U. S. AIR FORCE INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN

Moody AFB, Georgia

(See INRMP signature pages for plan approval date)

ABOUT THIS PLAN

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

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

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

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

DOCUMENT CONTROL

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

INRMP APPROVAL/SIGNATURE PAGES

The current INRMP for Moody AFB has been updated and is considered current for October 2018 through September 2023 (Fiscal Year (FY)19 - FY23). This version consists of minor edits that provides updated information on natural resources management at Moody AFB, to include addressing the centralization of programming, budgeting, and execution of natural resources funding by the Air Force. There have been minor changes to management goals and objectives, but these are not substantively different than previous management goals and objectives developed in coordination with the GA DNR and the USFWS and would not result in environmental consequences different from those in the existing INRMP. Per mutual agreement by our cooperating agencies (GA DNR and USFWS), this INRMP will remain current as documented by the signatures below, as required by the Sikes Act and Air Force Instruction 32-7064, *Integrated Natural Resources Management*.

Jennifer M. Short 7/16/18

JENNIFER M. SHORT, Colonel, USAF (Date)
Commander
Moody Air Force Base, Georgia

Donald W. Crews for 5/4/18

MIKE OETKER (Date)
Acting Director, Southeast Region
U.S. Fish and Wildlife Service

14 May 2018

RUSTY GARRISON (Date)
Director, Wildlife Resources Division
Georgia Department of Natural Resources

EXECUTIVE SUMMARY

PURPOSE OF THE INRMP

This Moody Air Force Base (AFB) Integrated Natural Resources Management Plan (INRMP) has been prepared to assist the Moody AFB installation commander with the conservation and rehabilitation of natural resources consistent with the military mission of Moody AFB for the next 5 years and has been developed to meet the statutory provision of the Sikes Act (16 United States [U.S.] Code [USC] 670a (b) (1)(I)) that there shall be "no net loss in the capability of military installation lands to support the military mission of the installation." The INRMP is based on an interdisciplinary approach to ecosystem management and addresses wildlife and forest management goals and objectives, as well as the conservation and enhancement of wetlands and protected species in the context of the military mission. Management plans addressed in the INRMP are focused on the unimproved areas of the installation and do not include the management of improved grounds, including grass and landscape maintenance, which are addressed in other installation plans and documents.

SCOPE

This INRMP was developed in coordination with other installation, Air Force, state and federal organizations and will primarily be implemented by the Moody AFB Installation Management Flight, Environmental Element, 23d Civil Engineer Squadron (23 CES), an element of Air Combat Command, U.S. Air Force (USAF or Air Force). The plan incorporates the provisions of the Sikes Act (16 USC 670a-670o, 74 Stat. 1052) and amendments contained in the Sikes Act Improvement Act; Department of Defense (DoD) Instruction (DoDI) 4715.3, *Environmental Conservation Program*; and Air Force Instruction (AFI) 32-7064, *Integrated Natural Resources Management*; and guides the implementation of the natural resources management program and its interaction with the military mission for Moody AFB (Main Base and Grand Bay Weapons Range) and the Grassy Pond Recreational Annex (GPRA) for the next 5 years, through 30 September 2023 (FY19 – FY23).

BENEFITS OF INRMP IMPLEMENTATION

The natural resources activities outlined in this INRMP have been developed in coordination with installation personnel and federal and state natural resources management agencies to provide the following benefits:

1) No net loss in the capability of military lands to support the military mission and promote the enhancement and sustainment of the military mission within the natural infrastructure of Moody AFB.
2) Maintenance of viable populations of native species, especially keystone and rare species, on Moody AFB.
3) Restoration and maintenance of the ecological processes of native ecosystems located on Moody AFB, especially the wetland complex within the Grand Bay-Banks Lake (GBBL) ecosystem.
4) Maintenance of the dynamic mosaic of wetland habitat types on Moody AFB.
5) Sustainment of other human uses and occupancy within the ecosystem without long-term environmental degradation.

In addition to the primary benefits of maximizing biodiversity and proactively managing rare, threatened, and endangered (RTE) species, the professional management of the natural infrastructure at Moody AFB

will also ensure the military mission at Moody AFB is realized through the establishment and maintenance of realistic training areas.

PRIMARY MANAGEMENT GOALS

The mission statement of the natural resources management program at Moody AFB is to facilitate and enhance the military mission through the conservation, protection, and consideration of natural resources on the installation. Inherent in this mission statement is the requirement to maintain realistic training areas with viable populations of native plants and animals, including RTE species, through the professional management of the natural infrastructure. Within the context of this mission statement, the following principle goals were developed to guide natural resources management activities outlined in this 5-year plan. These proposed natural resources management goals and associated management activities would not be a significant change in management direction for the installation.

- Principle Goal I: Enhance military mission flexibility and success while maintaining current populations of RTE species at Moody AFB.
- Principle Goal II: Enhance military mission flexibility and success while maintaining and enhancing the quality of existing wetlands and watersheds.
- Principle Goal III: Maintain and enhance fish and wildlife management opportunities at Moody AFB within the context of the military mission.
- Principle Goal IV: Enhance military mission flexibility and success through conducting land management and ground maintenance activities at Moody AFB.
- Principle Goal V: Enhance military mission flexibility and success while maintaining and enhancing commercial forest management at Moody AFB.
- Principle Goal VI: Utilize ecosystem and biodiversity management principles at Moody AFB to integrate the conservation of the natural infrastructure with military mission needs.

IMPLEMENTATION

In accordance with the Sikes Act and 32 Code of Federal Regulations (CFR) 989 (*The Environmental Impact Analysis Process*), the plan will be coordinated with appropriate federal, state, and local government officials, public groups, and individuals with interest in or jurisdiction of natural resources in south-central Georgia.

1.0 OVERVIEW AND SCOPE

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

1.1 Purpose and Scope

Moody AFB is an 11,481-acre (ac) installation administratively controlled by Air Combat Command (ACC) and located about 9 miles northeast of Valdosta, Georgia, in Lanier and Lowndes counties (Figure: Regional Location of Moody AFB, Georgia and Moody AFB and Grand Bay Weapons Range, Pg. 15) This INRMP has been prepared to assist the Moody AFB installation commander with the conservation and rehabilitation of natural resources consistent with the military mission of Moody AFB for the next 5 years and has been developed to meet the statutory provision of the Sikes Act (16 USC 670a (b) (1)(I)), viz. there shall be "no net loss in the capability of military installation lands to support the military mission of the installation." As such, the INRMP directs the implementation of the natural resources program for Moody AFB through 30 September 2023 (FY19 – FY23), and is based on an interdisciplinary approach to ecosystem management.

This INRMP was developed and will be implemented by the Moody AFB Installation Management Flight, Environmental Element, 23 CES. The plan incorporates the provisions of AFI 32-7064, Integrated Natural Resources Management, and guides the activities of the natural resources management program and its interaction with the military mission for Moody AFB (Main Base and Grand Bay Weapons Range) and GPRA. All installation decision makers and commanders will be informed of the condition of natural resources, the objectives of natural resources management, and potential or actual conflicts between mission activities and management plans through the EMS process with semi-annual updates at the installation Environmental, Safety, and Occupational Health (ESOH) Council.

1.2 Management Philosophy

The management of natural resources on Moody AFB will be based on the concept of multiple-use within the framework of ecosystem management as defined in AFI 32-7064, DoD directives, and current scientific literature. This management philosophy attempts to balance human needs (military mission activities, mission support, commodity production, recreational uses, etc.) with ecosystem values related to ecological functions by emphasizing the conservation and enhancement of biological diversity. This will be accomplished by focusing activities on the management of ecosystems located on the installation, using keystone and rare species as indicators of ecosystem health. Military mission requirements and needs will be incorporated and integrated into the development of INRMP management goals and objectives in support of the overall installation Comprehensive Planning Process. Additionally, the location of sensitive,

protected areas and species will be included in the Moody AFB Installation Development Plan (IDP). The INRMP supports the IDP by providing guidance on natural resource management activities and constraints to better inform the installation Comprehensive Planning Process.

In support of this management philosophy, a mission statement relating to the management of natural and cultural resources on Moody AFB was developed by the Installation Management Flight, Environmental Element and underlies all management activities proposed in this INRMP: "The mission of the environmental element is to facilitate and enhance the military mission through the conservation, protection, and consideration of cultural and natural resources at Moody AFB."

Ecosystem management is a land management approach that seeks to conserve viable populations of all native species, perpetuate natural disturbance regimes on a regional scale, adopt long-term planning timelines, and allow human use at levels that do not result in irreversible ecological degradation. As outlined by the DoD Undersecretary of Defense for Environmental Security, Sherri W. Goodman, in 1994, DoD natural resources management will:

1) Maintain and improve the sustainability and active biological diversity of ecosystems.
2) Administer with consideration of ecological units and time frames.
3) Support sustainable human activities.
4) Create a vision of ecosystem health.
5) Develop priorities and reconcile conflicts.
6) Work toward ecosystem health through coordinated approaches.
7) Rely on the best science available.
8) Use benchmarks to monitor and evaluate outcomes.
9) Practice adaptive management.
10) Implement ecosystem management through installation plans and programs.

In consideration of these requirements from DoD, coordination with outside entities, and a review of current scientific management principles, the goals of this INRMP are:

1) No net loss in the capability of military lands to support the military mission and promote the enhancement and sustainment of the military mission within the natural infrastructure of Moody AFB.
2) Maintenance of viable populations of native species, especially keystone and rare species, on Moody AFB.
3) Restoration and maintenance of the ecological processes of native ecosystems located on Moody AFB, especially the wetland complex within the GBBL ecosystem.
4) Maintenance of the dynamic mosaic of wetland habitat types on Moody AFB.
5) Sustainment of other human uses and occupancy within the ecosystem without long-term environmental degradation.

Because it is recognized that ecosystem boundaries do not conform to political boundaries, Moody AFB has entered into partnerships with surrounding landowners and stakeholders, and state, federal and nongovernmental agencies to facilitate management of resources on an ecosystem basis, and may enter into future partnerships as the need arises. These partnerships include the sharing of information pertinent to the scientific management of shared ecosystems and the potential sharing of finances, manpower, and other resources to accomplish specific management activities within these shared ecosystems. All agreements and partnerships between Moody AFB and any other entity will be entered into with the understanding that these entities may have differing legal requirements and goals. Any agreements and partnerships developed

will not place a financial commitment on Moody AFB. Actions taken and funds expended to implement any agreements or partnerships will be contingent upon approval by senior management, appropriations of funds, availability of manpower and other resources, installation priorities, and other constraints. In accordance with AFI 32-7064, cooperative agreements entered into pursuant to the Sikes Act (16 USC 670c-1) shall be accomplished by the Air Force Civil Engineer Center (AFCEC) on behalf of the installation.

Although management of resources on the installation will be conducted on an ecosystem basis, the installation has been classified and mapped into three land management types (improved grounds, semi-improved grounds, and unimproved grounds) to conform with other installation documents; acreages associated with these areas are provided in Section 2.1.1 Location and Area. Within the improved and semi-improved grounds areas, the actions identified in this INRMP primarily address only the management of the urban forest. The majority of the actions identified in this INRMP are on the management of the natural infrastructure of the unimproved grounds throughout the installation.

Land management unit numbers were assigned to all unimproved portions of the installation based on this gross classification scheme, and will be used to designate management activities outlined in this INRMP. The management plans for the other land management units consisting of improved and semi-improved grounds (including housing areas, airfield operations and maintenance areas, administrative areas, industrial areas, open space, commercial areas, medical areas, outdoor recreation areas, and the GPRA) are located in the grounds maintenance contract.

The current land classification number and the current condition of each of these unimproved land management units is described in Section 2.4.2 Land Use. Each natural resources project or program projected for funding will utilize this land classification scheme to identify which areas of the installation are being targeted for management.

1.3 Authority

This INRMP is prepared in accordance with the Sikes Act (16 USC 670) as amended. The Sikes Act mandates not only the preparation of an INRMP but also the implementation of the management activities contained in the plan. Additionally, this INRMP is prepared under authority of Air Force Policy Directive (AFPD) 32-70, *Environmental Quality*, and AFI 32-7064, *Integrated Natural Resources Management*. Additional DoD and Air Force policies, directives, regulations and instructions which were used in the preparation of this INRMP include DoDI 4715.03, Natural Resources Conservation Program; AFI 13- 212, Range Planning and Operations (as supplemented by ACC); and AFI 91-202, The US Air Force Mishap Prevention Program (as supplemented by ACC and Moody AFB).

Other federal and state laws and regulations which impact the management of natural resources at Moody AFB and which were considered during preparation of this INRMP include the Federal Water Pollution Control Act of 1977; Endangered Species Act (ESA) of 1973; Archeological Resources Protection Act of 1979; Fish and Wildlife Coordination Act; Migratory Bird Treaty Act (MBTA); Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990; Executive Order (EO) 11990, Protection of Wetlands; EO 11987, Exotic Organisms; EO 11989, Off-road Vehicles on Public Land; EO 11988, Floodplain Management; and EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds.

Installation-Specific Policies (including State and/or Local Laws and Regulations)	
MAFBSUP AFI 32-7064	Integrated Natural Resources Management, including hunting and fishing regulations for Moody AFB

1.4 Integration with Other Plans

The INRMP will be incorporated by reference into the Moody AFB Installation Development Plan (IDP) and INRMP digital maps will form the basis of the IDP's natural and cultural resource maps. The interface of the INRMP with the IDP will be such that whenever the INRMP maps and databases are updated, natural and cultural constraints sections of the IDP, including maps, will also be updated.

The INRMP supports the Comprehensive Range Plan for Grand Bay Weapons Range and other associated installation documents and activities, including the Moody AFB Bird/Wildlife Aircraft Strike Hazard (BASH) Plan (23d Wing [23 WG] 2017), Moody AFB Pest Management Plan, Moody AFB Integrated Cultural Resources Management Plan (ICRMP), Moody AFB Grounds Maintenance Contract, and Work Request Review Board. This INRMP serves as a source document on the current state of the natural infrastructure and potential constraints for the installation. Additionally, the INRMP addresses, incorporates, and proposes implementation of mission-required natural infrastructure management as identified in each of these plans and organizations.

2.0 INSTALLATION PROFILE

Office of Primary Responsibility	23d Wing Commander has overall responsibility for implementing the Natural Resources Management program and is the lead organization for monitoring compliance with applicable federal, state and local regulations
Natural Resources Manager/POC	Gregory Lee 23 CES/CEIE 3485 Georgia Street Moody AFB, GA 31699-1707 Gregory.lee.5@us.af.mil 229-257-5881
State and/or local regulatory POCs (For US-bases, include agency name for Sikes Act cooperating agencies)	Georgia Department of Natural Resources Mr. Greg Nelms 1773-A Bowen's Mill Highway Fitzgerald, GA 31750 US Fish and Wildlife Service Georgia Ecological Services Ms. Gail Martinez 4980 Wildlife Drive, NE Townsend, GA 31331
Total acreage managed by installation	11,481 (including 489 acre GPRA, not including 402 acres in various easements)
Total acreage of wetlands	6043
Total acreage of forested land	7,950
Does installation have any Biological Opinions? (If yes, list title and date, and identify where they are maintained)	Bemiss Field Drop Zone Biological Opinion and Incidental Take Statement for Eastern Indigo Snakes, 17 Dec 1996
NR Program Applicability (Place a checkmark next to each program that must be implemented at the installation. Document applicability and current management practices in Section 7.0)	☑Threatened and Endangered species ❒ Invasive species ❒ Wetlands Protection Program ❒ Grounds Maintenance Contract/SOW ❒ Forest Management Program ❒ Wildland Fire Management Program ☐ Agricultural Outleasing Program ❒ Integrated Pest Management Program ❒ Bird/Wildlife Aircraft Strike Hazard (BASH) Program ☐ Coastal Zones/Marine Resources Management Program ❒ Cultural Resources Management Program

2.1 Installation Overview

2.1.1 Location and Area

Moody AFB is located in Lowndes and Lanier counties in south-central Georgia (Figure Regional Location of Moody AFB, Georgia, Page 15) within the Valdosta, Georgia, Metropolitan Statistical Area (MSA). The Valdosta MSA consists of Lowndes, Lanier, Brooks, and Echols counties and has a population of 139,588 (U.S. Census Bureau [USCB] 2010). Nearby cities include Valdosta, about 10 miles to the southwest, and Lakeland, about 6 miles northeast. Valdosta is a city of 54,518 people (USCB 2010) located on U.S.

Highway 41 and 84 and Interstate 75 (I-75) in southern Georgia, 20 miles north of the Florida border. Lakeland has 3,366 people (USCB 2010) and is located on U.S. Highway 129 and 221. Moody AFB is located approximately 85 miles northeast of Tallahassee, Florida, and 120 miles northwest of Jacksonville, Florida. The closest major cities in Georgia are Macon and Atlanta, 150 miles and 220 miles north, respectively. Georgia State Highway 125 (Bemiss Road) is the primary access road to the developed portions of Moody AFB. Interstate I-75 passes about 10 miles west of the base, with access to the installation through Exit 22, North Valdosta Road, and Exit 29, Hahira.

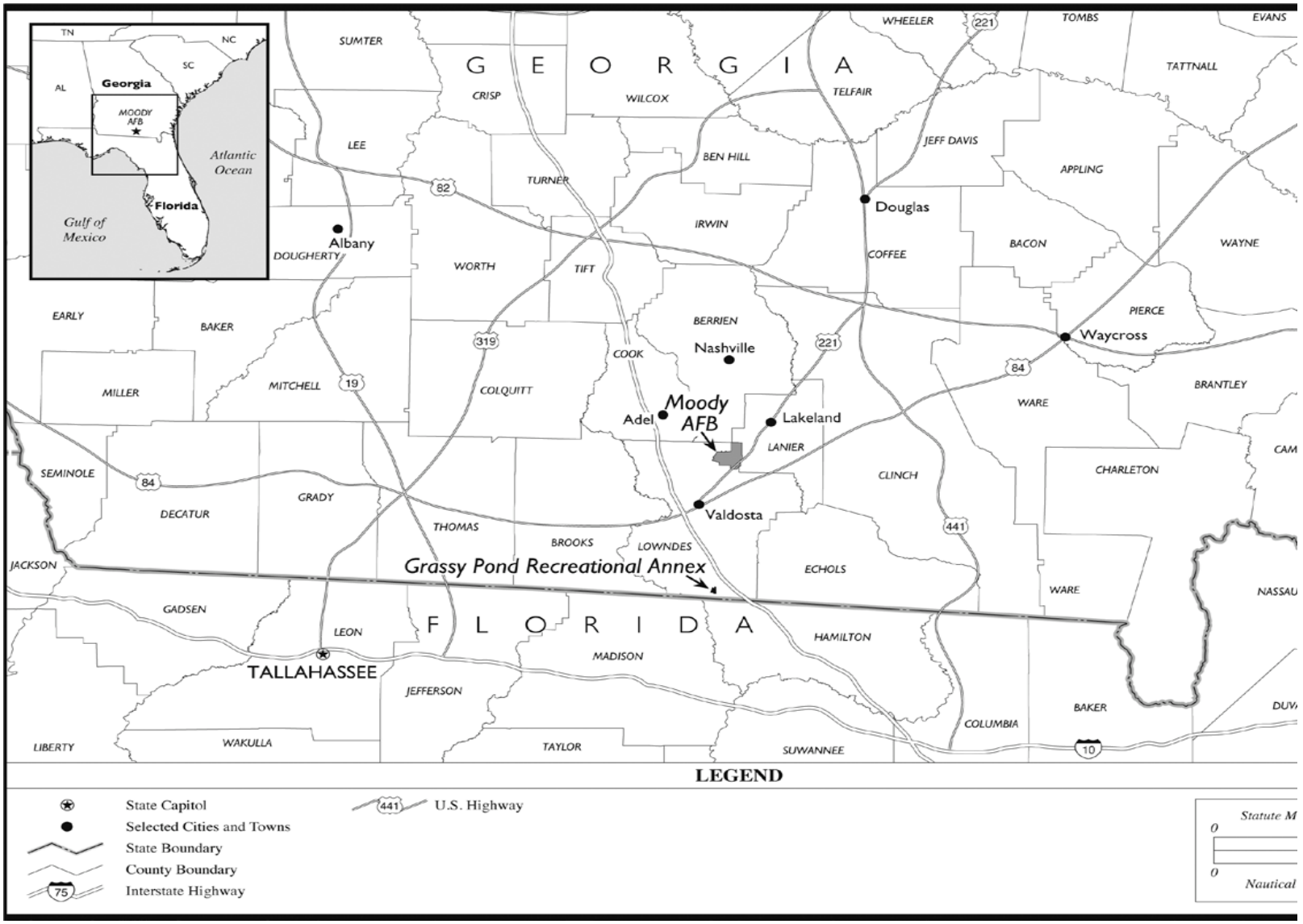
The western half of the installation is referred to as the Main Base (Figure: Moody AFB and Grand Bay Weapons Range, Pg. 16) and encompasses 5,118 ac. Highway 125 divides the Main Base into two functional units, with the privatized family housing area, golf course, and wastewater treatment plant facility located to the west and the remainder of the administrative assets of the installation to the east. The eastern portion includes the administrative, base support, aircraft operations and maintenance areas, and airfield. Moody AFB has two active runways oriented north-south: runway 18L/36R is 9,300 feet (ft) in length, and runway 18R/36L is 8,000 ft in length. Predominant land use immediately adjacent to the Main Base includes agriculture, forestry, and rural residential. Additionally, a privatized military family housing area is adjacent to the southwest boundary of the installation.

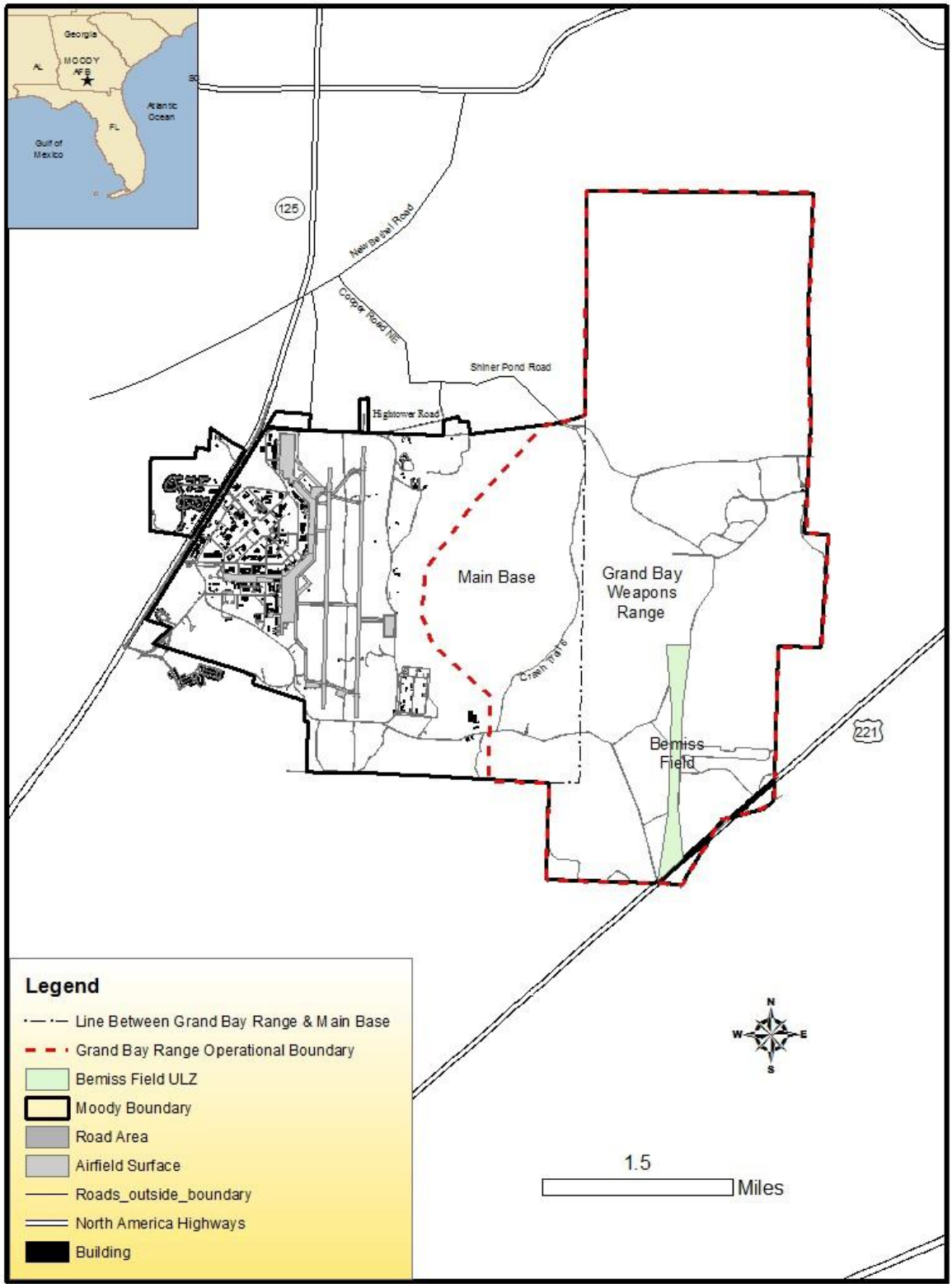
Grand Bay Weapons Range, a 5,874-ac air-to-ground bombing and gunnery range, is contiguous with Main Base and is located on the eastern half of the installation (Figure: Moody AFB and Grand Bay Weapons Range, Pg. 16). The target areas and range office and towers are located on 450 ac along the northeastern boundary of the range. The approximate 7,300-ac operational boundary defines the area where access by unauthorized personnel is controlled and non-range operations are restricted. This operational boundary has been established for operational and planning purposes and was instituted to contain the weapons and safety danger zones for range operations. Military operations on Grand Bay Weapons Range are managed by the 23 FG and 23 OSS.

Moody AFB also owns and manages the Grassy Pond Recreational Annex (GPRA), which is located 25 miles southwest of the installation and 3 miles north of the Georgia/Florida state line near Lake Park, Georgia (Figure: Regional Location of Moody AFB, Georgia, Pg. 15). The property was originally acquired by the U.S. government in 1928 for use as a fish hatchery and was transferred to the Air Force for use as a recreational area in 1954. The GPRA covers 489 ac and contains two lakes: Grassy Pond (217 ac) and Lot Pond (44 ac). Improved grounds and lands covered by improvements in the GPRA total 21.6 ac (slightly less than 4.5% of the area) (Figure: Class I Outdoor Recreation Areas, Grassy Pond Recreational Annex, Page 69).

All totaled, the Main Base, Grand Bay Weapons Range, and GPRA encompass 11,481 ac, of which roughly 5% are improved, 11% are semi-improved, and 84% are unimproved.

Regional Location of Moody AFB, Georgia





Moody AFB and Grand Bay Weapons Range

Installation/GSU Location and Area Descriptions

Base/GSU Name	Main Use/Mission	Acreage	Addressed in INRMP?	Describe NR Implications
[Moody AFB: Main Base]	Airfield and Aircraft Operations/Maintenance	5118	*Management of the unimproved areas of Main Base is addressed within the INRMP, as applicable.*	*Management of the unimproved areas of Main Base is addressed within the INRMP, as applicable.*
[Moody AFB: Grand Bay Weapons Range]	Air-to-Ground Military Training Range	5,874	*Management of the unimproved areas of Grand Bay Range is addressed within the INRMP, as applicable.*	*Management of the unimproved areas of Grand Bay Range is addressed within the INRMP, as applicable.*
[Moody AFB: Grassy Pond Recreational Annex]	Recreation	489	*Management of the unimproved areas of Grassy Pond is addressed within the INRMP, as applicable.*	*Management of the unimproved areas of Grassy Pond is addressed within the INRMP, as applicable.*

2.1.2 Installation History

Moody AFB had its beginning in 1940 when a group of concerned Valdosta and Lowndes County citizens, searching for a way to assist the expanding defense program, created interest within the War Department for a 9,300-ac tract located northeast of Valdosta, known as the Lakeland Flatwoods. On May 14, 1941, the War Department was granted exclusive use of the land by the Department of Agriculture, and Moody AFB was developed. The base is named in honor of Major George Moody, who was a test pilot for the first AT-10, a twin-engine trainer used at Moody during World War II. During the war, the base population exceeded 40,000 officers, airmen, and cadets (Moody AFB 2012a).

In 1946, following the end of World War II, Moody AFB was placed on inactive status until it was reopened in 1951 after the outbreak of the Korean conflict. From 1951 until 1975, Moody AFB was primarily involved in pilot training under the Air Training Command (ATC), with preflight, primary, and basic pilot training programs. In late 1975, ATC deactivated the 38th Flying Training Wing at Moody AFB, and the base was reassigned to Tactical Air Command (TAC) as the 347th Tactical Fighter Wing. In January 1987, the 347th Tactical Fighter Wing began conversions to the F-16 Fighting Falcon aircraft. In June 1992, TAC became ACC. In August 1992, shortly after the renaming of ACC, the 307th and 308th Fighter Squadrons were relocated to Moody AFB from Homestead AFB, Florida, because of the devastation caused by Hurricane Andrew.

Moody AFB began conversion to a composite fighter wing in 1994. By 1996, the 347th Wing contained three fighter squadrons: the 68th and 69th Fighter Squadrons flew the General Dynamics F-16C/D "Fighting Falcon," and the 70th Fighter Squadron flew A-10s. The wing also housed the 52nd Squadron, which flew C-130Es. The mission of the 347th Wing was to train for a high state of readiness for contingencies and general war operations, in the roles of offensive and defensive counter air tactics, close air support of friendly ground forces, and air superiority. Also in 1996, the 41st Rescue Squadron (41 RQS) and the 71 RQS bedded down at Moody AFB. They brought with them six HH-60 helicopters and nine HC- 130 aircraft.

In September 1998, the Air Force decided to establish an Introduction to Fighter Fundamentals (IFF) pilot training program at Moody AFB as a tenant organization, utilizing 57 AT-38 aircraft. Also in 1998, six additional HH-60 helicopters were added to the 41 RQS. In 2000, the 69th and 70th Fighter Squadrons were inactivated and the 820th Security Forces Group and the Joint Primary Aircraft Training System (JPATS), utilizing the T-6A aircraft, were bedded down at Moody AFB. In January 2001, the 68th Fighter Squadron was inactivated, and the last of the fighter aircraft departed Moody AFB. In May 2001, the 347th Wing was converted to the 347th Rescue Wing (347 RQW), becoming the Air Force's only active-duty combat search and rescue (CSAR) wing. In October 2003, the 347 RQW was realigned from ACC to Air Force Special Operations Command (AFSOC) in an effort to bring all CSAR assets under the same command, and was redesignated the 23d Wing (23 WG).

Under the 2005 Base Realignment and Closure (BRAC) findings, Moody AFB was transferred from AFSOC back to ACC to ensure CSAR assets are directly linked to the combat air forces and the personnel they support. Mission changes related to BRAC included the drawdown of the tenant aircraft from Moody AFB and addition of 48 A-10s. In October 2006, the Air Force redesignated the 347 RQW as the 347th Rescue Group (347 RQG) and assigned it to the 23 WG, which officially became the host unit at Moody AFB.

2.1.3 Military Missions

23d Wing

The current mission of the 23 WG at Moody AFB is to organize, train, and equip Flying Tigers to employ and execute the Global Precision Attack (GPA), Personnel Recovery (PR), and Agile Combat Support (ACS) service core functions to meet worldwide Combatant Commander requirements. The 23 WG organizes, trains, and employs combat-ready A-10C, HC-130J, HH-60G, Guardian Angel Weapons System, and personnel consisting of approximately 5,500 military and civilian personnel including geographically separated units (GSUs) in Nevada, Arizona, and Florida. The 23 WG is comprised of six groups: five located at Moody AFB, Georgia and one at Davis-Monthan AFB, Arizona.

The 347 RQG directs flying and maintenance of one of two active-duty Groups in the Air Force dedicated to Personnel Recovery (PR) (Combat Search and Rescue). The group is comprised of four squadrons: one HH-60G rescue squadron (41 RQS), one HC-130J rescue squadron (71 RQS), one Guardian Angel squadron (38 RQS), and 347 OSS.

The 23d Fighter Group (23 FG) directs the flying operations for the Air Force's largest A-10C fighter group, consisting of two combat-ready A-10 Thunderbolt II attack aircraft flying squadrons and an operations support squadron. The group ensures overall combat training and readiness for over 90 pilots and 180 support personnel. There are three squadrons aligned under the 23d FG to support the group’s mission: 74th Fighter Squadron, 75th Fighter Squadron, and 23d Operations Support Squadron (OSS). The 23 FG/OSS is also responsible for the management of Grand Bay Weapons Range, including setting and implementing range policy.

The 23d Mission Support Group (23 MSG) trains, equips, and deploys personnel support forces to build, protect, and sustain air bases worldwide for combat air operations. There are six squadrons aligned under the 23 MSG: security forces squadron, CES, contracting squadron, logistics readiness squadron, force support squadron, and communications squadron.

The 23d Medical Group provides outpatient medical, dental, occupational, environmental and preventive healthcare services in support of installation personnel. The group's 225 staff members serve more than 16,000 beneficiaries. The Medical Group consists of three squadrons: Medical Support, Medical Operations, and Aerospace Medicine.

The 23d Maintenance Group is responsible for the operation and quality of organization and intermediate-level maintenance and repair supporting combat-ready HC-130Js, HH-60Gs and A-10Cs. The group oversees the 23 WG's maintenance training program and ensures the work force qualification and capability for worldwide development of personnel and cargo. The maintenance group also supports the 93d Air Ground Operations Wing (93 AGOW), a tenant organization at Moody AFB. The 23d Maintenance Group includes seven squadrons: 23d Aircraft Maintenance Squadron, 23d Component Maintenance Squadron, 23d Equipment Maintenance Squadron, 23d Maintenance Operations Squadron, 563d Maintenance Squadron, and 723d Aircraft Maintenance Squadron, and 763d Maintenance Squadron.

