U. S. AIR FORCE

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN

Maxwell Air Force Base

DRAFT

(See INRMP signature pages for plan approval date)

ABOUT THIS PLAN

This installation-specific Environmental Management Plan is based on the Department of the Air Force (DAF) standardized Integrated Natural Resources Management Plan (INRMP) template. This INRMP has been developed in cooperation with applicable stakeholders, which includes Sikes Act cooperating agencies and/or local equivalents, to document how natural resources will be managed. Where applicable, external resources, including Air Force Instructions (AFIs); Department of Defense Instructions (DoDIs); DAF Playbooks; federal, state, and local requirements; Biological Opinions; and permits are referenced.

Certain sections of this INRMP begin with standardized, DAF-wide "common text" language that addresses DAF 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 DAF-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 the approved plan owner.

NOTE: The terms "Natural Resources Manager," "NRM," and "NRM/Point of Contact (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, Natural Resources Conservation Program.

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DOCUMENT CONTROL

Standardized INRMP Template

In accordance with (IAW) the Air Force Civil Engineer Center (AFCEC) Environmental Directorate Business Rule 08, *Environmental Management Plan Review, Update, and Maintenance*, the standard content in this INRMP template is reviewed periodically, updated as appropriate, and approved by the Natural Resources Subject Matter Expert (SME).

This version of the template is current as of 26 June 2020 and supersedes the 2018 version.

NOTE: Installations are not required to update their INRMPs every time this template is updated. When it is time for installations to update their INRMPs, they should adopt the most recent version of this template available in the Plan Tool.

Installation INRMP

Record of Review—The INRMP is updated no less than annually, or as changes to natural resource management and conservation practices occur, including those driven by changes in applicable regulations. IAW the Sikes Act and Department of the Air Force Manual (DAFMAN) 32-7003, *Environmental Conservation*, the INRMP is required to be reviewed for operation and effect no less than every 5 years. An INRMP is considered compliant with the Sikes Act if it has been approved in writing by the appropriate representative from each cooperating agency within the past 5 years. Approval of a new or revised INRMP is documented by signature on a signature page signed by the Installation Commander (or designee), and a designated representative of the United States Fish and Wildlife Service (USFWS), state fish and wildlife agency, and National Oceanic and Atmospheric Administration (NOAA) Fisheries when applicable (DAFMAN 32-7003).

Annual reviews and updates are accomplished by the installation Natural Resources Manager (NRM) and/or a Section 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 Section Natural Resources Media Manager) conducts an annual review of the INRMP in coordination with internal stakeholders and local representatives of USFWS, state fish and wildlife agency, and NOAA Fisheries, where applicable, and accomplishes pertinent updates. Installations will document the findings of the annual review in an Annual INRMP Review Summary. By signing 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 Maxwell Air Force Base (MAFB) Integrated Natural Resources Management Plan (INRMP) has been prepared for the 42d Air Base Wing (42 ABW) to maintain natural resources in support of the training mission. Significant natural resources include the presence of federal and/or state-listed protected species, fish and wildlife management plans, land management plans, and Waters of the United States to include wetlands on MAFB. The MAFB INRMP meets the intent of the Sikes Act (16 U.S. Code § 670a-o701, 74 Stat. 1052).

To the extent that resources permit, the U.S. Fish and Wildlife Service, Alabama Department of Conservation and Natural Resources, and MAFB by signature of their agency representative, do hereby enter into a cooperative agreement for the conservation, protection, and management of the natural resources present on MAFB. This agreement may be modified and amended by mutual agreement of the authorized representatives of the 3 agencies. This agreement will become effective upon the date of the last signatory and shall continue in full force for a period of 5 years or until terminated by written notice to the other parties, in whole or in part, by any of the parties signing this agreement. By their signatures below, or an attached sheet, all parties grant their concurrence with and acceptance of the following document.

_____ _____

SHAMEKIAN N. TOLIVER, Colonel, USAF Date

Commander, 42 ABW

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_____ _____

WILLIAM PEARSON, Field Supervisor Date

Alabama Ecological Service Field Office, United States Fish and Wildlife Service

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_____ _____

CHRISTOPHER BLANKENSHIP, Commissioner Date

Alabama Department of Conservation and Natural Resources

EXECUTIVE SUMMARY

The Sikes Act (16 U.S. Code [USC] § 670a et seq., as amended), requires federal military installations with significant natural resources to develop a long-term Integrated Natural Resources Management Plan (INRMP) and implement cooperative agreements with other agencies. The INRMP serves as a key component of the Installation Development Plan (IDP), which provides background and rationale for the policies and programming decisions related to land use, resource conservation, facilities, and infrastructure development, and operations and maintenance to ensure that they meet current requirements and provide for future growth. An INRMP is required by Department of Defense (DoD) and Department of the Air Force (DAF) Policy for Maxwell Air Force Base (MAFB) and its associated properties. The INRMP is the primary guidance document for managing natural resources on MAFB and its properties.

MAFB is located in the city of Montgomery, Alabama, and encompasses approximately 2,527 acres, with most of the land being improved or developed. This INRMP describes and directs DoD natural resource management on MAFB, Gunter Annex, and the 2 leased properties (Lake Martin Recreation Area and Vigilant Warrior Training Site) in accordance with (IAW) federal, state, and local guidelines.

Implementation of the INRMP will help ensure that MAFB property and leased lands continue to support present and future mission requirements while preserving, enhancing, and where possible, restoring ecosystem integrity. Over the long term, implementation of this and future INRMPs will guide base staff on how to maintain or improve sustainability and biological diversity of all ecosystems on MAFB properties and support sustainable economies, human use, and the environment required for realistic military operations.

The 42d Civil Engineer Squadron Environmental Flight (42 CES/CEIE) developed this INRMP in cooperation with the U.S. Fish and Wildlife Service and the Alabama Department of Conservation and Natural Resources. The details of this development process and the future review process are described in Section 9.3 of this INRMP. INRMP planning and decision-making is integrated with base comprehensive planning, proposed project planning, pest management planning, Bird/Wildlife Strike Hazard (BASH) reduction planning, airfield management planning, and cultural resources management planning. INRMP information was gathered from MAFB staff, installation stakeholders, federal and state agencies, universities, and peer-reviewed publications.

This INRMP provides a description of the military missions, the environment on the installation, and specific natural resource management designed for sustainable military training. The Natural Resources Management Goals, presented in in Section 8.0 of this INRMP, are the following:

- **Goal 1:** Maintain a natural resource management program that supports the 42d Air Base Wing (42 ABW) mission while complying with laws, regulations, and policies.
- **Goal 2:** Manage water resources with no net loss of acreage, or functions and values.
- **Goal 3:** Manage vegetation to promote a diversity of native species using cost-effective and sustainable methods.
- **Goal 4:** Provide and maintain outdoor recreation opportunities and educational initiatives in conjunction with 42 ABW Force Support Squadron (42 ABW/FSS) to highlight natural resources on MAFB IAW the Sikes Act, 16 USC 670a(a)(3)(a).
- **Goal 5:** Support biodiversity conservation IAW DoD Instruction (DoDI) 4715.03 and the 42 ABW mission by managing for fish and wildlife populations, including threatened and endangered (T&E) species and nuisance species.

These goals are supported in the INRMP by objectives, projects, management strategies, and specific actions summarized in Section 10.0. The implementation of this INRMP will ensure the successful accomplishment of the military mission while promoting adaptive management that sustains ecosystem and biological integrity and provides for multiple uses of natural resources.

1.0 OVERVIEW AND SCOPE

This Integrated Natural Resources Management Plan (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 Department of the Air Force (DAF). 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 DAF adaptability in all environments. The DAF has stewardship responsibility for 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 DAF natural resources program is to sustain, restore, and modernize natural infrastructure to ensure operational capability and no net loss in the capability of DAF 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

The purpose of this INRMP is to serve as the primary guidance document for managing natural resources at Maxwell Air Force Base (MAFB), including Gunter Annex, Vigilant Warrior Training Site, and Lake Martin Recreation Area. MAFB and its associated property incorporates 2,904 acres of federally-owned land and 241 acres of leased land under the command of the 42d Air Base Wing (42 ABW) Commander. MAFB must provide a variety of environmental conditions and habitats in which to train Airmen. The management of MAFB must be conducted in a way that provides for a sustainable, healthy ecosystem, with no net loss in the capability of the installation to support military training and missions. Installation commanders use INRMPs to manage natural resources more effectively to ensure that installation lands remain available and in good condition for installation mission sustainment.

This INRMP is intended to be consistent with the Sikes Act (16 U.S. Code [USC] § 670a et seq., as amended) and Department of the Air Force Manual (DAFMAN) 32-7003, *Environmental Conservation*, as required by the DoD and DAF. This INRMP integrates all aspects of natural resources management with the MAFB mission and therefore becomes the primary tool for managing MAFB ecosystems and habitat while supporting the military mission. A multiple-use approach is implemented to allow for mission-oriented activities while protecting environmental quality through the efficient management of natural resources. Management strategies are monitored and adjusted as needed.

The designation of critical habitat on the installation would have a negative impact on the military mission. Pursuant to Section 4(a)(3)(B)(i) of the Endangered Species Act (ESA; 16 USC §1533(a)(3)(B)(i)) and 50 Code of Federal Regulations (CFR) § 424.12(h), the Secretary of Interior "shall not designate as critical habitat any lands or other geographical areas owned or controlled by the DoD, or designated for its use, that are subject to an Integrated Natural Resources Management Plan prepared under Section 101 of the Sikes Act (16 USC § 670a), if the Secretary determines in writing that such plan provides a benefit to the species for which critical habitat is proposed for designation." This 2025 INRMP replaces the 2019 version of the INRMP for MAFB and meets the criteria listed above.

1.2 Management Philosophy

The INRMP serves as a key component of the Installation Development Plan (IDP), which provides background and rationale for the policies and programming decisions related to land use, resource conservation, facilities and infrastructure development, and operations and maintenance to ensure that they

meet current requirements and provide for future growth. The INRMP supports the mission by identifying the natural resources present on the installation, developing management goals for these resources, developing projects to achieve those goals, and integrating the management goals into the military requirements for mission operations/support and regulatory compliance to minimize natural resource constraints.

This INRMP outlines the steps needed to fulfill compliance requirements related to natural resources management and fosters environmental stewardship. It is organized into the following principal sections:

- An overview of the current status and potential future conditions of the natural resources
- Identification of potential impacts to or from natural resources
- The key natural resource management areas addressed
- Management recommendations and projects that incorporate the installation's goals and objectives for natural resource management areas
- Specific work plans for effective implementation of the INRMP

Management issues and concerns, as well as goals and objectives, are developed from analysis of all the gathered information and are reviewed by MAFB personnel involved with or responsible for various aspects of natural resources management. The INRMP was developed using an interdisciplinary approach and is based on existing information of the physical and biotic environments, mission activities, and environmental management practices at MAFB. Information was obtained from a variety of documents, ongoing monitoring and surveys, interviews with installation personnel, on-site observations, and communications with both internal and external stakeholders. Coordination and correspondence with these agencies is documented and satisfies a portion of the requirements of 32 CFR 989, *Environmental Impact Analysis Process (EIAP)*. Goals and objectives require monitoring on a continuous basis, and management strategies are updated whenever there are changes in mission requirements, adverse effects to or from natural resources, or changes in regulations governing management of natural resources.

Natural resources at MAFB and its associated properties are managed with an ecosystem management approach, as directed by DAFMAN 32-7003 and DoD Instruction (DoDI) 4715.03. Ecosystem management is defined as the management to conserve major ecological services and restore natural resources while meeting the socioeconomic, political, and cultural needs of current and future generations. The goal of ecosystem management on military lands is to ensure that military lands support present and future testing and training requirements while conserving, improving, and enhancing ecosystem integrity. As described in DoDI 4715.03 and DAFMAN 32-7003, the ecosystem management program for MAFB will incorporate the following elements, as described in Table 1-1.

Table 1-1. Elements and principles of ecosystem management

DoD Instruction 4715.03 Elements	
1	Avoid single-species management and implement an ecosystem-based multiple species management approach, as long as that is consistent with the requirements of the Endangered Species Act.
2	Use an adaptive management approach to manage natural resources.
3	Evaluate and engage in the formation of local or regional partnerships that benefit the goals and objectives of the Integrated Natural Resources Management Plan.
4	Use the best available scientific information in decision-making and adaptive management techniques in natural resource management.
5	Foster long-term sustainability of ecosystem services.

Table 1-1. Elements and principles of ecosystem management

Department of the Air Force Manual 32-7003 Principals	
1	Maintain or restore native ecosystem types across their natural range where practical and consistent with the military mission.
2	Maintain or restore natural ecological processes such as fire and other disturbance regimes where practical and consistent with the military mission.
3	Maintain or restore the hydrological processes in streams, floodplains, and wetlands when feasible and practical and consistent with military mission.
4	Use regional approaches to implement ecosystem management on an installation by collaboration with other DoD components; other Federal, state, and local agencies; and adjoining property owners.
5	Provide for outdoor recreation, agricultural production, harvesting of forest products, and other practical utilization of the land and its resources, provided that such use does not inflict long-term ecosystem damage or negatively impact the Department of the Air Force mission.

Biodiversity is the degree of variation of life within a given ecosystem, region, or the entire planet. The DoD's challenge is to manage for biodiversity in a way that supports the military mission. The DoD identifies the INRMP as the primary vehicle for conserving biodiversity on military installations. Specific management practices identified in the MAFB INRMP have been developed to enhance and maintain biological diversity within the installation's ecosystems. Ecosystem management includes biodiversity conservation and invasive species control as integral parts of ecosystem management. DAF installations should maintain or reestablish viable populations of all native species when practical and consistent with the military mission. DAF installations also should identify the presence of exotic and invasive species and implement programs to control and/or eradicate those species.

This plan presents both broad philosophical guidance and specific goals. INRMP planning and decision-making is integrated with base comprehensive planning, proposed project planning, pest management planning, Bird/Wildlife Aircraft Strike Hazard (BASH) reduction, airfield management planning, closed golf course environmental management planning, and grounds maintenance planning. Interdisciplinary input was incorporated into this plan from a wide variety of operational organizations on MAFB, as well as from various local, state, and federal agencies. This same cross-agency, cross-discipline approach will be used in preparing all major revisions of the INRMP. In recognition of the existing Cooperative Agreement between the DoD, U.S. Department of Interior, and the State of Alabama, represented by the 42 ABW, U.S. Fish and Wildlife Service (USFWS), and Alabama Department of Conservation and Natural Resources (ADCNR), respectively, the installation's Natural Resources Manager (NRM) will work with respective agency personnel to protect, develop, and manage the fish and wildlife resources on MAFB properties, thereby achieving the goals and objectives of the INRMP.

The INRMP is focused on supporting the base mission requirements while complying with the Sikes Act, ESA, Migratory Bird Treaty Act (MBTA), Clean Water Act (CWA), federal natural resource conservation laws and regulations, and various Executive Orders (EOs), including EO 11988, *Floodplains Management*; EO 11990, *Protection of Wetlands*; EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*; EO 12962, *Recreational Fisheries*; EO 11989, *Off-Road Vehicles on Public Lands*; and EO 13112, *Invasive Species*. Appendix A. Annotated Summary of Key Legislation Related to Design and Implementation of the INRMP

provides a summary of key legislation related to the design and implementation of the INRMP.

1.3 Authority

The DAF, USFWS, and ADCNR determine the requirement for an installation INRMP based on Category I and II criteria, as described in DAFMAN 32-7003. Category II installations do not require an INRMP because they do not have significant natural resources present to warrant such a plan. In consultation with USFWS and ADCNR, MAFB was designated a Category II installation by Air Education and Training Command (AETC) in January 2006. However, due to sightings of the federally protected wood stork and outdoor recreation activities requiring conservation and management, MAFB now meets Category I criteria in accordance with (IAW) DAFMAN 32-7003, and an INRMP is warranted.

The Sikes Act of 1960 (16 USC 670a-670o), as amended, provides for cooperation between the Department of Interior, DoD, and state agencies in planning, developing, and maintaining natural resources on military reservations. The Sikes Act (16 USC § 670a et seq., as amended) specifically calls for the cooperative preparation and implementation of INRMPs on military installations.

DoDI 4715.03, *Natural Resources Conservation Program*, identifies DoD policies and procedures concerning natural resources management and INRMP reviews, public comment, and endangered species consultation. INRMPs are required to be jointly reviewed by the USFWS, state fish and wildlife agency, and installation for operation and effect on a regular basis, but not less often than every 5 years. Minor updates and continued implementation of an existing INRMP do not require the installation to provide an opportunity for public comment. However, major revisions to an INRMP do require an opportunity for public review. The degree of endangered species consultation when updating or revising an INRMP depends upon specific projects identified in the MAFB INRMP and previous consultation. Most updates and revisions will not require formal consultation. ESA Section 7 consultation is required for INRMPs that contain projects that may affect federally listed species or designated critical habitat. The need for such consultation should become apparent during the review for operation and effect and implemented if necessary as part of an INRMP revision.

