3**	**28.8**	**0**	**3767.6**
Post Oak								
6	517.7	57.5	0	0	57.5	28.8	0	0
8	402.6	86.3	0	0	86.3	28.8	0	0
10	230.1	115.1	0	0	115.1	28.8	0	0
12	115	28.8	0	28.8	57.6	0	0	3163.6
14	172.6	143.8	0	28.8	172.6	57.6	0	5205.6
16	86.3	57.5	0	86.3	115.1	28.8	0	11504
18	57.6	57.5	0	57.5	115	28.8	0	6643.6
20	28.8	57.5	0	0	57.5	28.8	0	0
22	28.8	57.5	0	0	57.5	28.8	0	0

CutUnit 11

Row Labels	Trees	Pulp Tons EXP	CNS Tons EXP	Saw Tons EXP	Total Tons EXP	Pulp Cords EXP	CNS Cords EXP	Scribner EXP
24	28.8	57.5	0	57.5	115	28.8	0	7621.4
26	0	0	0	57.5	57.5	0	0	7937.8
32	0	57.5	0	0	57.5	28.8	0	0
Post Oak Total	**1668.3**	**776.5**	**0**	**316.4**	**1064.2**	**316.8**	**0**	**42076**
Southern Red Oak								
6	517.7	57.5	0	0	57.5	28.8	0	0
8	661.5	172.5	0	0	172.5	57.6	0	0
10	316.4	172.6	0	0	172.6	86.3	0	0
12	546.4	86.3	0	115.1	230.1	28.8	0	14322.5
14	201.3	57.5	0	115.1	172.6	28.8	0	13833.6
16	316.4	28.8	0	373.8	402.6	28.8	0	45814.7
18	172.6	0	0	316.3	316.3	0	0	36726.5
20	86.3	0	0	143.8	143.8	0	0	18780.3
22	57.5	0	0	172.6	172.6	0	0	24618.6
24	57.6	115	0	57.5	172.5	57.6	0	6787.4
26	28.8	0	0	115	115	0	0	13977.4
28	0	0	0	57.5	57.5	0	0	7937.8
32	0	0	0	57.5	57.5	0	0	7247.5
Southern Red Oak Total	**2962.5**	**690.2**	**0**	**1524.2**	**2243.1**	**316.7**	**0**	**190046.3**
Water Oak								
8	373.9	115.1	0	0	115.1	28.8	0	0
10	287.6	143.8	0	0	143.8	57.6	0	0
12	115	86.3	0	0	86.3	28.8	0	0
16	28.8	0	0	28.8	28.8	0	0	4141.4
22	28.8	0	0	57.5	57.5	0	0	7736.4
28	0	0	0	57.5	57.5	0	0	8081.6
Water Oak Total	**834.1**	**345.2**	**0**	**143.8**	**489**	**115.2**	**0**	**19959.4**
White Oak								
6	201.3	28.8	0	0	28.8	0	0	0
8	115	28.8	0	0	28.8	0	0	0
10	431.4	230.1	0	0	230.1	86.3	0	0
18	28.8	0	0	57.5	57.5	0	0	6442.2
20	28.8	0	0	57.5	57.5	0	0	9375.8
22	28.8	57.5	0	0	57.5	28.8	0	0
White Oak Total	**834.1**	**345.2**	**0**	**115**	**460.2**	**115.1**	**0**	**15818**
Willow Oak								
6	230.1	28.8	0	0	28.8	0	0	0
8	143.8	28.8	0	0	28.8	0	0	0
12	201.3	86.3	0	28.8	115.1	28.8	0	3451.2
16	28.8	57.5	0	0	57.5	28.8	0	0
18	28.8	57.5	0	0	57.5	28.8	0	0
Willow Oak Total	**632.8**	**258.9**	**0**	**28.8**	**287.7**	**86.4**	**0**	**3451.2**
Oak Total	**6989.4**	**2473.5**	**0**	**2157**	**4630.5**	**979**	**0**	**275118.5**
Misc. Hardwood								
Blackgum								
8	287.6	57.5	0	0	57.5	28.8	0	0
Blackgum Total	**287.6**	**57.5**	**0**	**0**	**57.5**	**28.8**	**0**	**0**
Dogwood								
6	201.3	28.8	0	0	28.8	0	0	0
8	604	115.1	0	0	115.1	28.8	0	0
Dogwood Total	**805.3**	**143.9**	**0**	**0**	**143.9**	**28.8**	**0**	**0**
Elm								
6	1696.8	172.6	0	0	172.6	28.8	0	0
8	287.6	57.5	0	0	57.5	28.8	0	0
10	115	28.8	0	0	28.8	0	0	0
12	57.5	0	0	28.8	28.8	0	0	2185.8
22	28.8	28.8	0	0	28.8	28.8	0	0
Elm Total	**2185.7**	**287.7**	**0**	**28.8**	**316.5**	**86.4**	**0**	**2185.8**
Hickory/Pecan								
6	287.6	28.8	0	0	28.8	0	0	0
8	402.6	115	0	0	115	28.8	0	0
10	431.4	230.1	0	0	230.1	86.3	0	0
12	115	28.8	0	28.8	86.3	28.8	0	3710
14	86.3	57.5	0	28.8	86.3	28.8	0	4889.2
16	86.3	0	0	86.3	86.3	0	0	10957.6
18	28.8	0	0	57.5	57.5	0	0	7190
20	57.5	0	0	86.3	86.3	0	0	12539.4
Hickory/Pecan Total	**1495.5**	**460.2**	**0**	**287.7**	**776.6**	**172.7**	**0**	**39286.2**
Miscellaneous								

CutUnit 11

Row Labels	Trees	Pulp Tons EXP	CNS Tons EXP	Saw Tons EXP	Total Tons EXP	Pulp Cords EXP	CNS Cords EXP	Scribner EXP
8	143.8	28.8	0	0	28.8	0	0	0
10	86.3	28.8	0	0	28.8	0	0	0
12	115	0	0	57.5	57.5	0	0	6384.7
24	28.8	0	0	57.5	57.5	0	0	6701.1
Miscellaneous Total	**373.9**	**57.6**	**0**	**115**	**172.6**	**0**	**0**	**13085.8**
Red Maple								
6	258.8	28.8	0	0	28.8	0	0	0
20	28.8	0	0	0	0	0	0	0
Red Maple Total	**287.6**	**28.8**	**0**	**0**	**28.8**	**0**	**0**	**0**
Sweetgum								
6	2013.2	230	0	0	230	86.3	0	0
8	1236.7	287.6	0	0	287.6	115.1	0	0
10	373.9	143.8	0	0	143.8	57.6	0	0
12	546.5	57.6	0	172.6	230	57.6	0	19758.1
14	316.3	28.8	0	201.3	230	28.8	0	28069.7
16	57.6	0	0	57.6	57.6	0	0	9634.6
18	28.8	0	0	57.5	57.5	0	0	6068.4
22	28.8	0	0	57.5	57.5	0	0	9203.2
Sweetgum Total	**4601.8**	**747.8**	**0**	**546.5**	**1294**	**345.4**	**0**	**72734**
Misc. Hardwood Total	**10037.4**	**1783.5**	**0**	**978**	**2789.9**	**662.1**	**0**	**127291.8**
Grand Total	**30947.2**	**4803.5**	**517.7**	**21886.3**	**27954.9**	**1842.4**	**230.3**	**3412202.1**