Listing of Tenants and NR Responsibility

Tenant Organization	NR Responsibility
93d Air Ground Operations Wing (93 AGOW)	*Natural resources within the training areas used by 93 AGOW units are managed through this INRMP.*
476th Fighter Group (Air Reserve Unit)	*Natural resources within the training areas used by the 476th FG are managed through this INRMP.*
336th Recruiting Squadron	Not Applicable
372nd Training Squadron (Detachment [Det] 9)	Not Applicable
Area Defense Council	Not Applicable
Air Force Office of Special Investigations (Det 211)	Not Applicable

2.1.4 Surrounding Communities

Moody AFB falls within the political boundaries of Lanier and Lowndes counties. Lanier County is considered a rural county, covering 187 square miles with a population of 10,078 people (USCB 2010). Economically, agriculture, agribusiness, and forestry operations are the largest industries in the county. Lowndes County is one of the fastest growing counties in south Georgia, with a total population of over 109,233 people (USCB 2010d). Lowndes County covers over 511 square miles and is bisected by I-75, with the majority of recent economic development occurring along I-75 and the Bemiss Road corridor towards Moody AFB. Agriculture, agribusiness, and forestry operations continue to be important industries in Lowndes County, although their impact has been declining in recent years as urbanization has increased. Major employers in the county include the federal government; educational, health, and social services; retail; and industrial.

Communities surrounding Moody AFB include Valdosta, located about 10 miles southwest; Ray City, located about 5 miles north; and Lakeland, located about 6 miles northeast. The following demographic information was obtained from the 2010 census.

Valdosta is a city of over 54,518 residents located in Lowndes County, and the largest city in the Valdosta MSA. The median age of residents is 26.9 years, with 47% males. The majority of residents are African American (approximately 51%) with a substantial population comprised of whites (approximately 43%). The median annual household income is $32,109 (USCB 2010).

Lakeland has a population of 3,366 people and is the only incorporated municipality in Lanier County. The majority of residents are whites, with a substantial minority population comprised primarily of African Americans. The median annual household income is $51,914 (USCB 2010).

Ray City is a small town in southern Berrien County with a population of about 1,090 people. Over 71% of the residents are whites, with 21% African American. The median annual household income is $41,702 (USCB 2010).

Predominant land use immediately adjacent to the Main Base includes agriculture, forestry, and rural residential. Additionally, a new housing area adjacent to the southwest boundary of the installation has been developed by a private entity for use as military family housing. The predominant land use immediately adjacent to Grand Bay Weapons Range includes agriculture, forestry, recreation, and rural residential. In an effort to prevent encroachment concerns, Lowndes County established the Moody AFB Zone (MAZ),

which precludes development that is not compatible with the military mission. Similarly, Moody AFB works closely with Lanier County to ensure that zoning and approval of building construction does not impact the military mission.

2.1.5 Local and Regional Natural Areas

Banks Lake National Wildlife Refuge (NWR)

Banks Lake NWR is located northeast of Moody AFB in Lanier County. Established in 1985, this NWR is just over 4,000 ac in size, with 1,000 ac of open water and approximately 3,000 ac of marsh, scrub- shrub, and hardwood wetlands. The predominant feature of Banks Lake NWR is Banks Lake, a 1,000-ac lake created by Joshua Lee in 1825 as a millpond. Moody AFB shares ownership of Oldfield Bay, a large Carolina Bay, with the Banks Lake NWR. Although the refuge is owned and managed by the USFWS, there is not a USFWS office located on the refuge. Personnel from Okefenokee Swamp NWR are responsible for the management of Banks Lake NWR.

Grand Bay Wildlife Management Area (WMA)

The Grand Bay WMA is located immediately south of Moody AFB, but also includes a sizeable portion of Moody AFB property. It is comprised of 8,663 ac of federal, state, county, and privately owned lands in Lanier and Lowndes counties (federal - 5,874 ac; state - 2,294 ac; county - 130 ac; private - 365 ac), which includes the Grand Bay Weapons Range. The federal portion of Grand Bay WMA (5,874 ac or 68%) is owned by Moody AFB and is co-managed by Moody AFB and the Georgia DNR.

The area currently known as Grand Bay Weapons Range has been in federal ownership since 1941. The Air Force originally acquired the property in 1941 and maintained ownership until 1967. In 1967, the Air Force declared this area excess and transferred ownership to the U.S. Forest Service (USFS). Grand Bay WMA was established by the State of Georgia in 1968 on this property, 1 year after the transfer of the property from the Air Force to the USFS. The Air Force reacquired this property in 1986 for the purpose of creating an air-to-ground gunnery and bombing range, originally designated as "Winnersville Weapons Range" but eventually named Grand Bay Weapons Range.

Grand Bay WMA is managed by the Georgia DNR. However, there is not a Georgia DNR office located on the property. The Georgia DNR maintains a check station on state-owned property that is manned during managed hunts and an equipment storage shelter and yard on Moody AFB property. Additionally, the Grand Bay Wetland Education Center, managed by the Coastal Plains Regional Educational Service Agency, is located on the state-owned portion of the WMA. This facility is used by local schools for wetland and natural resources interpretive field trips and is adjacent to the boardwalk and 1,000 ft observation tower located in Grand Bay.

2.2 Physical Environment

2.2.1 Climate

The climate of Moody AFB is classified as humid subtropical. This results from the relatively low latitude (approximately 31° north latitude) and the proximity of the Gulf of Mexico (80 miles south) and the Atlantic Ocean (100 miles east). These water bodies help to produce a climate that is typified by long, humid summers with frequent convective storms, and short, mild winters interrupted by frontal storm systems and infrequent cold snaps. The spring and fall seasons are generally short and mild. The average annual temperature for Moody AFB is 68 degrees Fahrenheit (°F) and the monthly mean temperatures vary from 52° F in January to 82° F in July and August. According to the Moody AFB Weather Flight (23 OSS/OSW),

the highest daily temperature in 30 years of recording is 105°F, recorded in June, and the lowest daily temperature is 4°F, recorded in January, although the actual year of record is undocumented. On average there are 73 days per year with maximum temperatures greater than 90°F. The average daily minimum temperature in January is 42°F. The average number of days with freezing temperatures is 17 per year.

Mean annual precipitation recorded at Moody is 47 inches. This rainfall is well distributed throughout the year, although summer is generally the wettest season and fall is the driest. Summer rainfall is often poorly distributed over the base due to the localized nature of thundershower activity. During normal years, showers will occur on or in the vicinity of the base nearly every afternoon in July and August. Lake evaporation at Moody AFB is estimated to be between 40 and 45 inches per year. Evaporation over land areas may be greater or less than this depending on vegetative cover type. An average of 58 thunderstorm days per year is recorded at Moody AFB. Extreme storm events, sometimes accompanied by tornadoes, occasionally occur in the area. Tropical storm systems accompanied by several days of heavy rains occur with a frequency of about one in 5 years. Maximum rainfall recorded in a 24-hour period is 8.6 inches.

Relative humidity is generally high with an annual average of 68%. The highest daily humidity is recorded in the early morning with an average at dawn of 83%. The average humidity at midday in spring is generally less than 50%, and during the rest of the year it averages 54%. Mean cloud cover is approximately 60% during the summer and 50% in winter. On the average, some fog is encountered at Moody AFB 185 days per year.

Wind speed at Moody AFB averages only 4 knots (4.6 miles per hour [mph]); however, a maximum wind speed of 65 knots (74.8 mph) has been recorded. Wind direction is generally from the north during the winter, from the west during the spring and early summer, and from the east during the late summer and fall. A summary of Moody AFB climatic data obtained from the Moody AFB Weather Flight is given in the Table below.

Climatic Summary for Moody AFB

Month	*Mean Daily Temperature (°F)*			*Monthly Precipitation (inches)*		
	Max.	*Min.*	*Monthly*	*Mean*	*Max.*	*Min*
January	62	42	52	3.8	8.0	0.4
February	65	45	55	4.2	11.1	1.3
March	72	51	62	4.9	12.1	0.7
April	79	58	68	3.7	11.6	0.3
May	85	65	75	3.8	11.3	0.2
June	90	71	80	4.5	11.7	0.8
July	91	73	82	6.3	11.2	1.6
August	90	73	82	5.2	15.5	1.3
September	87	70	78	3.4	9.0	0.1
October	79	59	69	2.0	7.3	0.0
November	71	50	61	2.4	6.4	0.1
December	63	44	54	3.6	9.1	0.1

Source: 23 OSS/OSW.

2.2.2 Landforms

Moody AFB is located in the Tifton Upland District, East Gulf Coastal Plain Section, Coastal Plain Province, Atlantic Plain Major Division physiographic province. The dominant landforms of the area

include Carolina Bays, limesinks, creek swamps, open water shallow lakes, ponds, flatwoods, and an elevated hammock. The Tifton Upland District is characterized by flat to sloping plateaus separated by shallow river valleys, broad wetland depressions, and karst topography. Elevations in this area range from 480 ft in the north to 150 ft in the southeast indicating the regional slope. The northwestern and northern boundary of this area is the base of the Pelham Escarpment which rises as much as 200 ft above the Dougherty Plain. The eastern boundary follows the eastern drainage divide of the Alapaha River.

Specifically, Moody AFB is located on the level plateau between the Withlacoochee River on the west and the Alapaha River on the east. The eastern portion of the base, Grand Bay Weapons Range, is primarily located in a low area comprised of several Carolina bays and generically referred to as "Grand Bay." Land surface elevations on Moody AFB vary from its lowest point on the eastern portion at approximately 190 ft above mean sea level (MSL) to about 240 ft MSL near the center of the base. Slopes range from 0 to 5%.

2.2.3 Geology and Soils

Geologically, Moody AFB is located within the Georgia Lower Coastal Plain. The predominant landform on about 80% of this area consists of moderately dissected, irregular plains of marine origin formed by deposition of continental sediments onto the submerged shallow continental shelf, which was later exposed when the sea receded from this area. Rock units that formed during the Mesozoic and Cenozoic Eras consist of Cretaceous marine sediments (sands and clays) and Tertiary marine deposits (siliceous strata with lignitic, sandy, and argillaceous deposits. The most important stratigraphic unit is Suwannee Limestone, which contains the upper portions of the Floridan Aquifer. This layer ranges in thickness from approximately 200 to 250 ft and is usually less than 200 ft below ground surface. There is a moderate density of small to medium perennial streams and associated rivers; this dendritic drainage pattern has developed on this moderately dissected plain, largely without bedrock structural control because of the preponderance of undifferentiated sediments. Moody AFB is located in the Tifton Upland District of the Lower Coastal Plain. In general, soils on uplands in this region were formed in deep sedimentary sands and clays. Alluvial soils near streams and tributaries generally originated from material eroded from the uplands.

Predominant Soil Associations

Based on the U.S. Department of Agriculture, Soil Conservation Service (USDA SCS) soil surveys of the counties in which Moody AFB is located, the predominant soil associations on Moody AFB are shown in the Figure Soil Types, Moody AFB (Page 25) and listed in the Table Soil Series (Page 26) at Moody AFB, GA.

Tifton-Pelham-Fuquay. This association consists of nearly level and gently sloping soils on ridge tops, hillsides, and in drainage ways that dissect the ridges. The ridges are typically less than 1 mile wide, and the drainage ways range from about 50 to 250 ft wide. This association makes up about 36% of the soils in Lowndes County. Tifton soils make up about 49% of the association, Pelham soils about 16%, the Fuquay soils about 8%, and the minor soils about 27%. Tifton and Fuquay soils are generally located along the ridges, and Pelham soils are in drainage ways and intermittently ponded depressions.

- Tifton soils are well drained and nearly level or very gently sloping. Typically, the surface layer is brown loamy sand about 8 inches thick. The subsoil is sandy-clay loam and extends to a depth of 60 inches or more.

- Pelham soils are poorly drained and nearly level. Typically, the surface layer is black loamy sand about 8 inches thick. The subsurface layer is gray loamy sand about 17 inches thick. The subsoil extends to a depth of 65 inches or more.
- Fuquay soils are well drained and nearly level or very gently sloping. Typically, the surface layer is dark grayish-brown loamy sand about 7 inches thick. The subsurface layer is light yellowish-brown loamy sand about 14 inches thick. The subsoil is dominantly sandy-clay loam and extends to a depth of 60 inches or more.

Minor soils in this association are the well-drained Dothan, Nankin, and Sunsweet soils and the moderately well-drained Stilson soils. Dothan, Nankin, and Sunsweet soils are on ridges and hillsides, as are Tifton and Fuquay soils, and the more sloping Sunsweet soils are on short hillsides. Stilson soils occur on low uplands.

Most of the cultivated land in Lowndes County is on Tifton and Fuquay soils. Corn, tobacco, soybeans, cotton, and peanuts are the major agricultural crops. Also, some areas are used for permanent pasture. The main concern of management is control of erosion on the gently sloping soils. Pelham soils are used mainly for producing timber, but some areas are in pasture. This association generally has slight limitations for most non-farm uses, but because of wetness and flooding, Pelham soils are severely limited for crop production.

Dasher or Swamp-Istokpoga. These soils are characteristic of swampy areas and level, very poorly drained organic soils in flooded areas.

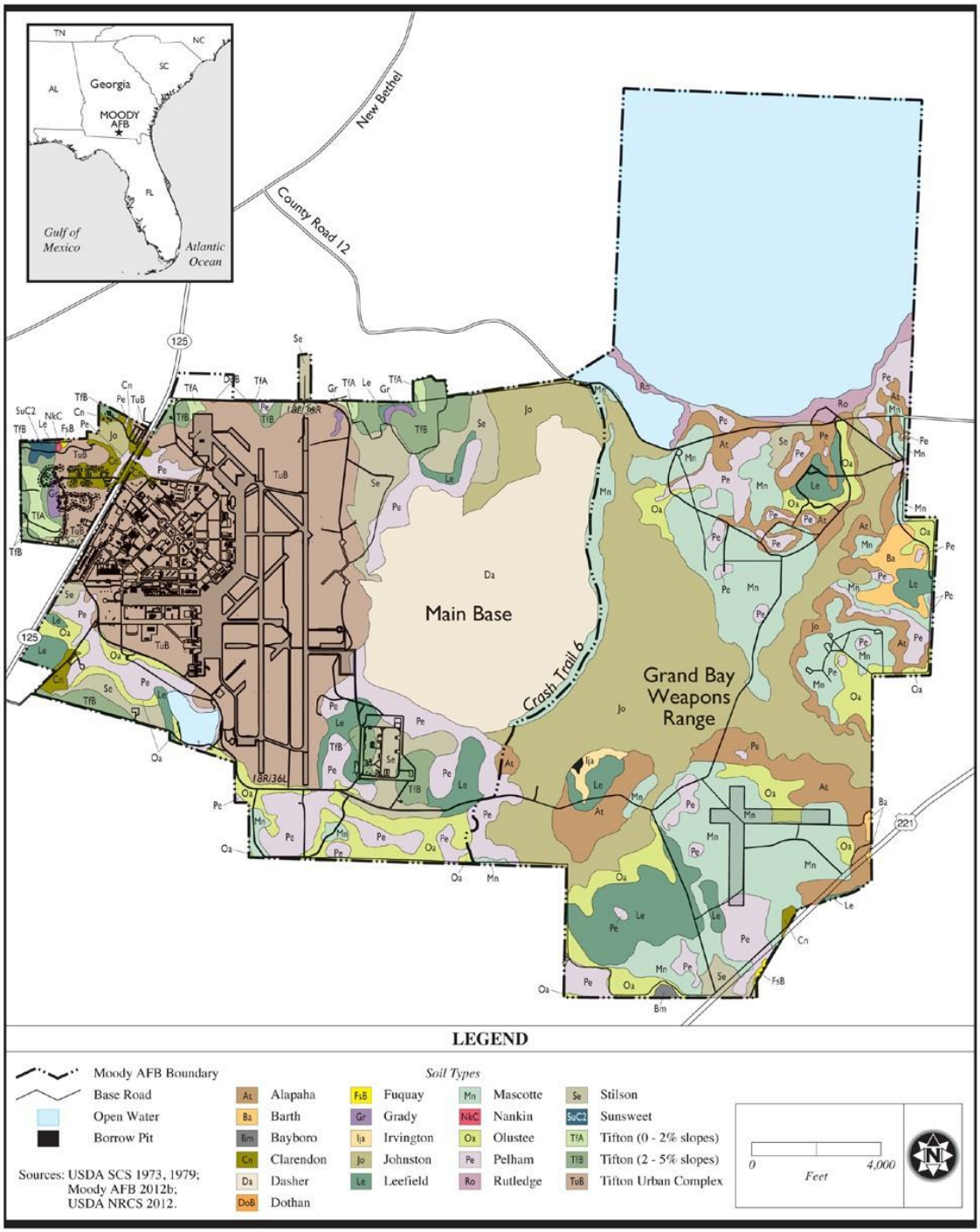
Mascotte-Albany-Pelham. These soils have a sandy surface layer and loamy or sandy subsoil and are found on flats and in depressions and drainages.

Leefield-Pelham-Clarendon. These soils have a sandy surface layer and loamy subsoil and are found in low uplands and in depressions.

Soil Types, Moody AFB

Note: See Table Soil Series at Moody AFB for definitions of soil types.

[The Table below lists the soil series identified on Moody AFB.]



Soil Series at Moody AFB, GA

Soil Series	*Map Symbol*	*Hydric*
Alapaha	At	X
Barth	Ba	X
Bayboro	Bm	X
Clarendon	Cn	
Dasher	Da	X
Dothan	DoB	
Fuquay	FsB	
Grady	Gr	X
Irvington	IjA	
Johnston	Jo	X
Leefield	Le	X
Mascotte	Mn	X
Nankin	NkC	
Olustee	Oa	X
Pelham	Pe	X
Rutledge	Ro	X
Stilson	Se	
Sunsweet	SuC2	
Tifton (0 - 2% slopes)	TfA	
Tifton (2 - 5% slopes)	TfB	
Tifton Urban Complex	TuB	

Sources: USDA SCS 1973, 1979; Moody AFB 2012; Moody AFB 2012b; USDA Natural Resources Conservation Service (NRCS) 2012.

Special Soil Considerations

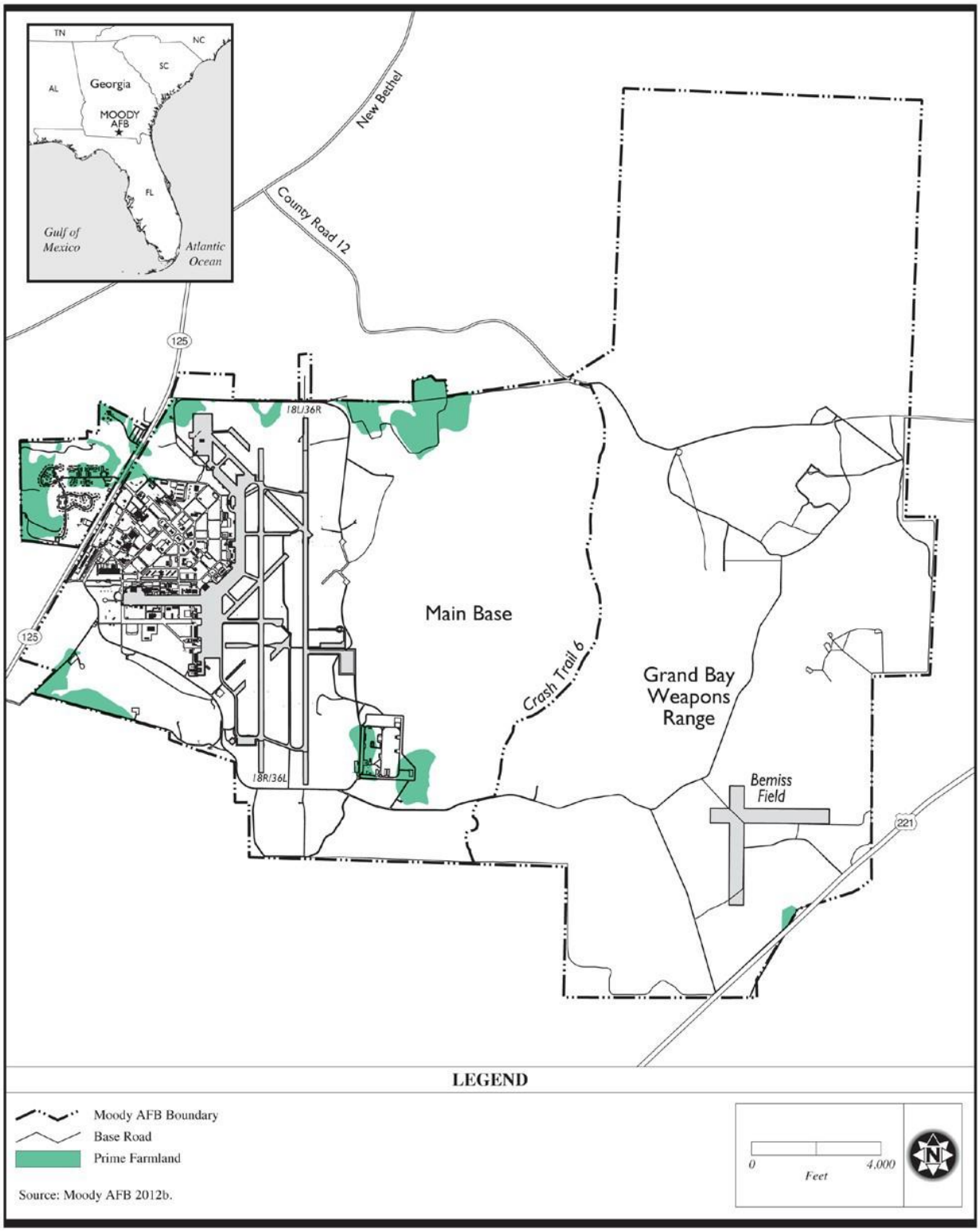
Well-drained Leefield and Stilson soils are often associated with the presence of gopher tortoises (see Sections 2.3.4 Threatened and Endangered Species and Species of Concern and 7.4 Management of Threatened and Endangered Species, Species of Concern and Habitats.). These soils occur on roughly 75 ac of Moody AFB (Figure: Soil Types, Moody AFB, Page 25).

Prime farmland soils in the Lowndes and Lanier County area include Carnegie Sandy Loam, Cowarts Loamy Sand, Dothan Loamy Sand, Irvington Loamy Sand, Tifton Loamy Sand, Clarendon Loamy Sand, and Nankin Sandy Loam. Prime farmland soils occurring on Moody AFB are shown in the Figure Prime Farmland, Moody AFB (Page 27).

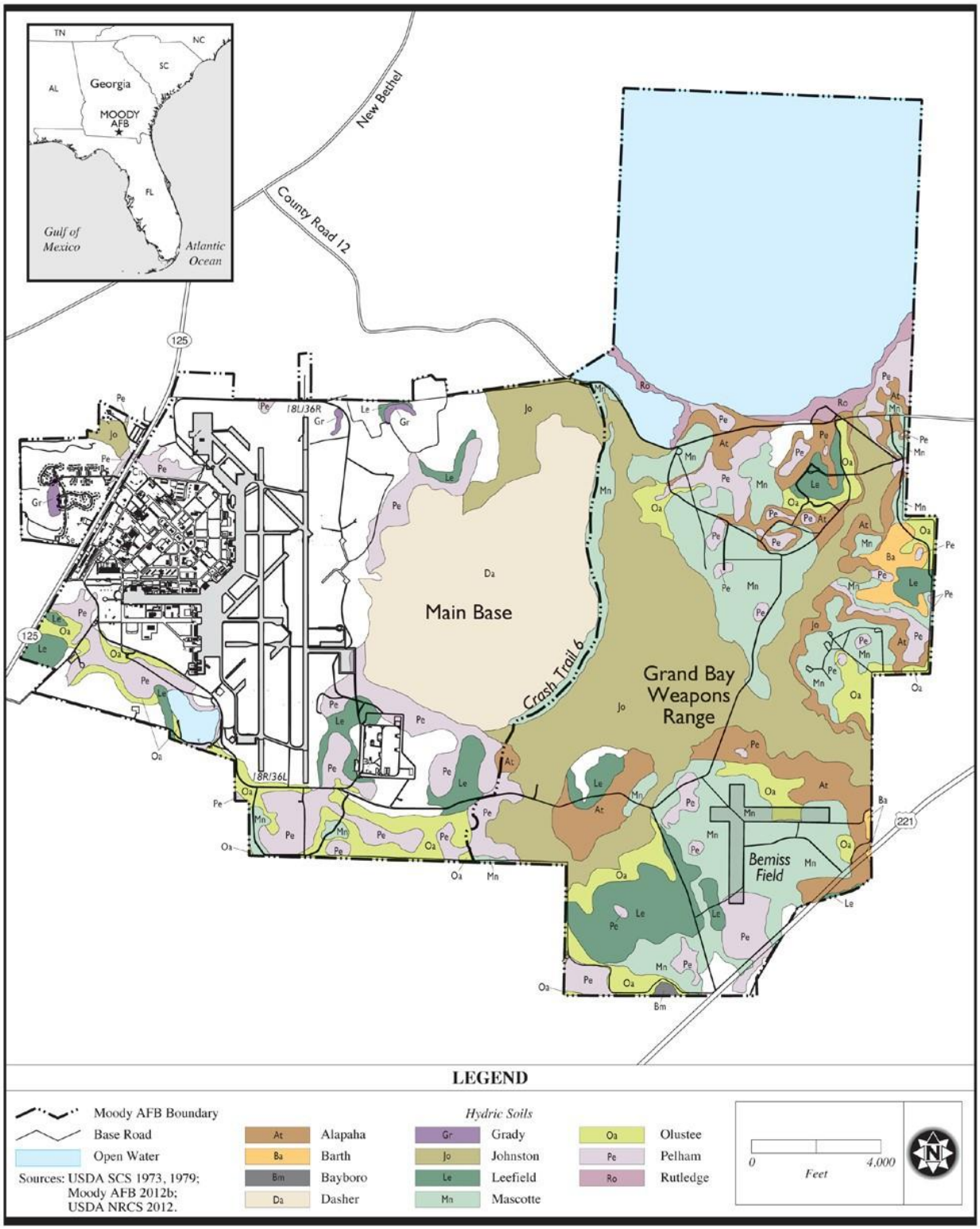
Hydric soils cover at least 60 to 70% of Grand Bay Weapons Range and 20-30% of the Main Base (see figure Hydric Soils, Moody AFB). Predominant soils, from wettest to driest sites in the area, are Dasher (Da), Johnston (Jo, Job), Alapaha (At), Barth (Ba), Bayboro (Bm), Mascotte (Mn), Olustee (Oa), Pelham (Pe, Pl), and Leefield (Le, Lsa). A map showing the location of these soils is at Figure Hydric Soils (Page 28).

Metals

Background soil analyses have confirmed that several metals occur naturally in the area of Moody AFB. Recordable levels of arsenic, barium, chromium, copper, iron, selenium, and zinc have been detected.



Prime Farmland, Moody AFB



Hydric Soils, Moody AFB

Note: See the table Soil Series at Moody AFB for definitions of soil types.

2.2.4 Hydrology

Groundwater

Groundwater occurs within two major water-bearing zones, the surficial aquifer system and the Floridan aquifer system. Although groundwater is generally 10 to 20 ft below the ground surface, the main water-bearing formation underlying Moody AFB is an artesian aquifer containing naturally high concentrations of sulfate, hydrogen sulfide, and iron. The water quality is attributable to the presence of the sulfate minerals gypsum and celestite in the host rock.

The surficial aquifer is composed of fine to coarse sands, gravels, silt, clayey silts, and clays. Water quality is generally good, and yields are usually less than 50 gallons per minute. The Floridan aquifer is the primary water-bearing unit in the area. Water quality is generally good and yields are plentiful. The Floridan aquifer furnishes almost all the local water for commercial, industrial, domestic, irrigation, and municipal use. The aquifer is typically encountered at a depth of 150 ft and is usually under artesian conditions.

Background groundwater analyses have confirmed that several metals occur naturally in the area of Moody AFB. Recordable levels of barium, cadmium, copper, iron, manganese, and zinc occur in the groundwater.

Watersheds, Wetlands, and Drainage Patterns

Moody AFB is located within the Suwannee River Basin, which discharges to the northeastern Gulf of Mexico. Major drainages in this basin which affect Moody AFB include the Withlacoochee River to the west and the Alapaha River to the east. A major feature of this basin is the GBBL wetland complex, which partially occurs within the political boundaries of Moody AFB. Exclusive of the Okefenokee Swamp, the GBBL wetland complex of over 13,000 ac is the largest freshwater lake/swamp system in the coastal plain of Georgia. This complex is composed of several broad Carolina bays (1 to 4 miles across) and shallow lakes, interconnected by swamp black gum - cypress swamp. The GBBL complex is owned and managed by several different landowners, including Moody AFB, USFWS, Georgia DNR, Georgia Department of Transportation (DOT), The Nature Conservancy (TNC), and private landowners (see figure Grand Bay-Banks Lake Stewardship Council Partner Ownership). Because it was recognized that this system should be managed as one large ecosystem, irrespective of land ownership, the major landowners within this complex created the GBBL Stewardship Council to provide for a coordinated effort in the management of the ecosystem.

The 1,255-ac Banks Lake, located within the Banks Lake NWR, is the only major body of water within this wetland complex. A smaller open water area located in this wetland complex is Shiner Pond, which is located along the central-northern boundary of Moody AFB. This area is approximately 65 ac in size but contains vast areas with cypress trees and other vegetative cover.

To some extent, the bays are all hydraulically connected through canals and man-made control structures. The various bays and lakes are laterally separated by more than 5.7 miles of earthen sills that were constructed by Moody AFB to facilitate emergency and security access within the wetlands. The primary inflow to this wetland complex is through a series of natural and enhanced canals that connect the wetlands with topographic high areas near Bemiss. With the exception of Banks Lake and a portion of Oldfield Bay, the bays are drained to the southeast through Grand Bay Creek.

The wetland system is recharged primarily by precipitation falling within the catchment basin, although the bays may receive a portion of their recharge water from adjacent shallow groundwater sources. Recharge by precipitation occurs mainly from December through March, when rainfall is typically heavy and evapotranspiration is low. Although rainfall can be heavy during July and August, summer storms generally

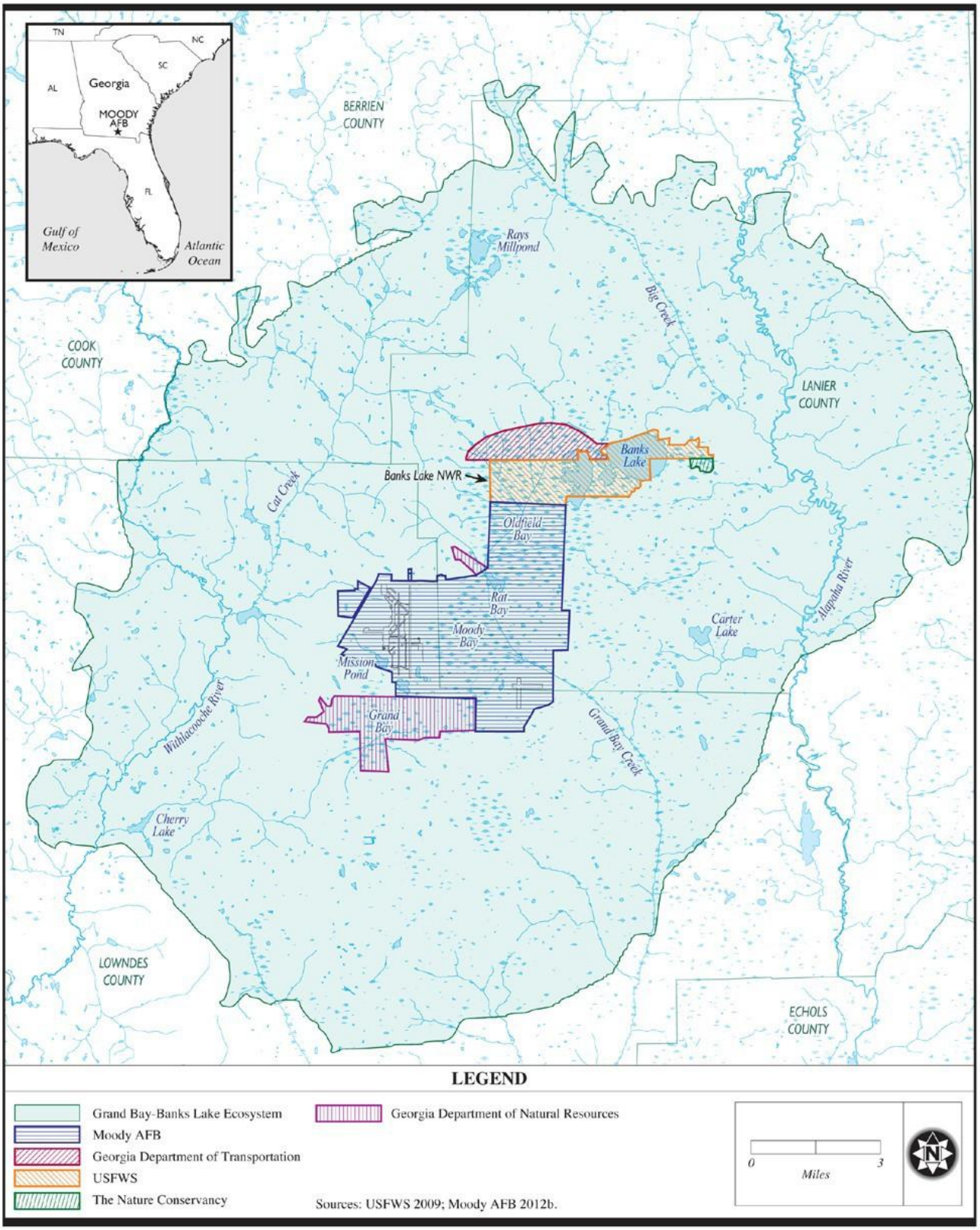
are of short duration and a large part of the water is lost to evapotranspiration and soil-moisture replenishment. In years when tropical weather systems move through the area, heavy rainfall can result in significant recharge to the Grand Bay wetland complex. Based on hydrological studies conducted within this wetland complex, it would take approximately 124 hours, or 5.2 days, to move the stored volume of water resulting from a significant rainfall event, from Grand Bay into Dudley Bay (Hicks and Clayton 2006).