Air Force Policy Directive (AFPD) 32-70, *Environmental Quality*, discusses general environmental quality issues, including proper cleanup of polluted sites, compliance with applicable regulations, conservation of natural resources, and pollution prevention.

DAFMAN 32-7003, *Environmental Conservation*, implements the Sikes Act and the DoD directives by establishing the INRMP as the primary planning document for natural resources at DAF installations. DAFMAN 32-7003 establishes the Installation or Wing Commander as the signatory authority for approval of the INRMP. The Commander's signature commits the DAF to the goals and objectives of the INRMP. Once signed by the cooperating agencies (USFWS and ADCNR), the INRMP takes on the status of an interagency compliance agreement.

DAFMAN 32-7003, *Environmental Conservation*, provides guidance on the preservation of cultural resources at DAF installations.

Other applicable guidance includes DoDI 7000.14, *DoD Financial Management Policy and Procedures*, and the regulatory guidance listed in Appendix A. Annotated Summary of Key Legislation Related to Design and Implementation of the INRMP

. Installation-specific policies, including state and local laws and regulations are summarized in Table 1-2.

Table 1-2. Installation-specific policies (including state and/or local laws and regulations)

Policy	Description
Base Recreation Access Policy	Recreational use is limited to Active-duty or retired military and their family members, Civil service personnel, and civilian personnel employed on Maxwell Air Force Base (MAFB) and their families and guests.
Alabama Code Title 9	All fishing is done in accordance with Title 9, *Conservation and Natural Resources*, of the Alabama Administrative Code, as adopted by the Alabama Department of Conservation and Natural Resources.
Fishing Permits	A MAFB fishing permit is required for people aged 16 to 65 fishing on the base, in addition to any other permits or licenses required by the State. The following permits and licenses must be carried at all times when fishing: (a) valid Alabama Sport Fishing License; (b) monthly or annual fishing permit issued by the 42d Air Base Wing Force Support Squadron, Outdoor Recreation Office.
Recreation Restrictions	• Activities such as metal detecting, camping outside of designated areas, and other activities not covered in this section are prohibited without the approval of the Natural Resources Manager (NRM). • Any activities from which an individual may make a financial profit from products or materials collected on MAFB are prohibited. • Campfires are not permitted on MAFB, except in designated Family Campground fire circles or areas specifically approved for special event bonfires. • Gas-powered boats are not permitted on any base waterbodies. • No wading or swimming is permitted in lakes and streams on the installation. • Recreational off-road driving of any motorized vehicle, including ATVs and side-by-sides, is prohibited at all times.
Aquatic Herbicide Applications	• All applications will be performed by DoD- or State-certified pesticide applicators. • Contractors are generally not permitted to mix or store pesticides on the installation (with exception of the Base Operating Support contractor that manages MAFB Civil Engineering [CE] Operations). • If temporary contractors have a need to mix or store pesticides or herbicides on the installation, they must coordinate with, and be under the direction of, the CE Pest Management shop. Contractors must report pesticide usage and application to the CE Pest Management shop. • Applicators will follow the storage, mixing, transport, application, and spill-response procedures of U.S. Environmental Protection Agency and Alabama Department of Agriculture and Industries rules, regulations, and label instructions. • Pesticides (including aquatic herbicides) will not be applied directly to flowing water. • Aquatic herbicides will not be applied during any wet weather or 12 hours before or after a rain event. Aquatic herbicides will be applied only when winds are less than 5 mph. • Aquatic herbicide applicators must ensure daily that application equipment is in proper working order. Spill-response and cleanup supplies will be maintained in all vehicles and pesticide storage areas.

Table 1-2. Installation-specific policies (including state and/or local laws and regulations)

Policy	Description
Wetland and Waterway Protection Measures	• Projects that impact wetlands or other Waters of the United States may require permits from the U.S. Army Corps of Engineers and Alabama Department of Environmental Management. Any required permitting will be coordinated through the installation Civil Engineer Environmental Office, 42 CES/CEIE, which reserves the right to oversee and require correction of environmental protection measures. • Environmental Awareness—A preconstruction briefing that discusses MAFB wetland protection measures will be given to all equipment operators prior to initiation of construction activity within regulated waters and wetlands. • Exclusion Period—It is recommended that no work be conducted during rain events or within 12 hours of a rain event. Work during the wet season is subject to temporary postponement until conditions permit construction equipment use without damaging the soil or vegetation cover. • A buffer area of a minimum of 50 feet in width shall be established to provide for undisturbed habitat adjacent to the wetland. • Equipment parked overnight and/or fueled shall be at least 100 feet from a waterbody or in an upland area at least 100 feet from a wetland boundary. • Biological Monitor—If the work is within 50 feet of a wetland/drainage, the MAFB Environmental Office reserves the right to require a biological monitor to be on site while work is conducted. • Subsurface Protection—If the project site is within 50 feet of a wetland, the preconstruction clearing of vegetation will be done with hand equipment to ensure no subsurface disturbance below 6 inches occurs in or near the wetland. • Construction Barriers—Orange barrier fences or pink flags will designate exclusion zones where construction activities cannot take place. A representative from MAFB Environmental office reserves the right to identify/flag areas where barrier fencing is needed to keep equipment out of wetland areas. • Trenching Controls—In wetlands, the top 6 to 12 inches of the trench should normally be backfilled with topsoil from the trench. • Equipment—Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance. • Disposal of excavated material—All dredged or excavated material must be deposited and retained in an upland area unless otherwise specifically approved by MAFB Environmental Office. • Excess soil protection—Recommend excess soil temporarily stored on-site during construction be covered with stabilization blankets/tarp and wattles to prevent exposure to the elements and to lessen chances of sedimentation due to stormwater runoff and wind erosion. • When the soil is revegetated, the contractor/shop will remove the erosion control systems. • Erosion Control Systems—Site-specific erosion control measures (i.e., hay bales, silt fencing) shall be implemented as specified in MAFB's "Site Disturbance During Construction Activities & Stormwater Pollution Prevention" and as directed by the MAFB Environmental Office. Proper erosion

Table 1-2. Installation-specific policies (including state and/or local laws and regulations)

Policy	Description
	and sediment control measures will be installed. The contractor/shop shall install and maintain erosion control systems such as gravel/sand bags, silt fence, straw bale barriers, erosion control/stabilization blankets, or straw wattles as needed to protect drainage ditches, storm drains, seasonal wetlands and waterbodies from sedimentation resulting from construction activity. • Fills Within 100-Year Floodplains—The activity must comply with applicable U.S. Federal Emergency Management Administration-approved, state, and local floodplain management requirements. • Removal of Temporary Fills—Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate. • Proper Structure Maintenance—Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety. • Revegetation—All vegetated areas disturbed by construction shall be revegetated with approved sod or native plantings. A stabilization plan may be required by the MAFB Environmental Office. Options for large-scale revegetation may include approved seed and "certified weed-free" straw mulch, or hydro-seeding and geo-textile fabric to prevent sediments from entering waterways. • Suitable Material—No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (Section 307 of the Clean Water Act).
Removal and Replacement of Landscaping Plants	• Removal of native and ornamental trees and shrubs requires the approval of the MAFB NRM. • When removal of vegetation becomes necessary, trees and shrubs will be replaced with equivalent plants or Landscaping Plants approved species on the MAFB Approved Plant List, where practicable. Replacement plantings may be relocated to nearby areas to eliminate incompatibility with facilities and mission needs. MAFB NRM can assist with suggested locations. • Trees prone to disease or fruit-bearing trees that attract wildlife are prohibited. Replacement trees and shrubs should be followed by at least 2 years of maintenance (watering and weeding).
Invasive Plants	Planting species that are classified under the Alabama Invasive Plant Council inventory as invasive or potentially invasive plants is prohibited.
Wildlife Exclusion Zone Restrictions	Maintain airfield environment in accordance with MAFB Bird/Wildlife Aircraft Strike Hazard Plan.

1.4 Integration with Other Plans

INRMP revisions and concurrence with the final plan must be coordinated through the installation chain of command and installation stakeholders including 42 Civil Engineering (CES/CEN), 42 Civil Engineering Squadron Operations (CES/CEO), 42 Civil Engineering Squadron Occupational Health (CES/CEOH), 42d Air Base Wing Safety Office (42 ABW/SE), 42d Air Base Wing Force Support Squadron (42 ABW/FSS), 42 ABW/JA, 42 AU/PA, and Federal Prison Camp Montgomery. The NRM must ensure that the INRMP, BASH,

Integrated Pest Management Plan (IPMP; Tab 3—Integrated Pest Management Plan (IPMP)), Grounds Maintenance Plan, and any other plans that may affect natural resources are mutually supportive and not in conflict.

The goals and objectives of this plan, described in Section 8.0, must be given consideration early in the planning process for projects and mission changes on the installation. To achieve this end, the INRMP will be incorporated by reference into the MAFB IDP, and INRMP digital maps will form the basis of A-2 maps (Management Areas). Whenever the INRMP maps and associated databases are updated, the IDP A-2 maps will also be updated.

By its nature, an INRMP is multidisciplinary and provides the summary for natural resources at a specific installation. As a result, information from an INRMP is incorporated into other plans, and these plans help identify management priorities and potential impacts to natural resources. The INRMP is integrated and mutually supportive with the following MAFB plans:

- Air Installation Compatible Use Zone (AICUZ)—Provides noise levels around the airfield, ranges, and other types of training areas (MAFB 2015).
- BASH Plan—Provides summary of the BASH program on MAFB, including techniques, processes, responsibilities, and management recommendations (Tab 1—Bird/Wildlife Aircraft Strike Hazard (BASH) Plan).
- IPMP—Plan for management of pest species, including nuisance wildlife and invasive species, to minimize impact to mission, natural resources and the environment (Tab 3—Integrated Pest Management Plan (IPMP)).
- *Community Involvement Plan for the Environmental Restoration Program at Maxwell Air Force Base*—A guide for MAFB personnel, contractors and federal and State of Alabama environmental regulators for continued community outreach and participation in environmental cleanup activities (MAFB 2017).
- *Integrated Contingency Plan* (including Spill Prevention, Control, and Countermeasures Plan for MAFB)—Plan for prevention and management of spills (MAFB 2002*b*).
- Integrated Cultural Resources Management Plan (ICRMP) for MAFB properties—Plan for management of cultural resources at MAFB, including archeological resources and historic structures (Tab 2—Integrated Cultural Resources Management Plan (ICRMP)).

2.0 INSTALLATION PROFILE

Table 2-1. Installation profile

Office of Primary Responsibility (OPR)	The Wing Commander has overall responsibility for implementing the natural resources management program and is the lead for monitoring compliance with applicable federal, state, and local regulations.
Natural Resources Manager/Point of Contact (POC)	42d Civil Engineer Squadron, Environmental Flight (42 CES/CEIE) Name: Davis Todd Phone*:* (334) 953-3840 *Email:* Davis.Todd.ctr@us.af.mil
State and/or local regulatory POCs (Include agency name for Sikes Act cooperating agencies)	Alabama Dept. of Conservation and Natural Resources: Name: Taconya Goar Phone: (334) 353-7484 Name: Traci Wood Phone: (334) 353-0503 U.S. Fish and Wildlife Service: Name: William Pearson Phone: (251) 441-5181
Total acreage managed by installation	3,153 acres
Total acreage of wetlands	35.8 acres
Total acreage of forested land	240 acres
Does installation have any Biological Opinions?	No
Natural Resources Program Applicability	☒ Fish and Wildlife Management ☒ Outdoor Recreation and Access to Natural Resources ☐ Conservation Law Enforcement ☒ Management of Threatened, Endangered, and Host Nation-Protected Species ☒ Water Resource Protection ☒ Wetland Protection ☒ Grounds Maintenance ☐ Forest Management ☐ Wildland Fire Management ☐ Agricultural Outleasing ☒ Integrated Pest Management Program ☒ Bird/Wildlife Aircraft Strike Hazard (BASH) ☐ Coastal Zone and Marine Resources Management ☒ Cultural Resources Protection ☒ Public Outreach ☒ Geographic Information Systems (GIS)

2.1 Installation Overview

2.1.1 Location and Area

MAFB is located in Montgomery County, Alabama, immediately south of the foothills of the Appalachian Mountains. It is located in the northwest section of the City of Montgomery, approximately a quarter-mile west of the downtown area. MAFB is bordered on the east and south by the City of Montgomery and on the northeast by the Alabama River, and it is 82 miles south of Birmingham. MAFB consists of improved or developed land and comprises the main installation, Gunter Annex, and 2 leased properties: Vigilant Warrior Training Site and Lake Martin Recreation Area (Figure 2-1).

MAFB consists of approximately 2,527 acres of land, nearly all of which is being improved or developed in some manner. Occupied buildings, structures, pavements, and landscaped building make up approximately 700 acres, and runways, taxiways, and the adjacent infield area account for approximately 880 acres. Playgrounds, picnic areas, a few recreational lakes, and 2 closed golf courses make up the remaining land. MAFB encompasses 4 Geographically Separated Units (GSUs), Gunter Annex, Vigilant Warrior Training Site, Lake Martin Recreation Area, and a Next Generation Radar (NEXRAD) site, which consist of over 1,000 acres of easements, rights-of-way, and clear zones (Table 2-2).

Gunter Annex

Gunter Annex was formerly Gunter AFB until it was consolidated with MAFB in 1991. Gunter Annex is located approximately 10 miles east of the main base in the northeast suburbs of Montgomery. Gunter Annex consists of approximately 377 acres of fully developed land, with buildings and structures supporting Air University academic schools, combat information systems, and network operations. There are 2 access gates for Gunter Annex, of which the primary gate is Congressman Dickenson Drive Gate.

Vigilant Warrior Training Site

The Vigilant Warrior Training Site in Elmore County is located near Lake Jordan, approximately 18 miles north of MAFB. MAFB currently utilizes the Vigilant Warrior Training Site to train Airmen. The 201-acre, semi-developed training site is leased by the DAF from Alabama Power Company. Prior to the DAF leasing the property, Alabama Power Company leased the site as a hunting area. Since the DAF lease, the property has been used as a field training facility that includes semi-permanent tent sites, a warehouse, a camouflaged office building, bathhouses, a dining facility, and other related structures. The remainder of the property is largely wooded, with a network of trails traversing the site. There are 2 small streams that flow through the site and drain into nearby Lake Jordan. Alabama Power Company retains the authority to oversee natural resources on the property and must approve changes in proposed activities and facilities on the property.

Lake Martin Recreation Area

Lake Martin Recreation Area, consisting of 46 acres in Tallapoosa County, is leased from Alabama Power Company. The site is located approximately an hour away from MAFB on Lake Martin Reservoir and includes picnicking, camping, and RV sites; mobile home rentals; cabins; a laundry facility, playground, swimming area, and fishing area; and boat ramp, boat rental, and boat storage areas. The site also includes a gasoline dispensing pump with above-ground storage tank for retail lakeside fueling. Active-duty military, reserve, and National Guard personnel; DoD civilians; retired military; retired DoD civilians; DoD contractors (listed); and dependents of listed personnel are authorized to use the Lake Martin Recreation Area and make reservations at https://www.lifeatthemax.us/lake-martin/.

Next Generation Radar Site

MAFB operates the NEXRAD Doppler Weather Radar site, located approximately 45 minutes away from the main installation. NEXRAD is a radar tower designed to detect severe weather events such as tornados, hail, and excessive rain events that could cause significant flooding and snowfall amounts. There are no significant natural resources on this site.

Table 2-2. Installation/Geographically Separated Unit (GSU) location and area descriptions

Installation/ GSU	Main Use/ Mission	Acreage	Addressed in INRMP[a]	Describe Natural Resource Implications
Main installation (Maxwell Air Force Base)	This installation primarily supports the Air University and academic colleges. Additionally, the installation supports a small flying mission.	2,527	Throughout	This installation is the primary focus of the installation's Natural Resources Program, as it contains significant natural resources.
Gunter Annex	Infrastructure to support the Air University, combat information systems, and network operations.	377	Throughout	The annex has minimal implications, as it is almost completely developed.
Vigilant Warrior Training Site	This site supports field training for Airmen.	201	Throughout	This site requires in-depth management, as it is semi-developed and has bottomland hardwoods and upland pine vegetation.
Lake Martin Recreation Area	This area provides a recreational opportunity and increases morale for DoD Common Access Card (CAC) and military ID holders.	46	Throughout	This site has minimal implications, as it mostly consists of RV and tent camping sites with a small store and lake facilities.
Next Generation Radar (NEXRAD)	This facility is designed to detect severe weather events, such as tornados, hail, and excessive rain.	2	No	This site has minimal implications, as it is small, developed, and has no significant natural resources.