Stand and Stock Report

Unit ID: 11
Unit Age: 63
Unit Acres: 287.6
Forest Type Acres: HN: 38.8,HP: 10,PH: 86.6,PN: 98.8,PP: 53.3
Cruise Date: 6/1/2009
 # Plots: 56
Annual % Growth: Pine: 0.6%, HWD: 0.7%
Annual % Mortality: 0.3%
CV Tons: 31
SE Tons: 4.02
SI: LOP: 80.5 (1), SHP: 78.7 (1), SLP: ()

Red River Army Depot

CutUnit 11

Row Labels	BA/Ac.	Trees/Ac.	Pulp Tons/Ac.	CNS Tons/Ac.	Saw Tons/Ac.	Total Tons/Ac.	Pulp Cords/Ac.	CNS Cords/Ac.	Scribner/Ac.
Pine									
Loblolly Pine									
6	1.5	7	0.7	0	0	0.7	0.2	0	0
8	1.4	3.8	1	0	0	1	0.4	0	0
10	1.1	1.7	0	0.8	0	0.8	0	0.3	0
12	2.5	3.1	0	0.2	2.1	2.6	0	0.1	282.4
14	3.5	3.1	0	0	3.6	3.9	0	0	506.8
16	8.3	5.5	0	0	9.4	9.9	0	0	1433.8
18	6.4	3.7	0	0	7.8	8.1	0	0	1222.5
20	5.4	2.4	0	0	6.7	6.8	0	0	1104.2
22	4.4	1.5	0	0	5.5	5.7	0	0	934.3
24	0.8	0.2	0	0	1	1	0	0	167.7
26	1.3	0.4	0	0	1.7	1.7	0	0	296.3
28	1	0.2	0	0	1.3	1.3	0	0	243.9
30	0.2	0	0	0	0.3	0.3	0	0	47.1
32	0.4	0	0	0	0.5	0.5	0	0	87.3
34	0.2	0	0	0	0.3	0.3	0	0	53.4
Loblolly Pine Total	**38.4**	**32.6**	**1.7**	**1**	**40.2**	**44.6**	**0.6**	**0.4**	**6379.7**
Shortleaf Pine									
6	0.4	1.3	0.2	0	0	0.2	0.1	0	0
10	0.6	0.8	0	0.5	0	0.5	0	0.2	0
12	1	1.1	0	0.2	0.8	1	0	0.1	106.2
14	4.3	3.9	0	0	4.9	5.2	0	0	752.9
16	3.6	2.5	0	0	4.5	4.7	0	0	718.5
18	5.2	2.9	0	0	7	7.1	0	0	1170.7
20	1.8	0.8	0	0	2.5	2.5	0	0	446.1
22	0.2	0.1	0	0	0.3	0.3	0	0	49.1
24	0.4	0.2	0	0	0.6	0.6	0	0	106.7
28	0.2	0	0	0	0.3	0.3	0	0	59
Shortleaf Pine Total	**17.7**	**13.6**	**0.2**	**0.7**	**20.9**	**22.4**	**0.1**	**0.3**	**3409.2**
Slash Pine									
12	0.4	0.5	0	0.1	0.1	0.3	0	0.1	18.9
16	0.6	0.3	0	0	0.6	0.6	0	0	86.5
18	0.8	0.4	0	0	0.8	0.8	0	0	132.1
20	1.5	0.7	0	0	1.7	1.7	0	0	282.1
22	0.6	0.2	0	0	0.6	0.7	0	0	113.2
24	0.2	0.1	0	0	0.3	0.3	0	0	43.5
Slash Pine Total	**4.1**	**2.2**	**0**	**0.1**	**4.1**	**4.4**	**0**	**0.1**	**676.3**
Pine Total	**60.2**	**48.4**	**1.9**	**1.8**	**65.2**	**71.4**	**0.7**	**0.8**	**10465.2**
Oak									
Misc Red Oak									
18	0.2	0.1	0	0	0.1	0.1	0	0	13.1
26	0.2	0.1	0.2	0	0	0.2	0.1	0	0
Misc Red Oak Total	**0.4**	**0.2**	**0.2**	**0**	**0.1**	**0.3**	**0.1**	**0**	**13.1**
Post Oak									
6	0.4	1.8	0.2	0	0	0.2	0.1	0	0
8	0.6	1.4	0.3	0	0	0.3	0.1	0	0
10	0.6	0.8	0.4	0	0	0.4	0.1	0	0
12	0.4	0.4	0.1	0	0.1	0.2	0	0	11