Surface water flow within and between the bays is driven by gravity; water in the bays flows from points of higher elevation to points of lower elevations. Grand Bay and Oldfield Bay have the highest elevations among the six bays: 192.2 and 191.0 ft MSL, respectively. The elevation of Banks Lake is the same as Oldfield Bay, 191.0 ft MSL. Essentially, Moody Bay, Rat Bay, Dudley Bay, and Moccasin Bay each share the same approximate elevation, ranging from 186.5 ft to 186.8 ft MSL. Based on the reported elevations, Grand Bay and Oldfield Bay would contribute flow into the other bays (Hicks and Clayton 2006).

Water flow through the Grand Bay wetland complex is generally southeastern and southward. The northern parts of Banks Lake and approximately one-third of the shrub/swamp area known as Oldfield Bay drain to the northeast into Mill Creek, a tributary of Big Creek, which discharges to the Alapaha River, and ultimately into the Suwannee River. Between Oldfield Bay and Grand Bay lies a system of open marsh and creek swamp. Watersheds from the two bays converge here to form Grand Bay Creek, the major surface water collector for the wetlands complex. Southern parts of Banks Lake, and the remainder of Grand Bay, drain to the southeast through Grand Bay Creek. Grand Bay Creek eventually flows into the Alapaha River (Hicks and Clayton 2006).

Water levels are primarily controlled by the balance between precipitation and evapotranspiration and anthropogenic modifications in the system, including the construction of dikes and sills. Several water control structures are located along the dikes and sills in the system, but are generally left open to facilitate "normal" hydrologic processes. The general locations of these water control structures are shown in the Figure Surface Water Features and Water Control Structures (Page 32), and information concerning the structures and their associated watersheds is given in the Table Moody AFB Water Control Structure Information (Page 33). The surface waters of the Grand Bay system are “blackwater” systems, characterized by very soft, poorly buffered, acid waters (pH of 4.5 to 6.5) of relatively low fertility. The characteristic brown tint of these waters is caused primarily by the presence of high concentrations of humic and tannic acids (Hicks and Clayton 2006).

Overall, there are about 6,008 ac of wetlands located within the boundary of Moody AFB (excluding Grassy Pond Recreational Area), with the majority of these wetlands belonging to the Grand Bay wetland complex (Figure: Grand Bay-Banks Lake Watershed, Page 31). Storm water from the Main Base area is discharged by a series of drainage ditches. Five major storm drain outfalls occur along Burma Road, with water from these outfalls eventually draining into Mission Lake. Storm water from the northwest portion of the airfield forms the headwaters of Beatty Creek, eventually draining through Cat Creek to the Withlacoochee River.



Grand Bay-Banks Lake Watershed

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN

Water Management Unit	*Acres*	*Date Established*	*Dike Length (ft)*	*Pool Elevation (ft MSL)*	*Emergency Spillway Length (ft)*	*Number& Type of Control Structures*[a]	*10 yr. Flow Event*			
							Capacity (ft)	*Weir*[b] *Orifice*	*Peak Discharge (cfs)*[d]	*Time to Peak (hrs)*
Grand Bay	1,353	1991	1300	192.2	120	3/6' r x 48"	59	189	68	58
Dudley Bay	250	1964	2,000	186.8	120	4/7' r x 48" 1/4' r x 36"	106[c]	265	93	44
Moody Bay	1,051	1964	2.5 mi	186.6	--	2/7' r x 48" 5/6'r x 36"	162[c]	449	168	39
Rat Bay	840	1988	4,000	186.6	300	3/7' d x 48" 1/6' r x 36"	277	362	356	60
Oldfield	2,000	1992	1.5 mi	191.03	300	4/7' r x 48" 1/4' r x 36" 2/6'r x 48"	145	394	283	51
Moccasin Bay	210	1989	2,000	186.5	200	4/7' r x 48" 2/7' d x 48"	244	460	650	65

[a] Structure diameter x culvert diameter; r=flashboard riser; d = drop inlet

[b] Weir flow capacity at 1.0 ft. flow over weir; orifice - total capacity of fully open structures with water level 1 ft over pool

[c] Flow capacity at 0.4 ft. flow over weir

[d] 10-year storm event defined as $\geq$ 7.2 in. of rainfall in 24 hours

cfs = cubic feet per second; hrs = hours; MSL = above mean sea level

Impoundments

Water bodies present on the Main Base include Mission Lake and Quiet Pines Lake (see figure Surface Water Features and Water Control Structures, Moody AFB). Mission Lake, situated southwest of the parallel runways, is an impoundment encompassing approximately 30 ac. Mission Lake is the primary pond utilized for sport fishing in the Main Base area. Both military and civilian anglers heavily use Mission Lake. The pond has been stocked with bluegill (*Lepomis macrochirus*) and largemouth bass (*Micropterus salmoides*), with occasional releases of channel catfish (*Ictalurus punctatus*). Other animals readily observed at Mission Lake include the American alligator (*Alligator mississippiensis*), herons, egrets, and numerous waterfowl.

Quiet Pines Lake is located in the vicinity of the Quiet Pines Golf Course and housing area and it provides some additional fishing opportunities for families. This water body, encompassing approximately 3 ac, is fed by a deep well. During dry periods, water is pumped into the pond to maintain water levels, and it is occasionally used as an irrigation source for the golf course.

Shiner Pond is the only large open water area on Grand Bay Weapons Range (see figure Surface Water Features and Water Control Structures, Moody AFB). Shiner Pond is located in the northwest corner of the range immediately north of Shiner Pond Road. It is a 65-ac impoundment on the southern fringe of Oldfield Bay. It is part of the larger Banks Lake system and previously was connected to Banks Lake by channels; however, these channels have been overgrown with shrubs and other vegetation and are currently impassable by boats. Shiner Pond is open for fishing and other recreational opportunities on weekends when Grand Bay Weapons Range is not being used for military training. Because of the license agreement with the Georgia DNR, users must have a valid Georgia WMA stamp or a Moody AFB fishing license in addition to appropriate state licenses in order to access this site.

The most popular fishing and boating facility on Moody AFB is GPRA located 25 miles south of the installation near Lake Park, Georgia (Figure: Regional Location of Moody AFB, Page 15). This recreation

area features Grassy Pond and Lot Pond, encompassing 217 and 44 ac, respectively, and offers some of the best bass fishing in South Georgia.

The management of Mission Lake and Grassy Pond is jointly conducted by the 23 Force Support Squadron (FSS), 23 CES Operations Flight (23 CES/CEO), and 23 CES Installation Management Flight, Environmental Element (23 CES/CEIE). The 23 FSS maintains the physical assets around the lakes, including the fishing docks, cabins, and pavilions. Additionally, they rent fishing equipment, boats, and other recreational equipment, and are in charge of the overall management of Grassy Pond. 23 CES/CEIE manages the biological resources associated with the lakes, including management of fish populations and control of nuisance vegetation.

Floodplains

A significant portion of Moody AFB and Grand Bay Weapons Range are located within the 100-year floodplain. These areas are primarily associated with the extensive Carolina Bay wetland complexes and the Grand Bay Creek drainage.

Water quality data for Moody AFB impoundments are not routinely collected; however, periodic sampling has been performed to monitor water quality prior to and immediately following herbicide treatments. Grassy Pond is showing signs of eutrophication as evidenced by the profuse growth of exotic weeds, primarily water hyacinth (*Eichhornia crassipes*). Excessive growth of the water hyacinth has been a common problem in Grassy Pond and in Mission Lake. Lot Pond has a problem with excessive fragrant water lily (*Nymphaea odorata)* growth in the shallow (3-4 ft deep) perimeter that extends as much as 100 ft from the shore. The water lilies are keeping the dissolved oxygen very low due to the shading out of other aquatic plants and by buffering the water surface from the wind, which under normal circumstances would cause ripples that mix atmospheric oxygen into the water. An evaluation of Grassy Pond by the University of Georgia Fisheries Department in 2000 indicated that excessive weed growth in Grassy Pond was limiting fish populations and impacting fish health. Evaluations of Lot Pond by the Georgia Cooperative Extension Service and the Georgia DNR in 2001 indicated that current water conditions were not conducive to maintaining viable populations of game fish. A fish pond analysis was conducted in 2012 (Aquatic Environmental Services, Inc. 2012) that concluded the excessive weed growth at Grassy Pond was degrading game fish condition indices and recommended treatment of the weeds. A 2018 pilot study by the Georgia DNR Fisheries office demonstrated that Grassy Pond was overpopulated with smaller largemouth bass and that forage fish populations had been negatively impacted. The DNR recommended increasing harvest of small largemouth bass (i.e. fish approximately 12” in length).

Water Management Units

Located within the GBBL ecosystem are seven water management units created through the division of several Carolina bays. The following is an overview of these water management units.

Dudley Bay

This 250-ac wetland, located south of Range Road to the installation's south boundary, is a slightly impounded portion of the original drain from Grand Bay into Grand Bay Creek. Dudley Bay was first impounded in 1967 through the use of four 7-ft high flashboard risers. These risers were removed in 2004 and four new risers were relocated east of the Moody AFB Explosives Ordnance Disposal (EOD) Range to avoid conflicts with buried communication and electrical lines. An additional 4-ft high flashboard riser was installed just east of Dudley's Hammock in September 1987 to provide greater flexibility in regulating water

levels in the impoundment. Currently, Dudley Bay is a combination of open emergent marsh dominated by fragrant water lily, bladderwort (*Utricularia biflora*), and black gum/cypress forest.

Moody Bay

This 1,051-ac impoundment is located west of Crash Trail 6 and is totally confined to the Main Base. Originally, it was probably part of a larger Carolina Bay that consisted of Moody Bay and Rat Bay. Moody Bay was probably created in the early 1940s when the Air Force constructed Crash Trail 6 through the middle of the original Carolina Bay. Seven 7-ft high risers are located on Crash Trail 6 to manage the water in the area, with the crash trail itself serving to form the dike for the bay. The habitat in this area is about half scrub-shrub with scattered pines, and the other half consisting of a swamp black gum/cypress forest. Because this area was removed from the main watershed flow through the GBBL system by the crash trail, it was assumed that manipulation of the water control structures would allow the water levels in the bay to be modified. However, recent hydrological studies have determined that the topographic gradient is not great enough to affect any real change in hydrology through manipulation of these structures (Hicks and Clayton 2006).

Rat Bay

This 840-ac impoundment is located east of Crash Trail 6, west of an improved range road, north of Dudley Bay, and south of Oldfield Bay. Originally, Rat Bay was probably part of a larger Carolina Bay that consisted of Moody Bay and Rat Bay. Rat Bay was created in the early 1940s when the Air Force created Crash Trail 6 through the middle of the original Carolina Bay. Rat Bay is equally divided between swamp black gum-cypress forest and open emergent marsh. Open marsh acreage in the bay was burned in October 1987. Three drop inlets and three 6-ft high flashboard risers were installed in the summer of 1989 to potentially control water flow through the bay, however recent studies have determined that the topographic gradient is not great enough to affect any real change in hydrology through manipulation of these structures. Two of the flashboard risers were replaced with culverts only in recent years. Two emergency spillways (one 200-ft and one 100-ft) were installed in 1991 to protect installation assets.

Moccasin Bay

Moccasin Bay is a 210-ac impoundment located on the eastern boundary of Moody AFB at the head of Grand Bay Creek, where the creek leaves the bay complex. Moccasin Bay is bounded by Cooter Creek and Grand Bay Creek. Five 6-ft high flashboard risers and two drop inlets were installed in 1989, and a 200-ft emergency spillway was developed in 1991. One of the flashboard risers has been removed. This impoundment incorporates the headwater swamp of Grand Bay Creek and is almost entirely vegetated with a black gum-cypress swamp.

Oldfield Bay

Oldfield Bay is an intact 6,000-ac Carolina bay located west/southwest of Banks Lake. It is owned jointly by the USFWS (2,400 ac), Moody AFB (2,100 ac), Georgia DOT (1,500 ac), TNC (106 ac), and private individuals (minimal acreage). A major feature of Oldfield Bay is Shiner Pond, a 65-ac lake occurring within the boundaries of Moody AFB. Historical records indicate that a small boat could traverse the bay from Banks Lake to Shiner Pond (approximately 3.3 miles) because a major wildfire in 1956-57 had removed significant areas of scrub-shrub habitat and layers of peat from the system, resulting in extensive regions of open water. Since this wildfire, natural community succession has occurred and the open water areas have converted to scrub-shrub habitat. A blackbird winter roost consisting of several million individuals once existed in this bay, with the birds nesting in the thick scrub-shrub habitat; however, this

roost was destroyed in a later smaller wildfire that burned through the bay and set back plant succession. Several flashboard risers (two 4-ft high; six 6-ft high) were installed on Shiner Pond Road to control water levels in Shiner Pond and the southern portion of Oldfield Bay. One of the 4-ft high riser was destroyed by road grading and repair activities. One of the 6-ft high risers has been removed.

Grand Bay

This 1,353-ac wetland, is a natural clay-based Carolina bay located on state-owned property immediately south of Moody AFB. It currently has 873 ac of open marsh and 480 ac of forested/shrub habitat. Marsh habitat ranges from open water with floating and submerged aquatic plants to an emergent marsh with floating sphagnum mats to a late sere of Virginia chain fern (*Woodwardia virginica*) and titi. This wetland dried out in 1984; however, no burning was accomplished during this period. Three water control structures, consisting of 6-ft high flashboard risers, were installed in 1991.

Banks Lake

Bank's Lake is a 1,000-ac lake created through the impoundment of Mill Creek sometime between 1827 and 1835 to create a grist mill. The impoundment of Mill Creek also flooded Milltown Bay, an original Carolina Bay in the region. Banks Lake is primarily owned by the USFWS and is designated as the Banks Lake NWR. However, private landowners own parcels of land surrounding the boundary of the impoundment. Frost and Langley (2006) provide an excellent summary of the features of Banks Lake:

"Banks Lake has all the classic features of a fully expressed Carolina Bay. It has a sandy rim and an oval shape elongated slightly from northwest to southeast and perfect oval development is interrupted only by the bluff of high land on the northwest side. The sandy rim has been mostly inundated by the impoundment but shows up on aerial photos as a ring of pond cypress which became established in shallow water or during periods of low water after impounding. The original vegetation of the rim was likely longleaf pine on the southeast side where it adjoined fire-exposed savannas and mixed longleaf-slash pine and possibly some hardwood hammock on the partially sheltered west side."

2.3 Ecosystems and the Biotic Environment

2.3.1 Ecosystem Classification

Moody AFB lies within the Outer Coastal Plain Mixed (OCPM) province of the U.S. lowland ecoregion (Bailey 1995). The OCPM is dominated by temperate rainforest, also called temperate evergreen forest and laurel forest. It differs from the equatorial and tropical rainforest by having fewer species of trees and hence, large populations of individual species. Trees are not as tall as in the low latitude rainforest, leaves usually are smaller and more leathery, and the leaf canopy is less dense.

The trees commonly found in the southeastern U.S. are pines (*Pinus* spp.), oaks (*Quercus* spp.), and members of the laurel and magnolia families. Southeastern forests usually have a well-developed lower stratum of vegetation that includes tree ferns, small palms, shrubs, and herbaceous plants. Lianas and epiphytes are abundant. An example of conspicuous epiphyte accumulation at low elevations is the Spanish "moss" (*Tillandsia usneoides*) that festoons the oaks, bald cypress (*Taxodium distichum*), and other trees of the eastern Gulf Coast. Forests of longleaf, loblolly, and slash pine dominate large areas of sandy upland xerophytic habitat as a subclimax forest, maintained by frequent fires. Vast areas of gum- bay swamps and scrub-shrub wetlands exist throughout the area. Bald cypress and pond cypress (*Taxodium ascendens*) are dominant trees in swamps and cypress domes throughout the region.

The majority of the pine forests found in the southeastern U.S. represent second-growth forests established after a disturbance event, such as a catastrophic wildfire or deforestation activity (natural or anthropogenic). Under natural conditions, lightning-caused summer fires were an important component in maintaining pine-dominated ecosystems in the coastal plain area. These fires not only burned through pine stands in upland and flatwoods areas, but would also burn wetlands and hammocks during periods of extreme drought. These periodic fires maintained the pine subclimax forest by controlling hardwood competition, encouraging the growth of herbaceous vegetation, and maintaining open water areas within the wetlands by removing layers of peat, sphagnum moss, and scrub-shrub vegetation.

Moody AFB is located in a region that originally experienced a 1-3 year fire frequency on upland sand ridges, upland flats, and in some of the smaller bays and isolated wetlands. However, despite frequent fire on the most fire-exposed uplands, a network of natural firebreaks and subtle differences in topography led to reduced fire frequency over substantial parts of the landscape. Reduced fire effects in the vicinity of steep bluffs, such as those along the western side of Oldfield Bay, permitted the coexistence of vegetation communities with frequent fires (e.g., longleaf pine/wiregrass [*Aristida* spp.]) on uplands in close proximity to less fire tolerant hardwoods (e.g., pignut hickory [*Carya glabra*]) on partially fire-protected parts of the landscape, and even magnolia (*Magnolia grandiflora*) and spruce pine (*P. glabra*) on the most fire-sheltered slope toes and hammocks (Frost and Langley 2006).

Located in the lower coastal plain physiographic region within the OCPM, Moody AFB possesses a diversity of habitats. The area is dominated by pines and lowland hardwoods and supports a wide array of plant and wildlife species typical of these systems. Habitats featured at Moody AFB include upland pine forest, pine flatwoods, gum-bay-shrub swamps, upland hardwood hammocks, and freshwater ponds.

Moody AFB is encompassed by an association of Carolina bay wetlands, which comprise the GBBL complex. Exclusive of the Okefenokee Swamp, the GBBL wetland complex is the largest freshwater lake-swamp system in the Coastal Plain of Georgia. Wetlands in this complex are composed of several broad Carolina bays (1 to 4 miles across) and shallow lakes, interconnected by swamp black gum-cypress swamp. A small, but unique, natural area known as Dudley's Hammock occurs in the south-central portion of Moody AFB. This hammock or “tree island” is a rare remnant of the mesic hardwood hammock community in South Georgia. The GBBL complex is owned and managed by several different landowners, including Moody AFB, USFWS, Georgia DNR, Georgia DOT, TNC, and private landowners. Refer to Section Wetlands and Floodplains and the Figure Grand Bay-Banks Lake Stewardship Council Partner Ownership for further information on the GBBL wetland complex.

The Grand Bay WMA is located within this wetland complex. Approximately 60% of the WMA consists of creek and bay swamp habitat. One-third of the area is covered by pine flatwoods, largely longleaf/slash pine stands and loblolly/slash pine plantations, with the remainder comprised of open fields and mixed hardwood/pine stands, probably indicative of fire suppression. For a detailed discussion of the history and ownership of the WMA refer to Section Local and Regional Natural Resources Areas.

2.3.2 Vegetation

2.3.2.1 Historic Vegetative Cover

The historic vegetative composition of Moody AFB and the GBBL ecosystem was reconstructed based on topography, modern soil maps, natural vegetation remnants, and historical records (i.e., land lot survey records and historical maps). Based on this reconstruction, it appears that the upland areas of Moody AFB

were once dominated by longleaf pine forests, with mesic longleaf pine savannas located on Main Base, and wet-mesic longleaf pine savannas and wet mixed-pine savannas in the Grand Bay Weapons Range. This configuration was related primarily to soils and fire periodicity, with the Main Base area receiving a fire frequency of 1-3 years, while the Grand Bay Weapons Range area was more fire-sheltered as a result of the extensive GBBL wetland complex dividing the two areas (Frost and Langley 2006).

2.3.2.2 Current Vegetative Cover

The current vegetative composition on Moody AFB is primarily a result of land management practices and actions undertaken during the 1940s during the construction of the installation. As a result, the current vegetation of Moody AFB does not resemble these historic community types. Because of land development, fire suppression, and conversion to other vegetative types (i.e., loblolly pine) very few remnants of these historic natural communities can be found throughout the installation or in the greater GBBL ecosystem.

Currently, the unimproved areas of Moody AFB feature several distinct natural communities or ecosystems that have been shaped or modified primarily through anthropogenic actions. These communities range from xeric to hydric, with transitions and dynamic interactions between the different areas. Natural communities on Moody AFB include upland pine forests, pine flatwoods, and extensive areas comprised of various wetland communities (Figure: Vegetation Communities within Unimproved Areas of Moody AFB, Page 40).

The primary key ecological feature of Moody AFB is the vast area contained in wetlands. Wetlands cover approximately 5,500 ac (46.4%) on the installation within the GBBL ecosystem complex (see Figure Surface Water Features and Water Control Structures, Moody AFB). The Carolina bays are typically vegetated with a scrub-shrub cover type; wetter areas transition into a swamp black gum-cypress swamp association with pockets of open water. The swamp black gum-cypress swamp association is primarily vegetated with an overstory of swamp black gum and cypress, but contains significant numbers of red maples (*Acer rubrum*) and sweetbays (*M. virginiana*). The understory vegetation is moderately dense and consists of heaths, redbay (*Persea palustris*), wax myrtle (*Myrica cerifera*), cinnamon fern (*Osmunda cinnamomea*), chain fern (*Woodwardia virginica*), and greenbrier (*Smilax* spp.). In the transition areas from wetlands to uplands, pond pine (*P. serotina*), slash pine, and dense thickets of evergreen shrubs and palmetto become more predominant as the soils transition from hydric to mesic. Eventually, the upland areas are comprised predominantly of a pine forest type, established either through natural community succession or through artificial regeneration (i.e., pine plantations).

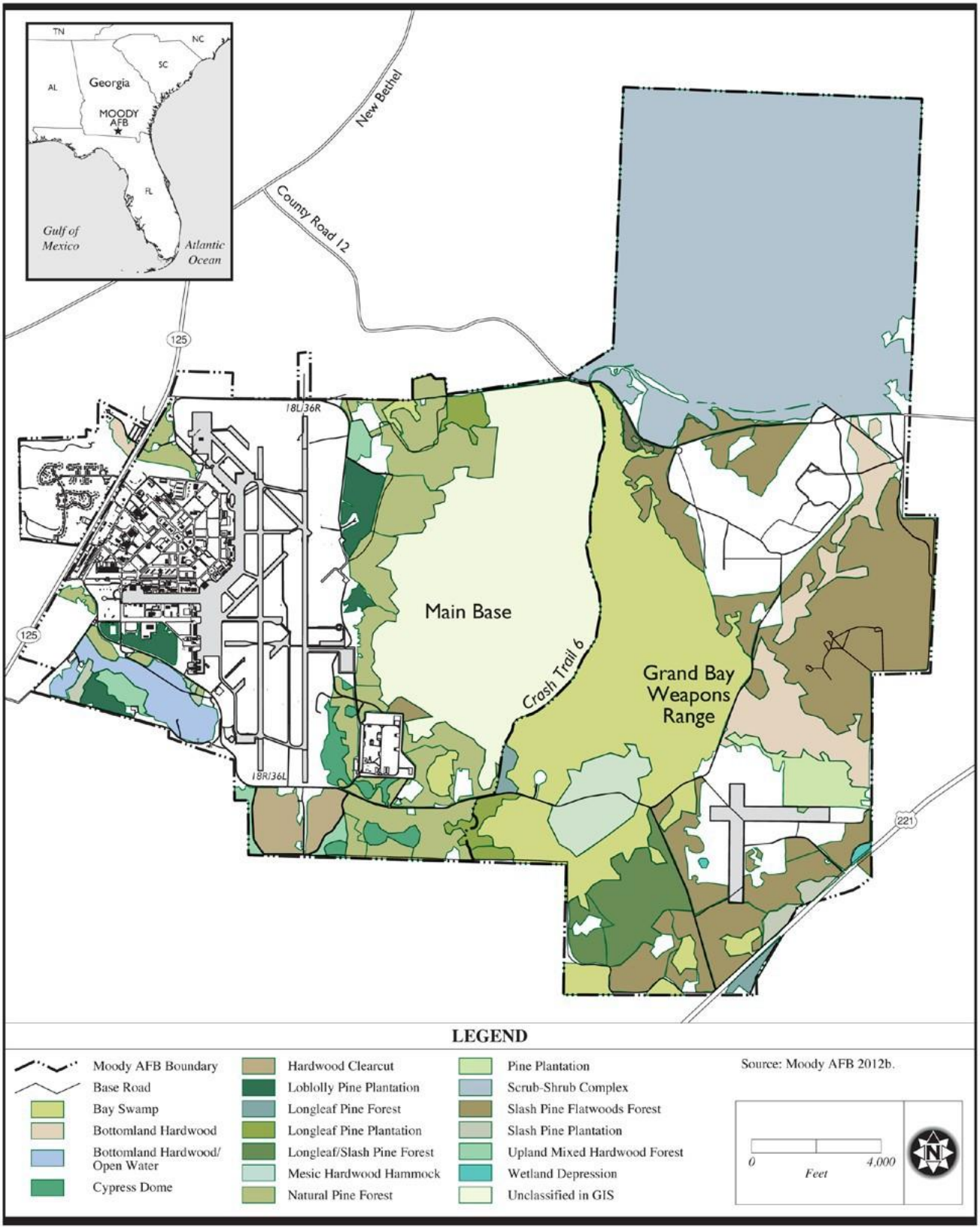
Upland Forests

As noted above, the uplands of Moody AFB were historically vegetated with a longleaf pine forest, grading from wet-mesic longleaf pine savannas including slash pines and other species suited for these wetter soils to mesic longleaf pine savannas, dominated by longleaf pine and wiregrass on the drier soils. While the current vegetation in these upland areas has compositionally changed, it is still dominated by southern pines which were established following the construction of the installation. A description of the current upland forest communities follows and are depicted in the Figure Vegetation Communities within Unimproved Areas of Moody AFB.

Longleaf Pine Forests

In southern Georgia, the longleaf pine community type is typically associated with sandhills, and the longleaf pines are found in association with turkey (*Quercus laevis*) and post oaks (*Q. stellata*). Because the sandhill community is not present on Moody AFB, the longleaf pine community in this area typically

existed as a monotypic longleaf pine forest with a moderately dense midstory of sparkleberry (*Vaccinium arboreum*), gallberry (*Ilex glabra*), hawthorn (*Crataegus* spp.), sassafras (*Sassafras albidum*), beautyberry (*Callicarpa americana*), and flowering dogwood (*Cornus florida*), and with a sparse herbaceous understory primarily comprised of wiregrass but occasionally with large areas of saw palmetto (*Serenoa repens*). These forests are maintained by periodic fire, which typically occurs with a 1-3 year periodicity. Without frequent fires, these areas quickly become invaded by sweetgums (*Liquidambar styraciflua*), water oaks (*Q. nigra*), and other upland hardwood species, and eventually succeed to a mixed hardwood/pine forest.



Vegetation Communities within Unimproved Areas of Moody AFB

Longleaf Pine/Slash Pine Flatwoods Forest

Pine flatwoods are typically flat, low-lying open woodlands that lie between the drier forest communities upslope and wetlands down slope. An organic hardpan, usually located 1-2 ft below the ground surface, inhibits subsurface water penetration and results in moist soils with water often at or near the surface (perched water table). Historically, these areas were comprised of slash pine in the wetter areas with longleaf pine in the drier areas and scattered pond pines throughout the stand. These communities are characterized by understories comprised of saw palmetto, gallberry, wiregrasses, and blueberries (*Vaccinium* spp.). Hooded pitcher plants (*Sarracenia leucophylla*) can be found occurring sporadically throughout this community. These forests are maintained by periodic fire, which typically occurs with a one to three year periodicity. Without frequent fires, the drier areas in this community quickly become invaded by sweetgums, water oaks, and other upland hardwood species, and eventually succeed to a mixed hardwood/pine forest; the wetter areas become invaded by wetland species, such as red maples and black gums, and eventually succeed to a mixed bottomland hardwood/pine forest. Frequent fire prevents both upland hardwoods and wetland species from replacing the pine associations.

Loblolly Pine Plantations

While not a historical natural community, a vast proportion of the upland habitat at Moody AFB has been converted to this community type. Traditionally, these areas were characterized as either longleaf or longleaf/slash pine flatwoods forest types, but were converted to pine plantations. The majority of the pine plantations on Moody AFB were created through artificial regeneration between 1980 and 1990, and include small acreages of slash pine plantations in addition to the more expansive loblolly pine plantations.

Upland Hardwood Forests

These community types are fairly uncommon in southern Georgia, and are typically associated with old field conditions or on sites with a history of fire suppression. These areas are typically vegetated with an overstory comprised of upland hardwoods such as water oak, sweetgum, black cherry, and live oak (*Q. virginiana*). On Moody AFB, these stands always have an intermingling pine constituent. They possess a relatively open understory of woody shrubs, blueberries, bracken fern (*Pteridium aquilinum*), broomsedge (*Andropogon virginicus*), and other grasses in areas where canopy closure has not been completed. However, in areas where the canopy is closed, there is very little herbaceous growth because of excessive shading of the forest floor.

Carolina Bay Swamp Complex

Carolina bays are elliptical, shallow depressions found primarily on the coastal plains of the southeastern U.S. They are characterized by being oriented on a northwest-southeast axis, and, in many cases, have a distinct sand rim on the southeast end. The origin of these bays is unknown, but many theories have been proposed, including remnants of meteor impacts, wind events, spring basins, segmentation of lagoons, and solution depressions. Several different community types occur within the Carolina bay swamp complex, including open water, scrub-shrub, bay swamp, cypress domes, shallow ponds, and wetland depressions. Typically, these community types occur along a moisture gradient, with open water areas giving way to scrub-shrub habitat, which, in turn, is adjacent to bay swamps. These communities require periodic fires to maintain their ecological integrity. Fires would sweep through these areas during times of drought in the growing season, with a periodicity of 7-25 years, top killing the scrub-shrub component and removing layers of peat and moss accumulation from wetland areas to set back succession.

Open Water

Within the Carolina bay swamp complex, there are small areas of open water, usually with a scattered tree overstory. These areas are typically characterized by their dark acidic water resulting from an accumulation of tannic and humic acids in the system. Open water areas contain typical aquatic plants, including water lily, water shield (*Brasenia schreberi*), fanwort (*Cabomba caroliniana*), and other associated emergents.

Scrub-Shrub Community

Within the Carolina bay swamp complex, the scrub-shrub community exists as a transition area between the open water areas and the drier bay swamps. Scrub-shrub areas are non-forested areas dominated by woody shrubs, seedlings, and saplings averaging less than 20 ft high. These wetlands intergrade with forested wetlands, non-forested emergent wetlands, and open water. The scrub-shrub areas are dominated by sweetbay, white titi (*Cyrilla racemiflora*), fetterbush (*Lyonia lucida),* Virginia sweetspire *(Clethra alnifolia),* red maple, and stunted pond pine, all interlaced with greenbrier vines to form an almost impenetrable thickness 15-20 ft high

Bay Swamp

Margins of the Carolina bays are dominated by swamp black gum-cypress forests, with significant amounts of red maples, swamp blackgum, pond cypress, sweetbay magnolia, and other wetland trees. Bay swamps have a moderate to dense understory layer, consisting of heaths, redbay, wax myrtle, cinnamon fern, and greenbriers. Many of the bay swamps on Moody AFB have succeeded or are succeeding toward denser and less diverse shrub vegetation as a result of long-term maintenance of artificially high water levels and the resultant lack of periodic fires.

Cypress Domes, Shallow Ponds, and Wetland Depressions

Dome swamps are characterized as shallow, forested, usually circular depressions that generally present a domed profile because smaller trees grow in the shallower waters at the outer edge, while bigger trees grow in the deeper water in the interior. They typically develop in sandy flatwoods and in karst areas where sand has slumped around or over a sinkhole, creating a conical depression. Cypress, swamp tupelo (*Nyssa sylvatica* var. *biflora*), and slash pine are common trees located in these depressions. Cypress domes typically contain areas of open water throughout the year; however, in times of extreme drought, these ponds may become totally dry.

Shallow ponds and wetland depressions are similar areas typically found within the pine flatwoods. These areas usually contain a mixture of wetland and upland species, with swamp black gum, red maple, pond pine, and cypress occurring as overstory species. These areas may have a very well-developed shrub layer, consisting primarily of fetterbush, white titi, black titi (*Cliftonia monophylla*), and Virginia sweetspire, or may exist in a largely grassy vegetative state, with grasses, sedges, and rushes throughout the depressions. These shallow ponds and depressions periodically become dry, either annually or every several years, and are important breeding sites for amphibians, especially those species which cannot breed in wetlands with piscine predators. Shallow ponds and depressions may range from no larger than one-quarter of an acre to several acres in size. Fire is essential for the maintenance of the cypress dome, shallow pond, and wetland depression communities. Without periodic fires, pine and upland hardwood invasion and peat accumulation would convert these areas to other habitat types. Fire frequency in these areas may range from as short as 3-5 years to as great as 100-150 years for the larger cypress domes.