[a] INRMP=Integrated Natural Resources Management Plan

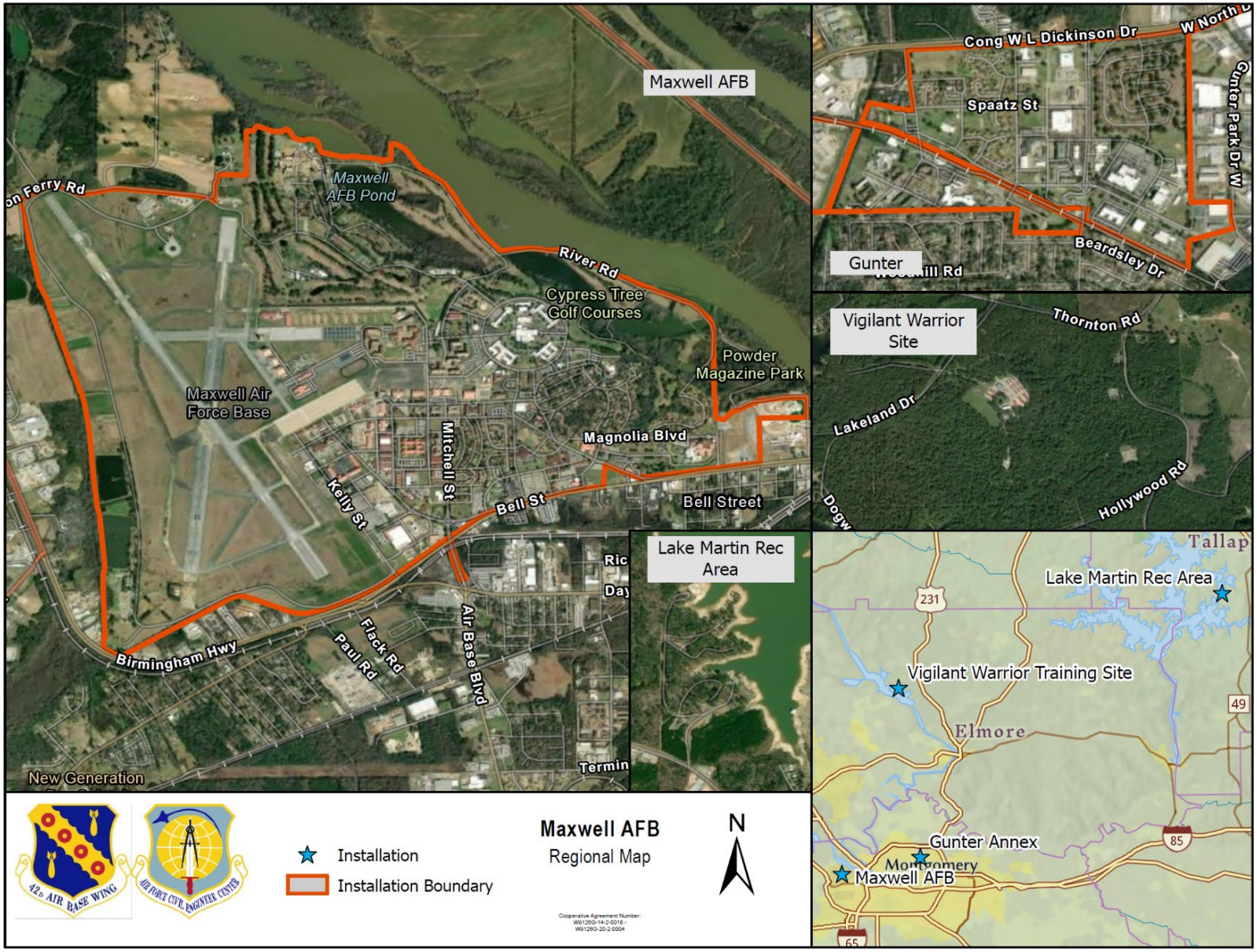

Figure 2-1. Detailed map of Maxwell Air force Base (AFB) and the other properties

2.1.2 Installation History

Maxwell Air Force Base

MAFB is one of the most historic Air Force bases. Its history spans over a century of aviation in Central Alabama, beginning with the Wright Brothers. MAFB was built on a site where the Wright Brothers established and directed the first civilian flight school in 1910.

In 1918, the Army leased the property and established an aviation repair depot to ensure the supply of planes and engines. In 1920, the U.S. Government purchased the property, and in 1921, it became the home of the 22d Observation Squadron and the 4th Photo Section. In 1928, it was announced that the property would become the home of the Air Corps Tactical School, then located at Langley Field.

Additional acreage was acquired to house the facilities for the new school. In 1929, construction started on a school (Building 800), a hospital (Building 713), an observation and parachute building (Building 844), a 2-story duplex, Non-Commissioned Officer Quarters, hangars, and warehouses. In 1931, the government acquired an additional 600 acres north and east of the original field. Officers' quarters constructed in this area formed a suburban enclave separated from the main post. French Provincial Revival-style dwellings lined curved streets. The officers' club, the bachelor officers' quarters, and the closed golf course were also built in this section.

During World War II, Maxwell was expanded, and barracks were constructed throughout the installations. At the end of World War II, another significant mission change occurred for MAFB. On 12 March 1946, the Army Air Forces renamed the Army Air Forces School to Air University. Since then, Air University has become the Air Force's postgraduate academic center for professional officer and enlisted military education, professional continuing education, and professional specialized education (Kane 2017).

Gunter Annex

Gunter Field (later renamed Gunter Annex) was established in 1941 and was the first installation approved for Basic Flight Training. Students from the U.S. Army, Great Britain, France, and Canada attended Basic Flight Training or Primary Training for 10 weeks or 70 flying hours. During World War II, Gunter Field served as a flying school, with over 400 aircraft, instructors, and support personnel assigned. After World War II, Gunter Field training ended, and flight training and aircraft were transferred to Spence Army Air Field, Georgia, and Maxwell Army Air Base.

In 1948, Gunter Field was renamed Gunter Air Force Base, and the Air University Extension Course Institute was established. In 1957, the Semi-Automatic Ground Environment Data Center was established as an early Air Force continental air defense network.

In 1971, approximately 800 acres of leased land adjoining the eastern side of the base were returned to the City of Montgomery. This parcel of returned land included the former runways and is now the Gunter Industrial Park. In 1973, Gunter Air Force Base was redesigned as the Gunter Air Force Station. Gunter Air Force Station was consolidated with MAFB in 1991 and is now known as MAFB Gunter Annex (Shaw 2004).

2.1.3 Military Missions

MAFB is an AETC base and headquarters to the 42 ABW and Air University. MAFB's primary mission is to provide support to Air University, the professional military education center of the Air Force, and to serve as a training site for over 90% of all Air Force officers. The host unit for MAFB and Gunter Annex is 42 ABW, which is responsible for providing base-level services and support. Tenant organizations at MAFB are the DAF Historical Research Agency, the Community College of the Air Force, the Headquarters Air Force Reserve Officer Training Corps, the Maxwell Federal Prison Camp, and several other schools for education,

graduate education, and professional continuing education for officers, non-commissioned officers, and civilians to prepare them for command, staff, leadership, and management responsibilities (Table 2-3). Air University is responsible for research in designated fields of aerospace, education, leadership, and management, and it contributes to the development and testing of Air Force doctrine, concepts, and strategy (USAF 1994).

The 42 ABW provides personnel, financial, civil engineering, information technology, and police and fire protection services to Air University and numerous organizations such as the 908th Flying Training Wing (908 FTW; Air Force Reserve Command), the National Headquarters of the Civil Air Patrol, and the Business Enterprise System Directorate, Air Force Life Cycle Management Center (Air Force Materiel Command).

MAFB is an operational airfield, serving MH-139 rotary wing aircraft (10 in total) and various transient aircraft. The 42 ABW supports more than 25,000 Active-duty, reserve, civilian and contractor personnel; students; family members, and military retirees, and it maintains over 4,100 acres of land, including nearby Gunter Annex, and 859 buildings. The wing is the largest employer in Montgomery County and contributes nearly $2.56 billion (in indirect jobs created, annual base payroll, and annual contracts) to central Alabama's economy (Montgomery Area Chamber of Commerce 2025).

The Department of the Air Force replaced the 908th Air Wing's previous C-130 flight mission with an Air Force Reserve Command Formal Training Unit operating 10 MH-139A aircraft in 2024. An Environmental Assessment (EA) was prepared to analysis the possible impacts to the environment with the implementation of the mission. The EA found no significant adverse impacts would be anticipated by this mission change if standing environmental protection measures and Best Management Practices (BMPs) were continued. This mission change is not expected to significantly change the way natural resources are managed on the installation.

Descriptions of the major units and tenants at MAFB are provided below:

42d Air Base Wing

The 42 ABW is assigned to AETC and is the MAFB host unit supporting all activities of the Air University, 908th FTW, Business and Enterprise Systems Directorate, and subordinate tenant units (Table 2-3).

Air University

Air University conducts professional military education, graduate education, and professional continuing education for officers, Airmen, and civilians to prepare them for command, staff, leadership, and management responsibilities. Specialized and degree-granting programs provide education to meet USAF requirements in scientific, technological, managerial, and other professional areas. In addition, Air University is responsible for research in designated fields of aerospace education, leadership, and management, and contributes to the development and testing of Air Force doctrine, concepts, and strategy.

Business and Enterprise Systems Directorate

The Business and Enterprise Systems Directorate at Gunter Annex is part of the Air Force Life Cycle Management Center and the information technology leader for the DAF and DoD. The system delivers information technology solutions to secure combat information systems and networks.

908th Flying Training Wing

The 908th Flying Training Wing is an Air Force Reserve unit that consists of 1,200 reservists that periodically train with the units. An additional 175 Air Reserve Technicians and small number of DoD Civilians run the

day-to-day operations. The 908 Flying Training Wing operates and trains personnel on the MH-139A aircraft, which is used to protect and support the nation's intercontinental ballistic missile fields.

42d Mission Support Group

The 42d Mission Support Group provides for the security and proper care of MAFB personnel and facilities. It includes the 42d Civil Engineer Squadron (42 CES), 42d Communications Squadron (42 CS), 42d Contracting Squadron 942 CONS), 42 ABW/FSS, 42d Logistics Readiness Squadron (42 LRS), 42d Security Forces Squadron (42 SFS), and 42d Operations Support Flight (42 OSS).

42d Medical Group

The 42d Medical Group is responsible for providing medical and dental care to support all wing and associated units.

42d Civil Engineer Squadron

The 42 CES includes the engineering and environmental flights, which are responsible for planning, developing, and managing contract programs to construct, improve, and maintain over 3,000 acres of land. The 42 CES is responsible for many installation functions, including facility maintenance, utilities, unaccompanied housing, engineering, fire and emergency services, readiness and emergency management, explosive ordinance disposal, and environmental management. The 42 CES also plans, programs, and executes all construction activities on the installation.

Table 2-3. Listing of tenants and natural resources responsibility

Tenant Organization	Natural Resources Responsibility
Air Force Historic Research Agency	Minimal natural resources impact
Air Force Legal Information Services	Minimal natural resources impact
Air Force Judge Advocate General's School	Minimal natural resources impact
Air Force Logistics Management Agency	Minimal natural resources impact
Air Force Program Executive Office Enterprise Information System	Minimal natural resources impact
Army and Air Force Exchange Service	Minimal natural resources impact
Civil Air Patrol National Headquarters	Minimal natural resources impact
Defense Commissary Agency	Minimal natural resources impact
U.S. Environmental Protection Agency National Air and Radiation Environmental Lab	Minimal natural resources impact
Federal Prison Camp	Minimal natural resources impact; the Federal Prison Camp maintains its own Environmental Management System (EMS), operated independently of the Maxwell Air Force Base EMS program
Air Force Counter-proliferation Center Headquarters	Minimal natural resources impact
Troy University	Minimal natural resources impact

2.1.4 Natural Resources Needed to Support the Military Mission

Natural resources needed to support the military mission include healthy vegetation for soil stabilization and adequate undeveloped open space. Undeveloped areas on the base are used for airfield buffering and ground-based contingency training and exercises. The abundance and health of natural resources on MAFB also provide outdoor recreation opportunities and general quality-of-life enhancements that contribute to the overall mission. A healthy natural environment and proactive natural resources management program will continue to enhance the viability of MAFB to support the Air Force mission.

This INRMP integrates aspects of natural resources management into the military mission. As such, it becomes the primary tool for ecosystem management at MAFB while ensuring the successful, efficient accomplishment of the military mission. A multiple-use ecosystem management approach will be implemented to accommodate mission-oriented activities and provide for good environmental stewardship, thereby maintaining and improving the quality, aesthetic values, and ecological relationships of the environment.

2.1.5 Surrounding Communities

The communities surrounding MAFB properties consists of 4 counties: Montgomery, Elmore, Autauga, and Tallapoosa. Montgomery county has been experiencing little to no growth, whereas the other counties are moderately growing. The industries in the surrounding communities are primarily educational and healthcare services, manufacturing, public administration, and retail. Table 2-4 details the demographics for each of these counties.

Table 2-4. Local county demographics

Geographic Unit	Population	Median Household Income	Percent of Individuals Below Poverty Level
Montgomery County, AL	228,954	$57,709	17.3%
Elmore County, AL	87,977	$71,651	10.7%
Autauga County, AL	58,805	$68,315	11.4%
Tallapoosa County, AL	41,311	$53,282	16.8%

Source: U.S. Census Bureau 2020

Montgomery County

Located in the south-central part of the state, along the Alabama and Tallapoosa rivers, Montgomery County is 785 square miles and has a population of 228,954 people. As the state capital and county seat, Montgomery is the largest city in the county and second-largest city in the state. Montgomery experienced a population decline (-2.57%) between the 2010 and 2020 censuses but is currently experiencing neither growth nor decline. MAFB is the leading employer and has a significant economic impact on Montgomery County and its surrounding communities, as nearly a quarter of the jobs in the county are government jobs (U.S. Census Bureau 2020). The counties workforce and industry makeup is detailed in Table 2-5.

Table 2-5. Industry makeup of the City of Montgomery

Industry	County Job Makeup (%)
Education services, and health care and social assistance	20.1
Public administration	13.6
Manufacturing	13.1
Professional, scientific, and administrative and waste management services	12.2
Arts, entertainment, recreation, and accommodation and food services	9.9
Retail trade	9.3
Transportation and warehousing, and utilities	6.3
Finance and insurance, and real estate and rental and leasing	5.1
Construction	3.8
Other services, except public administration	3.5
Wholesale trade	1.6
Information	1.4
Agriculture, forestry, fishing and hunting, and mining	0.2

Source: U.S. Census Bureau 2020

The general land use characterization of Montgomery County is mostly developed, with counties to the east-southeast of MAFB being a mixture of industrial, commercial, and residential. Counties to the northwest of MAFB are commercially developed along major roads and rural agriculture tracts and grazing parcels to the west and southwest.

Elmore County

Elmore County also has potential impacts on MAFB properties. Elmore County is approximately 619 square miles that was created from equal sections of Coosa, Autauga, Tallapoosa, and Montgomery counties. Located in the east-central part of the state, along the Tallapoosa and Coosa rivers, the county has a population of 87,977 people, making it one of the fastest-growing counties in the state. Other population centers in Elmore County include Eclectic, Coosada, Tallassee, Elmore, Deatsville, Millbrook, and the county seat, Wetumpka. The economy was historically based on agriculture, but as of the 2020 Census, the economy is currently divided among educational services (23.4%), public administrations (12.5%), manufacturing (11.4%), and retail (10.8%), along with many other industrial services which make up smaller components (U.S. Census Bureau 2020).

The MAFB Vigilant Warrior Training Site is located approximately 38 miles northeast of MAFB on the eastern shore of Lake Jordan, near the communities of Titus and Wetumpka in Elmore County. Vigilant Warrior Training Site is leased from Alabama Power Company and is semi-developed for military training. The surrounding area is primarily rural, forested, and undeveloped. A small number of permanent or seasonal residences are located to the south of Vigilant Warrior, along the shore of Lake Jordan, and recreational water activities in the surrounding areas center on the use of lake.

Autauga County

Autauga County also has potential impacts on MAFB properties due to its close proximity to the installation. Autauga County is 595 square miles, located approximately 17.5 miles from MAFB, and has a population of 58,805. The Alabama River runs along the county's southern border, along with numerous creeks. The city of Prattville serves as the county seat and the largest city in the county, with a population of 37,781. Industries in the county primarily consists of educational services/healthcare services (20.0%), manufacturing (12.4%), and retail trade (11.2%) (U.S. Census Bureau 2020).

Autauga County hosts several parks and recreational areas for outdoor activities. The Nature Conservancy's Robert Case Pine Hill Preserve is a 374-acre property that was developed to protect the federally endangered Alabama canebrake pitcher-plant (*Sarracenia rubra* ssp. *alabamensis*). This carnivorous pitcher plant is known to grow only in Autauga and Chilton counties and is believed to occur adjacent to MAFB in Montgomery and Elmore counties.