CutUnit 11

Row Labels	BA/Ac.	Trees/Ac.	Pulp Tons/Ac.	CNS Tons/Ac.	Saw Tons/Ac.	Total Tons/Ac.	Pulp Cords/Ac.	CNS Cords/Ac.	Scribner/Ac.
14	0.8	0.6	0.5	0	0.1	0.6	0.2	0	18.1
16	0.6	0.3	0.2	0	0.3	0.4	0.1	0	40
18	0.4	0.2	0.2	0	0.2	0.4	0.1	0	23.1
20	0.2	0.1	0.2	0	0	0.2	0.1	0	0
22	0.2	0.1	0.2	0	0	0.2	0.1	0	0
24	0.4	0.1	0.2	0	0.2	0.4	0.1	0	26.5
26	0.2	0	0	0	0.2	0.2	0	0	27.6
32	0.2	0	0.2	0	0	0.2	0.1	0	0
Post Oak Total	**5**	**5.8**	**2.7**	**0**	**1.1**	**3.7**	**1.1**	**0**	**146.3**
Southern Red Oak									
6	0.4	1.8	0.2	0	0	0.2	0.1	0	0
8	0.9	2.3	0.6	0	0	0.6	0.2	0	0
10	0.7	1.1	0.6	0	0	0.6	0.3	0	0
12	1.5	1.9	0.3	0	0.4	0.8	0.1	0	49.8
14	0.8	0.7	0.2	0	0.4	0.6	0.1	0	48.1
16	1.7	1.1	0.1	0	1.3	1.4	0.1	0	159.3
18	1.1	0.6	0	0	1.1	1.1	0	0	127.7
20	0.6	0.3	0	0	0.5	0.5	0	0	65.3
22	0.5	0.2	0	0	0.6	0.6	0	0	85.6
24	0.6	0.2	0.4	0	0.2	0.6	0.2	0	23.6
26	0.4	0.1	0	0	0.4	0.4	0	0	48.6
28	0.2	0	0	0	0.2	0.2	0	0	27.6
32	0.2	0	0	0	0.2	0.2	0	0	25.2
Southern Red Oak Total	**9.6**	**10.3**	**2.4**	**0**	**5.3**	**7.8**	**1.1**	**0**	**660.8**
Water Oak									
8	0.6	1.3	0.4	0	0	0.4	0.1	0	0
10	0.6	1	0.5	0	0	0.5	0.2	0	0
12	0.4	0.4	0.3	0	0	0.3	0.1	0	0
16	0.2	0.1	0	0	0.1	0.1	0	0	14.4
22	0.2	0.1	0	0	0.2	0.2	0	0	26.9
28	0.2	0	0	0	0.2	0.2	0	0	28.1
Water Oak Total	**2.2**	**2.9**	**1.2**	**0**	**0.5**	**1.7**	**0.4**	**0**	**69.4**
White Oak									
6	0.2	0.7	0.1	0	0	0.1	0	0	0
8	0.2	0.4	0.1	0	0	0.1	0	0	0
10	0.9	1.5	0.8	0	0	0.8	0.3	0	0
18	0.2	0.1	0	0	0.2	0.2	0	0	22.4
20	0.2	0.1	0	0	0.2	0.2	0	0	32.6
22	0.2	0.1	0.2	0	0	0.2	0.1	0	0
White Oak Total	**1.9**	**2.9**	**1.2**	**0**	**0.4**	**1.6**	**0.4**	**0**	**55**
Willow Oak									
6	0.2	0.8	0.1	0	0	0.1	0	0	0
8	0.2	0.5	0.1	0	0	0.1	0	0	0
12	0.6	0.7	0.3	0	0.1	0.4	0.1	0	12
16	0.2	0.1	0.2	0	0	0.2	0.1	0	0
18	0.2	0.1	0.2	0	0	0.2	0.1	0	0
Willow Oak Total	**1.4**	**2.2**	**0.9**	**0**	**0.1**	**1**	**0.3**	**0**	**12**
Oak Total	**20.5**	**24.3**	**8.6**	**0**	**7.5**	**16.1**	**3.4**	**0**	**956.6**
Misc. Hardwood									
Blackgum									
8	0.4	1	0.2	0	0	0.2	0.1	0	0
Blackgum Total	**0.4**	**1**	**0.2**	**0**	**0**	**0.2**	**0.1**	**0**	**0**
Dogwood									
6	0.2	0.7	0.1	0	0	0.1	0	0	0
8	0.7	2.1	0.4	0	0	0.4	0.1	0	0
Dogwood Total	**0.9**	**2.8**	**0.5**	**0**	**0**	**0.5**	**0.1**	**0**	**0**
Elm									
6	1.3	5.9	0.6	0	0	0.6	0.1	0	0
8	0.4	1	0.2	0	0	0.2	0.1	0	0
10	0.2	0.4	0.1	0	0	0.1	0	0	0
12	0.2	0.2	0	0	0.1	0.1	0	0	7.6
22	0.2	0.1	0.1	0	0	0.1	0.1	0	0
Elm Total	**2.3**	**7.6**	**1**	**0**	**0.1**	**1.1**	**0.3**	**0**	**7.6**
Hickory/Pecan									
6	0.2	1	0.1	0	0	0.1	0	0	0

CutUnit 11

Row Labels	BA/Ac.	Trees/Ac.	Pulp Tons/Ac.	CNS Tons/Ac.	Saw Tons/Ac.	Total Tons/Ac.	Pulp Cords/Ac.	CNS Cords/Ac.	Scribner/Ac.
8	0.5	1.4	0.4	0	0	0.4	0.1	0	0
10	0.9	1.5	0.8	0	0	0.8	0.3	0	0
12	0.4	0.4	0.1	0	0.1	0.3	0.1	0	12.9
14	0.4	0.3	0.2	0	0.1	0.3	0.1	0	17
16	0.4	0.3	0	0	0.3	0.3	0	0	38.1
18	0.2	0.1	0	0	0.2	0.2	0	0	25
20	0.4	0.2	0	0	0.3	0.3	0	0	43.6
Hickory/Pecan Total	**3.4**	**5.2**	**1.6**	**0**	**1**	**2.7**	**0.6**	**0**	**136.6**
Miscellaneous									
8	0.2	0.5	0.1	0	0	0.1	0	0	0
10	0.2	0.3	0.1	0	0	0.1	0	0	0
12	0.4	0.4	0	0	0.2	0.2	0	0	22.2
24	0.2	0.1	0	0	0.2	0.2	0	0	23.3
Miscellaneous Total	**1**	**1.3**	**0.2**	**0**	**0.4**	**0.6**	**0**	**0**	**45.5**
Red Maple									
6	0.2	0.9	0.1	0	0	0.1	0	0	0
20	0.2	0.1	0	0	0	0	0	0	0
Red Maple Total	**0.4**	**1**	**0.1**	**0**	**0**	**0.1**	**0**	**0**	**0**
Sweetgum									
6	1.6	7	0.8	0	0	0.8	0.3	0	0
8	1.7	4.3	1	0	0	1	0.4	0	0
10	0.7	1.3	0.5	0	0	0.5	0.2	0	0
12	1.6	1.9	0.2	0	0.6	0.8	0.2	0	68.7
14	1.3	1.1	0.1	0	0.7	0.8	0.1	0	97.6
16	0.4	0.2	0	0	0.2	0.2	0	0	33.5
18	0.2	0.1	0	0	0.2	0.2	0	0	21.1
22	0.2	0.1	0	0	0.2	0.2	0	0	32
Sweetgum Total	**7.7**	**16**	**2.6**	**0**	**1.9**	**4.5**	**1.2**	**0**	**252.9**
Misc. Hardwood Total	**16.1**	**34.9**	**6.2**	**0**	**3.4**	**9.7**	**2.3**	**0**	**442.6**
Grand Total	**96.8**	**107.6**	**16.7**	**1.8**	**76.1**	**97.2**	**6.4**	**0.8**	**11864.4**

Appendix H. TPWD: Wildlife Management Plan Update 2017

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WILDLIFE MANAGEMENT PLAN
UPDATE 2017

Landowner / Agent: Mike Foster
Hunting Club: Red River Army Depot
County: Bowie
Acreage: *10564*

Habitat Improvement Revisions and Alterations –

- Timber thinning
- Prescribed burning
- Control of exotics

Suggested Management Practices –

Continued Timber Management – Various timber management practices implemented on RRAD will enhance wildlife habitat through timber thinning, herbicide application, and small clearcuts.

Continued Prescribed Burning – Prescribed burning on a third of the Depot acreage should be a target for prescribed fire implementation every year. Burn units should have fire return intervals of three to five years will keep understories under control and provide nutritious browse.

Prescribed Burn Workshop – A prescribed burn workshop is being planned for the public to be held on RRAD to educate the general public on planning, implementation and liability.

Removal of other exotic invasive species – Removal of privet hedge, bahia grass, Bermuda grass, Johnson grass, etc. is a recommended practice at Red River Army Depot. Eliminating invasive exotics assists native species by removing competition for similar resources.