Hardwood Hammocks

Hardwood hammock communities are elevated areas surrounded by swamp which contain a unique community type. These areas can be considered islands physically (e.g., elevated areas surrounded by

wetlands) and biogeographically (e.g., possessing unique community types found only on these areas). While hammocks are relatively common ecological features in Florida, hammocks are less common in Georgia. Two mesic hardwood hammocks occur on Moody AFB: Dudley's Hammock, a 120-ac site in the south-central part of the installation (see figure Vegetation Communities within Unimproved Areas of Moody AFB), and Hickory Hammock, a 28-ac site located just south of the Grand Bay Weapons Range bomb target. The vegetation of Dudley's Hammock is typical of other hammocks found in northern Florida, except for the conspicuous absence of cabbage palmetto, and is apparently succeeding towards a lowland broad-leaf evergreen community. The prominent indicators of the hammock community are the Southern magnolias and the rare spruce pine. The mature magnolias act as hosts to the rare green-fly orchid *(Epidendrum conopseum)*. Other primary overstory vegetation consists of live oak, white oak (*Q. alba*), swamp chestnut oak (*Q. michauxii*), and pignut hickory. Two other unique plant species on Dudley's Hammock are needle palm *(Rhapidophyllum hystrix)* and climbing heath *(Pieris phillyreifolia)*. Hickory Hammock has been degraded through past agricultural and military actions and no longer possesses characteristic hammock vegetation.

2.3.2.3 Turf and Landscaped Areas

Urban Forests

The management of the urban forest on Moody AFB is the responsibility of the Operations Flight, 23 CES. The Installation Management Flight, Environmental Element, forester provides assistance in the management of this resource by serving as the resident expert and technical advisor. Additionally, the forester maintains and updates the urban tree inventory by documenting tree changes in the urban forest in the Moody AFB geographic information system (GIS). While the urban forest management program has been in effect for years as part of the overall maintenance of the grounds at Moody AFB, professional management of this resource began in earnest in 1999 when an initial survey of the composition of the urban forest on Moody AFB, including GPRA, was completed. The urban tree inventory has been continually updated by the base forester since its inception in 2003.

2.3.3 Fish and Wildlife

As discussed above, Moody AFB possesses a diversity of habitats. These habitats in turn support a wide array of wildlife species typical of these systems.

Upland Forests

Longleaf pine forests have a very diverse fauna community. Common mammals include the opossum (*Didelphis virginiana*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), gray fox (*Urocyon cinereoargenteus*), gray squirrel (*Sciurus carolinensis*), fox squirrel (*S. niger*), eastern cottontail rabbit (*Sylvilagus floridanus*), white-tailed deer (*Odocoileus virginianus*), and various small rodents.

Common birds found within longleaf pine forests include the northern bobwhite quail (*Colinus virginianus*), red-shouldered hawk (*Buteo lineatus*), yellow-billed cuckoo (*Coccyzus americanus*), ruby- throated hummingbird (*Archilochus colubris*), woodpeckers (downy [*Picoides pubescens*], red-bellied [*Melanerpes carolinus*], flicker [*Colaptes aurates*]), American crow (*Corvus brachyrhychos*), Carolina chickadee (*Parus carolinensis*), tufted titmouse (*Parus bicolor*), brown-headed nuthatch (*Sitta pusilla*), Carolina wren (*Thryothonis ludovicianus*), blue-gray gnatcatcher (*Polioptila caerulea*), ruby-crowned kinglet (*Regulus calendula*), white-eyed (*Vireo griseus)* and red-eyed (*Vireo olivaceus*) vireos, northern parula (*Parula americana*), common grackle (*Quiscalus quiscula*), summer tanager (*Piranga rubra*), Eastern towhee (*Pipilo erythrophthalmus*), and white-throated sparrow (*Zonotrichia albicollis*).

Common reptiles and amphibians include the eastern box turtle (*Terrapene carolina carolina*), eastern fence lizard (*Sceloporus undulatus*), five-lined skink (*Eumeces inexpectatus*), canebrake (timber) rattlesnake (*Crotalus horridus atricaudatus*), black racer (*Coluber constrictor*), eastern indigo snake (*Drymarchon couperi*), little grass frog (*Pseudacris ocularis*), squirrel tree frog (*Hyla squirella*), eastern spadefoot toad (*Scaphiopus holbrooki*), gopher tortoise (*Gopherus polyphemus*), and other similar lizards, frogs, and toads.

Longleaf pine/slash pine flatwoods also have a very diverse fauna community, including many species that are also found in longleaf pine forests. Common mammals include the opossum, raccoon, gray fox, gray squirrel, eastern cottontail rabbit, white-tailed deer, and various small rodents. Common birds include the northern bobwhite quail, red-shouldered hawk, yellow-billed cuckoo, ruby-throated hummingbird, woodpeckers (pileated [*Drycopus pileatus*], downy, red-bellied, and flicker), American crow, Carolina chickadee, tufted titmouse, brown-headed nuthatch, Carolina wren, blue-gray gnatcatcher, ruby-crowned kinglet, wild turkeys (*Meleagris gallopavo*), white-eyed and red-eyed vireos, northern parula, common grackle, summer tanager, rufous-sided towhee, and white-throated sparrow.

Common reptiles and amphibians include the eastern box turtle, flatwoods salamander (*Ambystoma cingulatum*), five-lined skink, canebrake (timber) rattlesnake, eastern cottonmouth (*Agkistrodon piscivorus*), indigo snake, little grass frog, squirrel tree frog, eastern spadefoot toad, gopher tortoise, and other similar lizards, frogs, and toads.

Typically there are minimal fauna species found in loblolly pine plantations unless extensive forest management activities, primarily consisting of thinning of the forest canopy and reintroduction of fire or other disturbances, are conducted. When the canopy is thinned and the site is burned on a periodic basis, the fauna constituent resembles that of the longleaf pine and slash pine flatwoods communities, although the diversity and density are not as great, with a noticeable decrease in amphibian presence.

Before canopy closure, fauna in upland hardwood forest is similar to that of other upland forest communities, although the diversity of small mammals, amphibians, and reptiles is not as great as the longleaf pine and slash pine flatwoods communities. After canopy closure, the fauna species consist primarily of canopy-dwelling avian species and mid-sized to larger mammals (i.e., white-tailed deer, gray fox, bobcat (*Felis rufus*), opossum, raccoon), although wild turkeys utilize these areas seasonally.

Carolina Bay Swamp Complex

Open water areas are important habitat types for fish species, including warmouth (*Lepomis gulosus*), red-breasted sunfish (*L. microlophus*), redfin pickerel (*Esox americanus*), lake chain pickerel (*Esox niger*), yellow bullhead (*Ameiurus natalis*), madtom (*Noturus* spp.), and largemouth bass. Mammal and bird species typically associated with these areas include raccoons, opossums, beavers (*Castor canadensis*), round-tailed muskrats (*Neofiber alleni*), prothonotary warblers (*Protonotaria citrea),* hooded warblers (*Wilsonia citrine),* common yellowthroats (*Geothlypis trichas),* herons, and egrets. Additionally, southern bullfrogs (*Rana catesbeiana*), pig frogs (*Rana grylio*), alligators, snapping turtles (*Chelydra serpentina*), eastern cottonmouths, southern water snakes (*Nerodia rhombifer*), and other water-dependent reptiles and amphibians can be found in these areas.

In scrub-shrub communities, mammalian wildlife species such as white-tailed deer, eastern cottontail rabbit, raccoon, bobcat, opossum, golden mouse (*Ochrotomys nuttalli*), and other small mammals can be found. Bird species associated with this area include eastern towhee, white-eyed vireo, gray catbird (*Dumetella carolinensis*), northern cardinal (*Cardinal cardinalis*), indigo bunting (*Passerina cyanea*), hooded warbler,

Swainson's warblers (*Limnothylpis swainsonii*), and other similar shrub-dwelling birds. Reptiles and amphibians that utilize this area are similar to both the open water and the bay swamp community types.

Fauna species associated with bay swamps include mammals such as the opossum, raccoon, gray fox, gray squirrel, eastern cottontail rabbits, and white-tailed deer. Birds commonly found include the red- shouldered hawk, woodpeckers (downy, red-bellied, pileated, yellow-bellied sapsucker [*Sphryaphicus varius*], northern flicker), great-crested flycatcher (*Myiarchus crinitus*), blue jay (*Cyanocitta cristata*), Carolina chickadee, tufted titmouse, Carolina wren, blue-gray gnatcatcher, ruby-crowned kinglet, brown thrasher (*Toxostoma rufum*), gray catbird, white-eyed and red-eyed vireos, northern parula, common grackle, northern cardinal, hooded warblers, and prothonotary warblers. Common reptiles and amphibians include the rainbow snake (*Farancia erytrogramma erytrogramma*), eastern box turtle, spotted salamander (*Ambystoma maculatum*), green tree frog (*Hyla cinerea*), southern toad (*Bufo terrestris*), eastern cottonmouth, and southern water snake.

Fauna species associated with cypress domes typically include mammals such as the opossum, raccoon, and beaver. Common birds include the wood duck (*Aix sponsa*), herons and egrets, red-shouldered hawk, belted kingfisher (*Ceryle alcyon*), woodpeckers (downy, red-bellied, red-headed [*Melanerpes erythrocephalus*], northern flicker, pileated), great-crested flycatcher, eastern kingbird (*Tyrannus tyrannus*), swallows, Carolina chickadee, tufted titmouse, Carolina wren, gray catbird, white-eyed and red-eyed vireos, common yellowthroat, and northern cardinal. Common reptiles and amphibians include the common snapping turtle, sliders, eastern cottonmouth, salamanders, green tree frog, and pig frog.

Because of their small size, shallow ponds and depressions are typically used by reptiles and amphibians as opportunistic breeding sites. Examples of fauna species found in these areas would include flatwoods salamander, striped newt (*Notophthalmus viridescens*), tiger salamander (*Ambystoma tigrinum*), eastern spadefoot toad, southern toad, eastern mud snake (*Farancia abacura*), and eastern cottonmouth.

Grand Bay, one of the water management districts within the GBBL ecosystem, contains a large heron, egret, and ibis rookery. Common gallinules (*Gallinula chloropus*), least bitterns (*Ixobrychus exilis*), and wood ducks are known to nest in this bay, and wood storks (*Mycteria americana*), common snipe (*Gallinago gallinago*), killdeer (*Charadrius vociferus*), sandpipers, and other shorebirds utilize the area during migration along with migrating waterfowl such as ringed-neck duck (*Aythya collaris*), mallard (*Anas platyrhinchos*), blue-winged teal (*A. dicors*), and green-winged teal (*A. crecca*). Approximately 2,000 Florida sandhill cranes (*Grus canadensis pratensis*) are considered year-round residents of the bay, while other migratory sandhills (*G. canadensis*) occur transiently during migration periods.

In 1987, the Georgia DNR discovered the presence of the state-threatened Florida water rat (round-tailed muskrat) in Grand Bay (additional populations were later discovered in Rat Bay and Oldfield Bay). Beginning in 1998, a 3-year study of bird movements in and around the Moody AFB airspace, including the Grand Bay Weapons Range impact area, was conducted (Air Force 1998). The study identified major roost sites in proximity to Moody AFB, including the heron and egret rookery located on Grand Bay WMA south of the installation and a large purple martin roost located north of the installation.

2.3.4 Threatened and Endangered Species and Species of Concern

Threatened and Endangered Species

Based on the 2018 listing status, there are two federally listed species located on Moody AFB: Eastern Indigo Snake (Threatened) and Wood Stork (Threatened). Additionally, the USFWS determined that the current listing of the gopher tortoise as threatened in the eastern portion of its range, which includes Moody

AFB, is warranted, but precluded by higher-priority listing actions. Therefore, the gopher tortoise is regarded as a federally listed species in regards to compliance with Section 7 of the ESA at Moody AFB.

The American alligator does occur on the installation and is classified in the Endangered Species Act as "threatened due to similarity of appearance to the American crocodile (*Crocodylus acutus*)," although it was officially removed from the list of endangered species in 1987. This classification of the alligator in the ESA allows the USFWS to regulate the harvest and legal trade in the animals, their skins, and products made from them, as part of efforts to prevent the illegal take and trafficking of endangered "look-a-like" reptiles. Beyond harvest and legal trade regulations, there are no other regulatory requirements for this species under the ESA, and alligators are not recognized as an endangered or threatened species and is not typically considered in Section 7 ESA consultations with the USFWS for installation activities.

There is no ESA-designated critical habitat located on the installation or at GPRA.

Other Sensitive Species

There are four other species on Moody AFB that are state-listed as threatened, but that are not federally listed: southern hognose snake, alligator snapping turtle, bald eagle, and round-tailed muskrat. An additional three species are included in the list of RTE species for Moody AFB because they are identified by the state as either rare or unusual.

It should be noted that the listing status of species occasionally changes and will be reviewed annually to ensure up-to-date lists are maintained on the installation.

Rare, Threatened, and Endangered (RTE) Species Identified on Moody AFB

Class	*Common Name*	*Scientific Name*	*2018 Federal Status[(a)]*	*2018 State Status[(b)]*	*2018 HP Status[(c)]*
Plants	Green-fly Orchid	*Epidendrum conopseum*	None	U	G4/S3
Birds	Eastern Indigo Snake	*Drymarchon couperi*	T	T	G3/S2
	Gopher Tortoise	*Gopherus polyphemus*	Candidate	T	G3/S2
	Southern Hognose Snake	*Heterodon simus*	None	T	G2/S2
	Alligator Snapping Turtle	*Macrochelys temminckii*	None	T	G3G4/S3
	Bachman's Sparrow	*Peucaea aestivalis*	None	R	G3/S2
	SE American Kestrel	*Falco sparverius paulus*	None	R	G5/S2
	Wood Stork	*Mycteria americana*	T	E	G4/S2
	Bald Eagle	*Haliaeetus leucocephalus*	None	T	G5/S2
Mammals	Round-tailed Muskrat	*Neofiber alleni*	None	T	G3/S3

Sources: Georgia DNR 2018; NatureServe 2018

(a) Federal: **E = Endangered** – a species that may become extinct or disapper from a significant part of its range if not immediately protected.
T = Threatened – a species that may become endangered if not protected.
S/A = Similarity of Appearance.

(b) State: **E = Endangered.** A species which is in danger of extinction throughout all or part of its range in Georgia.
T = Threatened. A species which is likely to become an endangered species in the foreseeable future throughout all or part of its range in Georgia.
R = Rare. A species which may not be endangered or threatened but which should be protected because of its scarcity.
U = Unusual. A species deserving of special consideration and plants subjected to commercial exploitation.

(c) Natural Heritage Program (NHP): **G1** = Critically imperiled globally because of extreme rarity (5 or fewer occurrences).
G2 = Imperiled globally because of rarity (6 to 20 occurrences).
G3 = Rare and local throughout range or in a special habitat or narrowly endemic (on the order of 21 to 100 occurrences).
S1 = Critically imperiled in Georgia because of extreme rarity (5 or fewer occurrences).

S2 = Imperiled in Georgia because of rarity (6 to 20 occurrences).
S3 = Rare and uncommon throughout the state or in a special habitat or narrowly endemic (on the order of 21 to 100 occurrences).
? = Denotes questionable rank; best guess given whenever possible.

2.3.5 Wetlands and Floodplains

Overall, there are approximately 6,008 ac of wetlands located within the boundary of Moody AFB, with the majority of these wetlands belonging to the Grand Bay wetland complex (see figure Surface Water Features and Water Control Structures, Moody AFB).

The Federal Emergency Management Agency (FEMA) maps the extent of 100-year floodplains in the U.S. The boundaries of floodplains may vary over time as the extent of impermeable surfaces increases flooding potential. The current 100-year floodplain for Moody AFB includes a significant portion of the unimproved area of the base, primarily as a function of the wetlands and Carolina Bay Complex, to include the Grand Bay Creek drainage area.

2.3.6 Other Natural Resource Information

In support of natural resources management, natural resources inventories and studies have been conducted on Moody AFB since approximately 1993. These inventories and studies have been focused on identifying ecosystems and rare, threatened, and endangered species. Earlier inventories were completed by the Georgia DNR for game animals, including white-tailed deer, eastern wild turkey, and northern bobwhite. Additional surveys to determine current gamefish population status and health condition are conducted at Grassy Pond and Mission Lake. Copies of these studies are available in the Natural Resources Office.

In partnership with The Nature Conservancy, the Georgia DNR, and the USFWS, the Grand Bay-Banks Lake Council was formed to develop an overall GBBL Cooperative Stewardship Plan (see section 14.0 Appendices). As part of this Plan, DoD Legacy Program funds were obtained to conduct three ecosystem-level studies to assist in the future management of the ecosystem. A hydrological study was conducted to determine the hydrologic response of the various wetland bays to rainfall, to define the effects the sills have on the flow of water throughout the system, to evaluate the potential for groundwater and surface water interaction, and to determine if the water control structures located within the sills might be used to manipulate the overland flow of wetland water as a fire management tool (Hicks and Clayton 2006). A study was conducted to determine the current and historic land cover of the GBBL ecosystem and to map vegetative changes in the ecosystem from the early 1940s to the present. A fire periodicity study was completed that included the mapping of the pre-settlement vegetation in the ecosystem to determine the normal fire frequencies that shaped the ecosystems in this region prior to modern human development.

2.4 Mission Impacts on Natural Resources

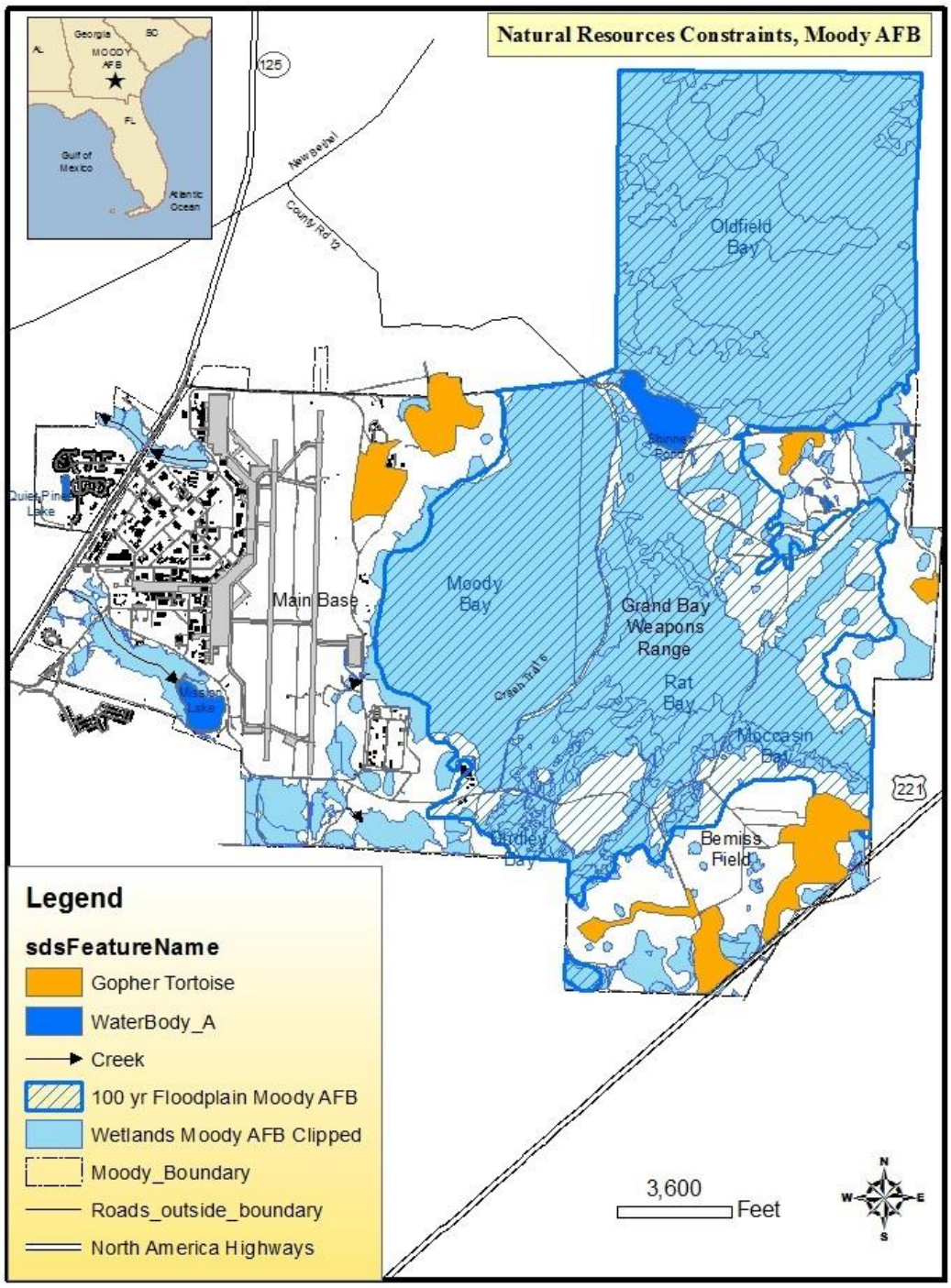
2.4.1 Natural Resource Constraints to Mission and Mission Planning

While there have not been any major conflicts between natural resources and installation planning and missions to date, there are several natural resources constraints which have the potential to impact military activities on the installation. The most notable concern is the presence of approximately 5,500 ac of jurisdictional and isolated wetlands within the boundaries of the installation. The majority is located in the central part of the installation, and part of the larger GBBL wetlands complex which extends north and south of the installation (See Figure: Grand Bay-Banks Lake Stewardship Council Partner Ownership (Page 31) and Figure: Surface Water Features and Water Control Structures (Page 32)). Military mission activities at Moody AFB rarely occur in wetlands, primarily because they are generally not suitable for construction

or military training (as currently conducted at Moody AFB) and because the policy of Moody AFB and the Air Force is no net loss of wetlands where practicable. When mission activities are proposed in these wetland areas, the installation coordinates with the USACE and the Environmental Protection Division of the Georgia DNR to receive the necessary permits, waivers, and approvals to complete the military mission requirement.

The presence of floodplains at Moody AFB and Grand Bay Weapons Range have the potential to impact development and expansion of the built infrastructure. The current 100-year floodplain for Moody AFB includes a significant portion of the unimproved area of the base, primarily as a function of the wetlands and Carolina Bay Complex, to include the Grand Bay Creek drainage area. (Figure: Natural Resource Constraints, Page 49). Construction within the 100-year floodplain would require compliance with applicable FEMA and NPDES regulations, in addition to compliance with NEPA/EIAP and AFI 32-7064 requirements.

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN



Natural Resource Constraints, Moody AFB

Another natural resources concern is the presence on the installation of several RTE species, most notably the gopher tortoise and the associated eastern indigo snake. Gopher tortoises are recognized as a "keystone" species. Keystone species are animals whose presence is required for the continued existence of other species. In the case of the gopher tortoise, the burrows created by the tortoise serve as habitat for over 200 other animals, including the federally and state-listed eastern indigo snake. If tortoise habitat was negatively impacted by installation activities, these burrow associates could also be negatively affected. Gopher tortoises are found in upland areas that are suitable for construction and military mission activities. Therefore, the presence of gopher tortoises on the installation has the potential to limit planned construction and military training activities (Figure: Natural Resource Constraints, Page 49). Because the gopher tortoise is a federal candidate species for listing under the ESA and because of its close association with the federally threatened indigo snake, any installation activity that occurs in or near gopher tortoise habitat is coordinated with the USFWS.

At present, there is no designated critical habitat as defined in the ESA located on Moody AFB.

2.4.2 Land Use

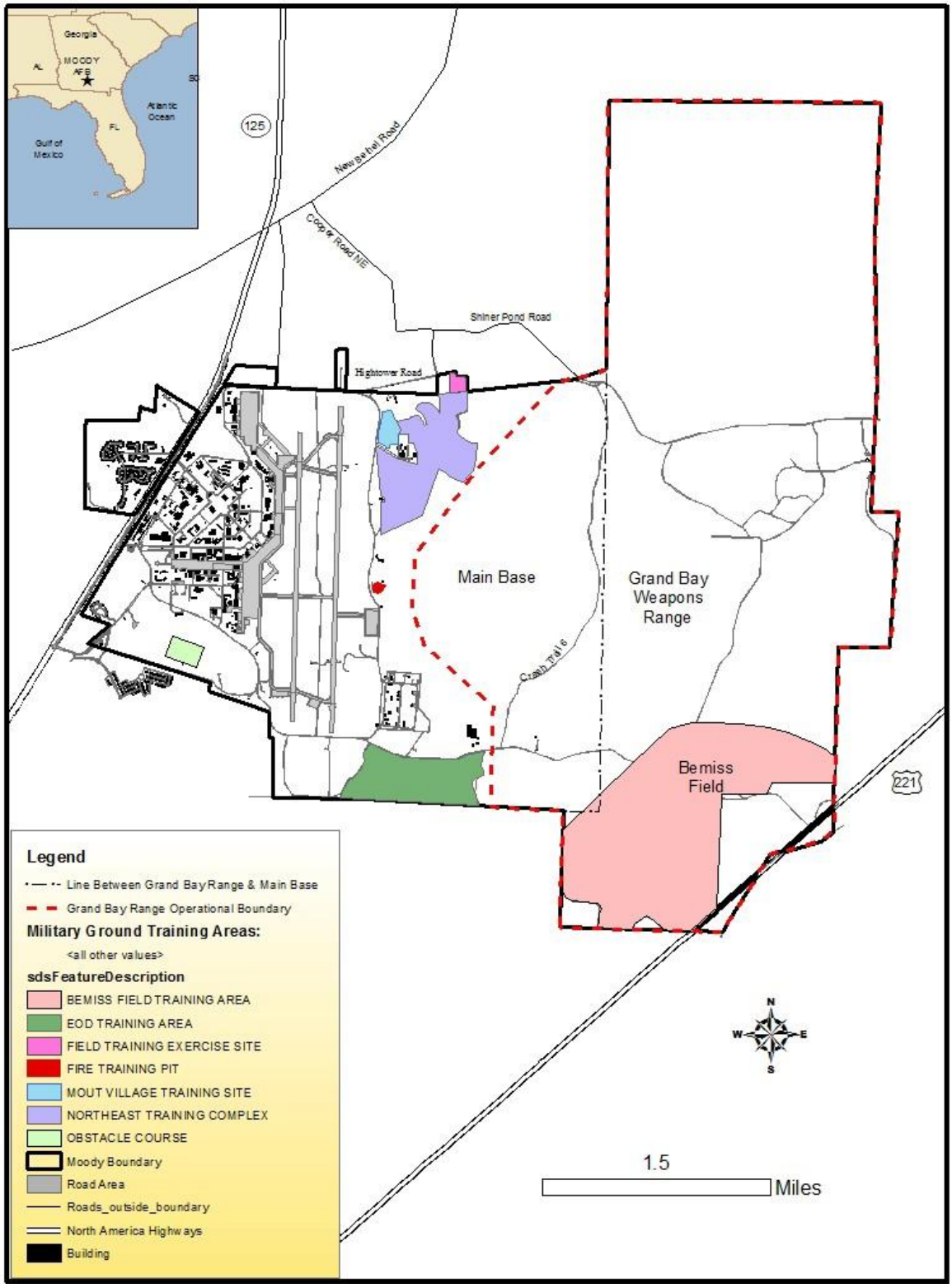
Moody AFB is divided into four major ground management units based on the scope and intensity of management: improved grounds, semi-improved grounds, unimproved grounds/open space, and aircraft operations and maintenance (Figure Ground Management Units, Moody AFB).

- *Improved grounds* are intensively managed, with turf maintained at less than 2 inches in height and extensive landscaping and planting or ornamentals and include all covered areas (under buildings, sidewalks, and so on) as well as land around base buildings and the family housing area. Improved lands encompass approximately 908 ac.
- *Semi-improved grounds* are less intensively managed, with turf maintained between 4 and 7 inches in height and more natural landscaping. Semi-improved grounds include the ±100-ac golf course/driving range complex, recreational ball fields, and the grounds in the vicinity of Mission Lake. Semi-improved lands account for approximately 1,092 ac.
- *Unimproved grounds* consist of military training areas and natural areas on the installation, such as wetlands, forests, and clearings within forested landscapes. The remaining 3,518 ac (64%) of the Main Base are classified as unimproved grounds and consist of commercial forest land and the 30-ac Mission Lake.
- *Airfield grounds* include the areas located immediately adjacent to the Moody AFB runways, taxiways, and other flightline assets. The majority of turf on the airfield is maintained at a height between 4 and 7 inches, although turf around airfield assets and structures is maintained below 2 inches in height.

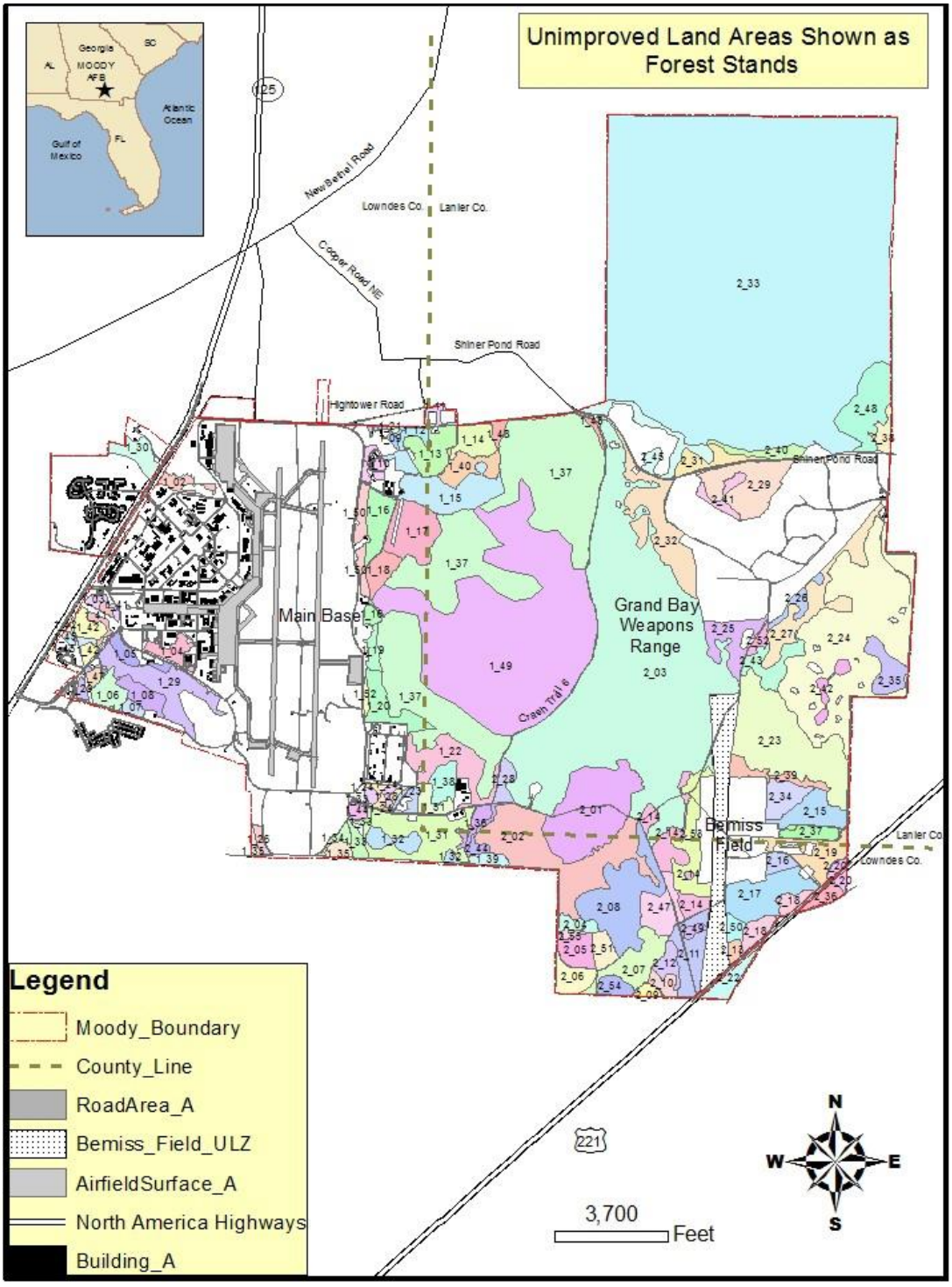
The Figure Ground Management Units (Page 52) shows the distribution of improved, semi-improved, unimproved, and aircraft operations and maintenance areas on the installation.

Management plans addressed in the INRMP are focused on the unimproved areas of the installation and do not include the management of improved grounds, including grass and landscape maintenance, which are addressed in other installation plans and documents. Management plans for the improved and semi-improved areas of the installation are located in the grounds maintenance contract, overseen by the Operations Flight of the 23 CES. Management of the improved areas within Quiet Pines Housing and Mission Point Housing is the responsibility of the privatized housing partner.

The current land classification number and the condition of each of these unimproved land management units is described in the Table Unimproved Ground Land Classification and Information and depicted in the Figure Unimproved Land Areas, Moody AFB. Stands that begin with "1" are located on Main Base. Stands that begin with "2" are located on Grand Bay Weapons Range. Each natural resources project or program projected for funding will utilize this land classification scheme to identify which areas of the installation are being targeted for management.