Tallapoosa County

Tallapoosa County also has potential impacts on MAFB properties. Tallapoosa County is located in east-central Alabama, approximately 70.6 miles from MAFB. Consisting of 717 square miles, Tallapoosa County has an estimated population of 41,311, with the largest city being Alexander City. Tallapoosa County is bisected by the Tallapoosa River, with Lake Martin located in the middle section of the river between Elmore and Coosa counties. Farming was historically the primary occupation, but occupations began to shift to a more industrial economy in the 20th century. The 2020 Census workforce data for Tallapoosa County is divided among education and health care services (21.4%), manufacturing (21.3%), retail (10.6%), construction (9.3%), arts/entertainment (7.0%), and many other industrial services (U.S. Census Bureau 2020).

2.1.6 Local and Regional Natural Areas

There are several regional areas that have significant natural features in the area surrounding MAFB, including parks, backwater lakes, impoundments, and the Alabama River. The Alabama River is an extensive navigable water feature that supports a wide variety of flora, fauna, and recreational activities. Northeast of MAFB is the Coosa River watershed that starts in Tennessee and eventually reaches the Tallapoosa River to form the Alabama River. There are 6 dam impoundments (Weiss Lake, Logan Martin Lake, Neely Henry Lake, Lay Lake, Mitchell Lake, Lake Jordan) on the Coosa River for Alabama Power Company.

Approximately 8.3 miles southwest of MAFB on the backwaters of the Alabama River is the U.S. Army Corps of Engineers (USACE) Gunter Hill Park. Gunter Hill is a popular campground that provides a natural setting for boating, fishing, and hiking. Located on the Coosa River and 30 miles north of MAFB is Lake Jordan. The 6,800-acre impoundment is a popular natural setting with scenic views and a water recreation area for boaters and anglers.

Powder Magazine Park is a community park near downtown Montgomery, adjacent to MAFB. The park provides a natural setting for scenic views, picnic areas, a historical structure, and boat ramp access to the Alabama River. In 2011, the City of Montgomery initiated a Maxwell Boulevard Neighborhood Plan that would connect downtown Montgomery with MAFB along the Alabama River.

There are numerous parks, trails, lakes, water features, and natural areas scattered throughout and near Montgomery County. These areas are run by the Montgomery Parks and Recreation Department and provide athletic and recreation amenities to the public. Parks and open space natural areas shape the physical environment of Montgomery County and enhance neighborhoods through natural resources conservation. Residents and visitors of Montgomery County have identified parks, trails, and recreational facilities as valuable community assets. Lake Martin is an important economic, recreation, and hydroelectric power site for the State of Alabama. MAFB leases 46 acres from the Alabama Power Company recreation area, which include spots for day picnicking with grills, rough camping, and 30 RV sites with water and electrical hook-ups.

2.2 Physical Environment

2.2.1 Climate

The climate is roughly uniform throughout the Southeastern Plains where MAFB is located. The climate at the installation is humid and subtropical, with hot, humid summers and relatively mild winters. This area has less of a moderating influence from the ocean than do areas farther south and east, and the northwestern most parts of this region have more continental influence, with greater possibility of extreme weather spells due to the movement of large air masses. Precipitation is high year-round, with relatively little seasonality. This region is subject to hurricanes and tropical storms, although their influence is usually weakened by the more inland location relative to the outer portions of the coastal plain to the southeast.

The National Oceanic and Atmospheric Administration (NOAA) National Weather Service in the city of Montgomery has recorded over 70 years of precipitation, temperature, and frost data. Severely cold weather seldom occurs; subfreezing temperatures have a short duration. January is the coldest month, with an average temperature of 48 °F and an average high of 60 °F. The summer's high temperatures reach the upper 80s and lower 90s (°F). The average growing season in the Montgomery area is 246 days (8 months). The Montgomery area has an average annual precipitation of 51 inches, with consistent rainfall throughout much of the year (NOAA 2024). Table 2-6 provides details on the typical temperatures and rainfall in the Montgomery area by month.

Table 2-6. Average precipitation and temperature for Montgomery, Alabama (1991–2020)

Month	Average Rainfall (inches)	Temperature (°F)		
		Minimum	Maximum	Average
January	4.64	36.5	59.8	48.1
February	4.88	40.4	64.7	52.6
March	5.21	46.5	71.9	59.2
April	3.99	52.6	78.8	65.7
May	3.88	61.3	86.0	73.6
June	4.08	69.0	91.5	80.2
July	5.06	72.1	93.7	82.9
August	4.02	71.4	93.6	82.5
September	3.69	66.3	89.3	77.8
October	2.87	54.5	80.2	67.4
November	3.85	43.3	69.8	56.6
December	4.99	38.6	61.9	50.2
Total (Average)	51.16 (4.26)	54.4	78.4	66.4

Source: NOAA 2024

Regional historical weather patterns and observations from recent decades indicate several key patterns to consider when using historical weather data, including:

- Increased frequency of heavy rainfall events in recent decades, with more occurrences of daily precipitation totals exceeding three inches
- Higher incidences of hot nights where overnight temperatures remain elevated, reducing nighttime cooling
- A noticeable extension of the frost-free season compared to mid-20th century trends
- Increased annual temperature extremes, with both high and low temperatures trending upward over several decades

The climate at MAFB is subject to a variety of extreme weather events (Montgomery City-County Emergency Management Agency and Lee Helms Associates 2015). These events can impact installation operations, infrastructure, natural resources, and the military mission and should be considered in planning. Natural hazards from extreme weather are discussed in Section 7.16.

2.2.2 Landforms

The MAFB runway is 170.8 feet above mean sea level (MSL) and is located south of the Appalachian Mountains, within the East Gulf Coastal Plain physiographic region and Coastal Plain province of the Atlantic Plain region.

The East Gulf Coastal Plain region covers the southern 60% of the state and includes a wide variety of landscapes. It is characterized by low rounded or eroding hills and shallow valleys that gradually slope to the sea. The East Gulf Coastal Plain is separated from the other regions to the north by the Fall Line, which is the most important physiographic feature affecting the distribution of many of Alabama's amphibians, reptiles, fishes, and mollusks. Landforms above the Fall Line are hilly, and streams above the Fall Line are generally swift with rocky bottoms. The land south of the Fall Line tends to be flatter, and streams below the Fall Line tend to be sluggish with muddy or sandy bottoms. The Fall Line represents the approximate point where streams leave the upland valleys bounded by older, more resistant rocks in the northern part of the state to

begin a gentle, winding path across a broader and more level floodplain. With a lower energy of flow below the Fall Line, rivers begin to drop some of their sediment load that was carried down from the eroding uplands.

Gunter Annex in north Montgomery lies within the transitional Fall Line Hills subdivision of the East Gulf Coastal Plain. The MAFB main base lies within the Alluvial Deltaic Plain on the bank of the Alabama River. The topography of both MAFB and Gunter Annex is generally level, with elevations averaging 168 feet above MSL at MAFB and 215 feet MSL on Gunter.

The Vigilant Warrior Training Site and Lake Martin Recreation Area in east-central Alabama are found within the Piedmont Upland Physiographic region of the Appalachian Highlands. This region of mostly rolling hills extends into central Alabama from Georgia. The region is somewhat mountainous near the northern boundary but becomes less mountainous toward the southern boundary. The areas around Vigilant Warrior Training Site and Lake Martin Recreation Area are relatively flat to moderately hilly. Elevations near Vigilant Warrior Training Site range from 200 to 350 feet MSL.

2.2.3 Geology and Soils

A soil survey of Montgomery County generally describes the Coastal Plains Region and most of the soils in this area as derived from marine and fluvial sediment that eroded from the Appalachian and Piedmont plateaus. The surficial geology is dominated by Quaternary Terrace and Alluvial deposits consisting of course sands, gravel, silts, and clays deposited over time by the Alabama River.

Eight soil types have been identified and mapped on MAFB and its associated properties, as detailed below in Table 2-7. On the MAFB main base, most soils consist of Amite-Cahaba-associated soils, which are typically found on level or sloping uplands of high stream terraces. The Cahaba-Wickham soils are typically found on level or gently sloping lowlands of floodplains and low stream terraces and are present along the north and west base, within the floodplain areas.

Gunter Annex has 6 soil types that have been mapped, belonging to 2 main soil associations. Three of these belong to the Amite Series, which covers about 95% of Gunter Annex. Developed mainly from old alluvium washed from well-drained upland soils, the Amite Series is deep and consists of a reddish-brown to grayish-brown surface layer and a red to dark brown, friable, sandy clay loam subsoil. On average, the soil profile for this series consists of dark gray, sandy loam topsoil that is 3 to 4 inches thick (MAFB 2007).

The soils of the Vigilant Warrior site include sandy loams of the Redbay, Orangeburg, Faceville, and Bowie series. The parent materials of these soils are moderate sands and sandy clays of the Coastal Plain. The Faceville series is highly to very highly erodible, while the other soil types have low to moderate erodibility. A small amount of mixed alluvial soils is also present along the streambeds, having mixed textures and variable drainage conditions. The soils are predominantly poorly drained, with slow runoff and slow internal drainage (MAFB 2008).

The predominant soil type at the Lake Martin Recreation Area is the Wedowee Series. This type of soil consists of very deep, well-drained, moderately permeable soils that formed from weathered igneous and metamorphic rocks of the Piedmont uplands. These soils are found on narrow ridges and on side slopes of uplands. They are gravelly sandy loam soils, which are strongly acidic and moderately eroded.

Table 2-7. Mapped Soils of Maxwell Air Force Base

Series	Permeability of Subsoil	Parent Material	Depth to Parent Material (feet)	Reaction	Depth to Water Table (feet)	Rate of Infiltration
Amite	Moderately slow	Sandy Loam	3–8	Medium to strong acid	3–4	Moderately Rapid
Byars	Moderate to Moderately Slow	Sandy Clay or Clays	2–3	Extremely to strong acid	1	Moderate
Myatt	Moderate to Moderately Slow	Sandy Clay or Clays	2–3	Very strong to moderate	1.5–2.5	Moderate
Red Bay	Well drained	Sandy Loam	3–6	Very strong to moderate	>4	Moderate
Orangeburg	Well drained	Sandy Loam	4–6	Very strong to moderate	>2	Moderate
Faceville	Well drained	Red clayey	5–6	Strongly acid	>6	Moderate to Well
Bowie	Moderately Rapid	Sandy and sandy Clay Loam	3–4	Very to slightly acid	>10	Moderately Rapid
Wedowee	Well drained	Sandy Loam	2–5	Extremely to strong acid	>10	Moderate

Source: U.S. Department of Agriculture Soil Conservation Service (1960)

2.2.4 Hydrology

2.2.4.1 Maxwell Air Force Base

The hydrology and water management on MAFB property is complex due to both natural and anthropogenic influences. The water table at MAFB ranges in depths from 4 to 40 feet below the ground surface. The Eutaw Formation is part of the Tuscaloosa Group aquifer system and is the principal aquifer supporting the Montgomery County area and MAFB. The Eutaw aquifer formation depth extends from near-surface to 488 feet below ground surface, and well yields typically produce 5 to 1,500 gallons per minute in support of public, domestic, agricultural, and industrial wells (Geological Survey of Alabama 2018).

Most of the groundwater used at MAFB occurs under artesian conditions, with water-table conditions occurring in the Pleistocene terrace deposits and recent alluvium, and outcrop areas of the Eutaw Formation. The groundwater in Montgomery County has a chemical quality that is satisfactory for most uses, although it is hard and high in iron or chloride content in some locations. The water from the Eutaw Formation, a few miles southwest of Montgomery's West well field, is very high in chloride content. Eutaw Formation water moves toward the cone of depression in the piezometric surface and is produced by pumping in the West well

field. Much additional groundwater could be pumped from the Eutaw Formation, especially south of Montgomery's West well field. Additional water is also available from the upper part of the Coker Formation. Before large groundwater developments are planned, well spacing and pumping rates should be studied to determine the maximum development permitted by the supply use (Knowles et al. 1963). MAFB receives its potable water from the Montgomery Water Works and Sanitary Sewer Board (MWWSSB). MAFB has 3 inactive wells that were used for the irrigation of training fields and campus landscaping.

Watershed, Surface Water, and Drainage

MAFB is located on the western bank of the Alabama River within the Alabama Cahaba River Basin. The surface drainage patterns on MAFB are generally from the southwest to northeast towards the Alabama River. Due to the predominance of impermeable surfaces located throughout MAFB, localized ponding occurs during heavy rain events.

A network of existing inverts and stormwater channels currently controls stormwater runoff from MAFB. Due to the large amount of impermeable surfaces throughout the MAFB property, the volume of stormwater runoff can be relatively high. The surface drainage patterns on MAFB are generally from southwest to northeast towards the Alabama River. Stormwater from MAFB is routed to 4 outfalls that discharge to the river and several other outfalls that discharge to other surrounding drainage ways. A majority of this stormwater runoff flows through the on-base drainage system and pond prior to discharging into the Alabama River. Prominent water features on the base include lakes and drainage basins associated with the river floodplains, several small ponds on the closed golf courses, and 2 retention ponds on the southwest side of the base that are used for fishing.

Any proposed construction in the developed areas of MAFB would have negligible impact on surface hydrology and would include BMPs to alleviate runoff, sedimentation, and erosion. National Pollutant Discharge Elimination System (NPDES) permitting for point and stormwater discharges has been delegated to the State of Alabama. Individual and general stormwater permits require the applicant to develop and implement a pollution prevention plan and, in some instances, monitor discharges for specific pollutants. The Alabama Department of Environmental Management (ADEM) Municipal Separate Storm Sewer System (MS4) Phase II NPDES General Permit issued to MAFB covers the Phase II Stormwater Program.

The installation operates a pumping station that withdraws surface water from the Alabama River for golf course irrigation. Water withdrawal is reported annually to the Alabama Department of Economic and Community Affairs as required.

There are a number of impoundments and open waterbodies on MAFB. The largest are 13 base recreational lakes and ponds, 6 streams and drainages and 19 wetlands. Of the total base acreage, lakes and ponds comprise approximately 115 acres, streams and drainages are 5.5 acres, and wetlands cover approximately 21 acres of land.

2.2.4.2 Gunter Annex

Watershed and Drainage

Gunter Annex is located within the Alabama Cahaba River Basin on the western bank of the Alabama River. Surface drainage patterns on Gunter Annex generally flow from northeast to southwest towards Three Mile Branch. Most stormwater is collected in surface drains, from which it flows into Montgomery municipal underground drainage ways off the installation. Due to the high proportion of impermeable surfaces on Gunter Annex, the volume of stormwater is moderate to high, and localized ponding will occur during heavy rain events. There is a 2,000-foot perennial stream section not owned by Gunter Annex on the western boundary that borders Three Mile Branch Creek. This perennial stream is the main surface water in the area; it flows

north to join the Galbraith Mill Creek and eventually discharges into the Alabama River. Due to urban development, ADEM has determined that Three Mile Branch Creek along Lower Wetumpka Road exceeds CWA Section 303(d) Total Maximum Daily Loads for pesticides (Dieldrin), siltation, and the *Escherichia coli* bacterium (ADEM 2019).

The groundwater resources at Gunter Annex are highly responsive to surface water conditions due to extremely permeable soils at shallow depths (3.5 to 40 feet below ground surface). Installation water level measurements indicate that groundwater flow varies across the installation, from a westerly flow in the western portion near Three Mile Branch Creek, to a north and northwest flow in other sections of the installation. Recharge occurs by precipitation falling on any exposed portions of the surface and from the terrace deposits at higher elevations. Gunter Annex obtains its water supply from MWWSSB, with 66.7% coming from the Tallapoosa River (a tributary of the Alabama River) and the remaining amounts from a combination of the Eutaw, Gordo, and upper and lower Coker aquifer systems (MAFB 2022*a*).

Any proposed construction would have negligible impact on surface hydrology and would include BMPs to alleviate runoff, sedimentation, and erosion. NPDES permitting for point and stormwater discharges has been delegated to the State of Alabama. Individual and general stormwater permits require the applicant to develop and implement a pollution prevention plan and, in some instances, monitor discharges for specific pollutants. ADEM MS4 Phase II NPDES General Permit issued to Gunter Annex covers the Phase II Stormwater Program (MAFB 2005).

2.2.4.3 Vigilant Warrior Training Site

Drainage and Groundwater

The Vigilant Warrior Training Site, located near Lake Jordan, is part of the Coker and Gordo formations that are found at the surface and overlay metamorphic water-bearing rocks. The groundwater is closely tied to the regional geology, and the Coker aquifer is the primary water source for Elmore County. Estimated well yields for the Coker Formation are 0.1 to 0.5 million gallons per day (Jennings and Cook 2008). At elevations below 300 feet MSL, the water permeability drops and wells produce less than 0.1 million gallons per day (MAFB 2008). Larger water yields may occur in cavities, and permeability may increase near stream sites. Regional recharge areas for groundwater occur to the north and northeast.