Harvest Summary –

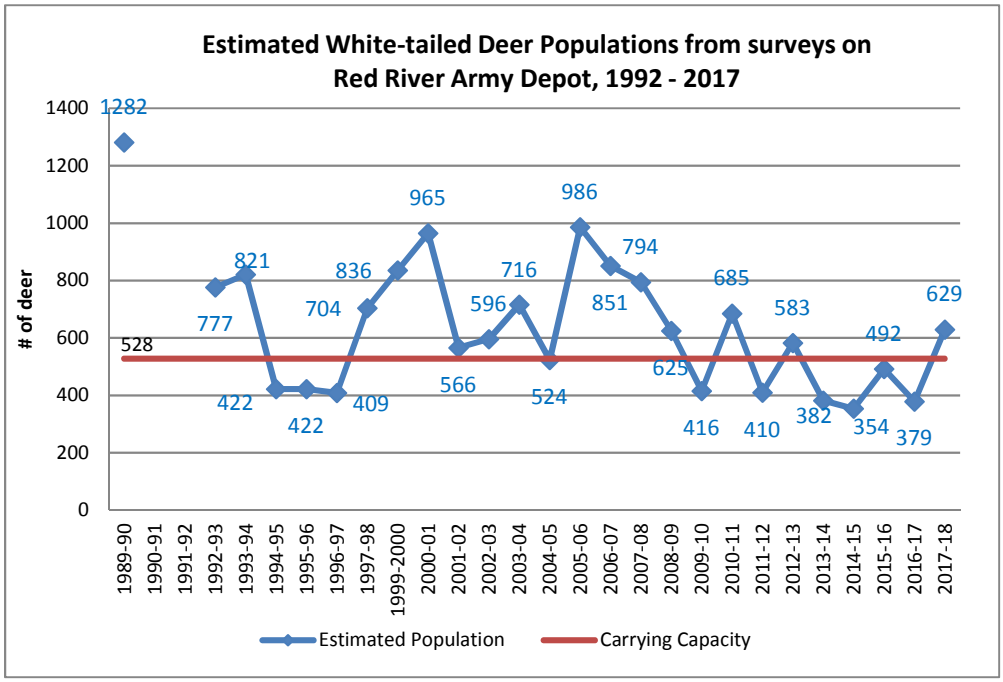
- Red River Army Depot harvested a total of 25 deer, including twelve (12) antlered buck and thirteen (13) antlerless deer including three (3) fawns (one fawn doe and two fawn bucks), during the 2016 – 2017 hunting season.

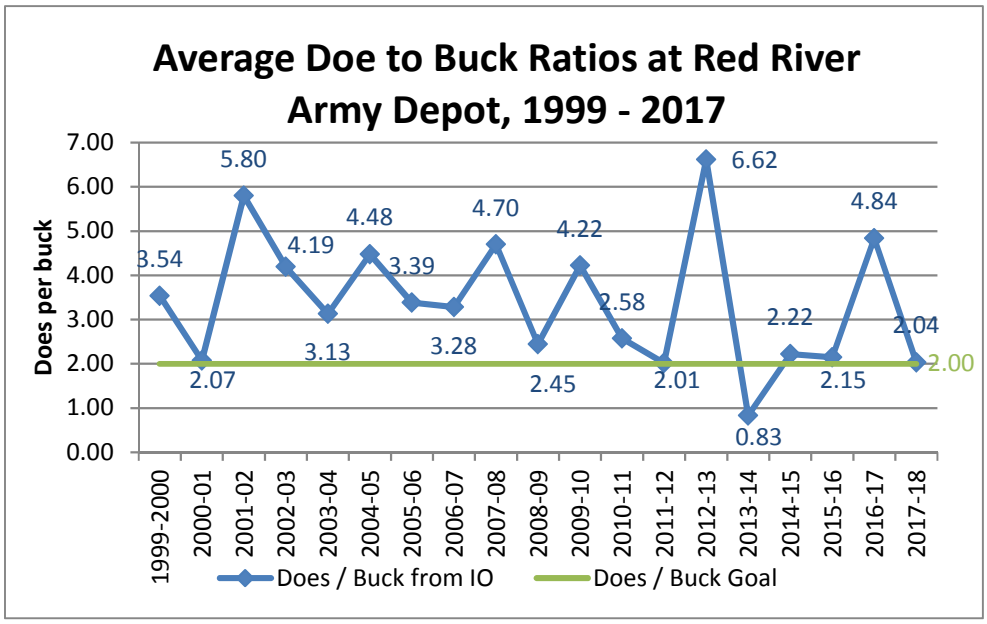
- Antlerless harvest included one (1) fawn doe, two (2) fawn bucks, three (3) 1½ year old does, one (1) 2½ year old does and six (6) 3½ year old does. The average of all does harvested (excluding the buck fawns) was 2.6 years old and 76 pounds. Ten (10) mature does (2½ and over) were harvested; their average age was 3.3 years and weight was 82.5 pounds. The average weight is just slightly more than last year's weight of mature does and a very close to the goal of 85 pounds for mature field dressed does. Average mature doe weights from the property support the previous year's survey data suggesting the deer herd is near carrying capacity (20 acres/deer.)

- Twelve (12) antlered bucks, six (6) mature bucks, three (3) immature bucks (less than 3½ years old and less than or equal to 13 inches inside spread) and one (1) cull buck (spikes or three points) including only (1) 1½ old with two unbranched antlers. Bucks older than 3½ averaged 118 pounds, 4.16 years and 14.7 inch inside spreads.

Herd Composition and Density Estimates –

- Camera and spotlight surveys were conducted during July & August 2017. Two spotlight counts surveyed 256 acres each for a total of 512 acres observing a total of 26 individuals. Camera surveys estimated a total of 600 deer on ninety-four (94) camera sites on an estimated 9400 acres (using 100 acres surveyed per camera and eliminating camera locations that did not capture any deer photographs.) Averaging all surveys results in an estimate of 626 total deer on 9912 acres resulting in a current density estimate of 15.83 acres per deer. Current estimates show populations have increased more than one and a half times from the last year's estimate of 23 acres per deer (see White-tailed Deer Estimated Populations Chart.) The last several years of survey data suggest that the population is exhibiting less extremes in population growth and loss and therefore stabilizing around carrying capacity (20 ac per deer or 528 deer on 10,564 acres.)





- Doe harvest recommendation has been increased to keep the population from rising again.

- Average doe to buck ratios the past three years out of four years from are very close to 2 does per buck this year (see Herd Composition chart). Goals for the property are to keep sex ratios between near 2 does per buck.

- Average fawning rates since the property began on MLDP have shown extreme fluctuation. The last few years, average fawn production rates have increased slightly with every year. Lactation rates were only recorded from two does on last year's harvest records, so no comparable data can be estimated using lactation to compare with fawn production. Please continue to record and submit summer and hunting observations to supplement survey estimates.

- This hunting season 2017 – 2018, will be the second year RRAD will continue with informal compartments to track harvest and manage hunting pressure across the entire facility. Recommendations will be made for the entire depot overall and specifics per compartment will also be specified in the harvest recommendations.

Harvest Recommendations for the upcoming hunting season:

- The MAXIMUM ANTLERLESS harvest is set at **85** (14.2 % of the *estimated* population minus buck harvest.) MINIMUM ANTLERLESS harvest to achieve sound population control is set at 60% of the harvest recommendation or 51 does.