Ground Management Units, Moody AFB


Unimproved Land Areas Shown as Forest Stands
Georgia
SC
AL
MOODY AFB
Atlantic Ocean
Gulf of Mexico
FL
125
New Bethel Road
Lowndes Co.
Lanier Co.
Copper Road NE
Shiner Pond Road
Hightower Road
Main Base
Grand Bay Weapons Range
Green Trail 6
Bemiss Field
Lanier Co.
Lowndes Co.
221
N
W
E
S
3,700
Feet
Legend
Moody_Boundary
County_Line
RoadArea_A
Bemiss_Field_ULZ
AirfieldSurface_A
North America Highways
Building_A

Unimproved Ground Land Classification and Information

Stand Number	*Stand Age (2018)*	*Stand Acreage*	*Current Condition (2018)*
1-02	74	32.7	Loblolly pine and yellow poplar sawtimber
1-03	35	7.8	Slash and loblolly pine sawtimber
1-04	32	18.5	Scattered loblolly pine sawtimber with pine regeneration
1-05	84	14.9	Loblolly pine sawtimber and hardwood pulpwood
1-06	37	22.4	Scattered loblolly pine sawtimber with pine regeneration
1-07	10	6.5	Planted longleaf pine saplings with loblolly pine volunteers
1-08	41	22.5	Oak pulpwood, large live oaks, scattered slash pine sawtimber
1-09	47	6.2	Low quality loblolly pine sawtimber and chip-n-saw
1-10	78	13.2	Large live oaks, scattered pine sawtimber, hardwood pulpwood
1-11	44	8.2	Scattered loblolly pine sawtimber and pulpwood
1-12	unknown	9.9	Sweetgum – red maple forested wetland
1-13	50	40.5	Loblolly pine sawtimber
1-14	15	29.4	Longleaf pine and loblolly pine pulpwood
1-15	87	85.4	Mixed mature pine sawtimber with hardwood pulpwood
1-16	37	42.6	Loblolly pine chip-n-saw and sawtimber with hardwood saplings
1-17	74	59.3	Semi-open scattered slash , loblolly, and longleaf pine sawtimber
1-18	73	22.5	Low quality loblolly pine pulpwood and sawtimber
1-19	79	11.4	Large live oaks, water oaks, scattered loblolly pine
1-20	97	41.5	Mature slash and loblolly pine sawtimber
1-21	7	1.6	Planted longleaf pine seedlings with loblolly pine volunteers
1-22	84	66.7	Mixed pine sawtimber and chip-n-saw
1-23	4	9.7	Planted longleaf pine saplings
1-24	37	10.5	Scattered loblolly pine sawtimber and pulpwood
1-26	10	5.9	Young loblolly pine pulpwood
1-28	unknown	9.1	Pond cypress – swamp blackgum forested wetland
1-29	unknown	79.0	Hardwood pulpwood and sawtimber with scattered pine
1-30	unknown	24.7	Mature sweetgum, yellow poplar, loblolly sawtimber bottomland
1-31	75	88.7	Mixed slash, loblolly, longleaf pine sawtimber recently thinned
1-32	unknown	20.0	Swamp blackgum – pond cypress forested wetland
1-33	5	14.3	Young planted longleaf pine saplings
1-34	10	8.0	Young planted loblolly pine pulpwood
1-35	unknown	8.5	Pond cypress – swamp blackgum forested wetland
1-36	15	14.0	Planted longleaf pine pulpwood
1-37	unknown	618.7	Swamp blackgum – sweetbay forested wetland
1-38	unknown	21.5	Sweetgum – red maple – swamp blackgum semi-forested wetland
1-39	15	10.5	Planted longleaf pine pulpwood
1-40	88	26.7	Longleaf and slash pine sawtimber seed trees recently thinned
1-41	Unknown	8.1	Pond cypress – swamp blackgum forested wetland
1-42	Unknown	23.2	Slash pine sawtimber with hardwood pulpwood
1-44	15	6.4	Planted slash pine saplings with loblolly volunteers
1-45	Unknown	6.1	Nonmerchantable brush and small hardwoods
1-47	Unknown	5.4	Pond cypress forested wetland
1-48	Unknown	15.0	Mixed sawtimber with loblolly saplings planted on old bug spot
1-49	Unknown	658.7	Sweetbay – red bay – swamp blackgum wetland scattered pond pines
1-50	4	23.7	Planted longleaf seedlings mixed with loblolly pine volunteers
1-51	4	16.6	Clearcut with loblolly pine volunteers
1-52	1	4.0	Planted longleaf seedlings with loblolly pine volunteers and HW SMZ
2-01	74	152.2	Mature loblolly sawtimber, hardwood pulpwood, Dudley's Hammock
2-02	Unknown	163.9	Pond cypress - swamp blackgum forested wetland
2-03	Unknown	939.3	Pond cypress - swamp blackgum forested wetland

Stand Number	*Stand Age (2018)*	*Stand Acreage*	*Current Condition (2018)*
2-04	9	11.9	Planted longleaf saplings
2-05	10	26	Planted longleaf saplings
2-06	Unknown	20.7	Sweetbay - swamp blackgum – pond cypress forested wetland
2-07	70	55.7	Mature slash pine and longleaf pine sawtimber
2-08	81	165.5	Mature slash pine, loblolly, longleaf pine sawtimber
2-09	Unknown	6.8	Slash pine - red maple - sweetbay forested wetland
2-10	0	11.8	Young planted longleaf pine seedlings, Low quality slash pine sawtimber
2-11	48	48.8	Thinned slash, loblolly pine sawtimber and chip-n-saw
2-12	Unknown	16.0	Sweetbay – swamp blackgum – red bay forested wetland
2-13	Unknown	6.2	Swamp blackgum – pond cypress – slash pine forested wetland
2-14	44	55.0	Recently thinned slash pine sawtimber
2-15	74	40.6	Mature slash pine sawtimber
2-16	45	20.7	Recently thinned slash and loblolly pine sawtimber
2-17	54	67.9	Recently thinned slash and loblolly pine sawtimber with oaks
2-18	23	28.0	Planted slash pine pulpwood
2-19	71	40.7	Mixed slash, loblolly pine sawtimber and hardwood pulpwood
2-20	Unknown	9.3	Slash pine sawtimber and swamp blackgum forested wetland
2-22	17	21.6	Planted longleaf pine pulpwood with small hardwood wetland
2-23	Unknown	184.3	Swamp blackgum – pond cypress forested wetland
2-24	73	370.7	Longleaf –slash – loblolly pine sawtimber and oak pulpwood
2-25	47	42.6	Bullet ridden slash and loblolly pines
2-26	76	14.3	Mature slash pine and pond pine sawtimber possible bullets
2-27	Unknown	73.9	Pond cypress – swamp blackgum forested wetland
2-28	10	15.8	Young planted longleaf pine and loblolly pine saplings
2-29	67	77.3	Mature slash pine sawtimber some bullet contaminated
2-31	37	25.6	Slash pine sawtimber and pulpwood
2-32	50	98.9	Thinned slash pine sawtimber some bullet contaminated
2-33	Unknown	2,161.8	Scrub – shrub-bay swamp, with scattered pines
2-34	7	29.5	Young longleaf pine plantation with scattered residual live oaks
2-35	Unknown	31.5	Pond cypress – swamp blackgum
2-36	17	13.2	Planted longleaf pine pulpwood with loblolly volunteers
2-37	Unknown	18.8	Low quality loblolly pine saplings and pulpwood west half thinned
2-38	Unknown	13.2	Slash pine, pond pine, loblolly pine recently heavily cutover
2-39	75	22.1	Mature slash-loblolly-pond pine forested wetland
2-40	Unknown	19.5	Sweetbay – swamp blackgum – pond cypress forested wetland
2-41	Unknown	15.9	Pond cypress – swamp blackgum forested wetland
2-42	Unknown	13.1	Pond cypress – swamp blackgum forested wetland
2-43	Unknown	33.7	Sweetbay – swamp blackgum – red bay forested wetland
2-44	Unknown	11.3	Slash pine and loblolly pine sawtimber
2-45	Unknown	42.9	Pond cypress – swamp blackgum forested wetland
2-47	Unknown	40.9	Recently thinned mature longleaf and slash pine sawtimber
2-48	Unknown	72.5	Swamp blackgum – red maple – pond cypress forested wetland
2-49	Unknown	5.0	Oak – maple sawtimber and pulpwood
2-50	44	9.5	Low quality loblolly pine pulpwood and sawtimber
2-51	4	19.0	Young planted longleaf pine around cypress - swamp blackgum wetland
2-52	5	7.5	Young planted longleaf saplings
2-53	14	55.2	Planted longleaf pine and loblolly pine volunteers saplings, pulpwood
2-54	0	14.5	Young planted longleaf seedlings
2-55	5	3.6	Young planted longleaf saplings

Military Impacts on Moody AFB

Moody AFB, including both the Main Base and Grand Bay Weapons Range, has been used by the military for various training activities since its acquisition in May 1941. It should be noted that the overall military mission, military training activities, and any restrictions on training on the installation are directed and authorized by DoD and USAF. Since the INRMP does not direct or mandate military training activities or restrictions, the descriptions below are made for informational purposes only.

When the Air Force acquired ownership of Moody AFB in 1941, it immediately began development of infrastructure necessary to support the military mission of the installation at that time. The majority of this development was concentrated on the Main Base, and included the creation of an airstrip, supporting facilities, and military housing areas. During this time, Mission Lake was created by damming a perennial unnamed stream flowing from the west onto Moody AFB.

An auxiliary airstrip, known as Bemiss Field, was created for additional training activities east of the Carolina Bay wetland complex near the Lakeland Highway. A series of emergency access crash trails was built to support military operations on the installation. These crash trails are maintained and utilized by installation personnel at the present time as access roads to various parts of the installation. The presence of this extensive crash trail network may serve as a migration barrier for some wildlife species, most notably amphibians and smaller reptiles and mammals. Additionally, the edge created by these crash trails may contribute to increased predation on nesting songbirds.

In 1967, the eastern half of the installation, including Bemiss Field, was declared excess and transferred to the USFS. This property was reacquired by the Air Force in 1986, when Grand Bay Weapons Range, the 5,874-ac air-to-ground gunnery and bombing range, was developed. Over the years, as the military mission has been modified and as installation needs have changed, other buildings and facilities have been built on the Main Base, most notably a Control Tower, firefighter training area, munitions area, recycling center, and security forces compound, all located on the east side of the airfield. Other facilities have been abandoned or converted to other uses. The historic auxiliary airstrip at Bemiss Field was converted into an unimproved landing zone (ULZ), primarily for C-130J training. Additionally, the airstrip is used as a helicopter landing zone and as a DZ for pararescuemen and heavy equipment.

The majority of installation military training activities are concentrated in five main areas: Moody AFB airfield (Main Base), security forces and rescue squadron training areas (Main Base), Grand Bay Weapons Range impact area (Grand Bay Weapons Range), Bemiss Field (Grand Bay Weapons Range), and the EOD range (Grand Bay Weapons Range). It should be noted that the operational boundary, which includes safety footprints for various weapon delivery systems, encompasses approximately 7,300 ac and includes the entire Grand Bay Weapons Range area and extends into Moody Bay when the range is in use (see figures Main Base and Grand Bay Weapons Range and Military Training Areas, Moody AFB). The Moody AFB airfield consists of two parallel runways oriented north to south. All aircraft operations at Moody AFB originate and terminate at this location. The airfield is primarily comprised of Bahia grass. However, because of construction and maintenance activities on the airfield, broad-leaved weeds, including verbena, vetches, and clovers, have become established. The overall management plan for the airfield calls for a monotypic grass groundcover maintained at the target height of 7-14 inches to minimize the presence of wildlife, primarily flocking birds and small mammals, on the airfield. Management of the airfield environment consists of periodic mowings and herbicide treatments by the grounds maintenance personnel and prescribed burning of the grass to remove thatch. On occasion, insecticides are sprayed on the airfield

to reduce insect numbers in an effort to reduce the attractiveness of the airfield to cattle egrets and other insectivorous birds.

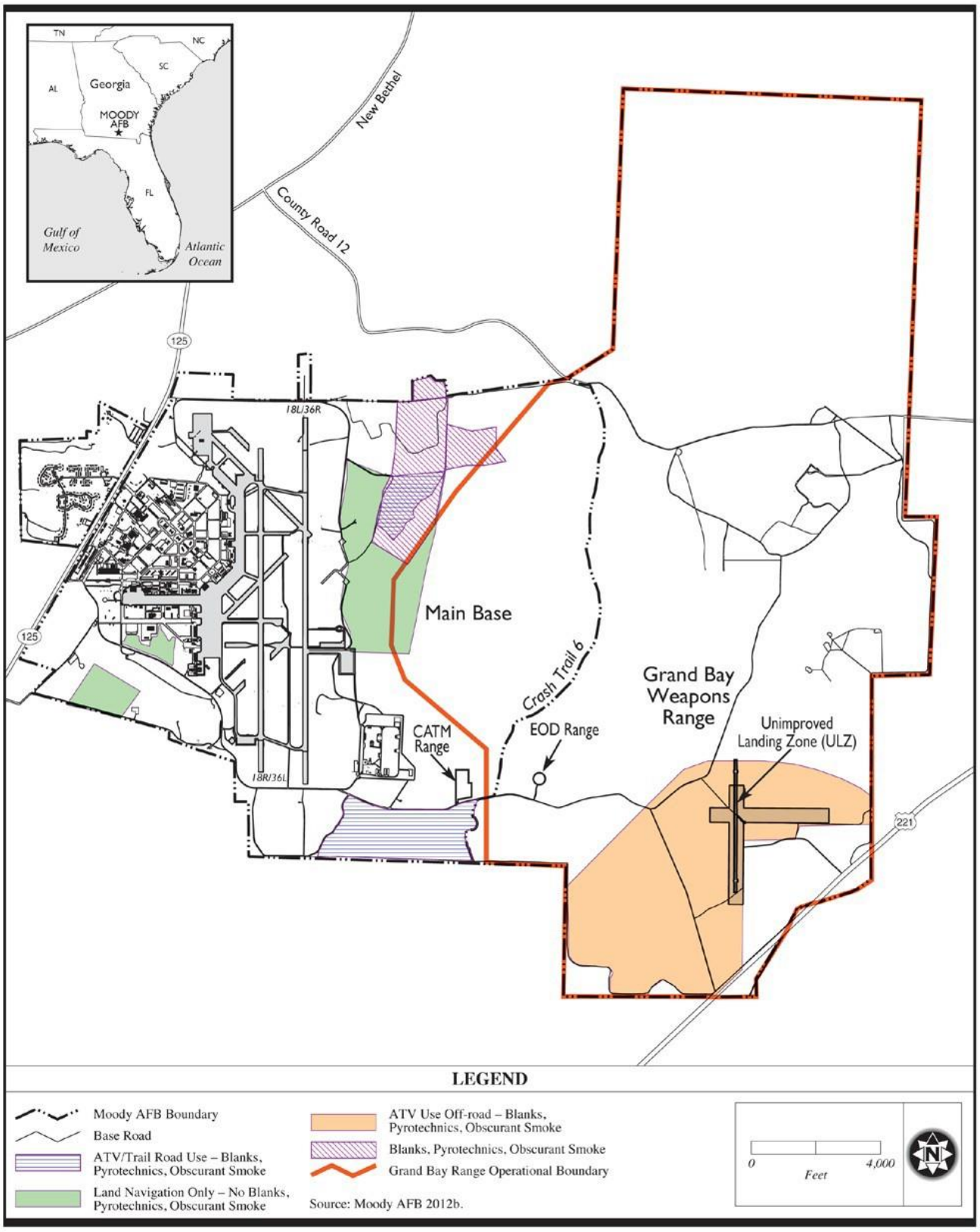
Forests throughout the Main Base are utilized by security forces and rescue squadron personnel as field training areas, and management of the forests is directed for the continued use and enhancement of these areas. Training in these areas typically consist of personnel movements in force-on- force training, land navigation, station training, air base defense training, pilot survival, and pilot rescue military operations. As part of the mission requirements, concurrence to conduct ground disturbance in the training area south of the Combat Arms Training Maintenance (CATM) Range, has been obtained from Moody AFB senior leaders and regulatory agencies (e.g. USFWS and State Historic Preservation Officer [SHPO]). The use of blank ammunition and pyrotechnics has been authorized by the installation senior leaders in all training areas east of the airfield where noise impacts do not affect off-base residences. Additionally, personnel utilize military wheeled vehicles and all-terrain vehicles (ATVs) on established roads and trails within these training areas.

Grand Bay Weapons Range, with its 450-ac impact area and associated footprints (see figure Main Base and Grand Bay Weapons Range) is primarily an air-to-surface range and is utilized by aircraft for simulated bombing and strafing activities. The Range is maintained by the range contractor, with overall oversight and management by the Range Manager 23 OSS/OSKR. Activities on the range, outside of aircraft operations, include maintenance of the area in an overall low vegetative state by harrowing (disking), mowing, and burning. Inaccessible areas are maintained by herbicide treatment and/or by prescribed burning. Only those areas essential for a clear line-of-sight are maintained in this stage. Two forest stands located between the flank tower and the strafe beds -- Stands 2-29 and 2-41, comprising 64 and 17 ac, respectively -- (see Figure: Unimproved Land Areas, Moody AFB, Page 53) are managed by the Moody AFB Installation Management Flight, Environmental Element through prescribed burning. These stands are not part of the commercial forestry program for Moody AFB because of residual metal contamination from past range activities.

Bemiss Field is used as an ULZ for C-130J training. Additionally, the airstrip and the surrounding area are used for a variety of military operations, including security forces training, C-130 DZ, pararescuemen DZ, and helicopter landing/hovering areas. None of these military actions involves ground disturbance. Vehicle use is primarily restricted to existing roads and trails. However, ATVs are authorized for off-road use in upland areas only (Figure: Military Training Areas, Page 58) and with a 50-ft buffer around gopher tortoise burrows.

The EOD Range is located west of Dudley's Hammock on a fill-area in Rat Bay (Figure: Military Training Areas, Page 58). This facility is used for two purposes: to conduct training of EOD personnel in the safe detonation of ordnance and for the disposal of unexploded ordnance from military operations, including those from the Grand Bay Weapons Range impact area. All activities on this facility are concentrated on the actual one-acre range. Detonations occur in specially designed bunkers, and no ground disturbance is associated with EOD activities on the site.

Occasionally, embers or debris from an EOD detonation or other range activities may ignite a wildfire, which is either extinguished by the Moody AFB wildland firefighters or allowed to burn out naturally. Wildfires rarely occur on Grand Bay Weapons Range, and when they do, they are typically of low intensity and are confined to the grassy areas adjacent to the range targets with no impacts on natural resources. Because of the surrounding wetlands and the low fuel conditions in the uplands adjacent to the EOD Range, wildfire impacts to natural resources are minimal and are considered to be a mimic of historic ecosystem processes.



Military Training Areas, Moody AFB

Aircraft Operations in Moody AFB Airspace

Moody AFB has two parallel runways oriented north-south. On either end of these runways, CZs have been delineated, extending 3,000 ft beyond the runway thresholds. The CZs indicate those areas where the probability of aircraft accidents is the highest. The south CZ at Moody AFB is within the installation boundaries and is open space with no incompatible activities. The north CZ extends slightly beyond the base boundary. Because most of the north CZ is under agricultural use, agreements have been entered into between the Air Force and the private landowners concerning the types of crops that will be grown, and restrictions are in place that ensure no structures will be erected.

Immediately beyond the CZs are accident potential zones (APZ) I and II, which extend for an additional 5,000 and 7,000 ft, respectively. The Barretts community lays partially within the northern APZ I. Just north of the installation boundary, within APZ I and APZ II, are several small clusters of mobile homes. St. John's Church is located to the north in APZ II. Immediately to the south of the installation are vast undeveloped wetland areas owned and managed by the Georgia DNR; these areas are part of the Grand Bay WMA and are used for public recreational activities. Four structures are located within the southern APZ I, all within the boundaries of Grand Bay WMA. These consist of the Grand Bay fire tower, the Grand Bay Wetland Education Center, the restroom adjacent to the education center, and the Grand Bay WMA Check Station. None of these facilities serve as a residence, and they are occupied primarily during daylight hours during the week. There are only a few isolated dwellings and St. Antioch Church in the southern APZ II. In general, there is little development in the surrounding areas, and encroachment is not considered a problem.

Any new land use or development in the vicinity of the base is reviewed by the Lowndes County Planning Commission, which includes a Moody AFB representative. Although Lanier County has a commission form of local government, the county has not yet adopted official zoning regulations or plans. All proposed changes and activities at Moody AFB are presented to the respective county commissions and appropriate federal and state agencies for review and comment prior to implementation in accordance with the provisions of the National Environmental Policy Act (NEPA) and the Air Force Environmental Impact Analysis Process (EIAP).

2.4.3 Current Major Impacts

Aircraft Operations in Low-level Routes

Moody AFB aircraft generally use southern Georgia and northern Florida as their primary low-level flying area. A BASH potential exists in this area because of the presence of resident and migratory birds and other wildlife species (i.e., bats, white-tailed deer, alligators, coyotes, foxes) in and around the airfield environment and in the Moody AFB operational airspace. The two most hazardous groups of birds with the potential to affect Moody AFB aircraft are raptors (hawks, black vultures, turkey vultures) and sandhill cranes. During the past 10 fiscal years, Moody AFB aircraft have been involved in an average of 93 wildlife (birds and bats) strikes annually, with a range from 48 to 137 strikes (USDA Wildlife Services 2012). Refer to Section Bird/Wildlife Aircraft Strike Hazard for a detailed discussion of the BASH program at Moody AFB.

Hazardous Waste

Moody AFB is a large-quantity generator of hazardous waste operating under the U.S. Environmental Protection Agency (USEPA) identification number GA-0570024109. Hazardous wastes generated at the facility primarily emanate from the maintenance and operation of military aircraft. Typical hazardous

wastes include waste paint, contaminated rags, and degreasers. Many wastes generated at the facility are recycled through various means. Batteries, including lead acid, nickel/cadmium (NiCad), and mercury batteries, are shipped to off-base private facilities for recycling. Other waste, including used oils, contaminated aircraft fuels, and diesel fuel, are also shipped to off-base private facilities for recycling. Aircraft fuel removed from planes during maintenance is returned to bulk fuels to be examined by fuels personnel. If deemed acceptable, these fuels are reused by aircraft.

Hazardous wastes are collected in 55-gallon metal drums or other suitable containers at numerous satellite accumulation points located throughout the base. These areas are managed by designated Satellite Accumulation Point Managers. Currently, Moody AFB has one 90-day Central Accumulation Point which is operated and managed by a private contractor. The Satellite Accumulation Point Managers contact our Hazardous Material Pharmacy (HAZMART) contractor for on-site waste pickup. HAZMART also operates a material exchange program that allows usable materials to be reissued and reused rather than being disposed.

In the past, Moody AFB engaged in a variety of activities that may have resulted in the release of hazardous materials. These activities included fuel storage and disposal, dichlorodiphenyl-trichloroethane (DDT) disposal, explosive ordnance disposal, fire-training exercises, and landfill operations. In light of these historic activities, an Environmental Restoration Program (ERP) was initiated at the base. Moody AFB implemented this program to comply with applicable laws and regulations and to ensure that present and future management practices at Moody AFB will protect human health and the environment.

Industrial Activities

Industrial operations at Moody AFB are traditionally associated with maintenance of aircraft engines, hydraulic systems, wheels and tires, aerospace ground equipment, and corrosion control. These operations historically generated from 25,000 to 50,000 gallons of waste oils, fuels, solvents, and cleaners annually. Industrial activities at Moody AFB can be grouped into four general categories: aircraft and flight line maintenance; munitions maintenance; facility and transportation maintenance; and petroleum, oils, and lubricants (POL) operations. Each of these operations is performed at various locations throughout the base.

The major sources of air emissions at Moody AFB are related to aircraft and vehicle operations. There are eight permitted categories of sources: boilers and heaters, diesel-burning generators, aircraft engine hush houses and testing operations, general chemical use, solvent degreasing operations, surface coating operations, fuel dispensing and loading operations, and miscellaneous activities (abrasive blasting, equipment leaks, wastewater treatment plant, etc.). Moody AFB is located in an air quality attainment area.

Wastewater

Moody AFB discharges its domestic and industrial wastewater to an on-site wastewater facility located in the northwest corner of the base, west of Georgia State Highway 125. The wastewater treatment plant is a conventional biological treatment facility. The wastewater is treated using trickling bed filters, clarifiers, and final chlorination before discharge of the treated water to Beatty Creek. The effluent is discharged under the state of Georgia National Pollutant Discharge Elimination System (NPDES) permit number GA0020001. The sludge generated during wastewater treatment is anaerobically digested and is dewatered in drying beds at the wastewater treatment facility. Approximately 120 cubic yards of dried sludge are disposed of annually at the county landfill after undergoing the required analyses for toxic metals. Industrial wastewater comprises approximately 5% of the total flow to the wastewater treatment facility. This consists of boiler blowdown and water discharged from the oil/water separators located near the aircraft and vehicle maintenance facilities and the base fire department.

Noise

Noise is one of the most common environmental issues associated with aircraft operations. The measurement and human perception of sound involves two basic physical characteristics: intensity and frequency or pitch. Intensity is a measure of the acoustic energy of the sound vibrations and is expressed in terms of sound pressure. The higher the sound pressure, the more energy carried by the sound and the louder the perception of that sound. Frequency is the number of times per second the air vibrates or oscillates. Low-frequency sounds are characterized as rumbles or roars, while high-frequency sounds are typified by sirens or screeches. Noise is represented using a logarithmic unit known as the decibel (dB). A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of about 60 dB. Sound levels above about 120 dB begin to be felt inside the human ear as discomfort and eventually pain at still higher levels. Most noise studies utilize "A-weighted sound levels", denoted as dBA, that de-emphasize the higher and lower frequencies to which humans are less sensitive. The A-weighting of decibel levels is closely related to human hearing characteristics and is of more value when assessing potential noise effects on humans.

Moody AFB has only one significant noise source – its aircraft. An air installation compatible use zone (AICUZ) study was completed on Moody AFB in 1994. A new AICUZ study was completed to address safety issues and identify hazard potential due to aircraft accidents and obstructions to navigation and compatible land uses based on exposure levels to aircraft noise in the surrounding area. Additional noise studies have been conducted as part of the environmental documentation of several mission changes, including the drawdown of the A-10s and F-16s and the beddown of the T-6 Texan Trainer and the T-38 aircraft. Most recently, noise studies were accomplished for the beddown of the A-29 trainer aircraft.

Noise exposure levels above 65 dBA extend approximately 1.75 miles north and south of the installation boundaries. No concentrations of homes fall with in this limit. The base family housing area experiences levels between 70 and 75 dBA. A few isolated dwellings to the west and south of the base may experience noise levels between 65 to 75 dBA. The base has a written protocol for handling occasional noise complaints. Agricultural and recreational activity in the area is considered a compatible use with these noise exposures.

Pesticide Management

Moody AFB has prepared a Pest Management Plan (PMP) to implement an active pest management program to control rodents, insects, weeds, and fungi on the base property. The PMP has been integrated with the INRMP to ensure that fish and wildlife species and sensitive ecological areas are not impacted by pest management activities. The majority of pest management actions occur within the developed areas of Moody AFB where fish and wildlife resources are not present. If pest management actions are proposed outside of this area, or if the action involves nuisance wildlife species, the Installation Management Flight, Environmental Element is consulted prior to implementation.

The 23 CES entomology office administers the program for the majority of the installation, including GPRA. However, wildlife damage complaints and nuisance calls are generally handled by the Environmental Element in coordination with the Pest Management Section of the Operations Flight, 23 CES. Most complaints are seasonal calls related to the presence of nuisance snakes and alligators.

Personnel with Force Support Squadron (FSS) oversee the pest management activities at the base golf course. Both the on-site contractor and FSS have state-certified pesticide applicators. The chemicals are stored and mixed at the entomology facility and at the golf course pesticide storage facility and are regularly inspected by Environmental Element personnel.

2.4.4 Potential Future Impacts

The only potential future project identified in the Installation Development Plan (IDP) with the potential to impact natural resources is the relocation of the CE Field Training Exercise (FTX) location. Currently, the FTX site is located north of the Eisemann Road, immediately adjacent to the base boundary. The proposed action consists of moving the CE FTX site across Eisemann Road south of the current location to move it farther away from off-base residences.

2.4.5 Natural Resources Needed to Support the Military Mission

Because of changes in the warfare operating environment, military training on Air Force installations includes more than air training. The modern operating environment requires airmen to be competent in engaging in warfare in ground areas as well, whether that is defending and protecting remote airfields or convoys on the battlefield. As a result of these changes, Moody AFB has seen an increase in field training activities by security forces and other installation units.

In order to effectively train airmen, whether for ground or air combat, a diversity of realistic training areas are required by the Air Force. Areas for field training require adequate vegetation for cover and concealment and must be readily accessible by military units. At Moody AFB, upland forests are managed to maintain a mosaic of training areas, from forests with a low basal area with wide spacing of trees and little mid-story to early successional areas planted with native vegetation. Wetland areas are managed to ensure accessibility, and roads and trails are sited on suitable soils through these areas to minimize degradation by training activities. The Grand Bay Weapons Range impact area, Bemiss Field, and the Moody AFB airfield are managed to provide a bahia grass monoculture to minimize the potential for wildlife interactions with aircraft. Areas surrounding the airfield and the range are managed to provide aircrews the ability to fly over a variety of ecosystems, from forested ecosystems to open water.

3.0 ENVIRONMENTAL MANAGEMENT SYSTEM

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

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

4.0 GENERAL ROLES AND RESPONSIBILITIES

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

Office/Organization/Job Title (Listing is not in order of hierarchical responsibility)	**Installation Role/Responsibility Description**
Installation Commander	23 Wing Commander (23 WG/CC): approves major revisions of the INRMP and ensures that appropriate funding and staffing are available to implement the goals and objectives of the plan.
AFCEC Natural Resources Media Manager/Subject Matter Expert (SME)/ Subject Matter Specialist (SMS)	Responsible for Planning, Programming, Budgeting, and Execution of projects identified in the INRMP work plan.
Installation Natural Resources Manager/POC	Implements the INRMP and ensures the INRMP is reviewed and revised annually.
Installation Security Forces	Implements force protection for Moody AFB
Installation Unit Environmental Coordinators (UECs); see AFI 32-7001 for role description	Serve as liaisons between the Environmental Element and their respective units.
Installation Wildland Fire Program Manager	Serves as the installation liaison for the AFCEC Wildland Fire Center and provides installation support for implementation of the Moody AFB Wildland Fire Management Plan.
Pest Manager	Serves as the POC for all herbicide and pesticide applications on the installation and reviews all natural resources contracts involving the application of chemicals for natural resources activities.
Range Operating Agency	Oversees the management of Grand Bay Weapons Range and ensures natural resources management activities occur in support of the military mission.
Conservation Law Enforcement Officer (CLEO)	N/A
NEPA/Environmental Impact Analysis Process (EIAP) Manager	Ensures all actions identified in the INRMP have been evaluated per 32 CFR 989.
National Oceanic and Atmospheric Administration (NOAA)/ National Marine Fisheries Service (NMFS)	N/A
US Forest Service	N/A
US Fish and Wildlife Service	Regulatory agency that oversees the conservation of threatened and endangered species for the U.S. Serves as a partner in the development and implementation of the INRMP.
Bird Hazard Working Group	Under the direction and oversight of the Wing Safety Office (WG/SE), is responsible for the development and implementation of the BASH program on the installation. This includes the preparation of the Moody AFB BASH Plan and its integration with the INRMP.
ESOH Council	Chaired by the Moody AFB Wing Commander (WG/CC), is responsible for reviewing, approving, and monitoring all natural resources management activities undertaken in support of the INRMP.
Mission Support Group Commander (MSG/CC)	Reviews the INRMP and ensures the integration of natural resources management as implemented by the 23 CES with other squadrons under his command, including the FSS and

Office/Organization/Job Title (Listing is not in order of hierarchical responsibility)	**Installation Role/Responsibility Description**
	Security Forces (SFS). Approves the annual reviews of the INRMP in years 4 and 5 of the five-year cycle.
23 CES Commander (23 CES/CC)	Designated as the Performance Report Officer for natural resources management on Moody AFB, and ensures integration of natural resources management with other squadron activities, including fire protection, operations, and engineering. Approves the annual reviews of the INRMP in years 1-3 of the five-year cycle.
Moody AFB Installation Management Flight, Environmental Element	This office is ultimately responsible for the development and implementation of the INRMP. Representatives brief the Environmental, Safety, and Occupational Health (ESOH) Council on semi-annually concerning the current status of active and proposed natural resources activities, and serve as functional members of the Bird Hazard Working Group (BHWG).

5.0 TRAINING

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

Installation Supplement – Training

1. Environmental Element personnel retain currency on natural resources management issues through training at various conferences, online classes, and other resources.

6.0 RECORDKEEPING AND REPORTING

6.1 Recordkeeping

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

Installation Supplement – Recordkeeping

N/A

6.2 Reporting

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

Installation Supplement –Reporting

N/A

7.0 NATURAL RESOURCES PROGRAM MANAGEMENT

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

Installation Supplement –Natural Resources Program Management

Federal and State Fish and Wildlife Agencies

The primary objective of the Air Force Natural Resources Program is to ensure continued access to land and airspace required to accomplish the Air Force mission by maintaining these resources in a healthy condition. Section 101(a) of the Sikes Act Improvement Act "requires" that the INRMP shall reflect the "mutual agreement" of the USFWS and appropriate state fish and wildlife agency "concerning conservation, protection, and management of fish and wildlife resources." In accordance with DoD and Air Force policy (DoDI 4715.03, *Natural Resources Conservation Program*; Air Force [2011]), each DoD installation shall establish and maintain regular communications with the appropriate USFWS and state fish and wildlife agency offices to address issues concerning natural resources management that are not addressed in the INRMP. At a minimum, this shall include annual coordination with all cooperating offices. Each DoD installation shall invite the USFWS and state fish and wildlife agency to participate cooperatively in the scoping, design, and preparation of the INRMP. This will serve to inform these offices about the DoD mission, invite them to consider solutions to difficult resource management problems, and expedite final INRMP coordination. Each DoD installation shall advise all appropriate internal and external stakeholders of the intent to prepare or revise an INRMP within 30 days of starting such an action. When providing this notification to USFWS and state fish and wildlife agencies, each DoD installation shall concurrently request the USFWS and state fish and wildlife agencies to participate in the development or revision of the INRMP. Each DoD installation shall notify appropriate USFWS and State fish and wildlife offices of its intent to provide a draft INRMP for review and coordination at least 60 days prior to delivering such document. For the USFWS, the appropriate office for initial contact by installations, for development and review of INRMPs, will be a field office. Pursuant to current USFWS Sikes Act Guidance, a field office must review the INRMP and provide preliminary agreement concerning the conservation, protection and management of fish and wildlife resources detailed in the INRMP prior to review in the regional office and final action by a Regional Director.