Groundwater quality in Elmore County is determined by aquifer characteristics and is considered generally good in the area, apart from elevated concentrations of iron (above the recommended limit of 0.3 milligrams per liter) may occur locally (Jennings et al. 2013). Potable water has low chloride levels and low hardness, at 0 to 6 parts per million, but iron and manganese content may be elevated in the area.

Surface Water

Surface water is the prevailing hydrology feature at Vigilant Warrior Training Site but is restricted to 2 small streams associated with Lake Jordan and the Alabama Coosa River Drainage Basin. Additional Vigilant Warrior property drainage information can be found in the *Biological Survey for Vigilant Warrior, Elmore County, Alabama* (MAFB 2016). According to the NOAA National Weather Service (2024), precipitation averages 52 inches annually in the river basin, and surface water is affected by stream and tributary influences. Seasonal variations in precipitation will affect stream flow, with flow being lowest in October and typically increasing in November to January due to winter rain and reduced evaporation. The peak stream flows and surface water coincide with spring rains and diminish during the summer months due to reduced rainfall and increased evaporation.

2.2.4.4 Lake Martin Recreation Area

Drainage and Groundwater

Lake Martin Recreation Area is located on the Lake Martin Reservoir and was formed by the construction of the Martin Dam on the Tallapoosa River in 1926. Built on the Cherokee Bluffs geological formation, alluvial deposits, and Coastal Plains physiographic sediment, Martin Dam created what was considered the world's largest artificial lake.

Groundwater is closely tied to the regional geology, and the Metasedimentary aquifer that overlies the Eutaw and Gordo formations, along with the Tallapoosa River, are the primary water sources for Tallapoosa County. Estimated well yields for the Eutaw Formation are >1500 gallons per day at 400 feet MSL. Greater water yields may occur in cavities, and permeability may increase near stream sites. Regional recharge areas for groundwater occurs to the north and northeast (Scott et al. 1987).

Groundwater quality is determined by aquifer characteristics and is considered generally good in Tallapoosa County and surrounding areas, although locally elevated concentrations of iron (above the recommended limit of 0.3 milligrams per liter) may occur (Kopaska-Merkel et al. 2000). Potable water has low chloride levels at concentrations of ~500 milligrams per liter.

Surface Water

Surface water is the prevailing hydrology feature at Lake Martin Recreation Area, along with aquifer recharge that occurs primarily in outcrop formations. According to the NOAA National Weather Service (2024), precipitation averages 50 inches annually, and surface water is affected by outcrop and tributary influences. Seasonal variations in precipitation are uniform throughout the area, with the mean rainfall ranging from 6.9 inches in March to 3.4 inches in October.

2.3 Ecosystems and the Biotic Environment

2.3.1 Ecosystem Classification

The biotic environment can be divided and classified based on climate, geologic structures, and undisturbed vegetative communities. MAFB and its properties are classified using the National Hierarchical Framework of Ecological Units (Cleland et al. 1997), also known as Bailey's ecoregions, which start with the broadest category, Domain, and narrows down to the Division, Province, and Section. MAFB, Gunter Annex, Vigilant Warrior Training Site, and the Lake Martin Recreation Area are located in the Humid Temperate Domain, Subtropical Division, and Coastal Plain-Middle Section ecosystem. MAFB and Gunter Annex are on the northern edge of the Outer Coastal Plain Mixed Province, with Vigilant Warrior Training Site and Lake Martin Recreation Area on the Southeastern Mixed Forest Province. The specific Coastal Plain-Middle Section of MAFB properties is described below.

Coastal Plain-Middle Section

Ecoregions are in part defined by shared biotic and abiotic characteristics, representing practical units on which to base conservation planning. Moreover, the hierarchical nature of Bailey's ecoregion classification allows conservation management to be planned and implemented at a variety of geographical levels, from small-scale programs focused on discrete Sections to much larger national or international projects that target Divisions (Cleland et al. 1997).

The Coastal Plain-Middle Section falls within the Coastal Plain Mixed and Southeastern Mixed Forest provinces, with the predominant landform consisting of moderately dissected, irregular plains of marine origin formed by deposition of continental sediments onto a submerged, shallow continental shelf, which was later

exposed by sea level subsidence. The elevation ranges from 80 to 650 feet. Local relief ranges from 100 to 300 feet. Rock units in this Section consist primarily of those from the Mesozoic (40%) and Cenozoic (60%) rock unit eras. The Mesozoic rock strata consist of Cretaceous marine sediments (sands and clays). Cenozoic strata consist of Tertiary marine deposits (siliceous strata with lignitic, sandy, and argillaceous deposits).

The climate in this Section is typified by annual precipitation levels ranging from 40 to 60 inches. The temperature averages 60 to 68 °F, and the growing season lasts about 200 to 280 days (Cleland et al. 1997). Vegetation communities in this Section are oak–hickory–pine forest, blackbelt forest, and oak–hickory forest. The predominant vegetation form is evergreen, needle-leaved forest with cold-deciduous, broad-leaved trees. The principal forest cover type consists of loblolly pine (*Pinus taeda*) and shortleaf pine (*Pinus echinata*) with hardwoods, including sweetgum (*Liquidambar styraciflua*), flowering dogwood (*Cornus florida*), elm (*Ulmus americana*), eastern red cedar (*Juniperus virginiana*), southern red oak (*Quercus falcata*), and hickories (*Carya* spp.). In central Alabama, the hardwood component may be dominant, depending on the soil moisture regime and past disturbance. A narrow band of the oak–hickory forest type occurs along the extreme western edge of the Section, adjacent to floodplains of the Mississippi River and along major river bottoms.

2.3.2 Vegetation

The vegetation on MAFB and its associated properties includes terrestrial plant communities, wetlands communities, and sensitive plant species. The historic vegetation on MAFB properties is similar to what is described for the Bailey's ecoregion provinces (Section 2.3.1).

2.3.2.1 Historical Vegetation Cover

Historically, the ecoregions of Alabama were a mosaic of ecotypes, predominantly comprised of longleaf pine (*Pinus palustris*) systems with fragmented Black Belt Region prairies. This forested system of the Coastal Plain occurred mostly throughout rolling uplands, while short-grass prairie lands (Black Belt Region) were found along sloping low terraces with good soil and drainage. The Black Belt Region is a wide belt of rich topsoil that runs from east to west and encompasses more than 18 Alabama counties.

Fire is possibly the most important natural process affecting the composition, density, and vegetation structure of the longleaf pine ecosystem. Areas in the region with more frequent fire may develop a relatively pure canopy of longleaf pine, characterized by an open woodland structure with scattered overstory trees and an herbaceous-dominated understory. These longleaf pine distribution boundaries indicate where the system formed the historical landscape matrix, with smaller patches of the system present in limited areas both north and south of the boundaries.

When the area was settled by European immigrants in the mid-1800s, development, fire suppression, and overgrazing by livestock began to transform the Coastal Plain region into urban development, agricultural, and grazing livestock/shrubland. In the late 1800s, these rich, vast stands of longleaf pine fed the expanding timber industry in Alabama. By the late 1920s, the old-growth forests were virtually gone, and timber growers replaced longleaf pine with faster-growing shortleaf pine, slash pine (*Pinus elliottii*), and loblolly pine varieties (MAFB 2015).

2.3.2.2 Current Vegetation Cover

A complete list of plant species detected in Montgomery, Tallapoosa, and Elmore counties is provided in the appendices below. For further information about vegetation classification and mapping at MAFB, refer to the Vegetation Classification and Mapping Report (MAFB 2024). A map illustrating vegetation communities on the installation can be found below in Figure 2-2.

Maxwell Air Force Base

MAFB is within the Eutaw Belt of the Central Pine Belt Region and is dominated by bottomland and floodplain forests and floodplain marsh communities. The urban forest areas consist of hardwoods and hardwood-dominated lowland areas (wetlands or floodplains), with maintained grassy areas of varying species, types, condition classes, site indices, stocking levels, and operating conditions. Almost all the areas that were former crop fields or former farmsteads still clearly exhibit the effects of disturbance, with reduced native plant diversity and missing native species. There are no natural wooded or forested communities (with the exception of the 2 small tracts mentioned in Section 2.3.2.2) or federally listed threatened and endangered (T&E) species, proposed species, or their designated critical habitat under USFWS jurisdiction on MAFB.

Trees that were planted for landscaping or urban forestry purposes include both native and nonnative species. Mature canopy trees, dominated by live oaks (*Quercus virginiana*), occur around the historic officer housing areas. More recently planted trees are found in the industrial and administrative areas east of the airfield. Dominant tree species on base include slash pine, loblolly pine, live oak, water oak (*Quercus nigra*), pin oak (*Quercus palustris*), southern red oak, pecan (*Carya illinoinensis*), and sweetgum. On the University Golf Course, maturing trees help to create a pleasing visual impact, define corridors of play, and protect golfers from stray shots. Dominant tree species on the golf course include slash pine, loblolly pine, bald cypress (*Taxodium distichum*), Chinese tallow (*Triadica sebifera*), and water oak.

Open space must be maintained around the airfield, and these mowed grass areas have become pseudo-meadow habitats. Dominant field species include crimson clover (*Trifolium incarnatum*), Kentucky tall fescue (*Schedonorus arundinaceus*), field clover (*Trifolium campestre*), bahiagrass (*Paspalum notatum*), and crabgrass (*Digitaria* spp.). Other dominant vegetation in the wetland areas and along the shores of open waters, include soft rush (*Juncus effusus*), red maple (*Acer rubrum*), floating seed box (*Ludwigia alternifolia*), alligatorweed (*Alternanthera philoxeroides*), buttonbush (*Cephalanthus occidentalis*), bald cypress, and black willow (*Salix nigra*).

Bottomland and Floodplain Forest Community

Bottomland forests are deciduous or mixed deciduous evergreen on terraces and levees within floodplains and shallow depressions. They are softwood or hardwood forest tree species occurring in soils that are inundated with moisture due to their proximity to streams. According to The Nature Conservancy, urban development and agriculture has caused significant loss of quality southern floodplain forest habitat and warrant conservation concern (MAFB 2002*b*).

- Dominant species in the floodplain forests include green ash (*Fraxinus pennsylvanica*), American sycamore (*Platanus occidentalis*), southern hackberry (*Celtis laevigata*), and sweetgum.
- Dominant species in the canopy include American sycamore, green ash, and silver maple (*Acer saccharinum*).
- Dominant species in the understory include bald cypress, water hickory (*Carya aquatica*), box elder (*Acer negundo*), American holly (*Ilex opaca*), and honeylocust (*Gleditsia triacanthos*).
- Other common species include Bradford pear (*Pyrus calleryana*), pecan, mountain laurel (*Kalmia latifolia*), crapemyrtle (*Lagerstroemia* spp.), southern magnolia (*Magnolia grandiflora*), sweetgum, live oak, and more than 150 other species of cultivated plants and shrubs.

Floodplain Marsh Community

Floodplain marsh communities are characterized as a wetland community in river floodplains and are dominated by herbaceous vegetation and shrubs. Most floodplain marsh communities are freshwater (with a salinity of less than 0.5 parts per thousand) and have permanent standing water, which may prevent most tree and shrub growth within the marsh community. These communities are represented as small, isolated patches within or adjacent to floodplain forests.

- Dominant species in floodplain marsh communities are sedges, grasses, forbs, including coast cockspur (*Echinochloa walteri*), bagpod (*Sesbania vesicaria*), catchfly grass (*Leersia lenticularis*), woolgrass (*Scirpus cyperinus*), and marshpepper knotweed (*Polygonum hydropiper*).
- Other dominant invasive plant communities include Chinese tallow, bamboo (*Bambusa vulgaris*), kudzu (*Pueraria montana*), silk tree (*Albizia julibrissin*), chinaberry (*Melia azedarach*), Japanese honeysuckle (*Lonicera japonica*), Japanese climbing fern (*Lygodium japonicum*), Chinese privet (*Ligustrum sinense*), Johnsongrass (*Sorghum halepense*), and dallisgrass (*Paspalum dilatatum*).

An ongoing initiative to survey and treat invasive species is occurring at MAFB. Due to anthropogenic disturbance on the installation and the spread of invasive species along the Alabama River, desirable native plant species were displaced. Subsequently, the disturbed areas allowed for the propagation of terrestrial and aquatic invasive plant species such as alligatorweed, water hyacinth (*Eichhornia crassipes*), water primrose (*Ludwigia peploides*), and Chinese tallow. A 2021 survey conducted on MAFB identified 22 invasive plant species (Table 2-8; Texas A&M Natural Resources Institute 2022).

Table 2-8. Invasive plant species present on Maxwell Air Force Base

Common Name	Scientific Name
Chinese tallow	*Triadica sebifera*
Chinese privet	*Ligustrum sinense*
Silk tree	*Albizia julibrissin*
Japanese honeysuckle	*Lonicera japonica*
Johnson grass	*Sorghum halepense*
Alligatorweed	*Alternanthera philoxeroides*
Water hyacinth	*Eichhornia crassipes*
Bamboo	*Phyllostachys aurea*
Trifoliate orange	*Citrus trifoliata*
Chinaberry	*Melia azedarach*
Red-tip photinia	*Photinia serrulata*
Bradford pear	*Pyrus calleryana*
Monkey grass	*Liriope spicata*
Japanese climbing fern	*Lygodium japonicum*
Sweet autumn clematis	*Clematis terniflora*
Taro	*Colocasia esculenta*
Thorny-olive	*Elaeagnus pungens*
English ivy	*Hedera helix*

Common Name	Scientific Name
Chinese holly	*Ilex cornuta*
Waxy privet	*Ligustrum lucidum*
Kudzu	*Pueraria montana*
Heavenly bamboo	*Nandina domestica*

Source: Texas A&M Natural Resources Institute 2022

Gunter Annex

Gunter Annex is situated within the Eutaw Belt Subregion of the central Pine Belt. Due to permanent development across the installation, virtually no original vegetation or naturally wooded areas exist. Presently, the vegetation on Gunter Annex mainly consists of urban or improved vegetative communities. Planted ornamental trees and shrubs are the dominant vegetation (MAFB 2002*b*).

- Dominant species include crapemyrtle, Bradford pear, loblolly pine, hackberry, and various oak species.
- Non-dominant species include cherry (*Prunus* spp.), catalpa (*Catalpa* spp.), American sycamore, southern magnolia, and pecan.
- The dominant invasive plant community is Chinese tallow.

Vigilant Warrior Training Site

The Vigilant Warrior Training Site is located in the Southern Inner Piedmont Sub-ecoregion (Griffith et al. 2001) of the Coastal Plain Province and is an unmanaged forest with numerous trails and an obstacle course. In December 2016, CCR Environmental conducted a biological survey for the Vigilant Warrior site and identified 4 primary vegetative communities: upland pine forest, upland hardwood forest, bottomland hardwood forest, and woodland seep forest (MAFB 2016).

Upland Pine Forest Community

The upland pine forest ecosystem is rolling terrain with a combination of well-drained loose soils that support a shrub layer of grasses and herbs between widely spaced pines. The longleaf pine community has been degraded because of fire suppression, deforestation, and invasion of nonnative plants. Herbaceous cover varies from sparse to abundant, dependent upon the density and shading effects, and promotes many different species of forbs and grasses (MAFB 2002*b*, 2016).

- Dominant species in the upland pine forest include southern red oak, water oak, and loblolly pine.
- Other common species include mockernut hickory (*Carya tomentosa*), chinquapin (*Castanea pumila*), swamp dogwood (*Cornus foemina*), flowering dogwood, littlehip hawthorn (*Crataegus spathulata*), persimmon (*Diospyros kaki*), honeylocust, black walnut (*Juglans nigra*), eastern red cedar, sweetgum, wax-myrtle (*Morella cerifera*), black cherry (*Prunus serotina*), Darlington's oak (*Quercus hemisphaerica*), post oak (*Quercus stellata*), winged sumac (*Rhus copallinum*), sassafras (*Sassafras albidum*), Chinese tallow, loblolly pine, sourwood (*Oxydendrum arboreum*), American holly, red maple, American beautyberry (*Callicarpa americana*), blackgum (*Nyssa sylvatica*), sweetgum, dwarf pawpaw (*Asimina parviflora*), American beech (*Fagus grandifolia*), white oak (*Quercus alba*), American basswood (*Tilia americana*), winged elm (*Ulmus alata*), and more than 70 other species of cultivated plants, vines, and shrubs.
- Other dominant invasive plant species include Chinese tallow, silk tree, and chinaberry.

Upland Hardwood Forest Community

Upland hardwood forest communities are located on elevated slopes and characterized by overstory, shade-tolerant deciduous trees with shrubs and herb type groundcover vegetation. Known for species diversity, upland hardwood forest communities do not tolerate fire, and many native species will not reestablish if fire occurs. Upland hardwood forests also significantly protect watersheds and minimize soil erosion.

- Dominant species include dwarf pawpaw, water oak, and sweetgum.
- Other common species include pignut hickory (*Carya glabra*), flowering dogwood, persimmon, American holly, tuliptree (*Liriodendron tulipifera*), loblolly pine, black cherry, southern red oak, Darlington's oak, water oak, post oak, winged sumac, American beech, white oak, American basswood, and sassafras.
- Another dominant invasive plant species is Chinese tallow.