- The **MAXIMUM BUCK harvest is set at 35** (14.4% of the *estimated* buck population.) No more than thirty (30) mature quality bucks and five (5) spike or cull buck can be taken. Mature or cull (other than spikes) bucks should be at least 3 ½ years old. The only 1 ½ or 2 ½ year old bucks in the harvest should be bucks with one unbranched antler.

- Mature bucks should be a minimum of 3 ½ years old (preferably 4 ½.) Inside spread is an indication of maturity; older bucks will have larger inside spreads. Therefore, I suggest buck harvest should be limited to individuals with inside spreads at least 15 inches; to protect a greater portion of young bucks.

Harvest Recommendations for North (Ammo) Compartment

- The MAXIMUM ANTLERLESS harvest is set at **25** (13.5% of the *estimated* population minus buck harvest.)
- The **MAXIMUM BUCK harvest is set at 15** (12.5% of the *estimated* buck population.) Any combination of mature quality bucks and spike or cull buck can be taken.

South (Lakes) compartment

- The MAXIMUM ANTLERLESS harvest is set at **60** (15.7% of the *estimated* population minus buck harvest.)
- The **MAXIMUM BUCK harvest is set at 20** (16% of the *estimated* buck population.) No more than twenty total bucks including: fifteen (15) mature quality bucks and five (5) spike or cull buck can be taken.

Data collection needs:

1) Please remember to have hunters record **lactation rates** for all does harvested. Also please make sure and record **ALL** antler dimensions for antlered bucks.

Person preparing update: Penny Wilkerson  Wildlife Biologist Date:9/13/2017

Owner/Agent Signature:_____ Date:_____

PLEASE SIGN AND RETURN TO ACKNOWLEDGE PLAN GOALS, REQUIREMENTS & CURRENT HARVEST RECOMMENDATIONS.

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Appendix I. 2017 Deer Population Summary

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DEER POPULATION SUMMARY

Ranch: Red River Army Depot

Survey Technique: Camera & Spotlight

County: Bowie

Year: 2017

Survey Route/Pasture	Date	Deer Observed					Acres Sampled	Acres Per Deer	Deer Per 1,000 Ac.
		Bucks	Does	Fawns	Undet	Total			
Camera Survey	7/6 - 8/6	173	382	45		600	9,400	15.67	63.8
Spotlight Survey	7/20/2017	11	2		3	16	256	16.00	62.5
Spotlight Survey	8/3/2017	3	3	4		10	256	25.60	39.1
Survey Totals		187	387	49	3	626	9,912	15.83	63.2
Incidental Observations		31	62	42		135			
Combined Totals		218	449	91		758			

Ranch Size (ac.): 13,379

Acres/Deer: 15.83
Does/Buck: 2.06
Fawns/Doe: 0.20

Composition -
- Bucks: 29.0%
- Does: 59.3%
- Fawns: 11.7%

Deer/1,000Ac: 63.16
Adult/1,000Ac: 55.77
Acres/Adult: 17.93

Estimated Population -
- Bucks: 245
- Does: 501
- Fawns: 99
- Total: 845

Harvest Recommendation

Antlered Bucks: The recommended MAXIMUM buck harvest is 35. No more than thirty 30 quality bucks (at least 3 1/2 years old) and five (5) spike/cull bucks. More culls may be taken in lieu of mature bucks.

Antlerless Deer: MAXIMUM ANTLERLESS harvest should be no more than 85.

MINIMUM ANTLERLESS HARVEST is to achieve sound population control is set at 51.

Remarks:

4/18/2018

DEER HARVEST RECOMMENDATION

Ranch: Red River Army Depot County: Bowie Year: 2017

Objective & Goals:

Ranch Size: 13,379 acres

Estimated Deer Population:

Bucks	245
Does	501
Fawns	99
Total	845

1. Recommended Population Harvest

845 Total Deer X .14 Kill Rate = 120 Deer Harvest Quota

2. Recommended Buck Harvest

245 Total Bucks X .14 Kill Rate = 35 Buck Harvest Quota

3. Recommended Doe or Antlerless Deer Harvest

120 Recommended Deer Harvest Quota
-35 Recommended Buck Harvest Quota
85 Recommended Doe Or Antlerless Deer Harvest Quota

17% Of The Does Recommended To Be Harvested

4. Recommended Spike Buck Harvest

35 Buck Harvest X .15 Spike Kill Rate = 5 Spike Buck Quota

5. Potential Effect of The Harvest

	Bucks	Does	Fawns
Census	245	501	99
Rec. Har.	-35	-85	
	210	416	
Yearlings	50	49	
Carryover	260	465	

Estimated Winter Density	18.45	acres/deer
Estimated Winter Sex Ratio	1.79	does/buck

Remarks:

4/18/2018

Appendix J. Updates to the INRMP

[Note: INRMP updates will be added as they are made]

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Appendix K. Agency Correspondence

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
2005 NE Green Oaks Blvd., Suite 140
Arlington, Texas 76006

In Reply Refer To:
02ETAR00-2018-I-1557

August 7, 2018

Mr. Terry S. Boone
Chief, Environmental Division
Land Management Branch
Red River Army Depot
Texarkana, TX 75507

Re: draft final Integrated Natural Resources Management Plan 2018 for Red River Army Depot, Bowie County, Texas

Dear Mr. Boone:

Thank you for your July 9, 2018, letter requesting our review and concurrence on the *draft final 2018 Integrated Natural Resource Management Plan (INRMP) for Red River Army Depot, Bowie County, Texas*. The U.S. Fish and Wildlife Service has reviewed the INRMP and provide the following comments pursuant to the Sikes Act Improvement Act of 1997, as amended (16 U.S.C. 670a-670o et seq.), and the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). Red River Army Depot is an installation of the Army Material Command and occupies approximately 15,846 acres in northeastern Texas. The INRMP addresses natural resources and their management on all lands over which Red River Army Depot has jurisdiction and control, including land occupied by tenants or lessees and used by anyone else pursuant to a permit, license, right-of-way, or any other form of permission.

The natural resource management goals and objectives described in the INRMP do not appear to pose any substantial and/or permanent adverse impacts to natural resources found at Red River Army Depot. No federally listed species or their habitats are known to occur at Red River Army Depot. We believe that the planned projects as proposed will assist in accomplishing the desired and reasonable land management goals and objectives as outlined within Chapter 6 of the INRMP. These resource management projects include fish and wildlife management, soils management, invasive species management, forest management, wetland management, wildland fire and prescribed fire management, and climate change management.

Thank you for the opportunity to review the 2018 INRMP revision. We look forward to assisting your staff in future INRMP reviews. Please contact Sean Edwards, Arlington Ecological Services Field Office, at 817-277- 1100 or Allison Arnold, Regional Sikes Act Coordinator, Region 2, at 512-490-0057, ext. 242 if you have any questions or require additional assistance.