To ensure that natural resources management and other mission activities at Moody AFB are integrated and in agreement with federal mandates, this INRMP has been prepared in cooperation with the USFWS, Georgia DNR, and other pertinent groups and agencies. Moody AFB maintains communication with these groups and agencies throughout the year as necessary to collaborate on management decisions.

7.1 Fish and Wildlife Management

Applicability Statement

This section applies to all AF installations that maintain an INRMP. This section IS applicable to Moody AFB

Program Overview/Current Management Practices

Deliberate management of wildlife populations is necessary to sustain and enhance biological diversity and the viability of wildlife populations and to maximize the compatibility of wildlife and human activities. The fish and wildlife management component of this INRMP is primarily focused on the management and conservation of game fish and wildlife. However, this component also includes the management of non-game and non-RTE species, such as neotropical migratory birds, furbearers, predators, etc.

The Moody AFB Installation Management Flight, Environmental Element is a member of the BHWG, which oversees the implementation of the BASH Program at Moody AFB. Moody AFB has contracted BASH management to USDA Wildlife Services through the Wing Safety Office (23 WG/SE). For more information on the BASH program, see Section 7.12 Bird/Wildlife Aircraft Strike Hazard (BASH) and the Moody AFB Bird/Wildlife Aircraft Strike Hazard (BASH) Plan at Tab 2.

7.2 Outdoor Recreation and Public Access to Natural Resources

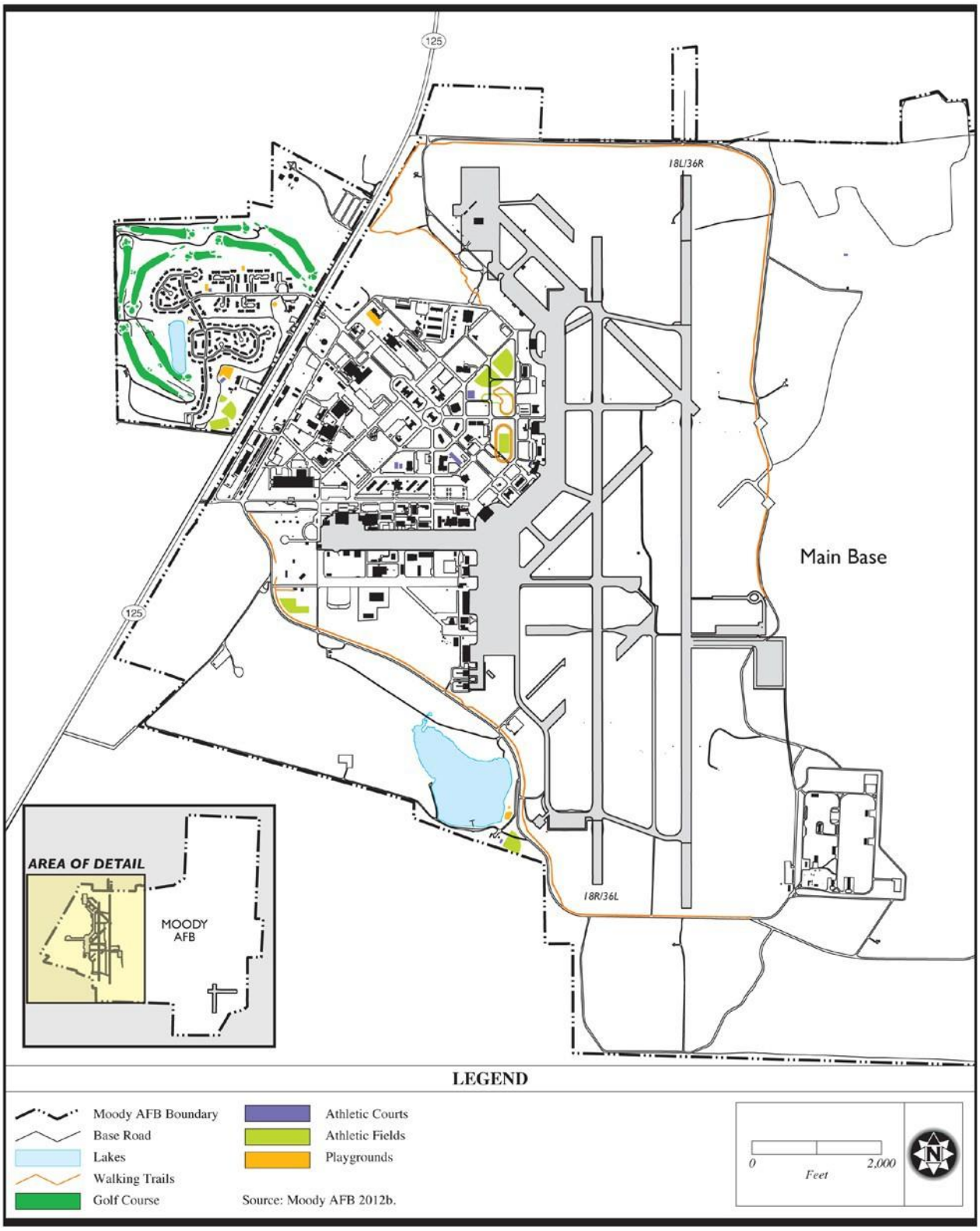
Applicability Statement

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

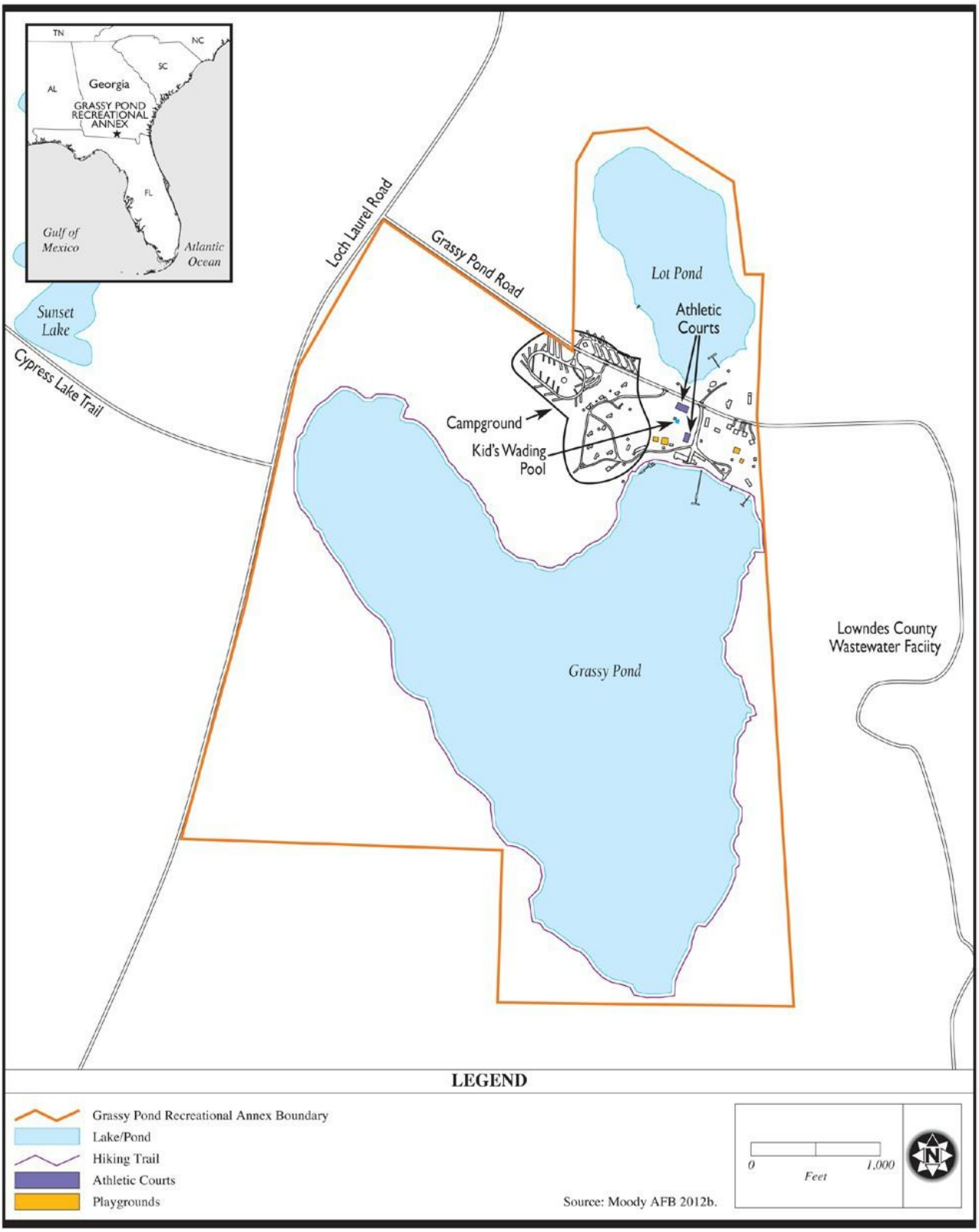
Program Overview/Current Management Practices

Outdoor recreation assets are developed and managed to provide outdoor recreational opportunities for installation personnel and the public, where applicable. Per AFI 32-7064, Moody AFB has classified areas suitable for outdoor recreation into three classes of use based on outdoor recreation potential and ecosystem sustainability: Class I, II, and III.

Class I recreation areas are developed recreation areas and include facilities designed to accommodate intensive recreational activities such as athletic fields and courts, picnic areas, paved walking and jogging trails, playgrounds, swimming pools, campgrounds, and the golf course. Class I recreation areas only occur on the Main Base of Moody AFB and at the GPRA and do not occur on the Grand Bay Weapons Range. Since these areas are managed and maintained by the FSS, they are not discussed or considered further in this INRMP. The Figure, Class I Outdoor Recreation Areas (Page 67) shows the location of Class I recreation areas on Main Base and the Figure, Class I Outdoor Recreation Areas, Grassy Pond Recreational Annex (Page 68) shows the location of Class I recreation areas at GPRA.



Class I Outdoor Recreation Areas, Moody AFB



Class I Outdoor Recreation Areas, Grassy Pond Recreational Annex

Class II recreation areas are areas that are suitable for dispersed recreational activities such as hunting, fishing, boating, hiking, and wildlife observation. Class II areas occur on both Main Base and Grand Bay Weapons Range at Moody AFB and at GPRA (see figures Class II and Class III Outdoor Recreation Areas, Moody AFB (Page 70) and Class II Outdoor Recreation Areas, Grassy Pond Recreational Annex (Page 71)). A discussion of hunting and fishing activities in these areas is found in this Section, and a discussion of other natural resources management activities in these areas is found in Section 7.4 Management of Threatened and Endangered Species, Species of Concern and Habitats and 7.8 Forest Management below.

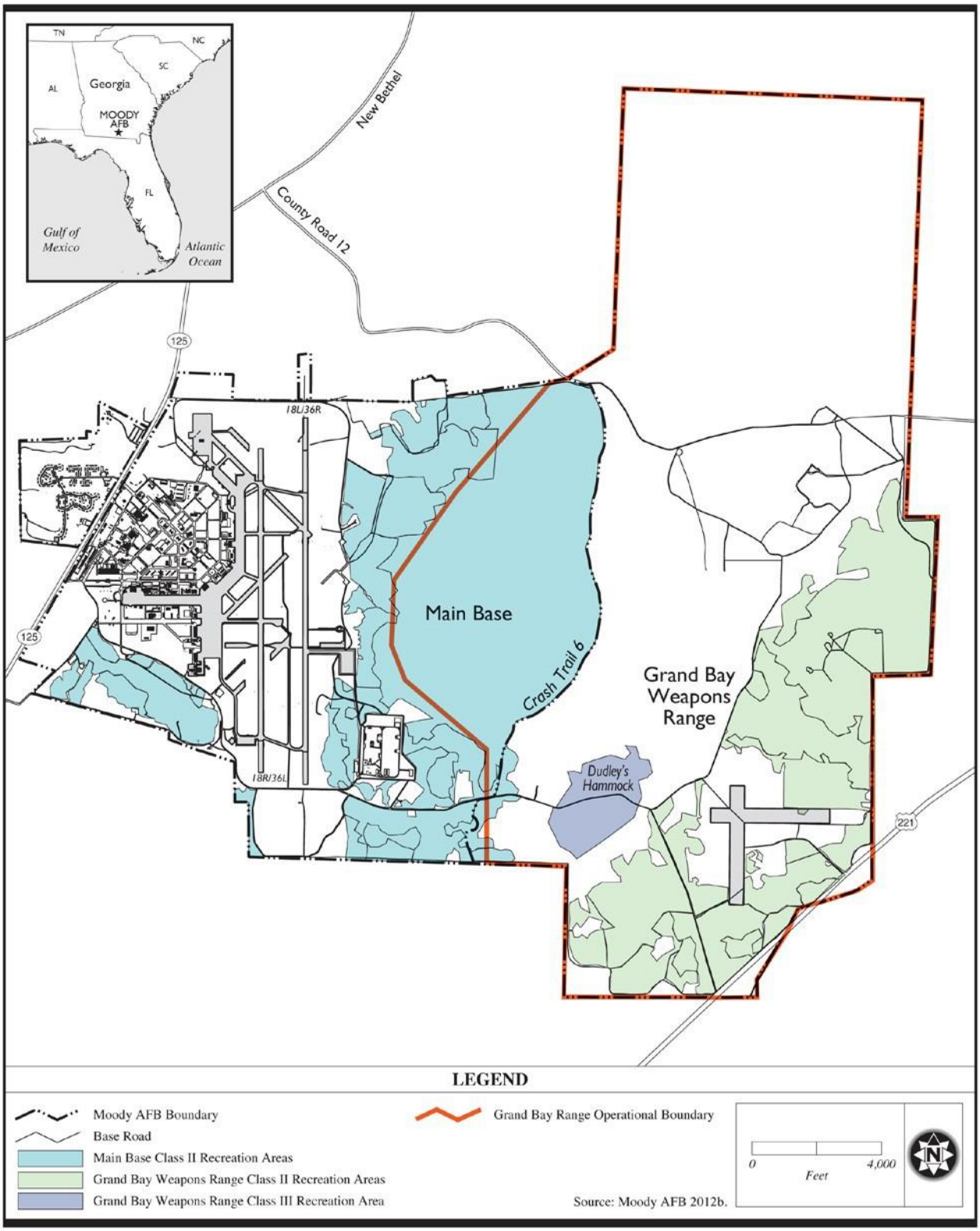
Boating is allowed at all of these installation impoundments, although engine size is limited at Mission Lake and Grassy Pond to prevent damage to the boat ramp. The use of powered boats is discouraged in the smaller impoundments (Shiner Pond, Lot Pond, and the Golf Course Pond) because of a lack of access and the small size of these areas. A launch fee is charged by the GPRA for powered boats at Grassy Pond to assist with maintenance of the boat ramp and other facilities on the lake.

The only designated hiking trail and wildlife observation area is located at GPRA. This 3.1 mile trail circles Grassy Pond and traverses a variety of natural habitats, from bottomland hardwoods to upland pine forests with periodic informational kiosks. This trail is managed and maintained by the FSS.

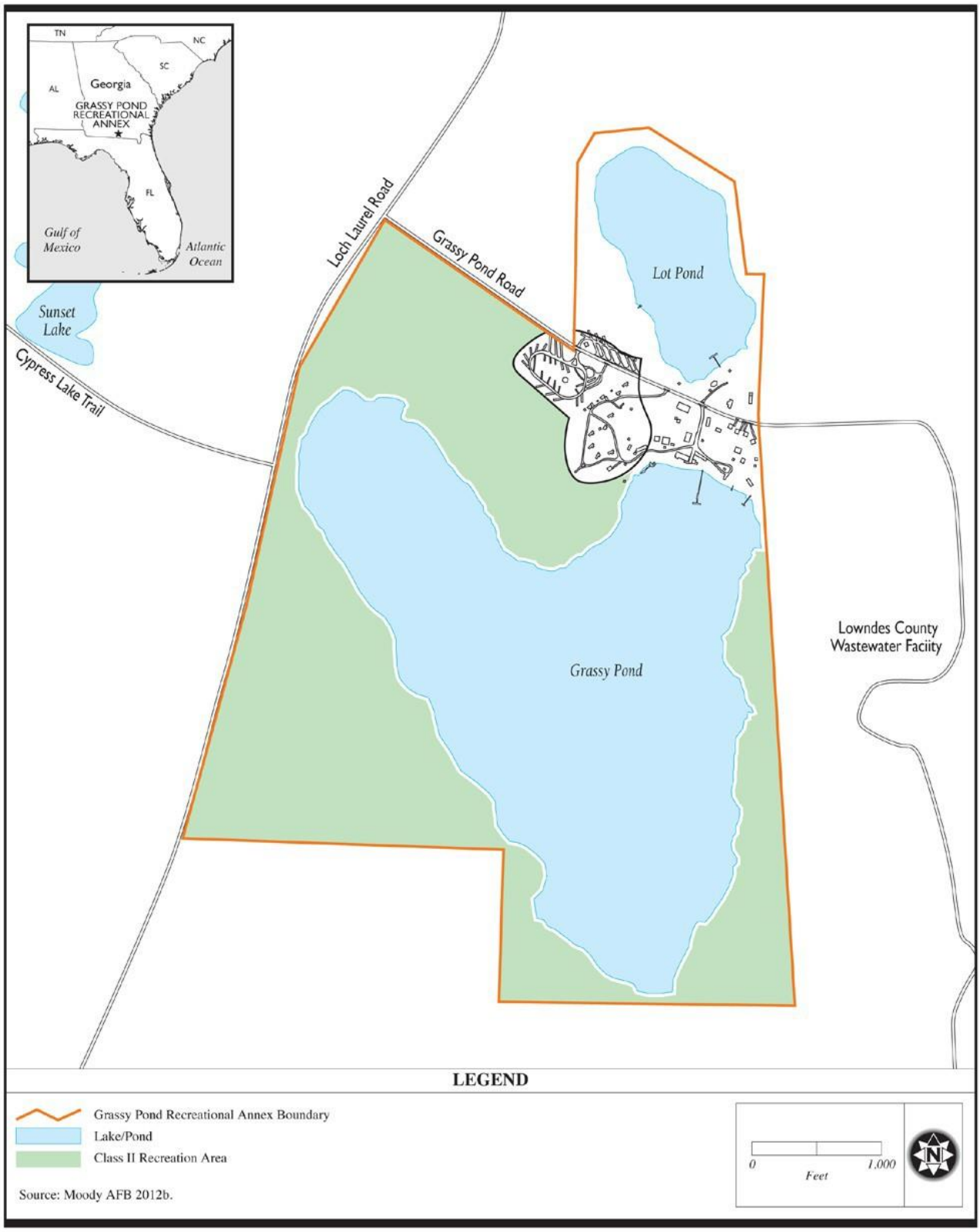
Class III recreation areas are areas that contain valuable archeological, botanical, ecological, geological, historic, zoological, scenic, or other features that warrant special protection and access control. There is only one Class III area classified at Moody AFB -- a small, but unique, natural area known as Dudley's Hammock. Dudley's Hammock occurs in the south-central portion of Moody AFB (see Figure Class II and Class III Outdoor Recreation Areas, Moody AFB (Page 70)). This hammock or "tree island" is a rare remnant of the mesic hardwood hammock community in South Georgia. This site contains the only extant populations on Moody AFB of a state-listed "unusual" plant species: green-fly orchid. Additionally, the federally and state-listed threatened eastern indigo snake has been occasionally sighted on Dudley's Hammock. This site has limited access, not because of its ecological significance, but because of its location within the boundaries of the Grand Bay Weapons Range and its proximity to the EOD range. Military personnel traverse the hammock enroute to field training areas on the main part of the Grand Bay Weapons Range and installation personnel are allowed to hunt in this area in accordance with the rules and regulations of the installation hunting program. Outside access is limited to scientific researchers and sponsored field trips by school groups and conservation groups.

Off-road vehicles are defined as any vehicle capable of traversing roadless areas, including four-wheeled drive passenger vehicles, motorcycles, and all-terrain three-wheeled or four-wheeled vehicles (e.g., ATVs, three-wheelers, four-wheelers). The use of off-road vehicles at Moody AFB is limited to authorized military use (including natural resources management activities) within areas approved by the wing leadership. Non-military uses by installation personnel or the general public are not authorized, and the Georgia State Hunting Regulations for the Grand Bay WMA specifically states that "No ATVs or motorcycles allowed on area."

The use of mountain bikes is permitted on established roads and trails on Main Base by installation personnel and on the Grand Bay Weapons Range by any users. There are no established mountain bike trails on the installation, and the FSS does not currently offer sponsored mountain biking expeditions on the installation.



Class II and Class III Outdoor Recreation Areas, Moody AFB



Class II Outdoor Recreation Areas, Grassy Pond Recreational Annex

Moody AFB allows hunting and fishing on the Main Base and fishing at the GPRA in accordance with installation regulations. Hunting and fishing on Main Base is restricted to those persons who are authorized access to the installation without an escort, and their dependents: active duty military, retired military, DoD civilian employees, and employees of installation prime contractors (defined as a contractor with at least a 5-year contract term). In addition to these, guests of authorized persons can also fish on Moody AFB. Grassy Pond is open to the public, so anyone with appropriate licenses can fish on Grassy Pond.

The hunting and fishing programs on the Main Base are managed by the Installation Management Flight, Environmental Element. Volunteers, known as hunt masters, assist the hunting program by managing hunter access, maintaining deer stands, and checking harvested game during managed hunts. Hunters and fishermen are required to purchase a Moody AFB Hunting and Fishing Permit, in addition to applicable state licenses, to participate in these activities on the Main Base and GPRA (fishing only). As of FY18, permits cost $10 for hunting only, $10 for fishing only, and $15 for hunting/fishing combination. Additionally, 2-week fishing permits are available for $7 and daily fishing permits are available for $2. Permits are primarily purchased through the iSportsman system online (https://moody.isportsman.net) as mandated by AFCEC, although Outdoor Recreation and Grassy Pond still have a few hard copy permits available for users who do not have online access. Proceeds from permit sales, less a $0.50 administrative fee charged by the Services Squadron for hard copy permits, are deposited into the Sikes Act Account (57X5095) for use in the Moody AFB Fish and Wildlife Management Program. Hunting on the Main Base is limited to white-tailed deer, eastern wild turkey, and small game in season, and is conducted only on weekends and down days. Approximately 75-100 days are available annually for hunting activities on the Main Base.

Public hunting and fishing opportunities are available on Grand Bay Weapons Range as part of the Grand Bay WMA. These activities on the USAF-owned portion of Grand Bay WMA are managed by the Georgia DNR under a license agreement. Persons entering the area are required to have a Georgia WMA stamp in addition to other applicable licenses. However, Moody AFB personnel with a valid Moody AFB Hunting and Fishing Permit are allowed to hunt or fish on Grand Bay WMA without purchasing a WMA stamp. Recreational facilities on the USAF-owned portion of Grand Bay WMA include a primitive campground with restroom facilities. Hunting on Grand Bay WMA is limited to white-tailed deer, eastern wild turkey, American alligator, and small game, and is only conducted on weekends when Grand Bay Weapons Range is not being used for military training. Approximately 56 days are available annually for hunting activities on Grand Bay WMA.

The Installation Management Flight, Environmental Element is the primary organization involved in the management of the installation impoundments (Grassy Pond, Lot Pond, Mission Lake, Quiet Pines Lake, Shiner Pond) for fishing. The Community Services Flight of the FSS is responsible for the development and continuation of additional recreational opportunities in these areas, most notably the rental of boats and fishing equipment. Because of the small income from the sale of hunting and fishing permits, fisheries management has historically been limited to the stocking of game fish and grass carp into the impoundments. Other aquatic resources management activities, such as aquatic weed control, have been accomplished through coordination and integration with other organizations and program areas. Fish population surveys are conducted for Mission Lake and Grassy Pond approximately every 5 years. Stocking of game fish is conducted as required based on periodic population analyses.

7.3 Conservation Law Enforcement

Applicability Statement

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

Program Overview/Current Management Practices

Moody AFB does not have an installation conservation law enforcement program. As part of the license agreement with the Georgia DNR, conservation law enforcement activities are conducted by Georgia DNR Conservation Rangers and the Grand Bay WMA Manager.

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

Applicability Statement

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

Program Overview/Current Management Practices

There are 10 RTE species located on Moody AFB (see Table RTE Species Identified on Moody AFB (Page 46)). Of these 10 species, two are federally listed as threatened: wood stork and eastern indigo snake. The gopher tortoise is currently a state-threatened species and a federal candidate species for listing under the ESA. Six species are state-listed threatened or endangered species: eastern indigo snake, gopher tortoise, southern hognose snake, wood stork, alligator snapping turtle, bald eagle, and round-tailed muskrat. The eastern indigo snake and gopher tortoise are the only RTE species that are actively managed because these species are most likely to be potentially affected by the military mission. There is no critical habitat as defined under the ESA located on the installation or at GRPA.

Moody AFB has completed installation-wide baseline surveys for RTE species (see Section 2.3.4, Threatened and Endangered Species and Species of Concern for detailed information on previous surveys). However, because of the dynamic nature of these species and changes in the listing status, additional surveys are conducted periodically to ensure Moody AFB is complying with the provisions of the ESA.

When actions occur in habitat for federally listed species, Moody AFB coordinates with the USFWS as required by Section 7 of the ESA. The majority of consultations at Moody AFB involve proposed military training and construction/demolition activities and their potential impact on gopher tortoise/indigo snake habitat.

Moody AFB has been involved in three formal consultations which resulted in BOs and ITSs. In 1996, the USFWS issued a BO and ITS for eastern indigo snakes for impacts related to the proposed construction and implementation of a C-130 heavy equipment DZ at Bemiss Field (FWS Log 4-4-96-457; USFWS 1996). The ITS for using Bemiss Field as a C-130 heavy equipment DZ does not expire until 2026. If construction or military training activities are proposed for the Bemiss Field area and are deemed to have the potential to adversely affect gopher tortoises or indigo snake populations, Moody AFB will consult with the USFWS to determine the need for reinitiation of consultation for these actions. Moody AFB is currently in compliance with the terms and conditions of the BO and ITS (USFWS 1996).

Two formal consultations were conducted for off-base training in the Gulf of Mexico. In December 1999, NMFS issued a BO and ITS for sea turtles in the Gulf of Mexico for impacts related to the creation and use of a Water Training Area (WTA) for CSAR training; this ITS expired in December 2009 (NMFS 1999). Moody AFB reinitiated formal consultation with NMFS prior to the expiration of this ITS. NMFS issued a BO in 2010 and the ITS was renewed for an additional 10-year period (Consultation Number F/SER/2009/02629; NMFS 2010).

Direct management of RTE species at Moody AFB is primarily directed towards the enhancement and maintenance of gopher tortoise habitat. Since gopher tortoises and their habitat are more easily identifiable than eastern indigo snakes and since these species are inextricably linked, it is assumed that management activities directed towards the improvement and enhancement of gopher tortoise habitat will benefit the eastern indigo snake and other RTE species commonly found in this habitat type.

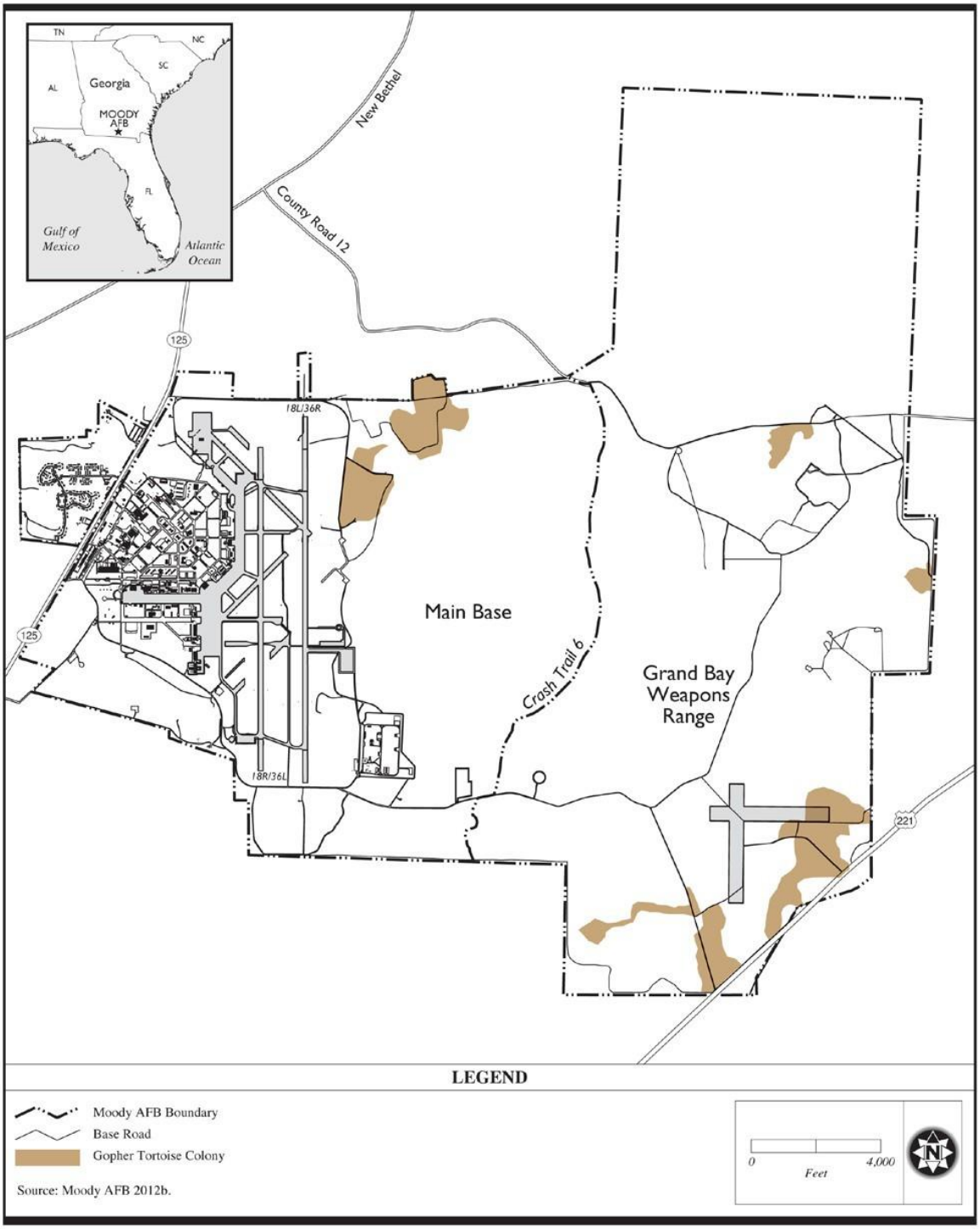
Gopher Tortoise and Indigo Snake Management

Potential gopher tortoise habitat was determined based on gap analysis using attributes in the GIS database, primarily soil type, land use, and forest stand type. Surveys were conducted in all suitable habitat to determine if tortoises were present in the area and to quantify the quality of the habitat. Based on this survey, specific management plans were developed for each area to enhance and improve the habitat for gopher tortoise populations. Generally, habitat management for gopher tortoises has included prescribed burning on a 2-3 year rotation, thinning of pine stands to open the canopy for increased herbaceous growth, and the removal of mid-story hardwoods and invasive vegetation.

Gopher tortoise populations have been monitored for the past 20 years. Pedestrian surveys of suitable habitat are conducted annually to identify new gopher tortoise burrows, and all burrows are marked in the field, measured, and the position collected with Global Positioning System (GPS) for incorporation into the installation GIS database. The activity status of each burrow is collected annually and is used for making tortoise population estimates. Gopher tortoises have been captured and marked with subcutaneous and external radio frequency identification (RFID) tags and movements are monitored via a set of continuous RFID readers placed on selected burrows in the largest gopher tortoise colonies. The Figure, Gopher Tortoise Colonies on Moody AFB and Grand Bay Weapons Range as of 2018 (Page 75), provides the current distribution of gopher tortoise colonies on Moody AFB and Grand Bay Weapons Range.

Surveillance for upper respiratory tract disease (URTD) began in 2000 and is scheduled to continue indefinitely pending funding by AFCEC. Upper respiratory tract disease is caused by a mycoplasma, and can potentially depress gopher tortoise populations and lead to tortoise fatalities. The gopher tortoise conservation community has concerns that the translocations of tortoises from URTD infected tortoise colonies may result in additional URTD-contaminated colonies. Data from this study is used to support relocations and translocations of gopher tortoises in support of military activities, including construction and military training.

Concurrent with gopher tortoise surveys, installation personnel conduct visual searches for eastern indigo snakes, including the examination of burrows for tortoises with burrow cameras and burrow entrance cameras and searches of burrow entrances for indigo snake skin sheds. All potential sightings of indigo snake skin sheds on the installation are reported to CEIE and the areas are immediately surveyed for indigo snakes by CEIE personnel.