Bottomland Hardwood Forest Community

Bottomland hardwood forest communities occupy approximately 2.7 million acres of land in Alabama (U.S. Department of Agriculture [USDA] Forest Service 2015). They occur along low-lying lands of floodplains, wetlands, streams, and rivers. Due to routine flooding, stream deposits, and natural weathering, these ecosystems are comprised of alluvial soils that support many different species of deciduous and evergreen hardwoods, shrubs, and wildlife. Bottomland hardwood forests play an important role in controlling soil erosion, maintaining water quality, recharging groundwater, and preventing flood damage.

- Dominant species include American basswood, American beech, and white oak.
- Other common species include pignut hickory, persimmon, sweetgum, tuliptree, hophornbeam (*Ostrya virginiana*), loblolly pine, southern red oak, and water oak.
- Another dominant invasive plant species is chinaberry.

Woodland Seep Community

Woodland seep communities are typically small areas of saturated herbaceous wetlands in upland mixed-pine forests that occur along steep slopes, where groundwater discharges, or close to stream headwaters. Seeps are typically dominated by rare and unusual floral and faunal species and vegetation litter due to soil saturation and downed trees.

- Dominant species include blackgum, American holly, red maple, beautyberry, net leaf-chain fern (*Woodwardia areolata*), and slender woodoats (*Chasmanthium laxum*).
- Other common species include swamp dogwood, persimmon, sweetgum, tuliptree, sweetbay magnolia (*Magnolia virginiana*), swamp tupelo (*Nyssa biflora*), loblolly pine, southern red oak, water oak, and black willow.
- Other dominant invasive plant species include chinaberry, Chinese tallow, swordfern (*Macrothelypteris torresiana*), silk tree, Japanese honeysuckle, autumn olive (*Elaeagnus umbellata*), Japanese climbing fern, and Chinese privet.

Lake Martin Recreation Area

The Lake Martin Recreation Area is located in the Southern Inner Piedmont Sub-ecoregion (Griffith et al. 2001) of the Coastal Plain Province. It is a forested area with numerous trails. The Nature Conservancy completed a Natural Community and Rare Plant and Animal Survey for MAFB, Gunter AFB, and Maxwell–Gunter Lake Martin Recreation Area in 2002 and identified 4 natural vegetation communities.

Seep Forest Community

This community is typically seepage-influenced forested wetlands in the Cumberland Plateau, Ridge, and Valley regions of Alabama. It often occurs along streamhead swales or on broad sandstone ridges, where soils are sandy and saturated due to a combination of perched water table and seepage flow. Seeps are typically dominated with rare and unusual flora and fauna, and some seeps may lack a canopy, causing them to be dominated by shrubs or herbs.

- Dominant species include blackgum, Lescur's sphagnum (*Sphagnum lescurii*), red maple, cinnamon fern (*Osmunda cinnamonea*), greater bladder sedge (*Carex intumescens*), and slender woodoats.
- Other common species include red maple, blackgum, tuliptree, sweetgum, American holly, American hornbeam (*Carpinus caroliniana*), bigleaf magnolia (*Magnolia macrophylla*), winterberry (*Ilex verticillata*), hazel alder (*Alnus serrulata*), great laurel (*Rhododendron maximum*), black chokeberry (*Aronia melanocarpa*), eastern poison ivy (*Toxicodendron radicans*), climbing hydrangea (*Hydrangea petiolaris*), royal fern (*Osmunda regalis*), slender woodoats, and New York fern (*Thelypteris noveboracensis*).
- Dominant invasive plant species include Chinese tallow, silk tree, and chinaberry.

Longleaf Pine Woodland Community

This is one of several associations representing longleaf pine stands of the interior regions of the southeastern United States, including the Piedmont, Cumberland Plateau, and Southern Ridge and Valley. This community is dominated by pine and occurs on rolling, sometimes mountainous upland slopes in Alabama. Vegetation is usually variable and dependent on previous disturbances and fire frequency, and the pine canopy can be open or closed, depending on the vegetation composition.

- Dominant species include longleaf pine, shortleaf pine, blackjack oak (*Quercus marilandica*), chestnut oak (*Quercus montana*), Blue Ridge blueberry (*Vaccinium pallidum*), and Virginia pine (*Pinus virginiana*).
- Other common species include post oak, scarlet oak (*Quercus coccinea*), eastern black oak (*Quercus velutina*), white oak, southern red oak, blackgum, sourwood, red maple, sassafras, sand hickory (*Carya pallida*), mockernut hickory, sparkleberry (*Vaccinium arboreum*), deerberry (*Vaccinium stamineum*), buffalograss (*Bouteloua dactyloides*), silver bluestem (*Bothriochloa saccharoides*), and dwarf violet iris (*Iris verna*).
- The dominant invasive plant species is Japanese climbing fern.

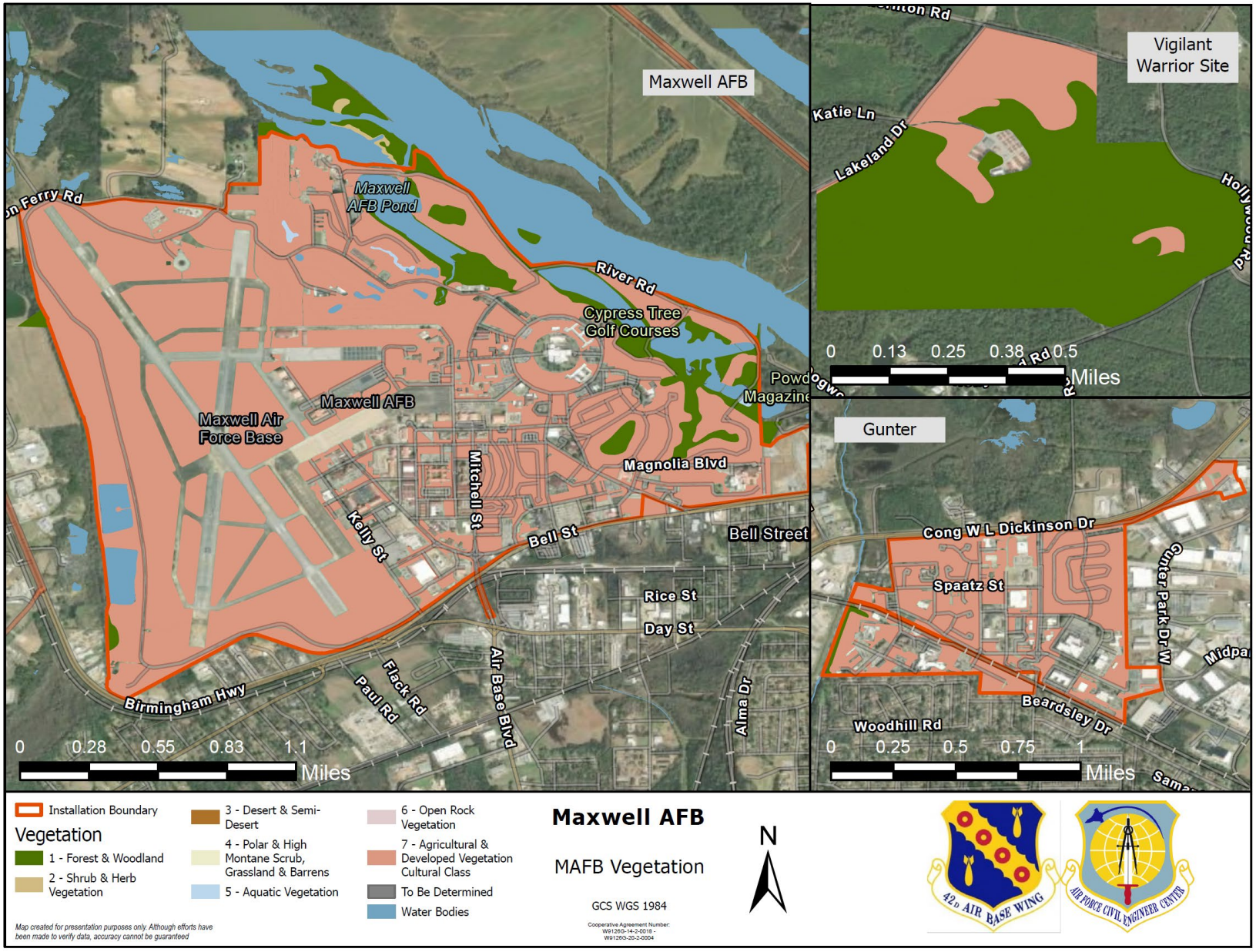

Figure 2-2. Vegetation communities on Maxwell Air Force Base (AFB)

2.3.2.3 Future Vegetation Cover

Most of the vegetation on MAFB and Gunter Annex is landscaped lawns and improved grounds with planted shade trees and ornamental shrubs. Native vegetation species are nonexistent at Gunter Annex and rare at the main base, except along undisturbed areas adjacent to the Alabama River. The vegetation at the Vigilant Warrior Training Site and Lake Martin Recreation Area is mostly native in undisturbed areas, with disturbed vegetation communities comprised of early successional and invasive weed species (MAFB 2002*b*, 2016). Historically, the vegetation cover at MAFB and throughout Alabama has been influenced by prolonged fire suppression, clear-cutting, human disturbances, disease, and weather changes. Future vegetation cover and habitat quality will continue to be altered and shaped by natural hazards, anthropogenic disturbance, timber harvesting, nonnative species, and disease.

Predicting future vegetation cover is difficult due to changes in land use patterns, population growth and development, natural resources demand, technology, and regulatory compliance. Furthermore, any shifts in regional temperatures and precipitation, including the frequency of drought, would be likely to alter current vegetation dynamics. Frequent droughts reduce vegetation productivity and can increase damage from insects and pathogens.

Loss of vegetation cover can reduce mission readiness and installation resilience. Warwick and Clarke (1995) revealed that vegetation distinctness decreased with anthropogenic disturbance in communities and that taxonomic changes were more sensitive to disturbance than was vegetation range. Anthropogenic disturbance may result in vegetation cover that is composed of species that are very similar to each other, as the disturbed environment supports only specific species. Disturbed environments may result in difficult growing conditions, allowing exotic plant species to colonize and outcompete native species. As such, proactive vegetation management is needed to ensure no net loss in future mission capabilities.

The future vegetation cover at MAFB and its associated properties will be defined by mission goals and objectives and support the IDP. Since most of the land on MAFB and Gunter Annex is developed, future vegetation cover opportunities will be limited to urban-type ornamental vegetation. Vigilant Warrior Training Site and Lake Martin Recreation Area will maximize current vegetation resources and land use techniques prior to any development. The Montgomery area has many native trees, shrubs, and groundcover types that have demonstrated their hardiness and ability to thrive without supplemental water.

2.3.2.4 Turf and Landscaped Areas

Turf and landscaped areas on MAFB have been extensively developed in the past and occur in and around the flightline, main base, family housing areas, and along principal transportation corridors. Maintaining the airfield grass height and surrounding landscape features IAW specifications in MAFB's BASH Plan is an important mission requirement. Most turf in improved areas is composed of Bermudagrass (*Cynodon dactylon*), St. Augustine grass (*Stenotaphrum secundatum*), bahiagrass, and crabgrass. Tree and shrub cover is composed of crapemyrtle, Bradford pear, southern magnolia, water oak, southern red oak, loblolly pine, sweetgum, and live oak. Open space areas or semi-improved areas (e.g., airfield) include bahiagrass, crimson clover, tall fescue, low-hop clover, Johnsongrass, and crabgrass. On the University Golf Course, dominant grass species include Tifgreen II Hybrid Bermuda, with maturing trees to define corridors of play and protect golfers from stray shots. Dominant tree species on the golf course include slash pine, loblolly pine, bald cypress, Chinese tallow, and water oak.

2.3.3 Fish and Wildlife

MAFB properties provide a variety of terrestrial habitats as well as limited aquatic habitats. Many wildlife surveys have been conducted over the years, including a 2002 Natural Community and Rare Plant and Animal Survey by the Alabama Natural Heritage Program (MAFB 2002*a*), T&E Species Survey (Woolpert

Consultants 1994), Wildlife Hazard Assessment (MAFB 2018), bat acoustic surveys (Hauar et al. 2017), and faunal survey (MAFB 2021). These surveys conclude that there are 14 species of terrestrial mammals at MAFB, 2 at Gunter Annex, eight at Vigilant Warrior Training Site, and 4 at Lake Martin Recreation Area. All mammal species identified were common across the region and no protected terrestrial mammals or critical habitat were identified on MAFB properties. Twelve bat species, more than 31 avian species, 29 herpetofauna species, 16 fish species, and 27 insect families were also identified across all of the properties. Additional details regarding historical surveys, as well as species of fish and wildlife occurring on MAFB properties and species that have the potential to occur, can be found in the 2021 faunal survey (MAFB 2021). Fish and wildlife management information on MAFB properties can be found in Section 7.1.

MAFB has continued to monitor bat populations and status on the installation through bat acoustic surveys conducted in 2023 and 2024. These surveys involved deploying acoustic monitoring devices in areas where bat activity is likely. These devices record acoustic data that is processed through software programs that identify the presence of bat species based on acoustic calls. The species identification is then vetted and confirmed by qualified experts. This data is valuable for conserving protected species and monitoring bat populations on the installation.

Five bat species were confirmed through this acoustic monitoring which includes the hoary bat (*Lasiurus cinereus*), northern yellow bat (*Lasiurus intermedius*), evening bat (*Nycticeius humeralis*), Brazilian free-tailed bat (*Tadarida brasiliensis*), and tricolored bat (*Perimyotis subflavus*). The tricolored bat is proposed to be listed as threatened under the ESA and is discussed further below in Section 2.3.4. Continuous bat acoustic monitoring, as outlined in Section 8.0, will help ensure bat populations on the installation are not being impacted by installation operations.

2.3.4 Threatened and Endangered Species and Species of Concern

2.3.4.1 Relevant Legislation

Several pieces of legislation regulate the listing criteria for special-status species and dictate the responsibilities of federal landholders. Special-status species in this INRMP are those species recognized on either federal or state conservation lists. The acts described below are the primary drivers for actions relating to T&E species and Alabama's state-protected species in this INRMP.

The most prominent piece of legislation affecting installation natural resources is the 1973 ESA. This Act requires that all federal agencies implement protection programs for designated species or critical habitat and use their authorities to further the purposes of the Act. Federal agencies, in consultation with the USFWS, must ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species. However, most DoD properties can be exempted from critical habitat designation if their INRMP benefits the species for which critical habitat is proposed. Furthermore, the Act prohibits any action that causes a "taking" of any listed species of endangered fish or wildlife. To comply with the ESA, the DAF is required under regulation DAFMAN 32-7003 to inventory their lands for federally listed T&E species and, if present, provide an overall ecosystem management approach for the protection and management of the species.

The Bald and Golden Eagle Protection Act (BGEPA) prohibits any person or agency, without a permit issued by the Secretary of the Interior, from "taking" bald or golden eagles, including their parts, nests, or eggs. Furthermore, the Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb." If these species are present on the installation, potential impacts of construction projects, training events, or other actions should be assessed. Consultation with the USFWS may be necessary to reduce or eliminate impacts on the species.

The MBTA is intended to ensure the sustainability of all protected migratory species by prohibiting their take without prior authorization by the Department of the Interior (16 USC 703-712). The MBTA is a federal statute that implements 4 treaties between the United States and Canada, Mexico, Japan, and Russia on the conservation and protection of migratory birds. More than 800 species of birds are protected by the MBTA (50 CFR 10.13). The MBTA prohibits taking, killing, or possessing migratory birds unless allowed by regulation or permit. In 2003, the National Defense Authorization Act directed the Secretary of the Interior to exempt the Armed Forces from incidental take during military readiness activities authorized by the Secretary of Defense. Effective 30 March 2007, the USFWS issued a Final Rule authorizing such take, provided it does not have a significant adverse effect on a species' population (USFWS 2007*b*).

Furthermore, EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, provides guidelines for federal agencies to protect migratory birds. This EO requires federal agencies that are taking actions that have or are likely to have a measurable negative effect on migratory bird populations to develop and implement a Memorandum of Understanding (MOU) with the USFWS. Accordingly, the DoD and USFWS signed an MOU in 2006 to promote the conservation of migratory birds (DoD and USFWS 2006). This MOU, which was updated and signed again in 2014 (DoD and USFWS 2014), describes specific actions that should be taken by the DoD to advance migratory bird conservation, avoid or minimize the take of migratory birds, and ensure that DoD operations, other than military readiness activities, are consistent with the MBTA.