Sincerely,

FOR Debra Bills
Field Supervisor

cc: Allison Arnold, USFWS Regional Sikes Act Coordinator, Southwest Region

S:\Correspondence\FY 2018\Project Files\2018-I-1557 Red River Army Depot 2018 annual INRMP\2018-I-1557 Red River Army Depot 2018 annual INRMP Response Letter.docx

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July 30, 2018

Mr. Dennis Kuykendall
Natural Resource Manager
Land Management Branch
Red River Army Depot
100 James Carlow Drive
Texarkana, TX 75507

RE: Draft Final Integrated Natural Resources Management Plan for Red River Army Depot, Bowie County

Dear Mr. Dennis Kuykendall:

Texas Parks and Wildlife Department (TPWD) received the June 2018 draft final Integrated Natural Resources Management Plan (INRMP) for Red River Army Depot (RRAD). TPWD staff has reviewed the draft final INRMP and finds that the plan provides adequate guidance for the Army Materiel Command to conserve, protect, and manage the natural resources at RRAD. However, please consider the attached comments and recommendations regarding certain aspects of the INRMP.

Thank you for the opportunity to review and comment on the INRMP. TPWD looks forward to continue working with RRAD personnel to ensure the responsible management of fish and wildlife resources on this facility. Please contact me at Karen.Hardin@tpwd.texas.gov or (903) 322-5001 if TPWD may be of further assistance.

Sincerely,

Karen Hardin
Wildlife Habitat Assessment Program
Wildlife Division

/kbh 40339

Attachment

4200 SMITH SCHOOL ROAD
AUSTIN, TEXAS 78744-3291
512.389.4800
www.tpwd.texas.gov

Attachment

July 30, 2018

Texas Parks and Wildlife Department (TPWD) Comments and Recommendations on the Red River Army Depot (RRAD) Draft Final Integrated Natural Resources Management Plan (INRMP) (June 2018)

Section 6.14.3 Hunting Program

Page 65 (Line 17 and Line 22) mentions Level 3 of the TPWD Managed Lands Deer Permit (MLDP) Program. However, TPWD no longer has levels, and RRAD is currently enrolled in the MLDP – Conservation Option.

> **Line 17 Recommendation:** TPWD recommends the following language: "Under the program, the installation is enrolled in the Conservation Option, which authorizes the Depot to implement the state's most flexible seasons and bag limits."

Page 65 (Line 22) also indicates that RRAD has flexibility in determining hunting seasons for antlerless deer, spikes, and buck deer, which is technically not true. MLDP cooperators do not have control of season dates, yet they can set their own hunting periods any time during the MLDP season from the opening day of archery season until the last day of February.

> **Line 22 Recommendation:** TPWD recommends the following language: "Because of RRAD's enrollment in the MLDP program, county and statewide bag limits do not apply to individual hunters and RRAD has flexibility in determining hunting periods for antlerless deer, spikes, and buck deer within the MLDP-Conservation Option season dates."

Special Status Species

Section 6.20 Management Measures (Page 73), Section 7.0 Management Goals, Objectives, and Projects (Page 77, Goal 2: Project 2.1.3), and Table 17 Summary of INRMP Projects (Page 89) indicate to coordinate with TPWD to ensure that appropriate procedures are followed and permits are obtained if the take of any state-listed species is required because of RRAD operations.

Please note that there is no provision for take (incidental or otherwise) of state-listed species, and TPWD does not issue permits for take of state-listed species. TPWD does issue permits that allow for handling state-listed species for the purposes of relocation, surveys, monitoring, and research. In the event a state-listed species may be impacted due to RRAD operations, TPWD recommends relocating state-listed species per a TPWD permit to avoid take. Permits regarding the handling of terrestrial state-listed species are authorized through the TPWD Wildlife Permits Office, http://www.tpwd.texas.gov/business/permits/land/wildlife/research/. Permits regarding aquatic state-listed species are coordinated through the TPWD Kills and Spills Team, http://www.tpwd.texas.gov/landwater/water/environconcerns/kills_and_spills/regions/.

> **Pages 73, 77, and 89 Recommendation:** TPWD recommends the following language: "Coordinate with TPWD to ensure that appropriate procedures are followed and permits are obtained if handling or relocating state-listed species is required because of Depot operations and to avoid take."

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December 22, 2016

Ms. Valerie Whalon
HDR
3025 Chemical Rd, Suite 110
Plymouth Meeting, PA 19462-1736

RE: Draft Environmental Assessment for Defense Logistics Agency Proposed 2019 General Purpose Warehouse at Red River Army Depot, Bowie County
TPWD Project 37309

Dear Ms. Whalon:

On behalf of the Defense Logistics Agency (DLA) and Red River Army Depot (RRAD), HDR has requested the Texas Parks and Wildlife Department (TPWD) review the draft Environmental Assessment (EA) for the above-referenced project and provide recommendations to minimize potential impacts.

As the state agency with primary responsibility for protecting the state's fish and wildlife resources, in accordance with the authority granted by Parks and Wildlife Code §12.0011 and per coordination under the National Environmental Policy Act, TPWD hereby provides the following comments and recommendations to minimize potential adverse impacts to the state's fish and wildlife resources, including rare, threatened and endangered species, in the construction and operation of the proposed project.

Project Description

The DLA proposes to construct and operate the fiscal year 2019 general purpose warehouse (GPW) on approximately 33.5 acres at RRAD. The project would be located west of the proposed fiscal year 2017 GPW in a primarily upland hardwood forest area adjacent to perennial, intermittent and ephemeral streams. The project would clear approximately 28 acres of hardwood forest and pine/hardwood forest, representing approximately 0.26 percent of the more than 10,000 acres of forest land at RRAD. Construction would involve upgrading roads and culverts, installation of new access roads, underground utilities, parking areas, and a storm water detention pond. The project indicates disturbances to streams would be minimal and no disturbances to wetlands.

Federal Regulations

Migratory Bird Treaty Act (MBTA)

The project area is located within the Central Flyway, a major bird migration corridor that leads to the Texas coast and Central/South America. Artificial nighttime lighting can attract and disorient night-migrating birds. Birds circling the lights' glare can cause exhaustion mortality.

Recommendation: Because the project would be located within a bird migration corridor, TPWD recommends DLA, use the minimum amount of night-time lighting

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needed for safety and security and to down-shield lighting to light only the ground and reduce glare.

State Regulations

State-Listed Species

Section 68.015 of the Parks and Wildlife Code regulates state-listed species. Please note that there is no provision for capture, trap, take, or kill (incidental or otherwise) of state-listed species. The *TPWD Guidelines for Protection of State-Listed Species* includes a list of penalties for capture, trap, take, or kill of state-listed species (http://www.tpwd.texas.gov/huntwild/wild/wildlife_diversity/habitat_assessment/media/tpwd_statelisted_species.pdf). State-listed species may only be handled by persons authorized through the TPWD permits offices. For more information on wildlife permits please visit http://www.tpwd.texas.gov/business/permits/land/wildlife/, and for information regarding permits for aquatic resources, please visit http://tpwd.texas.gov/landwater/water/environconcerns/kills_and_spills/.