Gopher Tortoise Colonies on Moody AFB and Grand Bay Weapons Range as of 2018

7.5 Water Resource Protection

Applicability Statement

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

Program Overview/Current Management Practices

Water resources include groundwater, streams, lakes, bays, bayous, sounds, and wetlands. Given the military mission of Moody AFB, there is a potential for non-point source pollution, in the form of sediment, nutrients, pesticides, oils, greases, and debris, which have the potential to enter the waters of Moody AFB as stormwater runoff. Industrial stormwater is managed under the Moody AFB Industrial Stormwater Permit, as administered by the Georgia EPD. Additionally, non-point source pollution is mitigated by implementing erosion and sedimentation control practices around construction sites in accordance with the Georgia Erosion and Sediment Control Act and the NPDES Phase II Stormwater regulations.

7.6 Wetland Protection

Applicability Statement

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

Program Overview/Current Management Practices

Management of wetlands and water resources at Moody AFB is primarily limited to identification and conservation. Wetland locations are maintained in the Moody AFB GIS database and are provided to military planners to minimize impacts to wetlands from proposed construction, demolition, and military training activities. Water levels in wetlands can be somewhat manipulated through the use of flashboard risers located at strategic points along each water management unit. However, the current water management practice is to maintain the flashboard risers in an open position, allowing water flows and levels to approximate natural conditions to the maximum extent possible given previous hydrological disturbances (e.g. dikes, dams, causeways).

A study of the hydrology of the GBBL ecosystem was completed in 2007 to quantify and determine the actual flow of water through the system with a focus on stormwater impacts. Additional studies on historic and current vegetation conditions and historical fire frequency were also completed in 2006. In 2008, hydrological evaluations of Grand Bay and the Banks Lake area was conducted. Six water monitors have been periodically deployed to measure temperature, dissolved oxygen, specific conductivity, pH, and turbidity.

7.7 Grounds Maintenance

Applicability Statement

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

Program Overview/Current Management Practices

Typical land management and grounds maintenance activities conducted on Moody AFB include mowing, fertilization, pest management, urban landscape management, and related activities. These actions are accomplished under contract on both the Main Base and GPRA. Other grounds maintenance operations that are accomplished by contract involve airfield and road maintenance, and maintenance of absorbent booms at the stormwater outfalls. Grounds maintenance activities are managed and coordinated by the 23 CES Operations Flight and are not addressed in this INRMP. The Georgia DNR performs limited grounds maintenance activities around their facilities on Grand Bay WMA (public-use campground; DNR equipment compound), and the Grand Bay Weapons Range contractor performs ground maintenance in association with the range.

7.8 Forest Management

Applicability Statement

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

Program Overview/Current Management Practices

Commercial forest management to support military training needs is integrated with management goals for wildlife and RTE species. Commercial forest management is typically conducted on unimproved grounds throughout the installation. The section Ecosystems and the Biotic Environment provides information on the general biotic condition of the forests on the installation. Of the 11,481 ac under the control of Moody AFB, a total of 7950 ac (63%) are forested and are under some form of management. Out of these forested stands, 2,610 ac (35%) are considered upland forests, either pine or mixed pine/hardwood, with the remaining 4,859 ac (65%) consisting of wetland forests of pond pine, cypress, or black gum. The Table Forest Stand Inventory (2011) lists the forest stand inventory based on the 2011 forest inventory by CEAN personnel. The Figure Forest Composition within Unimproved Areas of Moody AFB depicts the forest composition based on predominant overstory species and the Figure Forest Stands, Moody AFB depicts the forest stands.

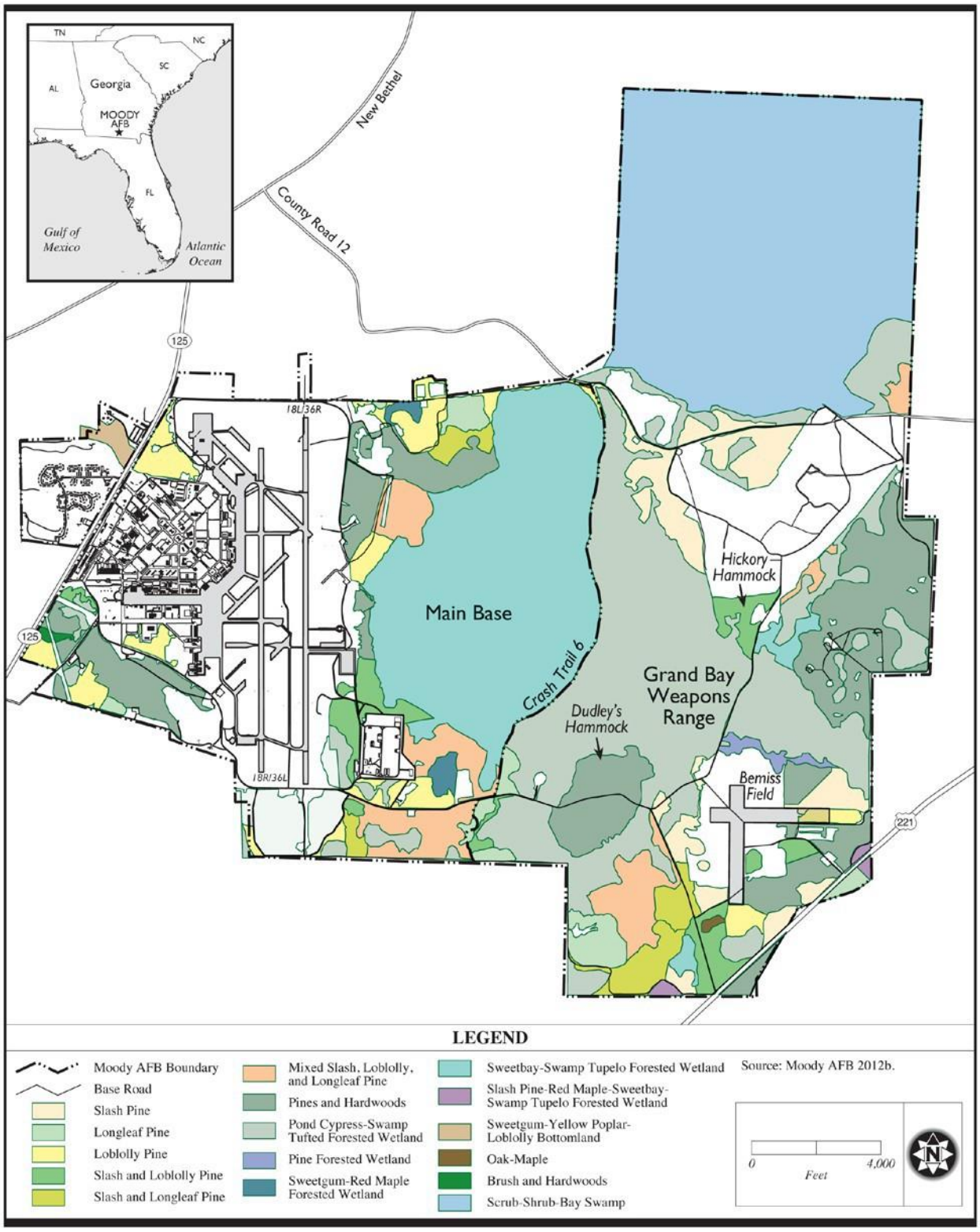
The first record of a timber inventory was in 1986, when the USACE conducted an installation-wide inventory of both the Main Base and the newly acquired Grand Bay Weapons Range. In 1999 an initial survey of the urban forest on Moody AFB, including GPRA, was conducted by Davey Tree Company. In 2003, this survey was updated by the Deloris Group with actual field work conducted by Landscape Design, Inc., a local landscaping contractor. The Moody AFB forester updates the installation's urban tree inventory by documenting tree removals and additions on a quarterly basis. In 1999, a forest inventory of upland stands was completed under contract by AFCEE. Information from this inventory was updated by the installation forester to provide a current upland forest stand inventory.

Primarily, commercial forest management at Moody AFB is restricted to upland pine forests. Currently, there is a very limited market for hardwoods near Moody AFB, with only very distant mills that accept hardwoods. As such, there is not a significant financial incentive to manage and promote hardwoods on the installation. Additionally, historic vegetation studies have demonstrated that the predominant forest type in south Georgia at the time of colonization was upland pines, primarily longleaf and slash pines maintained through periodic wildland fires, either natural or anthropogenic in origin. For these reasons, the decision was made to promote upland pine forests through the commercial forest management program.

The forests at Moody AFB are generally managed on a sustained-yield basis with a 60-80 year rotation based on biological and economic reasons. Pines greater than 80 years in age generally become larger than

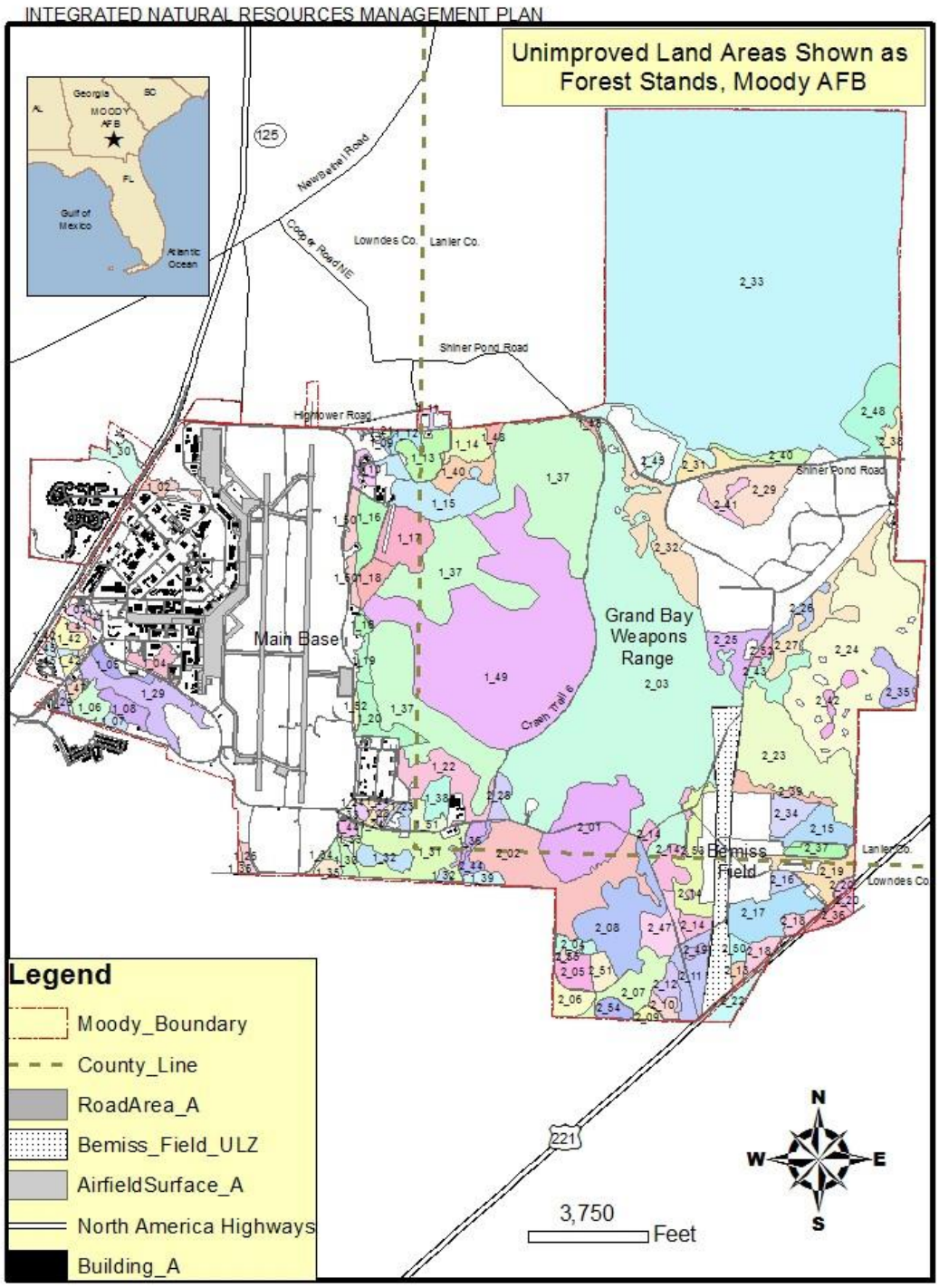
the diameter limits set at the major saw mills in the local market area, resulting in difficulty in removal to facilitate military mission requirements. In areas where some military training activities are a high priority (land navigation, etc.), an open scattered overstory may be left longer than 80 years old as long as they are healthy to maintain and not significantly dying due to a major beetle infestation, damaging storm event, or wildfire, etc. Most of the older longleaf pines will be left for natural regeneration beyond 80 years old while loblolly and slash pines mixed in the older longleaf stands may be thinned out to help favor a higher longleaf pine component in the future. In addition, as pines near the end of their natural life span, the prevalence of pathogens and parasites, including red heart disease and pine beetles, increases, resulting in degeneration of individual trees, a lessening of value for solid wood products, and the potential for catastrophic loss of forests.

Harvests are planned in forest stands to improve overall forest health, achieve ecosystem goals (including RTE habitat improvement), and to meet military mission requirements. As a result, Moody AFB primarily conducts thinning of pine stands from below to remove poorly formed, diseased, and smaller trees. However, because the majority of the pine forests on the installation are nearing their rotational age, small reforestation cuts have been proposed for implementation across the landscape to provide a more balanced age structure on the installation. Additionally, small clearcuts are created during salvage cuts or to support the military mission (e.g. creation of DZs and other small training areas).



Forest Composition within Unimproved Areas of Moody AFB

(as of 2012)



Forest Stands, Moody AFB

(as of 2018)

Table 7-1. Forest Stand Inventory (2011)

Stand Number	*Acres*	*Age*	*Forest Type*	*dbh (inches)*	*Tree Height (ft)*	*BA (ft^2)*	*Site Index*	*% Annual Growth*	*Pine Pulp (tons/ac)*	*Pine Sawtimber (tons/ac)*	*Hard Pulp (tons/ac)*	*Hard Sawtimber (tons/ac)*
Moody AFB												
1-01	12.9	34	Lob	18.3	66.0	90.0	78.0	2.3	10.0	87.0	0.0	0.0
1-02	32.7	74	Lob	16.0	93.0	155.0	78.0	1.0	22.7	188.3	17.3	0.0
1-03	7.3	28	Slash/Lob	15.8	79.0	27.0	113.0	2.7	4.0	39.2	6.7	0.0
1-04	18.1	25	Lob	17.0	75.0	25.0	110.0	3.3	0.0	46.9	0.0	0.0
1-05	14.9	77	Lob/WaO	6.1	67.0	104.0	97.0	0.0	10.7	30.3	54.6	0.0
1-06	22.6	30	Lob	11.9	63.0	20.0	96.0	3.7	0.0	32.4	0.0	0.0
1-07	7.0	4	LLF	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1-08	24.6	34	WaO – LO - Slash	13.8	64.0	70.0	103.0	2.8	6.7	19.7	47.3	0.0
1-09	6.4	30	Lob	12.0	55.0	73.0	90.0	3.0	10.2	25.0	7.6	0.0
1-10	13.0	71	SG - WaO – LO	17.0	81.0	123.0	96.0	2.0	5.0	4.6	28.2	0.0
1-11	8.1	37	Lob	17.0	81.0	30.0	96.0	3.2	6.0	20.0	0.0	0.0
1-12	12.0	unk	SB - ST									
1-13	39.2	43	Lob	18.4	81.0	51.0	92.0	3.2	3.9	85.4	2.3	0.0
1-14	29.1	8	LLF									
1-15	86.7	80	Lob – LLF - Slash	18.4	78.0	77.0	93.0	1.4	3.8	77.7	16.5	2.0
1-16	63.3	40	Lob	12.2	60.0	61.0	90.0	3.2	6.5	83.2	1.6	0.0
1-17	59.3	67	Slash – Lob - LLF	17.4	74.0	54.6	85.0	2.1	12.7	41.3	10.7	2.7
1-18	26.4	66	Lob - Hard	15.7	70.0	95.0	76.0	1.0	5.6	49.5	18.9	20.4
1-19	11.6	64	Slash - Lob	14.9	74.0	94.0	82.0	1.2	0.0	86.1	24.0	0.0
1-20	41.1	89	Slash - Lob-Pond	15.5	82.0	104.0	88.0	1.0	5.2	107.5	33.6	4.9
1-21	1.6	1	LLF	0.0	2.0	0.0	81.0	0.0	0.0	0.0	0.0	0.0
1-22	66.3	77	Slash - Lob-Pond	15.5	75.0	58.0	83.0	1.2	5.9	35.0	22.3	0.0
1-23	27.0	34	Lob	14.6	74.0	65.0	90.0	3.4	20.7	92.4	1.0	0.0
1-24	14.4	30	Lob	15.6	66.0	80.0	99.0	0.0	160.0	67.7	0.0	0.0
1-25	25.0	46	Lob - Slash	17.5	82.0	110.0	95.0	2.2	0.0	110.1	6.5	9.3
1-26	5.9	3	Lob	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1-27	127.5	unk	South EOR Cutover									
1-28	27.3	un	Cypress - ST									
1-29	78.0	unk	WaO - Maple - Lob									
1-30	25.0	unk	SG- Yellow Poplar- Lob									
1-31	93.6	68	Slash – Lob - LLF	17.2	81.0	123.0	84.0	1.9	6.2	136.0	23.5	14.3
1-32	23.3	unk	Pond cypress									
1-33	16.0	81	LLF - Slash	16.0	85.0	102.0	87.0	1.4	0.0	178.3	15.5	10.5
1-34	7.0	3	Lob	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1-35	12.2	unk	Cypress - ST									
1-36	13.6	8	LLF	0.0	11.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1-37	587.0	unk	Cypress - ST									
1-38	20.8	unk	SG - ST									
1-39	10.0	8	LLF	0.0	11.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1-40	26.7	81	LLF - Slash	18.1	94.0	25.0	72.0	1.8	0.0	48.2	0.0	0.0
1-41	11.5	unk	Cypress - ST									
1-42	22.3	unk	Slash - Hard									

Stand Number	*Acres*	*Age*	*Forest Type*	*dbh (inches)*	*Tree Height (ft)*	*BA (ft^2)*	*Site Index*	*% Annual Growth*	*Pine Pulp (tons/ac)*	*Pine Sawtimber (tons/ac)*	*Hard Pulp (tons/ac)*	*Hard Sawtimber (tons/ac)*
1-44	5.8	8	Slash	0.0	20.0		0.0	0.0	0.0	0.0	0.0	0.0
1-45	5.7	unk	Brush									
1-46	16.4	unk	Lob									
1-47	5.3	unk	Bald cypress									
1-48	15.5	unk	Lob - Hard									
1-49	658.7	unk	SB - ST - RB									
Grand Bay Weapons Range												
2-01	152.1	67	Lob	16.3	77.0	110.0	94.0	1.8	23.9	113.6	25.6	23.4
2-02	163.9	unk	Cypress - ST									
2-03	946.0	unk	Cypress - ST									
2-04	11.9	2	LLF	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2-05	26.0	3	LLF	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2-06	20.7	unk	SB - ST									
2-07	75.0	63	Slash - LLF	15.0	79.0	40.0	81.0	2.4	5.6	48.2	9.6	4.1
2-08	165.5	74	Slash - Lob - LLF	15.8	80.0	60.0	79.0	1.6	3.5	77.4	11.3	1.3
2-09	6.8	unk	Cypress - ST									
2-10	11.8	33	Slash	11.9	74.0	45.0	88.0	4.4	21.0	12.0	0.0	0.0
2-11	85.2	41	Slash - Lob	13.9	80.0	67.0	93.0	2.5	17.4	82.7	2.4	0.0
2-12	16.2	unk	SB - ST - RB									
2-13	22.6	unk	SB - ST - RB									
2-14	48.7	37	Slash	12.4	75.0	56.0	86.0	2.1	9.2	90.6	3.6	0.0
2-15	41.2	67	Slash	13.6	76.0	51.0	76.0	2.7	6.5	66.2	8.2	0.0
2-16	20.7	38	Slash - Lob	15.3	68.0	70.0	80.0	1.7	6.0	106.0	10.1	0.0
2-17	62.0	47	Slash - Lob - WaO	15.5	75.0	54.0	84.0	2.5	11.2	31.6	16.3	12.0
2-18	28.0	16	Slash	8.3	46.0	0.0	88.0	8.8	27.1	0.0	0.0	0.0
2-19	40.7	64	Slash - Lob - WaO	13.0	77.0	97.0	90.0	3.7	20.4	58.4	34.7	3.2
2-20	9.2	0	Cypress - ST									
2-22	21.1	10	LLF									
2-23	214.4	unk	Cypress - ST									
2-24	379.3	74	LLF - Slash-Lob	14.2	75.0	38.0	65.0	2.1	3.0	55.3	1.4	0.0
2-25	42.9	40	Slash - Lob									
2-26	15.8	76	Slash - Pond									
2-27	75.8	unk	Cypress - ST									
2-28	8.0	3	LLF - Lob									
2-29	73.4	67	Slash									
2-31	30.3	30	Slash	11.1	72.0	120.0	92.0	3.5	34.0	136.6	0.0	0.0
2-32	102.6	unk	Slash									
2-33	2192.2	unk	b - Shrub - Bay									
2-34	29.2	unk	LLF									
2-35	31.5	unk	Cypress - ST									
2-36	13.6	10	LLF									
2-37	17.7	unk	Lob									

Stand Number	*Acres*	*Age*	*Forest Type*	*dbh (inches)*	*Tree Height (ft)*	*BA (ft^2)*	*Site Index*	*% Annual Growth*	*Pine Pulp (tons/ac)*	*Pine Sawtimber (tons/ac)*	*Hard Pulp (tons/ac)*	*Hard Sawtimber (tons/ac)*
2-38	13.3	unk	Slash - Pond									
2-39	26.1	68	Slash - Lob - Pond	13.6	70.0	127.0	68.0	2.6	10.7	90.1	40.8	8.4
2-40	20.9	unk	B – ST – pond cypress									
2-41	19.0	unk	Cypress - ST									
2-42	13.4	unk	Cypress - ST									
2-43	33.5	unk	SB - ST - RB									
2-44	10.8	unk	Slash - Lob									
2-45	43.8	unk	Pond cypress									
2-47	41.6	unk	LLF - Slash									
2-48	72.2	unk	Cypress - ST									
2-49	5.0	unk	WaO - Red Maple									
2-50	22.2	37	Lob	12.0	73.0	120.0	86.0	2.0	38.0	70.0	0.0	0.0
2-51	19.0	74	LLF									

Notes: BA = Basal Area; BG = Blackgum; dbh = diameter at breast height; Hard = Hardwood, LLF = Longleaf Pine; LO = Live Oak; Lob = Loblolly Pine; Pond = Pond Pine; RB = Red bay; SB = Sweetbay; ST = Swamp tupelo; SG = Sweetgum; Slash = Slash Pine; Spruce = Spruce Pine; unk = unknown; WaO = Water Oak.

Commercial forestry operations improve and enhance military training by providing realistic training areas with a mosaic of mature and intermediate forests and early successional habitats. Thinnings benefit gopher tortoises and indigo snakes by opening the forest canopy and increasing the amount of sunlight that reaches the ground, encouraging the growth of herbaceous vegetation, and increasing the ability of stands to promote prescribed burning.

In recent years, the forestry program has been focusing on the restoration of native pine forests on the installation. Because of fire exclusion and poor management prior to 1994, many forest stands on the installation had a significant amount of mid-story hardwood competition that was impeding the application of prescribed fire and negatively affecting RTE species, especially the gopher tortoise. Mid-story hardwoods and hardwood regeneration was removed and controlled through mechanical and chemical techniques followed by periodic prescribed burns. Additional silvicultural activities occurring on the installation include artificial and natural regeneration of native pines and prescribed burning. Details on the prescribed burning and wildland fire management program are in Section Wildland Fire Management below.

The forestry program at Moody AFB is self-sustaining. Income from commercial timber sales is used to pay all commercial forest expenses annually. Typically, gross proceeds from timber sales on the installation usually exceeds the annual forest management budget, which averages around $32,000 annually. However, timber sale income is occasionally higher as a result of proposed training activities or tree removals in support of construction activities. In accordance with the DoD Financial Management Regulation (Volume 11A, Chapter 16, Paragraph 1602) and AFI 32-7064, 40% of the profits from these sales are provided to Lowndes and Lanier counties in lieu of property taxes.

Moody AFB has been a member of Tree City USA for 19 years. The Tree City USA program, sponsored by the Arbor Day Foundation in cooperation with the USDA Forest Service and the National Association

of State Foresters, provides direction, technical assistance, public attention, and national recognition for urban and community forestry programs.

7.9 Wildland Fire Management

Applicability Statement

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

Program Overview/Current Management Practices

The wildland fire management program involves both prescribed burning and the control of wildfires. In accordance with AFI 32-7064, a wildland fire operational plan has been developed and implemented in cooperation with various on-base and off-base organizations, including the Moody AFB Fire Department, Airfield Management, Public Affairs, Grand Bay Weapons Range, Georgia DNR, and the Georgia Forestry Commission. This plan is reviewed annually and updated as needed, with a major revision occurring at least every 5 years. A copy of the current Moody AFB Wildland Fire Plan is included in Section 15.0 Associated Plans Tab 1 and addresses specific roles and responsibilities relative to wildland fire management at Moody AFB. Recently, the Air Force Wildland Fire Branch has taken over most of the prescribed burning program, and has hired a contractor to rewrite the Moody AFB Wildland Fire Management Plan in an effort to move more towards a national AF plan template and national NWCG standards. The first rough draft has been submitted and is now being reviewed and will need changes before a final version is completed and signed.

In the past, prescribed burning on Moody AFB was managed by 23 CES/CEIE Base Forester with the use of trained volunteers and Georgia DNR personnel. Since the AF Wildland Fire Branch has taken over prescribed burning, the Base Forester coordinates with and assists the AF Wildland Fire Branch who supplies NWCG qualified personnel and equipment usually from the US Fish and Wildlife Service, the US Forest Service, or from other AF bases. Upland forest stands are generally burned on a 2-4 year rotation to meet forestry, wildlife management, and military mission goals and requirements (i.e. fuel reduction, ecosystem restoration, wildlife habitat improvement, disease/parasite control, improvement of military training areas, and reduction of BASH hazards). A map of the areas to be burned each coming year is briefed at the fall meeting of the ESOH Council. Moody AFB has identified two burn seasons: dormant season (December through mid-March), and growing season (mid-March through May). The annual prescribed burn plans identify the preferred season of burn based on habitat condition and management goals as outlined in this INRMP and USFWS directives. Burning is typically conducted on weekends and down-days on Main Base and can be conducted any time bombing and strafing activities are not occurring on Grand Bay Weapons Range. Generally, around 700 acres are selected for burning annually. However, the actual acreage planned for burning will vary because of size differences between burn units. Actual burns may not reach the planned acreage because of constraints related to weather conditions, manpower, accessibility, and military mission requirements.

Wildfires are uncommon occurrences at Moody AFB, with an average of five wildfires on the Main Base per year. Wildfire occurrence in Georgia demonstrates a bimodal periodicity, with peak danger periods occurring between mid-winter and early summer and then again in mid-fall. Wildfires on Moody AFB are generally attributed to military-caused fires, with ignition from stray tracer rounds or flares. Only one wildfire has been attributed to natural causes (e.g., lightning) over the last 20 years. Wildfire intensity on the installation has been lessened because of the reduction of fuel loads through prescribed burning, the

thinning and management of commercial forest stands, and the creation and annual maintenance of permanent firebreaks throughout the installation.

Wildfires are reported to Moody AFB Fire Emergency Services, who then immediately respond to the location to determine a plan of action. If needed, the Base Forester is called for assistance in fire suppression or advice. If the fire is beyond the capability of installation resources, the Georgia Forestry Commission is called to bring a tractor fire plow (and/or wildland engines). Most wildfires are suppressed because of their proximity to installation facilities or the possibility that smoke from the wildfire could impact installation personnel or military training. In some circumstances, some wildfires may be allowed to burn in order to meet ecosystem management objectives within natural and man-made fire breaks. Wildfires that are allowed to burn are monitored by CEIEA, Georgia Forestry Commission, Moody Fire Emergency Services personnel, or AF Wildland Fire Branch supplied firefighters. A list of the wildland fire-fighting assets on Moody AFB is included in the Moody AFB Wildland Fire Operational Plan. In cases where the wildfire extends for more than a day, the AF Wildland Fire Branch resources may be requested in addition to the Georgia Forestry Commission.

7.10 Agricultural Outleasing

Applicability Statement

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

Program Overview/Current Management Practices

An evaluation of the potential for agricultural outleasing at Moody AFB was conducted as part of this INRMP, and it was determined that there were no suitable areas located within the boundaries of the installation. The unimproved areas of Main Base are used for military training activities and encompass the surface danger area for the CATM small arms range, thus limiting the potential for development as agricultural outleases. Additionally, the proximity of the airfield to the unimproved areas would prohibit agricultural activities which might attract birds and other wildlife species that could potentially be a risk to aircraft and pilots.

Grand Bay Weapons Range is an air-to-ground gunnery and bombing range, and access to this area is not allowed during operations for safety purposes, which eliminates the possibility for agricultural outleasing. Additionally, this area is already encumbered through an existing license agreement with the State of Georgia, which allows the area to be managed and use for hunting and fishing as a WMA during times when military operations are not occurring.

Prime farmland soils in the Lowndes and Lanier County area include Carnegie Sandy Loam, Cowarts Loamy Sand, Dothan Loamy Sand, Irvington Loamy Sand, Tifton Loamy Sand, Clarendon Loamy Sand, and Nankin Sandy Loam. Prime farmland soils occurring on Moody AFB are shown in Figure Prime Farmland, Moody AFB.

7.11 Integrated Pest Management Program

Applicability Statement

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

Program Overview/Current Management Practices

The integrated pest management program as addressed in this INRMP primarily concerns the management of invasive species and involves two separate resources: invasive plants and invasive animals. The establishment of invasive exotic species in the forested areas is a major threat to biodiversity since these invaders often thrive with no natural pests, often displacing native species. In the long run, endangered and threatened species habitat can be destroyed as well as other negative impacts. To date, the first invasive species survey was conducted a few years ago by a contractor on 380 acres on Main Base and also a targeted survey along several roads, ditches, and power line right of ways. However, most of the forest land on Moody AFB has not been surveyed, and exotic invasive vegetative species on Moody AFB are mostly treated on a case by case basis as they are discovered. Control measures may be implemented depending on budget constraints and the significance to the overall mission.

Chinese privet (*Ligustrum sinense*) is well established along many roadside edges and in the understories of many forest stands. In 2016, a contractor was hired to treat Chinese privet on about 25 acres in Stand 1-30, as well as targeted spraying and hack and squirt applications to control Tallowtree, Chinaberry, Wisteria, Japanese Climbing Fern, Tung Oil Tree, and Mimosa on another 22.6+- acres. A significant species that personnel will look out for in the future is cogongrass (*Imperata cylindrical*). Chinese tallow tree has also been noted and sprayed with the assistance of the Entomology shop near the jogging trail. Japanese climbing fern (*Lygodium japonicum*) has been spreading aggressively along the roadsides and ditches of woodland areas in the past several years. Directed herbicide treatments have been conducted by the Base Forester and Entomology shop to help prevent the spread of these species.

Tung Oil tree is poisonous and found in several areas on Main Base and will be planned for control efforts in the future. In 2011, the Asian ambrosia beetle and the associated laurel wilt fungal disease have been killing most of the redbay trees across Grand Bay Weapons Range and Main Base in and near wetland areas.

The Base Forester is a DoD-certified pesticide applicator with the ability to chemically treat invasive species when warranted and within budget constraints on woodland areas. On improved to semi-improved areas, outbreaks are reported to the Entomology shop for herbicide control. Efforts have been made to inform environmental staff and contractors regarding the identification of cogongrass, which has not been identified on base property.

The primary two aquatic invasive plants that are a concern at Moody AFB are water hyacinth (*Eichhornia crassipes*) and hydrilla (*Hydrilla verticillata)*. Water hyacinth is a floating weed originally introduced into Florida from South America in the 1880s. Its growth rate is among the highest of any plant known; hyacinth populations can double in as little as 12 days. Besides blocking boat traffic and preventing swimming and fishing, water hyacinth infestations also prevent sunlight and oxygen from getting into the water. Decaying plant matter also reduces oxygen in the water, leading to impacts to fish and other animal species. Thus, water hyacinth infestations reduce fisheries, shade out submersed plants, crowd out immersed plants, and reduce biological diversity (Schmitz et al. 1993). At Moody AFB, water hyacinth has been a continuing problem at Grassy Pond and Mission Lake. Prior to 2004, an aquatic weed harvester was used to mechanically remove water hyacinth from installation lakes and ponds. However, this was discontinued because the mechanical harvester actually increased hydrilla populations and because the harvester could not effectively reduce water hyacinth populations at either lake because of the water hyacinth's rapid growth rate. Since 2004 installation lakes and ponds have been periodically treated with herbicides to control water hyacinth. While complete eradication is considered impossible, the population at Grassy Pond and Mission

Lake has been greatly reduced and is considered controlled at this time. Boating, fishing, and recreational activities at Grassy Pond and Mission Lake are not currently impacted by water hyacinth.