Alabama does not maintain a legal equivalent to the federal ESA, but some species receive state-level protection through the Alabama Regulations on Game, Fish, and Fur-Bearing Animals. Management of state-protected fauna is controlled under the Protected Nongame Species Regulation, Alabama Administrative Code 220-2-.92, *Protected Nongame Species*. This contains protections for certain fishes, herpetofauna, mammals, and nearly all nongame birds in the state. Additionally, certain invertebrates are protected by Alabama Administrative Code 220-2-.98, *Invertebrate Species Regulation*. These are the only regulations affording state protection for fauna in Alabama and are administered by the ADCNR. The Alabama Wildlife Action Plan also identifies species within the state in need of conservation action and provides discretionary management direction. Species are identified in the Alabama Wildlife Action Plan as Priority 1 through 5 species, with Priority 1 being the highest conservation concern and Priority 5 being the lowest. However, the Alabama Wildlife Action Plan affords no state protections to species it recognizes.

However, DAFMAN 32-7003, Section 3.38.2, states that INRMPs should provide for the protection and conservation of state-listed protected species when practicable and consistent with the military mission. If conflicts with such conservation occur, the 42d Civil Engineer Squadron Environmental Flight (42 CES/CEIE) will consult with the appropriate state authority to determine if any conservation measures can be feasibly implemented to mitigate impacts.

2.3.4.2 Protected Species Occurrence and Status

There are currently 6 species known to occur on the installation that are federally protected, state protected, or under review for protection. Species that are federally protected are the bald eagle (*Haliaeetus leucocephalus*), Alabama map turtle (*Graptemys pulchra*) and wood stork. The black-knobbed map turtle (*Graptemys nigrinoda*), alligator snapping turtle, tricolored bat, and various nongame bird species are protected by state regulations. The USFWS has proposed the alligator snapping turtle and tricolored bat to be listed on the ESA, with decisions expected soon. The black-knobbed map turtle is under USFWS review for ESA listing, but no proposal has been made.

All federally listed wildlife species with a known occurrence in Montgomery, Elmore, and Tallapoosa counties are listed in Table 2-9**Error! Reference source not found.**. Management and survey efforts for these species are based on their regulatory status; known occurrence on or near MAFB, Gunter Annex, Vigilant

Warrior Training Site, or Lake Martin Recreation Area; or highly likely occurrence on MAFB property. Section 7.4 provides more detail about the management of protected species on the installation.

Table 2-9. Federally protected species in Montgomery, Elmore, and Tallapoosa counties

Common Name	Scientific Name	Federal Status	Suitable Habitat and Potential Occurrence on Maxwell Air Force Base (MAFB) Properties
BIRDS			
Wood stork	*Mycteria americana*	T	**Yes**—Forages in prairie ponds, flooded pastures, ditches, and other shallow standing water, including saltwater; usually roosts communally in tall snags; breeds in Mexico and moves into Gulf States in search of mudflats and other wetlands. Stopover habitat located in wetlands; occurs in and around Montgomery, Elmore, and Tallapoosa counties.
Bald eagle	*Haliaeetus leucocephalus*	BGEPA	**Yes**—Found in forested habitats with large old-growth trees adjacent to shorelines and large bodies of open water with an abundant food supply; occurs in and around Montgomery, Elmore, and Tallapoosa counties.
Red-cockaded woodpecker	*Picoides borealis*	E	**No**—A cavity nester found exclusively in mature pine trees, preferring long-leaf pine but will use other species of southern pine; due to fire suppression and forest removal on MAFB properties, the species has been extirpated from those locations.
MOLLUSKS			
Narrow pigtoe	*Fusconaia escambia*	T	**No**—A freshwater bivalve found within the East Gulf Coastal Plain Physiographic Region rivers that drain southeastern; historically known to occur in Montgomery County.
Choctaw bean	*Villosa Choctawensis*	E	**No**—Found in southeastern United States and listed in Montgomery County.
Southern kidneyshell	*Ptychobranchus jonesi*	E	**No**—Known to occur in high-quality habitats of the Choctawhatchee River tributaries, and historical range included Montgomery County.
Southern sandshell	*Hamiota australis*	T	**No**—Occurs in medium-sized creeks and rivers with slow to moderate currents of Alabama drainages.
Southern clubshell	*Pleurobema decisum*	E	Critical Habitat in Elmore County; no suitable habitat on MAFB properties
Fuzzy pigtoe	*Pleurobema strodeanum*	T	**No**—Freshwater bivalve endemic to the United States; occurs in Coosa River, a tributary of the Alabama River, Montgomery County.
Southern acornshell	*Epioblasma othcaloogensis*	E	Critical Habitat in Elmore County; no suitable habitat on MAFB properties.
Upland combshell	*Epioblasma metastriata*	E	Critical Habitat in Elmore County; no suitable habitat on MAFB properties.
Finelined pocketbook	*Lampsilis altilis*	T	Critical Habitat in Elmore County; no suitable habitat on MAFB properties.

Table 2-9. Federally protected species in Montgomery, Elmore, and Tallapoosa counties

Common Name	Scientific Name	Federal Status	Suitable Habitat and Potential Occurrence on Maxwell Air Force Base (MAFB) Properties
Ovate clubshell	*Pleurobema perovatum*	E	Critical Habitat in Elmore County; no suitable habitat on MAFB properties.
Triangular kidneyshell	*Ptychobranchus decisum*	E	Critical Habitat in Elmore County; no suitable habitat on MAFB properties.
Alabama moccasin-shell	*Medionidus acutissimus*	T	Critical Habitat in Elmore County; no suitable habitat on MAFB properties
Coosa moccasin-shell	*Medionidus parvulus*	E	Critical Habitat in Elmore County; no suitable habitat on MAFB properties.
Southern pigtoe	*Pleurobema georgianum*	E	Critical Habitat in Elmore County; no suitable habitat on MAFB properties.
PLANTS			
Alabama Canebrake pitcher-plant	*Sarracenia rubra*	E	**No**—The insectivorous plant occurs in swamps, seeps, and bogs and prefers acidic soils in full sunlight; occurs in Montgomery and Elmore counties.
Georgia rockcress	*Arabis georgiana*	T	**No**—Found on rocky slopes of hardwood forests along streams or eroded river banks; Occurs in Montgomery, Elmore, and Tallapoosa counties.
Little amphianthus	*Amphianthus pusillus*	T	**No**—Small aquatic herb that grows on weathered granite outcrops and vernal pools; occurs in Tallapoosa County.
White fringeless orchid	*Platanthera integrilabia*	T	**No**—A perennial herb that grows in forested areas with wet soil and obtains nutrients from fungus; occurs in Tallapoosa County.
Kral's water plantain	*Sagittaria secundifolia*	T	**No**—Only found in rocky creeks in Tallapoosa County.
SNAILS			
Tulotoma snail	*Tulotoma magnifica*	T	**No**—Found in Montgomery and Elmore counties in Coosa-Alabama River.
Rough hornsnail	*Pleurocera foreman*	E	**No**—Species is endemic to the Coosa River. Critical Habitat in Elmore County.
Interrupted rocksnail	*Leptoxis foreman*	E	**No**—Species has Critical Habitat in Elmore County.
MAMMALS			
Indiana bat	*Myotis sodalist*	E	**No**—Small bat with dull chestnut to bronze color on basal side, with cinnamon color on underpart of body.
Northern long-eared bat	*Myotis septentrionalis*	E	**No**—Medium size bat that is dusky-brown in color with noticeably large distinguished long ears: occurs in Tallapoosa County.
Tricolored bat	*Perimyotis subflavus*	PL	**Yes**—Schwab (2018) confirmed this species with Bat Acoustic Survey.
REPTILES			
Alligator snapping turtle	*Macrochelys temminckii*	PL	**Yes**—This species was confirmed to occur on the installation in 2024 through U.S. Fish and Wildlife Service surveys.

Table 2-9. Federally protected species in Montgomery, Elmore, and Tallapoosa counties

Common Name	Scientific Name	Federal Status	Suitable Habitat and Potential Occurrence on Maxwell Air Force Base (MAFB) Properties
Alabama map turtle	*Graptemys pulchra*	T	**Yes**—This species was confirmed to occur near the installation on the shoreline of the Alabama River, outside of the installation boundary, in 2021 during faunal surveys.
INSECTS			
Monarch butterfly	*Danaus plexippus*	PL	**No**—Surveys needed to determine if this species is present

Federal Status Codes: BGEPA=Bald and Golden Eagle Protection Act; E=Endangered; T=Threatened; PL=Proposed Listing

In addition to these federally listed species described above, species petitioned for listing on the ESA that may occur on or near the MAFB main base or Gunter Annex include the black-knobbed map turtle, impressed-nerved sedge (*Carex impressinervia*), and Harper's heartleaf (*Hexastylis speciosa*).

Petitioned species that may occur on or near Vigilant Warrior Training Site include the coal darter (*Percina brevicauda*), Alabama rainbow (*Villosa nebulosa*), and Coosa creekshell (*Villosa vanuxemensis umbrans*). Petitioned species that may occur on or near Lake Martin Recreation Area include the delicate spike and Tallapoosa orb (*Quadrula asperata archeri*).

2.3.5 Wetlands and Floodplains

2.3.5.1 Wetlands

The USACE defines wetlands as "those areas that are inundated or saturated with ground or surface water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (33 CFR 328). Wetlands are an important natural system because of the diverse biological and hydrologic functions that they perform. These functions include water quality improvement, groundwater recharge, pollution treatment, nutrient cycling, provision of wildlife habitat and niches for unique flora and fauna, stormwater storage, and erosion protection. As a result, wetlands are protected as a subset of the "Waters of the United States" under Section 404 of the CWA. The term "Waters of the United States" has broad meaning under the CWA and incorporates deep water aquatic habitats and special aquatic habitats (including wetlands). "Jurisdictional" waters of the United States are areas that are regulated under the CWA and also include coastal and inland waters, lakes, rivers, ponds, streams, intermittent streams, vernal pools, and other waters that, if degraded or destroyed, could affect interstate commerce.

Section 404 of the CWA authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits for the discharge of dredged or fill materials into Waters of the United States, including wetlands. Therefore, even an inadvertent encroachment into wetlands or other Waters of the United States that results in displacement or movement of soil or fill materials has the potential to be viewed as a violation of the CWA if an appropriate permit has not been issued by the USACE. In addition, wetlands are protected under EO 11990 (43 Federal Register 6030), the purpose of which is to reduce adverse impacts associated with the destruction or modification of wetlands.

Wetlands also contribute to the food chain because they typically provide for dense, high-quality vegetation for wildlife. Amphibians, which are ecologically important due to their position in the food chain and their biomass, are dependent on wetlands. Many proximate small wetlands can be just as important as large

wetlands and allow for a wider dispersal of amphibians across the landscape. The wetlands and surrounding vegetation of the floodplain (marsh, submerged vegetation, wet meadow, etc.) are important habitats in amphibians' life cycles. Amphibians use both aquatic and terrestrial environments, making them very sensitive to the water level variation that affects these habitats. Water level fluctuations offer food and shelter from potential predators. Periodic drying of smaller wetlands prevents the establishment of fish that can eat amphibian eggs. In addition, wetlands serve as natural filters, reducing polluted runoff to streams and drainage and contaminant flow into waterbodies.

Woolpert Consultants conducted an inventory of the wetlands at MAFB, Gunter Annex, Vigilant Warrior Training Site, and Lake Martin Recreation Area IAW the USFWS classification system (Dister 1994). The wetland survey was updated by the MAFB Environmental Office in 2009 and by CCR Environmental in 2021, and it confirmed 14 jurisdictional wetlands (Figure 2-3). These sites are described as forested and scrub-shrub type wetlands and considered important constraints to future development on the base (AETC Headquarters 2009, CCR Environmental 2021). Wetlands and floodplain maps for MAFB can be found on the Alabama Department of Economic and Community Affairs Office of Water Resources website (ADECA 2018).

The results of the survey provided a quality ranking for the wetlands on the MAFB, as well as a description of vegetation found in each wetland area. These results help manage information to improve and protect wetlands. As a part of the management system, the wetlands will be routinely monitored for changes in vegetation, hydrology, and size. Management practices to improve the quality of or expand wetlands focus on wetlands connected to other wetlands or watersheds extending beyond the base boundary. MAFB maintains and remains in compliance with MS4 permits issued through ADEM and Sanitary Sewer Pretreatment Permits through MWWSSB.

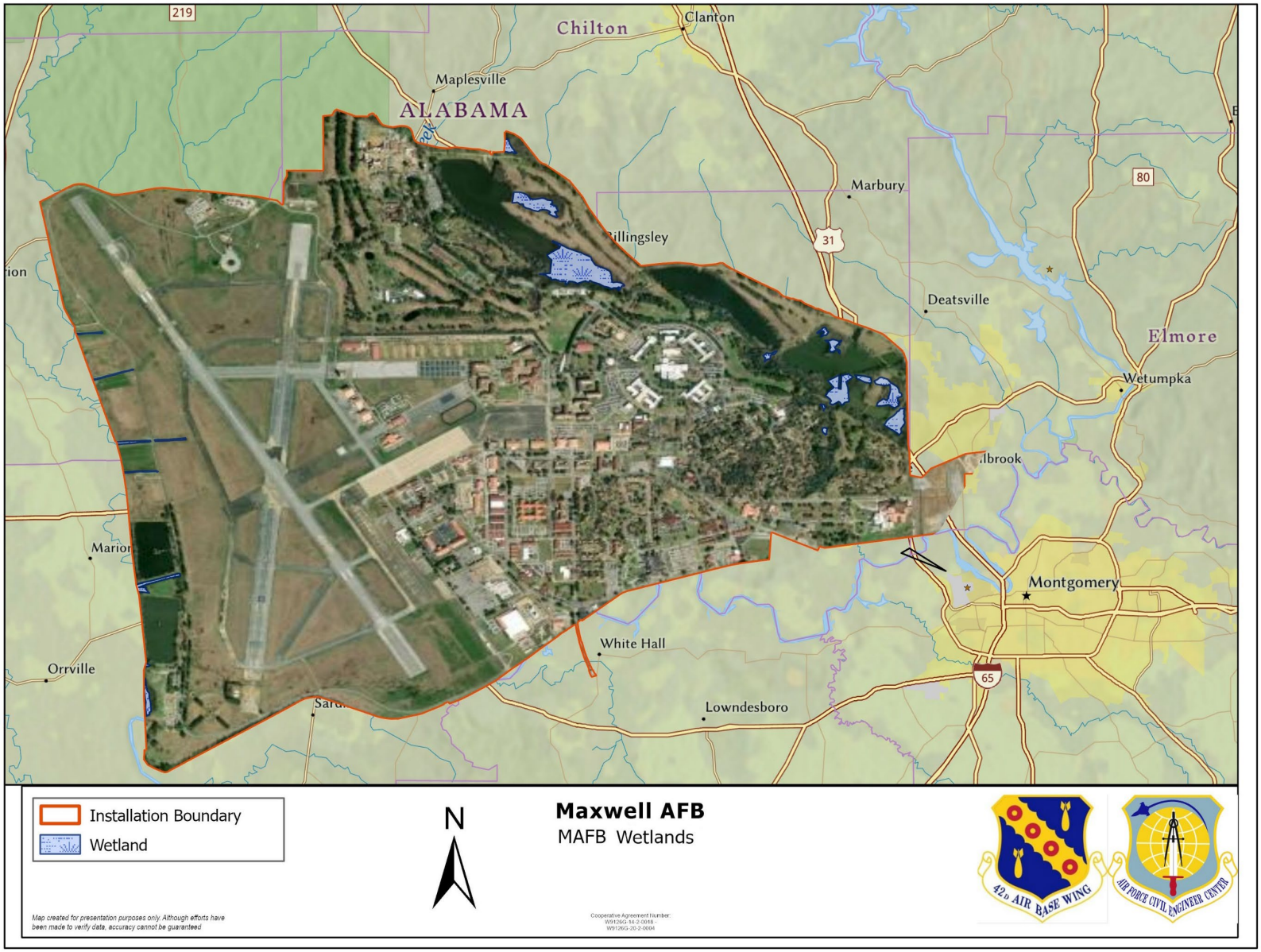

Figure 2-3. Wetlands on Maxwell Air Force Base (AFB)

2.3.5.2 Floodplains

Floodplains are defined by the United States Geological Survey (USGS) as "flat or nearly flat land along a river or stream or in a tidal area that is covered by water during a flood." These areas must be reserved to discharge a 100-year flood without cumulatively increasing the water surface elevation by more than a designated height. When a floodplain is established, no additional obstruction (e.g., buildings) should be placed in the floodplain that will increase the 100-year floodwater surface elevation. EO 11988 requires all federal agencies to provide leadership and take action to reduce the risk of flood loss; to minimize the impacts of floods on human safety, health, and welfare; and to restore and preserve the natural and beneficial values served by floodplains, specifically the 100-year floodplain, in managing federal lands and conducting federal activities and programs affecting land use. DAF installations have the responsibility to determine if proposed actions will occur in a floodplain, evaluate and document the potential effects, and consider alternatives to avoid these effects and incompatible development in the floodplain.