The EA incorporates the TPWD Annotated County Lists of Rare Species, which are available at http://tpwd.texas.gov/gis/rtest/. These lists provide information regarding state-listed and rare species that have potential to occur within each county in Texas. State-listed species could potentially be impacted if suitable habitat is present at or near the project site.

Of the terrestrial species listed for Bowie County, the state-threatened timber rattlesnake (*Crotalus horridus*) is more at risk for being impacted by construction activities due to its limited mobility and because suitable riparian and upland woodland habitat occurs in and adjacent to the project area. The timber rattlesnake is a rather docile species that would be slow to evacuate the construction area. The Northern scarlet snake (*Cemophora coccinea copei*) was considered, then eliminated from potentially occurring due to requiring well-drained soils.

Page 26 of the EA indicates that no state-listed species or their habitats occur within the project area. Although planning level surveys of the RRAD did not reveal occurrences of state-listed species, habitat for the state-listed timber rattlesnake occurs in the project area, indicating a potential for occurrence of state-listed species.

Recommendation: TPWD recommends correcting the EA to indicate there are no known occurrences of state-listed species within or near the project area, but the site provides suitable provide habitat for the state-listed timber rattlesnake.

Various small vertebrates including snakes, lizards, toads and mice fall into trenches and become trapped. Wildlife unable to escape from trenches are susceptible to loss from backfilling activities, exposure to elements, starvation, dehydration, and predation by other wildlife. The following are Best Management Practices that could be employed to minimize potential impacts to state-listed species if occurring in the project area.

Recommendation: TPWD encourages the DLA and its contractors to be informed of the federal- and state-listed species and species of greatest conservation need (SGCN) with potential to occur in the project county and to take precautions avoid

impacts to rare species if encountered in the project area. Wildlife observed during construction should be allowed to safely leave the site.

Recommendation: Because snakes are generally perceived as a threat and sometimes killed when encountered during clearing or construction, TPWD recommends DLA inform employees and contractors of the potential for the state-listed threatened timber rattlesnake to occur in the study area. Contractors should be advised to avoid impacts to this and other snakes. Compared to other rattlesnakes, the timber rattlesnake is a rather docile species. Injury to humans usually occurs when the snake becomes agitated following harassment or when someone attempts to handle a recently dead snake that still contains its bite reflex. Therefore, contractors should avoid contact with the species if encountered.

Recommendation: When trenching for installation of underground utilities, TPWD recommends that contractors keep trenching and backfilling crews close together to minimize the amount of trenches left open at any given time during construction. TPWD recommends that any open trenches or excavation areas be covered overnight and/or inspected every morning to ensure no reptiles or other wildlife species have been trapped. Trenches left open for more than two daylight hours should be inspected for the presence of trapped reptiles prior to backfilling. If trenches cannot be backfilled the day of initial trenching, then escape ramps should be installed at least every 90 meters. Escape ramps can be short lateral trenches or wooden planks sloping to the surface at an angle of less than 45 degrees.

Recommendation: For soil stabilization and/or revegetation of disturbed areas within the proposed project area, TPWD recommends erosion and seed/mulch stabilization materials that avoid entanglement hazards to snakes and other wildlife species. Because the mesh found in many erosion control blankets or mats pose an entanglement hazard to wildlife, TPWD recommends the use of no-till drilling, hydromulching and/or hydroseeding rather than erosion control blankets or mats due to a reduced risk to wildlife. If erosion control blankets or mats will be used, the product should contain no netting or contain loosely woven, natural fiber netting in which the mesh design allows the threads to move, therefore allowing expansion of the mesh openings. Plastic mesh matting should be avoided.

Recommendation: To aid in the scientific knowledge of a species' status and current range, TPWD encourages reporting encounters of state-listed species to the Texas Natural Diversity Database (TXNDD) according to the data submittal instructions found at http://tpwd.texas.gov/txndd.

State Fish and Wildlife Resources

In addition to federal- and state-threatened and endangered species, Texas contains over 1,300 species that are considered to be SGCN that, due to limited distributions and/or declining populations, face threat of extirpation or extinction but currently lack the legal protections given to threatened or endangered species. Information regarding SGCN can be found at http://www.tpwd.texas.gov/huntwild/wild/wildlife_diversity/texas_rare_species/sgcn/. Special landscape features, natural plant communities, and SGCN are rare resources for

which TPWD actively promotes conservation, and TPWD considers it important to minimize impacts to such resources to reduce the likelihood of endangerment.

Based on habitat requirements and denning characteristics, SGCN fauna from the Bowie County list with greater potential to occur in the project area and with greater potential to be impacted by project activities include Plains spotted skunk (*Spilogale putorius interrupta*). The Arkansas oak (*Quercus arkansana*) and Arkansas meadow-rue (*Thalictrum arkansanum*) are SGCN plants for which suitable habitat may occur in the project area.

The Texas Natural Diversity Database (TXNDD) is intended to assist users in avoiding harm to rare species or significant ecological features. Given the small proportion of public versus private land in Texas, the TXNDD does not include a representative inventory of rare resources in the state. Please note that absence of information in the database does not imply that a species is absent from that area. Although it is based on the best data available to TPWD regarding rare species, the data from the TXNDD do not provide a definitive statement as to the presence, absence or condition of special species, natural communities, or other significant features within your project area. These data are not inclusive and **cannot be used as presence/absence data**. This information cannot be substituted for on-the-ground surveys. The TXNDD is updated continuously based on new, updated and undigitized records; for questions regarding a record or to obtain digital data, please contact TexasNatural.DiversityDatabase@tpwd.texas.gov.

A review of the TXNDD indicated no known occurrences of state-listed species within the vicinity of the project area, however, the TXNDD did reveal that the Arkansas oak, an SGCN ranked G3S1, occurs within RRAD.

> **Recommendation:** TPWD recommends that precautions be taken to avoid or minimize impact to SGCN flora and fauna and natural plant communities if encountered during project construction, operation and maintenance activities.

Overall, it appears that the 2019 GPW was designed and placed to avoid the loss of wooded stream corridors and maintains natural areas between other RRAD developments such as the adjacent 2017 GPW. Additionally, the warehouse was placed near other developments, which minimizes fragmentation of forest and wildlife resources elsewhere on RRAD.

Thank you for considering the fish and wildlife resources of Texas. If you have any questions, please contact me at Karen.Hardin@tpwd.texas.gov or (903) 322-5001.

Sincerely,

Karen B. Hardin

Karen B. Hardin
Wildlife Habitat Assessment Program
Wildlife Division

kbh/37309

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Carter P. Smith
Executive Director

December 08, 2017

Mr. Dennis W. Kuykendall
Red River Army Depot
Natural Resources Manager
Chief Land Management Branch
Dennis.W.Kuykendall4.civ@mail.mil

RE: Draft Environmental Assessment for Defense Logistics Agency Proposed Disposition Services Complex at Red River Army Depot, Bowie County
TPWD Project 38916

Dear Mr. Dennis W. Kuykendall:

The Defense Logistics Agency (DLA) and Red River Army Depot (RRAD) have requested the Texas Parks and Wildlife Department (TPWD) to review the draft Environmental Assessment for the above-referenced project and provide recommendations to minimize potential impacts.