Hydrilla was first discovered in the U.S. in Florida in 1960 and rapidly spread throughout the southeastern U.S. Hydrilla is a submerged aquatic weed, capable of completely overtaking ponds and lakes, hampering recreational opportunities and impacting the pond's natural ecological processes. An overabundance of hydrilla can severely deplete dissolved oxygen levels, reduce light penetration, and alter water circulation patterns to such an extent that water temperatures are increased and normal water pH levels and nutrient stratification in the water column are affected (Leslie et al. 1983; Getsinger 1998). The ultimate result of a hydrilla infestation is often a reduction in biodiversity, caused primarily by the displacement of native aquatic plants such as pondweeds (*Potamogeton* sp.) and eelgrass (*Vallisneria americana*) (Langeland 1996). Hydrilla was a major problem at Grassy Pond, but was not present at Mission Lake or any of the other installation lakes or ponds. A Lake Management Plan and Environmental Assessment (EA) were prepared and implemented for the control of hydrilla at Grassy Pond. Through winter drawdowns, use of pelleted herbicides, and introduction of grass carp, Grassy Pond has been free of hydrilla for over 10 years.

Currently there is only one animal species at Moody AFB that is considered invasive and that is targeted for limited removal and control: feral hogs (*Sus scrofa*). Feral hogs were discovered on the installation in 2005 and were observed fairly often through 2006 in the remote areas of Grand Bay Weapons Range, including Crash Trail 6. It is unknown if their presence was due to natural expansion from off-base areas or an illegal, planned introduction. Major concerns with the establishment of this species on Moody AFB are potential damage to sensitive wetland ecosystems and to airfield vegetative cover, although no such damage has been noted to date. Additionally, this species would be considered to be a major threat to aircraft if their populations reached the point where they were commonly observed foraging or crossing the airfield or Bemiss ULZ. Currently, the USDA Wildlife Services biologist is trapping and removing feral hogs, and hunters on both Main Base and Grand Bay WMA have been instructed to harvest hogs if the opportunity presents itself.

The only other common exotic animal species on the installation is the Eurasian collared dove (*Streptopelia decaocto*). Eurasian collared doves were introduced into the Bahamas in the 1970s and migrated into peninsular Florida in the early 1980s. By the mid-1990s this species had become established in south Georgia and is a common resident on Moody AFB and in other urban environments throughout the region. The Eurasian collared dove appears to be restricted to the cantonment area and other developed regions and has not been observed in unimproved areas of the installation. This species does not appear to negatively impact native doves or other similar species.

7.12 Bird/Wildlife Aircraft Strike Hazard (BASH)

Applicability Statement

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

Program Overview/Current Management Practices

As with most Air Force installations, Moody AFB experiences BASH potential within the confines of the installation and within its low-level aircraft operating routes. This BASH risk exists because of the presence of resident and migratory birds and other wildlife species (i.e. bats, white-tailed deer, alligators, coyotes, foxes) in and around the airfield environment and in the Moody AFB operational airspace. The two most hazardous groups of birds with the potential to affect Moody AFB aircraft are raptors (hawks, black

vultures, turkey vultures) and sandhill cranes. During the past 10 fiscal years, Moody AFB aircraft have been involved in an average of 93 wildlife (birds and bats) strikes annually, with a range from 48 to 137 strikes.

In support of the military mission, Moody AFB has implemented a BASH management program under the direction of a contract wildlife biologist from USDA Wildlife Services designed to minimize aircraft exposure to potentially hazardous wildlife strikes, especially birds, within the boundaries of the installation. The BASH program, while the responsibility of the installation Safety Office, also includes personnel from the flying safety, airfield management, grounds maintenance, pest management, and environmental organizations. As part of the program, an installation-specific BASH plan (Section 15.0 Associated Plans Tab 2) has been prepared that identifies techniques and best management practices to reduce the risk of bird and wildlife strikes.

In 1998, Geo-Marine completed a 3-year study of bird movements in and around the Moody AFB airspace, including the Grand Bay Weapons Range impact area. These observations included the analysis of radar observations of bird movements in the airspace, Christmas Bird Counts, Breeding Bird Surveys, and telemetry of radio- and satellite transponder-tagged sandhill cranes and turkey vultures. Information from this study was used to develop a BAM for the Moody AFB operating environment, which provides installation-specific information on projected bird movements in the Moody AFB airspace; these projections are in and around Moody AFB. This BAM, along with daily wildlife sighting reports and implementation of the BASH plan, is used to reduce BASH risk on Moody AFB.

To assist in the reduction of BASH on the installation, natural resources management activities in and near the flightline are coordinated with the BASH biologist and are integrated with the BASH plan. Permanent hunting stands for large game have been set up around the flightline, and hunters are provided with daily sighting reports of deer and turkeys from the BASH biologist to concentrate hunting efforts in those areas in an effort to either directly remove animals or discourage the use of the area. In late winter/early spring, one-third of the airfield environment is burned to remove thatch, kill herbaceous weeds, and promote the establishment of a bahia grass monoculture. Based on the recommendation of the Air Force Forester, additional natural resources management actions proposed to assist in the reduction of BASH risk include the management of the forests around the airfield in such a way as to minimize wildlife usage. For instance, loblolly pine plantations have been created around the flightline and are maintained with a close spacing of trees to encourage canopy closure and the shading of the forest floor. Canopy closure inhibits the development of a herbaceous understory that could possibly be used by wildlife species for forage and cover.

7.13 Coastal Zone and Marine Resources Management

Applicability Statement

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

Program Overview/Current Management Practices

Since Moody AFB is located inland, there are no coastal zone management issues relative to the purposes or scope of this INRMP. However, Moody AFB personnel and aircraft do operate in marine environments in both the Atlantic Ocean and Gulf of Mexico, utilizing established Water Training Area and DZs. In 1999 and 2010, NMFS issued a BO and ITS for sea turtles in the Gulf of Mexico for impacts related to the creation and use of a Water Training Area for CSAR (now known as PR) training.

7.14 Cultural Resources Protection

Applicability Statement

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

Program Overview/Current Management Practices

The management of cultural resources on Moody AFB is directed by the ICRMP. There are numerous archeological sites on Moody AFB, with two sites identified as eligible for listing under the National Register of Historic Places. Natural resources management activities proposed for implementation are coordinated with the Georgia State Historic Preservation Officer (SHPO) to minimize potential impacts to installation cultural resources. Generally, natural resources activities that may generate ground disturbances, such as timber harvesting, site preparation, planting, and mid-story hardwood removal are not conducted in known archeological areas.

7.15 Public Outreach

Applicability Statement

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

Program Overview/Current Management Practices

(Discuss organizations involved in Public Affairs and outreach for natural resources programs, natural, resources awareness programs on the installation, and brochures, posters, videos and other natural resources program educational materials.)

7.16 Geographic Information Systems (GIS)

Applicability Statement

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

Program Overview/Current Management Practices

Information from all natural resources surveys and monitoring projects have been converted into digital format and incorporated into Moody AFB GIS/Geobase. The natural resources data layers are maintained by personnel in Moody AFB Management Flight, Environmental Element, and are updated as new information becomes available. Additional layers are created as needed by Moody AFB to fulfill military mission requirements.

These GIS layers are used by the Environmental Element to develop and implement natural infrastructure management actions as identified in this INRMP. By using GAP analysis procedures, potential locations for the enhancement of areas for military training, RTE species, and wetland restoration were identified and incorporated into this INRMP. These layers are also used by other installation organizations and offices to support development of military mission requirements, to document environmental effects of mission actions as required by NEPA/EIAP, to conduct comprehensive installation and range planning, and to identify BASH and pest management issues. The Table below lists all natural resources data layers available in GIS and all layers used for the management of natural resources. However, not all of the data layers are

available to installation personnel or the general public because of the requirement to limit knowledge of the location of vulnerable natural resources assets.

GIS Data Layers Applicable to Natural Resources Management

GIS Data Maintained by Moody AFB Management Flight, Environmental Element	*GIS Data Maintained by the Engineering Flight*
Gopher Tortoise Burrows	Installation Boundary
Gopher Tortoise Capture Locations	Installation Roads and Buildings
Gopher Tortoise Telemetry Locations	Lakes, Ponds, and Impoundment Locations
Indigo Snake Sighting Locations	Stormwater Outfall Areas
Bat Survey Points	Boat Ramps and Docks
RTE Species Sightings	Hiking and Fitness Trails
Flatwoods Salamander Survey Locations	Explosives Quantity-Distance Arcs and Blast
Reptile and Amphibian Sighting Locations	Firing Range Footprints
Food Plot Locations	Aerial Photography
Deer Stand Locations	Installation Infrastructure
Forest Stand Map	Military Training Areas
Urban Tree Inventory	Utilities and Infrastructure
Prescribed Burn Plans (by FY)	
Prescribed Burn History (by FY)	
Timber Harvest Units	
Site Preparation Units	
Ecosystem Restoration Units	
Wetland Boundaries	
Water Control Structures	
GBBL Ownership Boundaries	
Grand Bay WMA Facilities	

8.0 MANAGEMENT GOALS AND OBJECTIVES

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

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

Installation Supplement – Management Goals and Objectives

Principal Goal I: Enhance Military Mission Flexibility and Success While Maintaining Current Populations of RTE Species at Moody AFB

As part of the overall natural biodiversity on Moody AFB, several RTE species are known to occur on or near Moody AFB. The ESA of 1973 and AFI 32-7064 require proactive management to ensure the long-term viability of these RTE species and their habitat. Due to this requirement, and because it is an accepted scientific principle that the management of the habitat for one species also benefits other species that share similar resource requirements, it was felt that efforts should be focused on managing for the habitat needs of the keystone and RTE species. This would in turn maximize overall biodiversity on Moody AFB while at the same time providing realistic areas for military training. Additionally, by ensuring that populations of keystone and RTE species are not declining, military trainers will have additional flexibility in planning mission activities in these habitats and Moody AFB can ensure that there is no net loss in the amount of land available to support military training requirements.

Generally, RTE species management activities proposed for the next 5 years will be based upon the following supporting goals and objectives:

- Supporting Goal 1 – Identify keystone and RTE species populations on Moody AFB.
    - *Objective 1*. Maintain current listings of keystone and RTE species and listing statuses known to occur, or that could potentially occur on Moody AFB.
    - *Objective 2*. Continue to support surveys and inventories of known keystone and RTE species on Moody AFB.
    - *Objective 3*. Continue to conduct surveys and inventories for newly listed species.
    - *Objective 4*. Continue to identify keystone and RTE species locations and/or habitat in the field using GPS techniques, where appropriate.
- Supporting Goal 2 – Continue to collect demographic information on keystone and RTE species.
    - *Objective 1*. Estimate population size of each keystone and RTE species on Moody AFB.
    - *Objective 2*. Determine sex and age distribution for each species of interest.
    - *Objective 3*. Determine home range for each species of interest.
    - *Objective 4*. Monitor reproductive success and determine annual recruitment for each species of interest.
- Supporting Goal 3 – Continue to enhance keystone and RTE species habitat on Moody AFB in a manner consistent with the military mission.
    - *Objective 1*. Identify suitable habitat for each keystone and RTE species on Moody AFB through gap analysis utilizing GIS databases and field observations.
    - *Objective 2*. Determine the quantity and quality of habitat for each keystone and RTE species and identify fragmented habitat on Moody AFB.
    - *Objective 3*. Implement management activities to create, improve, or enhance habitat for each keystone and RTE species.

- Supporting Goal 4 – Determine impact of military mission on keystone and RTE species and habitat.
    - *Objective 1*. Identify areas of conflict in the field between keystone and RTE species and military mission locations.
    - *Objective 2*. Monitor species habitat to track degradation as a result of mission related activities.
    - *Objective 3*. Create a Terms and Conditions database to develop a comprehensive system for tracking and enforcing management requirements and mitigation measures.
- Supporting Goal 5 – Continue to increase awareness and public education on the conservation of keystone and RTE species.
    - *Objective 1*. Maintain updated maps of environmental constraints, including keystone and RTE species habitat, for use by military trainers, planners, and other installation personnel.
    - *Objective 2*. Continue to conduct briefings to ESOH Council on legal requirements to manage RTE species and on installation-specific information pertaining to these species.
    - *Objective 3*. Provide educational talks to installation organizations, youth camps, schools, and other gatherings to provide information on species known to occur on Moody AFB and on the efforts of the Air Force to manage these species.
    - *Objective 4*. Continue to publicize keystone and RTE species management activities and success stories through newspaper and magazine articles, scientific meetings, and seminars.

Principal Goal II: Enhance Military Mission Flexibility and Success While Maintaining and Enhancing the Quality of Existing Wetlands and Watersheds

Because of its geographic setting within the GBBL ecosystem, the protection and enhancement of wetlands and watersheds on Moody AFB is of prime importance. Out of the 11,481 ac on Moody AFB, 6,043 ac (53%) are classified as jurisdictional or isolated wetlands (detailed information on wetlands and watersheds can be found in Sections 2.2.4 and 2.3.5). Because of this, wetlands have the potential to constrain military mission activities, including training or expansion of infrastructure. Conversely, the military mission has the potential to impact wetlands through direct conversion or stormwater contamination. By maintaining and enhancing the quality of wetlands on Moody AFB, Moody AFB will better be able to leverage future military mission activities through mitigation of potential impacts while at the same time proactively improving the wetland ecosystem functioning.

Generally, wetlands and watershed management activities proposed for the next 5 years will be based upon the following supporting goals and objectives:

- Supporting Goal 1 – Maintain the current comprehensive database information on wetland and watershed locations on Moody AFB and surrounding environs.
    - *Objective 1*. Conduct a jurisdictional wetland boundary survey for Moody AFB every 5 years as required for new projects and update Moody AFB GIS data layer.

- *Objective 2*. Continue the hydrologic study of water quality in the wetlands and watersheds at Moody AFB by deploying water monitoring probes.

- Supporting Goal 2 – Continue to restore and enhance normal hydrological functions within the GBBL ecosystem.
    - *Objective 1*. Continue to maintain water monitoring probes to enhance installation data on hydrological functions of the GBBL ecosystem.

Principal Goal III: Maintain and Enhance Fish and Wildlife Management Opportunities at Moody AFB within the Context of the Military Mission

Generally, management of unimproved areas of Moody AFB will focus on the protection and enhancement of keystone and RTE species within the constraints of the military mission. However, consideration will be given to the needs of game species and management plans will be modified where possible to improve game species populations while at the same time meeting the overall goals for military mission requirements and keystone and RTE species management. The fish and wildlife management goals and objectives identified under this section will be focused on game species (white-tailed deer, eastern wild turkey, small game) and game fish, and will generally consist of activities related to consumptive uses of these resources (i.e., facilitation of hunts, stocking of ponds, aquatic weed management). These goals and objectives directly support the military mission by maintaining reduced populations of wildlife species near the airfield in support of Moody AFB BASH program.

Generally, fish and wildlife management activities proposed for the next 5 years will be based on the following goals and objectives:

- Supporting Goal 1 – Improve recreational hunting activities on Moody AFB.
    - *Objective 1*. Monitor annual population statuses through harvest records for white-tailed deer, eastern wild turkeys, and feral hogs.
    - *Objective 2*. Maintain hunting areas on Moody AFB, concentrating hunters in areas around the airfield to reduce BASH risk.
    - *Objective 3*. Continue license agreement with Georgia DNR to facilitate wildlife management on Grand Bay Weapons Range.

- Supporting Goal 2 – Improve recreational fisheries activities on Moody AFB.
    - *Objective 1*. Continue to conduct population censuses for preferred game fish in installation impoundments, as needed.
    - *Objective 2*. Continue to implement aquatic weed control in Grassy Pond and Mission Lake.
    - *Objective 3*. Continue to stock game fish into installation impoundments as required based upon population data.

- Supporting Goal 3 – Continue to maintain a comprehensive database of game species populations.
    - *Objective 1*. Maintain Moody AFB's database of harvest data from previous years in tabular and spatial format.

Principal Goal IV: Enhance Military Mission Flexibility and Success through Conducting Land Management and Ground Maintenance Activities at Moody AFB

Professional land management and grounds maintenance is required to ensure the successful completion of the military mission at Moody AFB. This includes ensuring that adequate roads and trails are available for access to military training areas and for force protection initiatives. Land management and grounds maintenance is a cross-functional program at Moody AFB. The majority of work under this program is accomplished by the Moody AFB grounds maintenance contractor under the direction of the Operations Flight, 23 CES. However, work is also accomplished by the Grand Bay Weapons Range contractor and the Georgia DNR. The Environmental Element's responsibility in this area is primarily to provide technical assistance as needed by other organizations and to identify areas of deficiency.

Generally, land management and grounds maintenance activities proposed for the next 5 years will be based on the following goals and objectives:

- Supporting Goal 1 – Continue to implement urban forest management to protect, maintain, and enhance the urban forest on Moody AFB.
    - *Objective 1*. Update and maintain tabular and spatial data pertaining to Moody AFB urban forest.
    - *Objective 2*. Ensure changes to the urban forest through planting, tree maintenance, and removals are reflected in the Moody AFB GIS system and Urban Tree Inventory System (UTIS) database.
- Supporting Goal 2 – Continue to comply with federal and state erosion control regulations.
    - *Objective 1*. Continue to incorporate erosion and sedimentation control provisions into construction and land-disturbing project specifications and accompanying environmental documentation.

Principal Goal V: Enhance Military Mission Flexibility and Success while Maintaining and Enhancing Commercial Forest Management at Moody AFB

Military training at Moody AFB is dependent on the availability of realistic training areas with a mosaic of different habitat types. The majority of the habitat types on Moody AFB are forested. Besides serving as important military training areas, installation forests are home for a vast assemblage of native animals, including keystone and RTE species. Thus, management of this resource is a primary component of the INRMP.

Generally, forest management activities proposed for the next 5 years will be based on the following underlying goals and objectives:

- Supporting Goal 1 – Establish a balanced age class distribution of forest stands on Moody AFB.
    - *Objective 1*. Update Moody AFB forest stand map and inventory annually to reflect changes as a result of silvicultural actions.
    - *Objective 2*. Continue to plan forest harvests and silvicultural activities to obtain desired age distribution and to maintain realistic training areas.
    - *Objective 3*. Prioritize and implement silvicultural activities on the installation to meet management goals and military mission requirements.

- Supporting Goal 2 – Continue to maintain and enhance forest health on Moody AFB.
    - *Objective 1*. Monitor forest stands for parasites, diseases, and invasive species and identify critical forest stands.
    - *Objective 2*. Continue to plan forest harvests and silvicultural activities to improve health and vigor of residual stands.
    - *Objective 3*. Continue to reduce and control the spread of invasive, exotic plant and animal species throughout Moody AFB.
    - *Objective 4*. Continue chemical and mechanical treatments to control competing vegetation and meet management goals in areas unsuitable for prescribed burning.
- Supporting Goal 3 – Restore historic forest composition and structure on Moody AFB.
    - *Objective 1*. Continue to maintain suitable habitat in all pine forests to enhance gopher tortoise and indigo snake habitat.
    - *Objective 2*. Ensure regeneration in understocked and older stands.
    - *Objective 3*. Continue to promote native species (longleaf, slash) in all regeneration projects and restore the longleaf pine/slash pine forest community in suitable areas.
- Supporting Goal 4 – Establish priorities for prescribed burning program throughout installation.
    - *Objective 1*. Prepare and implement annual prescribed burning plans to coincide with historic fire periodicity, to include dormant and growing season burns.
    - *Objective 2*. Annually review prescribed burning notification procedures for installation and off- base organizations.
    - *Objective 3*. Conduct educational activities (newspaper articles, briefings) to installation organizations to increase awareness of need for prescribed burning and compatibility with military mission.
- Supporting Goal 5 – Continue to integrate commercial forest activities with military mission.
    - *Objective 1*. Determine maximum heights related to glide slopes and other areas adjacent to Moody AFB airfield and proactively manage forests in this area to minimize impacts to the flying mission.
    - *Objective 2*. Maintain a complex mosaic of forest stands in a variety of successional stages through the professional application of silvicultural techniques to provide realistic military training areas.

Principal Goal VI: Utilize Ecosystem and Biodiversity Management Principles at Moody AFB to Integrate the Conservation of the Natural Infrastructure with Military Mission Needs

This natural resources management plan was integrated into an overall ecosystem management plan for the GBBL ecosystem. Primarily, the focus of ecosystem management at Moody AFB will be the restoration of natural community processes in each of the identifiable and distinct ecosystems present on Moody AFB or in the GBBL ecosystem. Establishing ecosystem processes will result in the availability

of realistic training areas capable of withstanding training pressure without degradation or decreases in quality, quantity, or function.

Generally, overall ecosystem management activities proposed for the next 5 years will be based on the following underlying goals and objectives:

- Supporting Goal 1 – Continue to maintain comprehensive database of ecological information from Moody AFB and the GBBL ecosystem.
    - *Objective 1*. Continue to conduct field surveys to identify habitats located within the Moody AFB boundaries and the GBBL ecosystem boundary.
    - *Objective 2*. Continue to classify and quantify faunal and floral communities located within these ecosystems.
- Supporting Goal 2 – Continue to implement management techniques to mimic historic natural ecological disturbances and practices to restore community integrity and function.
    - *Objective 1*. Continue to conduct prescribed burning in the GBBL ecosystem in accordance with historic fire periodicity, to include dormant and growing season burns.
    - *Objective 2*. Continue to monitor ecological components of ecosystems to determine adaptive management activities.
- Supporting Goal 3 – Continue to increase awareness and public education of the native ecosystems on Moody AFB.
    - *Objective 1*. Continue to work with local media to circulate news releases and public briefings on the GBBL ecosystem.

9.0 INRMP IMPLEMENTATION, UPDATE, AND REVISION PROCESS

9.1 Natural Resources Management Staffing and Implementation

Implementation

The Moody AFB Installation Management Flight, Environmental Element will conduct annual reviews and revisions of the INRMP, and will coordinate reviews with the following Moody AFB organizations and agencies: CES, Mission Support Group, ESOH Council, Range Operating Agency, and the Moody AFB Wing Commander. Additionally, annual revisions to the INRMP will be reviewed by AFCEC functional representatives, the USFWS Ecological Field Office, and the Regional Office for the Wildlife Resources Division of the Georgia DNR.

Natural Resources Management Staffing

Only one dedicated natural resources management position is programmed for Moody AFB:

- Forester, GS-0460-11

Historically, Moody AFB had two natural resources management positions to facilitate implementation of projects identified in the INRMP: Forester (GS-0460-11) and Biologist (GS-0401-12). During recent transformations and reorganizations of the Air Force, the biologist position was eliminated, and these duties

were added to the workload of the forester position. Because of the size of Moody AFB and the current workload associated with the management of Moody AFB and Grand Bay Range for the continuation of the military mission, there is not sufficient manpower available at Moody AFB level to complete all proposed projects in this INRMP and fulfill regulatory requirements. The need for the reestablishment of the biologist position has been identified to ACC and AFCEC through the Conservation planning, programming, budgeting, and execution (PPBE) process.

9.2 Monitoring INRMP Implementation

INRMP implementation will be monitored through a variety of procedures, including analyzing and evaluating data from inventories, surveys, and other studies on Moody AFB. Moody AFB Management Flight, Environmental Element must monitor the progress of natural resource projects to measure their success and recommend adjustments in management actions, if necessary, that increase progress toward achieving the goals and objectives outlined in this INRMP. To assist in measuring the progress and accomplishments of the natural resources management program, monitoring will be based on the following objectives: (1) completion of a goal and/or objective confirmed; (2) determination of the effectiveness of a project to reach a goal/objective assessed; and (3) confirmation that a standard, regulation, or requirement is addressed.

9.3 Annual INRMP Review and Update Requirements

Annual Review – the INRMP will be reviewed annually to assess the effectiveness of integration linkages. Findings from this annual review will be presented to update senior Base leaders of the status and effectiveness of the Plan. Major mission realignments shall require a quarterly review of the current Plan. Annual updates of the INRMP, including specific proposed projects for each upcoming FY, will be prepared by the Moody AFB Installation Management Flight, Environmental Element prior to the preparation of the annual Forestry and Fish and Wildlife budgets. These annual updates will be approved by the 23 CES/CC Commander for years 1-3, and by the Mission Support Group Commander for years 4 and 5, as delegated by the installation commander. Planning conflicts that arise and cannot be resolved at the CES level will be elevated to the Moody AFB ESOH Council. Projected changes or project additions in out-years will be added to the Environmental Quality programmed budget as required.

In coordination with the local offices of the USFWS and Georgia DNR, the Environmental Element will conduct annual reviews to evaluate the progress of INRMP implementation and to make recommendations on how management actions need to be adjusted to improve the efficiency and effectiveness of the Plan. Components will include the review of all goals/objectives/projects, monitoring data, undertakings that required submission of Air Force Forms 332 or 813, and stakeholder involvement activities. Each review should result in adding another year of projects to the Plan. The target date for conducting annual reviews is prior to the close of each FY (30 September).

A critical consideration is to ensure that there is no net loss of military capability as a result of implementing the INRMP. Specifically, this evaluation will require careful examination of management objectives from which annual projects are developed. There may be instances in which a “net loss” may be unavoidable in order to fulfill regulatory requirements other than the Sikes Act (e.g., complying with a BO under the provisions of the ESA). Loss of mission capability in these instances will be identified in the INRMP and a discussion included of measures taken to recapture the net loss.

Consensus should be reached on (1) whether or not the INRMP was fully implemented, and (2) whether or not the management scheme was effective. If no significant revisions are required, the parties should sign a memorandum stating that the plan was fully implemented and that management schemes are effective. If

it is determined that the plan is ineffective or needs substantial revision, the update process should be initiated as described below.

Findings from this annual review will be presented as part of updates to the WG Commander on the status and effectiveness of the INRMP. On completion of an annual review, the Environmental Element will prepare written documentation to include:

1. The year the most recent INRMP was completed or revised.
2. The organizations contacted and/or that participated in coordination.
3. Feedback (if any) from the coordination groups/organizations.
4. Any changes made, as a result of the coordination (e.g., project changes, document changes, etc.).
5. Status of project funding.
6. Accomplishments for the previous year and planned future efforts.
7. Determination of whether the INRMP requires revision.

As the foundation for adaptive management on-base, these annual reviews will help keep the INRMP current and relevant with the incorporation of new projects, additional data, new understanding of natural processes and species, knowledge of other Base operations impacting natural resources, and lessons learned from completed and ongoing projects.

INRMP UPDATE AND REVISION PROCESS

Natural resource management is a dynamic process and as such management plans often require frequent reviews and updates. To ensure the continued utility of this INRMP, periodic reviews and updates will be conducted to account for changes in the military mission, condition of natural resources, the ecosystem, and regulatory requirements. More specifically, the INRMP will be updated for the following reasons:

(1) when mission interference or lack of mission support requires a change in natural resource management direction;

(2) when ecological monitoring data reveals management actions are having a negative effect on the resources and have reached a threshold of significance, requiring a fundamental change in management methods; and

(3) when new laws or regulations require additions or deletions of management activities. If major revisions are needed, the Environmental Element should outline a schedule to accomplish the revision and notify the MAJCOM.

All periodic updates to the INRMP will be documented by the Environmental Element in a Master Update List. Relevant INRMP sections and pages should be referenced as well as a brief description of the update and the corresponding rationale.

5-Year Review - Revisions or updates to this INRMP are required at least once every 5 years or more frequently in cases of changes to the military mission, environmental compliance requirements, or other new information that significantly affects the ability of Moody AFB to implement the INRMP. The 5- year review will follow a development process similar to the initial development of this document including formal submission for review and comment by AFCEC, USFWS, and Georgia DNR in addition to Moody AFB offices and organizations listed in Section 9.1 above.

10.0 ANNUAL WORK PLANS

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

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

Primary Goal/Supporting Goal/Action	Implementation Year						
	Status	**Priority**	**FY 19**	**FY 20**	**FY 21**	**FY 22**	**FY 23**
PG I/SG 2/Gopher Tortoise Demographic Study	Conservation: Contracted By USFWS	High	X	X	X	X	X
PG I/SG 2/Gopher Tortoise Disease Study	Conservation: Contracted By USFWS	Low	X	X	X	X	X
PG I/SG 2/Gopher Tortoise Movement Study	Conservation: Contracted By USFWS	Low	X	X	X	X	X
PG I/SG 5; PG VI/SG 3/Natural Resources Program Outreach	In-house: Ongoing	Low	X	X	X	X	X
PG I/SG 1/Surveys for Newly Listed Species	Conservation: Contracted As Required	High					
PG I/SG 1, 2/Snake Fungal Disease Study	Conservation: Contracted By USFWS	Low	X				
PG I/SG 1,2/Indigo Snake, Gopher Tortoise, Spotted Turtle, and Striped Newt Survey	Conservation: Contracted in F2F	Med	X				X
PG II/SG 1/Complete jurisdictional wetland boundary surveys	Ongoing -- As required	Med					
PG IV/SG 3; PG V/SG 2, 4; PG VI/SG 2/Prescribed Burning	AFCEC Wildland Fire Center Funded	High	X	X	X	X	X
PG IV/SG 3; PG V/SG 2, 4; PG VI/SG 2/Firebreak Maintenance	Forestry and/or Conservation: Contracted BPA	High	X	X	X	X	X
PG IV/SG 3; PG V/SG 2, 4; PG VI/SG 2/Firebreak Maintenance	In house: Harrow with Farm Tractor	Med	X	X	X	X	X

	as needed and available time and access allows						
PG II/SG 1, 2, 3; PG VI/SG 2/Monitoring Water Quality in Wetlands	Conservation: Contracted in F2F	Low	X	X	X	X	X
PG III/SG 1/Purchase and Maintain Hunting Stands	Fish and Wildlife: Ongoing	Low	X	X	X	X	X
PG III/SG 2/Aquatic Weed Control at Grassy Pond & Mission Lake	In-house: Ongoing	Low	X	X	X	X	X
PG IV/SG 1; PG V/SG 1,2/Urban Forest Management	In-house: Ongoing	Low	X	X	X	X	X
PG IV/SG 1/Remove Hazard Trees in urban Settings	Contracted by CES/CEO	Low	X	X	X	X	X
PG I/SG 3,4; PG VI/SG 1,2/Monitor Dudley's Hammock	In-house: Ongoing	Low	X	X	X	X	X
PG III/SG 2; PG V/SG 2/Invasive Species Control (contracted)	Conservation: Contracted in F2F	Low	X	X	X	X	X
PG III/SG 2; PG V/SG 2/Invasive Species Control	In-house: Ongoing	Low	X	X	X	X	X
PG V/SG 1-5/Forest Management: Seed Tree Regeneration Harvest, Stand 2-08 (42 acres)	Forestry	Low	X				
PG V/SG 1-5/Forest Management: Plant containerized longleaf pine in understory of Stand 1-15 and 1-17	Forestry	Low	X				
PG V/SG 1-5/Forest Management: Clearcut Timber Sale in north Stand 1-31 (16 acres)	Forestry	Low		X			
PG V/SG 1-5/Forest Management: Site Preparation and planting of longleaf pine, Stand 1-31 (16 acres), followed in spring with banded herbicide application over each row of pines for herbaceous weed control	Forestry	Low		X			
PG V/SG 1-5/Forest Management: Thinning Stand 1-14 (29.4 acres)				X			
PG V/SG 1-5/Forest Management: Clearcut, site preparation, and planting of longleaf pine in east side of Stand 2-24 followed in spring with banded herbicide application over each row of pines for herbaceous weed control (20 acres)	Forestry	Low			X		
PG V/SG 1-5/Forest Management: Thinning Stand 1-16 (34 acres)	Forestry	Low			X		
PG V/SG 1-5/Forest Management: Clearcut, Site preparation, and planting of Slash Pine, in Stands 2-08 and 2-07 (20 acres), followed in spring with banded herbicide application over each row of pines for herbaceous weed control	Forestry	Low				X	
PG V/SG 1-5/Forest Management: Clearcut, site preparation, and planting of loblolly pine in Stands 1-26, 1-34, and 1-44 followed in spring with banded herbicide application over each row of pines for herbaceous weed control (20.3 acres)	Forestry	Low					X
PG V/SG 1-5/Forest Management: Thinning in East Stand 2-24 (45 acres)	Forestry	Low					X

11.0 REFERENCES

11.1 Standard References *(Applicable to all AF installations)*

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

11.2 Installation References

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12.0 ACRONYMS

12.1 Standard Acronyms *(Applicable to all AF installations)*

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

12.2 Installation Acronyms

- **23 WG –** 23d Wing
- **38 RQS –** 38th Rescue Squadron
- **41 RQS –** 41st Rescue Squadron
- **347 RQG –** 347th Rescue Group
- **ACC –** Air Combat Command
- **AGOW –** Air Ground Operations Wing
- **CATM –** Combat Arms Training Maintenance
- **CEAN CES –** Civil Engineer Environmental Civil Engineer Squadron
- **CSAR –** Combat Search and Rescue
- **DNR** Department of Natural Resources
- **FSS –** Force Support Squadron
- **GBBL –** Grand Bay-Banks Lake
- **GPRA –** Grassy Pond Recreational Annex
- **ITS –** Incidental Take Statement
- **MSA –** Metropolitan Statistical Area
- **OSS –** Operations Support Squadron
- **PPPBE –** Planning, Programming, Budgeting, and Execution
- **PR –** Personnel Recovery
- **RQS –** Rescue Squadron
- **ULZ –** Unimproved Landing Zone
- **WMA –** Wildlife Management Area

13.0 DEFINITIONS

13.1 Standard Definitions *(Applicable to all AF installations)*

- Natural Resources Playbook – Definitions Section

13.2 Installation Definitions

- No unique state, local and installation-specific definitions have been identified.

14.0 APPENDICES

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

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

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

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

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

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

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

15.0 ASSOCIATED PLANS

Tab 1 – Wildland Fire Management Plan

Tab 2 – Bird/Wildlife Aircraft Strike Hazard (BASH) Plan

Tab 3 – Integrated Pest Management Plan (IPMP)

Tab 4 –Integrated Cultural Resources Management Plan (ICRMP)