As the state agency with primary responsibility for protecting the state's fish and wildlife resources, in accordance with the authority granted by Parks and Wildlife Code §12.0011 and per coordination under the National Environmental Policy Act, TPWD hereby provides the following comments and recommendations to minimize potential adverse impacts to the state's fish and wildlife resources, including rare, threatened and endangered species, in the construction and operation of the proposed project.

Project Description

The DLA proposes to construct and operate a Disposition Services Complex on 128 acres within the northern portion of RRAD near other developed sites. The project would involve constructing a general purpose warehouse, holding/sales yard, transport inspection station, scrapyard, purge shed, chop shop, and fluid storage containment area; upgrading roads and culverts; and installing new access roads, underground utilities, parking areas, and storm water detention pond. The project would be located on the south side of North Patrol Road in an undeveloped hardwood and mixed pine-hardwood forest area that has undergone timber management activities since the early 1950s and was selectively thinned in 2016. Of 33.3 acres of proposed ground disturbance, 16.7 acres are proposed to be developed with impervious cover. Wetlands occur outside of the project area.

Federal Regulations

Migratory Bird Treaty Act (MBTA)

The project area is located within the Central Flyway, a major bird migration corridor that leads to the Texas coast and Central/South America. Artificial nighttime lighting can attract and disorient night-migrating birds. Birds circling the lights' glare can cause exhaustion mortality.

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Recommendation: Because the project would be located within a bird migration corridor, TPWD recommends DLA use the minimum amount of night-time lighting needed for safety and security and to use dark-sky friendly lighting that is on only when needed, down-shielded, as bright as needed, and minimizes blue light emissions. Appropriate lighting technologies and best management practices (BMPs) can be found at the International Dark-Sky Association website.

State Regulations

State-Listed Species

Section 68.015 of the Parks and Wildlife Code regulates state-listed species. Please note that there is no provision for capture, trap, take, or kill (incidental or otherwise) of state-listed species. The *TPWD Guidelines for Protection of State-Listed Species* includes a list of penalties for capture, trap, take, or kill of state-listed species and can be found on the TPWD Wildlife Habitat Assessment Program website.

Although the state-listed threatened timber rattlesnake (*Crotalus horridus*) has not been observed during planning level surveys at the RRAD, suitable woodland habitat for this species may occur within or near the project area, indicating a potential for occurrence. Of the terrestrial species listed for Bowie County, the timber rattlesnake is a rather docile species that would be slow to evacuate the construction area and is more at risk for being impacted by construction activities. TPWD recommends DLA implement the following construction BMP recommendations to avoid or minimize potential impacts to the state-listed threatened timber rattlesnake:

Recommendation: Because snakes are generally perceived as a threat and killed when encountered during clearing or construction, TPWD recommends informing employees and contractors of the potential for the state-listed threatened timber rattlesnake to occur in the project area corridor. Contractors should be advised to avoid impacts to this and other snakes. Injury to humans usually occurs when the snake becomes agitated following harassment or when someone attempts to handle a recently dead snake that still contains its bite reflex. Contractors should avoid contact with the species if encountered and allow snakes to safely leave the premises.

Recommendation: For encounters with rare species that will not readily leave the premises, TPWD recommends a permitted individual translocate the animal. Translocations of reptiles should be the minimum distance possible no greater than one mile, preferably within 100-200 yards from the initial encounter location. For purposes of relocation, surveys, monitoring, and research, terrestrial state-listed species may only be handled by persons authorized through the TPWD Wildlife Permits Office.

Recommendation: Various small vertebrates including snakes, lizards, toads and mice fall into trenches and become trapped. Wildlife unable to escape from trenches are susceptible to loss from backfilling activities, exposure to elements, starvation, dehydration, and predation by other wildlife. Because installation of utilities and footings may require trenching, TPWD recommends that any open trenches or excavation areas be covered overnight and/or inspected every morning to ensure no reptiles or other wildlife species have been trapped. If trenches cannot be backfilled

the day of initial trenching, then escape ramps should be installed at least every 90 meters consisting of short lateral trenches or wooden planks sloping to the surface at an angle of less than 45 degrees. Trenches should be inspected for the presence of trapped reptiles prior to backfilling.

Recommendation: For soil stabilization and/or revegetation of disturbed areas within the proposed project area, TPWD recommends erosion and seed/mulch stabilization materials that avoid entanglement hazards to snakes and other wildlife species. Because the mesh found in many erosion control blankets or mats pose an entanglement hazard to wildlife TPWD recommends the use of no-till drilling, hydromulching and/or hydroseeding rather than erosion control blankets or mats due to a reduced risk to wildlife. If erosion control blankets or mats will be used, the product should contain no netting or contain loosely woven, natural fiber netting in which the mesh design allows the threads to move, therefore allowing expansion of the mesh openings. Plastic mesh matting should be avoided.

Recommendation: To aid in the scientific knowledge of a species' status and current range, TPWD encourages reporting encounters of state-listed species to the Texas Natural Diversity Database according to the data submittal instructions found at http://tpwd.texas.gov/txndd.

Overall, it appears that the proposed project was designed and placed to avoid impacts to stream corridors and wetland areas. Additionally, the complex would be placed near other developments, which minimizes fragmentation of forest and wildlife resources elsewhere on RRAD.

Thank you for considering the fish and wildlife resources of Texas. If you have any questions, please contact me at Karen.Hardin@tpwd.texas.gov or (903) 322-5001.

Sincerely,

Karen B. Hardin
Wildlife Habitat Assessment Program
Wildlife Division

kbh/38916

DEFENSE LOGISTICS AGENCY
HEADQUARTERS
8725 JOHN J. KINGMAN ROAD
FORT BELVOIR, VIRGINIA 22060-6221

Texas Parks and Wildlife
Attn: Ms. Karen Hardin
4200 Smith School Road
Austin, TX 78744-3291

RE: Draft Environmental Assessment (EA) for the Defense Logistics Agency (DLA) Proposed Disposition Services Complex at Red River Army Depot (RRAD), Bowie County TPWD Project 38916

Dear Ms. Hardin,

Thank you of taking the opportunity to review the subject Draft EA.

Based on your comments, the EA will be revised to indicate there are no known occurrences of state-listed species within or near the project area. The EA will note the project area provides suitable habitat for the state-listed timber rattlesnake and construction activities should avoid or minimize potential impacts to the state-listed timber rattlesnake and other wildlife species.

We have coordinated with the Red River Army Depot and they will consider adding nighttime lighting impacts to migratory birds into their Integrated Resource Management Plan.

We will include your letter as an enclosure to the EA to ensure all comments and recommendations will be carefully considered in the design phase for this project.

If you have any questions regrading our response, please contact Mr. Ronald Scherer of my staff at (269) 961-5911 or email: ron.scherer@dla.mil.

WILLIAM JEROME
Chief, Engineering and Environmental Services
DLA Installation Operations Battle Creek