Portions of MAFB property fall within the 100-year floodplain (areas with a 1% chance of being inundated by floodwater in a given year). Most 100-year floodplains are in the northeast section of the installation, along the Alabama River. The largest 100-year floodplain is associated with a recreation area, the 2 closed golf courses, surface lakes, and Federal Prison Camp facilities.

On MAFB, approximately 672 acres (21% of total acreage) of floodplain marshes and floodplain forest communities lie within an identified 100-year floodplain zone of the Alabama River (MAFB 2015). The floodplain elevation varies slightly in different locations on base, from 156 to 158 feet above MSL (U.S. Federal Emergency Management Administration 2015), covering a large area in the northeast portion of the base and extending along the south and west perimeters of the base. Some of the floodplain communities have been impacted by base development and mostly occur on land that is used for recreation, including the closed golf courses. Other areas susceptible to flooding on the base include the Federal Prison Camp and immediate surrounding facilities.

2.3.6 Other Natural Resource Information

Riparian areas are located along the margins of waterbodies and support vegetation that typically prefers moist soil, higher humidity, periodic inundation, and sloping soils. They provide highly valuable habitat because of the access to water, density of cover, and diversity of plant species. In this region, it is common to find bird species that forage and nest only in riparian areas. Some species require specific riparian zone widths to successfully breed. There are recently completed projects aimed at removing invasive vegetation and restoring native trees to riparian areas at several locations at MAFB.

Riparian areas have been surveyed and mapped throughout MAFB. The width of the riparian zone at MAFB varies depending on several factors, including stream bank slope, area of typical inundation, and interpretation of relative change in plant series. Riparian areas on the base typically mimic the floodplain boundaries on the installation. Approximately 21% of the total acreage is classified as floodplains, covering a total of 672 acres. The riparian areas along drainages in the bottomland hardwood habitats are broad, based on the lack of topographical change in the area. The riparian areas in the southwest portion of the installation are narrow because of the slopes and dry uplands, and they play an important role similar to wetlands in the protection of streams and drainages from contaminants in runoff.

2.4 Mission and Natural Resources

2.4.1 Natural Resource Constraints to Mission and Mission Planning

There are limited natural resource constraints to the MAFB missions, with the IDP listing natural resources as a minor constraint to installation development (MAFB 2015). The most prominent constraint is the high acreage of wetlands on the installation. Another constraint is the potential for delayed use of the airfield when there are high levels of wildlife activity near the airfield. This constraint is mitigated through the implementation of the BASH Plan and the recommended management actions within that Plan.

The alligator snapping turtle and tricolor bat, both of which are found on the installation, are currently proposed to be listed on the ESA. If these listings are finalized, it may become more difficult to complete installation development that may impact their habitats.

Natural hazards will present numerous constraints to the mission and mission planning and are further detailed in Section 7.16.

2.4.2 Land Use

Current and historic information pertaining to land uses on the installation and in the surrounding communities is necessary to properly manage natural resources and assess future management activities. A summary of land use categories and infrastructure at MAFB is provided in Table 2-10. MAFB contains 2,138 acres of improved grounds (including 501 acres of high-intensity development, 430 acres of medium-intensity development, 49 acres of low-intensity development, and 1,158 acres of developed open areas) and 478 acres of unimproved areas.

The main base cantonment area is centrally located and encompasses 720 acres. The airfield, which includes the parking ramp, maintained cleared areas, taxiways, and runways, encompasses approximately 1,110 acres. Private family housing (262.09 acres) is located in the southeastern corner. The University Golf Course (280 acres) is located north to northeast of the cantonment area. Other land use areas primarily on the eastern side of MAFB include housing, medical, training, industrial, academic, and administrative. The remaining unimproved areas occur in the eastern, southwestern, and northwestern sections of the base, with a small amount along the ridge north of the airfield.

Table 2-10. Distribution of developed lands (acreage) on Maxwell Air Force Base (MAFB)

Land Use Description	MAFB	Gunter	Vigilant Warrior	Lake Martin
Academic	108.52	19.00	N/A	N/A
Administration	151.06	85.99	N/A	N/A
Airfield	698.08	N/A	N/A	N/A
Airfield Operations & Maintenance	39.55	N/A	N/A	N/A
Ammunition Storage	7.67	N/A	N/A	N/A
Community (Commercial & Services)	160.22	43.52	N/A	N/A
Governmental	52.91	12.40	N/A	N/A

Table 2-10. Distribution of developed lands (acreage) on Maxwell Air Force Base (MAFB)

Land Use Description	MAFB	Gunter	Vigilant Warrior	Lake Martin
Housing	262.09	69.47	N/A	N/A
Industrial	86.26	8.67	N/A	N/A
Medical	18.74	N/A	N/A	N/A
Open Space	282.82	78.42	2.0	N/A
Outdoor Recreation	504.68	35.58	25.0	46.0
Training	118.21	N/A	50.0	N/A
Utility	4.43	0.33	N/A	N/A
Open Water	121.27	N/A	N/A	N/A
Total	2,616.00	377.00	77.0	46.0

Source: Installation Development Plan (MAFB 2015)

2.4.3 Current Major Mission Impacts on Natural Resources

There are a variety of mission-related activities on MAFB and Gunter Annex that have the potential to adversely impact the environment. The most significant constraints are related to environmental concerns, BASH risk, future development, potential T&E species, and water quality. More information on T&E species and water quality is provided in Sections 2.3.4, 2.4.3.4, and 7.4.

2.4.3.1 Air Quality

IAW federal Clean Air Act requirements, the air quality in a given region or area is measured by the concentration of various pollutants in the atmosphere. Concentrations are normally expressed in units of parts per million, milligrams per cubic meter, or micrograms per cubic meter. Air quality is determined by the type and amount of pollutants in the atmosphere, the size and topography of the air basin, and local and regional meteorological influences.

The ADEM provides ambient air quality standards for the state, which are the same as the National Ambient Air Quality Standards for the criteria pollutants presented in the State of the Air in Alabama (http://adem.alabama.gov/programs/air/airquality/2018AmbientAirPlan.pdf).

Six air quality monitoring stations are currently located within Montgomery County. Primary onsite emissions sources at the 42 ABW include the following:

- Vehicle operation and maintenance (including aerospace ground equipment)
- Combustion sources (jet engine tests, boilers, water heaters, aircraft arresting barrier engines, diesel-fired generators and fire pumps)
- Fuel-storage/transfer operations (fuel-storage tanks)
- Operational sources (solvents, cleaners, antifreeze, and other materials containing volatile organic compounds and hazardous air pollutants)

MAFB and Gunter Annex are considered a true minor source of air pollution and are exempt from permitting by the ADEM.. MAFB and Gunter Annex have no permitted point sources. MAFB has the freedom to adjust, modify, or move equipment, as long as total capacity remains below the maximum capacity set forth in ADEM Permit No. 335-3-15-03 for each bubble source category.

Air quality is important to the health of fish and wildlife species and their habitats. As MAFB has minimized or eliminated excessive or potentially polluting air emissions, there are no air sources known to negatively affect the natural resources on the installation or surrounding area.

2.4.3.2 Water

MAFB and Gunter Annex are supplied with potable water by the City of Montgomery, which obtains its water from the MWWSSB. MAFB and Gunter Annex water is obtained from underground aquifers (Eutaw aquifer) utilizing well fields and surface water such as the Tallapoosa River. The C. T. Perry Water Purification Plant located on the Tallapoosa River has a capacity of 60 million gallons per day and is the primary water source for Montgomery County.

2.4.3.3 Wastewater

Wastewater at MAFB is collected in the sanitary sewer system and piped to the MWWSSB Towassa Water Pollution Control Plant, where it is treated and discharged to the Alabama River. Gunter Annex utilizes the MWWSSB Econchate Wastewater Treatment Plant to treat sanitary sewage prior to discharge to the Alabama River (MAFB 2005). The only pre-treatment of sanitary and other wastewater on the installation occurs through oil-water separators and grease traps before disposal into the sanitary sewer system. Final Pre-treatment Permits for both MAFB and Gunter Annex are maintained with MWWSSB. The City of Montgomery regulates the use of drinking water by MAFB and Gunter Annex to determine discharge of wastewater to the Montgomery sanitary wastewater collection system. Stormwater infiltration into the sanitary sewers does not occur frequently, but excessive flow during and after rainfall has been known to cause localized flooding and exceed the specified maximum flow rates (MAFB 2015).

Vigilant Warrior Training Site has a septic system with a maintained grass field area in the cantonment area, and Lake Martin Recreation Area operates septic systems on site.

2.4.3.4 Stormwater Runoff

MAFB and Gunter Annex operate under one MS4 Phase II NPDES Permit for stormwater discharge. Maxwell has 24 outfall locations and Gunter Annex has 12 outfall locations that are inspected as reported in the annual MS4 Reports. Currently, no effluent sampling is required.

Stormwater management and spill prevention is important and monitored at all MAFB locations. To ensure mission sustainment, MAFB land use changes follow strict requirements to preserve high-quality water or sensitive water resources (streams, wetlands, lakes, soil erosion, etc.).

2.4.3.5 Erosion and Erosion-Sensitive Soil

BMPs must be implemented with all ground-disturbing activities to prevent soil erosion and protect surface waters on MAFB. Soil erosion control measures are implemented during all construction projects and monitored by quality assurance and environmental personnel.

2.4.3.6 Aircraft Safety

The DAF has defined 5 mishap classifications (Classes A through E). Each classification may drive a mishap investigation according to the mishap classification and injury or property damage. Class A mishaps result in a fatality or permanent total disability; total cost in excess of $2 million for injury, occupational illness, and property damage; or destruction or damage beyond repair to military aircraft. Class B mishaps result in a permanent partial disability; total cost in excess of $500,000 but less than $2 million for injury, occupational illness, and property damage; or hospitalization of 5 or more personnel. Class C mishaps result in total damages between $50,000 and $500,000, and Class D is any nonfatal injury or occupational illness that does not meet the definition of Lost Time. The fifth mishap category, Class E events, comprises incidents resulting in total damages between $2,000 and $50,000. Class E events include BASH (Wildlife Strikes) and High Accident Potential reports.

Accident Potential Zones (APZs), extending immediately beyond the ends of runways and along the approach and departure flight paths, have significant potential for aircraft accidents. Development restrictions within APZs are intended to preclude incompatible land use activities from being established in these areas. At MAFB, the areas extend longitudinally 15,000 feet from the threshold beyond either end of the east-west runway are designated as APZs. APZs are 3,000 feet, laterally centered on the runway center line. Currently, incompatible land use exists in these areas. State, county, and municipal regulations are attempting to curb incompatible development in these zones through land use zoning practices (MAFB 2018).

BASH is defined as the threat of aircraft collision with birds and other wildlife during flight operations and is a safety concern at all airfields due to the frequency of aircraft operations and the possibility of encountering birds at virtually all altitudes. Most birds fly close to ground level; correspondingly, more than 95% of all reported bird strikes occur below 3,000 feet above ground level. At most military installations, about half of reported bird strikes occur in the immediate vicinity of the airfield and another 25% occur during low-altitude local training exercises. Reported strikes to 42 ABW aircraft primarily occur in low-altitude training areas and transition areas. Bird strike hazards are also a potential concern within the immediate vicinity of the main airfield and in route to other locations.

2.4.4 Potential Future Mission Impacts on Natural Resources

Future mission impacts at MAFB include continuation of current impacts and additional impacts due to new missions or mission components. MAFB and Gunter Annex are developed nearly to capacity and mostly landlocked within environmental constraints. Space is a major constraint for future initiatives, making it difficult to incorporate additional initiatives or activities that require land development. Development and relocation of missions to MAFB or Gunter Annex may be further constrained by limited perimeter standoff and infrastructure access. Most future initiatives for MAFB and Gunter Annex involve updating and renovating current infrastructure to support current missions.

An Air University future development plan ("AU 2030") is currently being formulated, with potential realignment of academic schools within Air University, including possible relocation of some academic functions between MAFB's main base and Gunter Annex. This plan, if adopted, may propose new lodging, academic, and support facilities, but these would be constructed in already-developed areas of MAFB and Gunter Annex and are not anticipated to have major impacts on natural resources.

Other construction-related activities that might be planned for MAFB or Gunter Annex would undergo a National Environmental Policy Act (NEPA) process and fall into one of the following main categories:

- Renovation or replacement of aging facilities
- Short-term facilities construction intended to streamline operations and comply with minimum anti-terrorism standards set forth by the DoD
- Airfield-related maintenance and infrastructure alterations to support more aircraft and to enable compliance with airfield safety requirements
- Demolition projects required to enable the execution of short-term construction and infrastructure alterations

Current and future mission impacts at Vigilant Warrior Training site include impacts to stream and wetland areas and trail maintenance. Currently, trails are highly erodible and degraded due to heavy cadet foot traffic, utility vehicle traffic, and seasonal rainfall. Mission activities should avoid disturbing these areas to minimize erosion and runoff. A comprehensive maintenance and management plan is needed.

There are no known projected changes in mission or potential impacts at Lake Martin Recreation Area.

3.0 ENVIRONMENTAL MANAGEMENT SYSTEM

The DAF environmental program adheres to the Environmental Management System (EMS) framework and its "Plan, Do, Check, Act" cycle for ensuring mission success. EO 14057, *Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability*; DoDI 4715.17, *Environmental Management Systems*; Department of Air Force Instruction (DAFI) 32-7001, *Environmental Management*; and International Organization for Standardization 14001 standard, *Environmental Management Systems—Requirements with guidance for use*, 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 manage associated risks, and instill a culture of continual 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.

Table 4-1. General roles and responsibilities

Office/Organization/Job Title	Installation Role/Responsibility Description
Installation Commander	The Wing Commander oversees the installation properties and is responsible for the goals and objectives of the Integrated Natural Resources Management Plan (INRMP). The Maxwell Air Force Base (MAFB) Wing Commander is responsible for the following aspects of the INRMP: • Approve and sign INRMP, or delegate signature authority to no lower than a group commander; • Control access to and use of installation natural resources; • Ensure the implementation of the INRMP to the fullest extent practicable based on available funding and manpower.
Air Force Civil Engineer Center (AFCEC) Natural Resources Media Manager/ Subject Matter Expert/Subject Matter Specialist	AFCEC/Natural Resources Environmental Quality provides the primary source of funding to support the management of natural resources at MAFB. This budget is managed by AFCEC/TDNC and AFCEC/Environmental Restoration Technical Support Branch (CZOW). AFCEC/CR Environmental Quality provides funding for natural resource surveys, environmental monitoring projects, and compliance-related projects. Subject Matter Experts/Specialists are the natural resources program managers for the entire DAF and/or West Region. They provide technical assistance and guidance to DAF Natural Resources Managers (NRMs) on natural resources issues, advocate for resources required to implement approved INRMPs, and administer the reimbursable forestry, agricultural and grazing, and fish and wildlife account programs, as well as dispersed outdoor recreation programs. Installation Support System Media Manager provides and manages contracts, interagency agreements, and cooperative agreements for natural resources programs (DAFMAN 32-7003).

Table 4-1. General roles and responsibilities

Office/Organization/Job Title	Installation Role/Responsibility Description
Installation Natural Resources Manager/Point of Contact	The NRM is the technical point of contact on all natural resource-related activities for MAFB and its associated properties. The NRM Program Manager tracks DoD and DAF policies and helps program funding requirements for projects identified as a priority in the MAFB INRMP. The development of projects included in the INRMP and any deviations from those projects will be submitted to the AFCEC/CZOW Natural Resource Program Manager for review and concurrence. Decisions resulting from those reviews will be cooperative efforts between the AFCEC/CZOW Natural Resource Program Manager and installation's Natural Resources Manager (or Environmental Manager when applicable). Responsibilities include the following: • Ensure INRMP is jointly reviewed by the U.S. Fish and Wildlife Service (USFWS) and Alabama Department of Conservation and Natural Resources (ADCNR) for operation and effect on a regular basis, but not less often than every 5 years. • Conduct annual review of the INRMP in coordination with USFWS and ADCNR, including updates and adjustments to goals and objectives as conditions change. • Project 5-year goals for the implementation of the MAFB INRMP. Identify objectives which will support each goal. • Request appropriate funding from AFCEC to achieve project objectives. • Manage available manpower to implement MAFB INRMP. • Review Air Force (AF) Form 813s and other Environmental Impact Analysis Process (EIAP) documentation to determine natural resource impacts.
Installation Security Forces	Enforce laws, Air Force Instructions (AFIs), and Department of the Air Force Manuals (DAFMANs) to support natural resource management and regulations.
Installation Unit Environmental Coordinators (see AFI 32-7001 for role description)	Serve as EMS conduit between the installation environmental function and the unit. Unit Environmental Coordinators manage and monitor the EMS requirements for the unit by attending Cross Functional Team and working group meetings as requested, and advice work area supervisors on EMS policy.

Table 4-1. General roles and responsibilities

Office/Organization/Job Title	Installation Role/Responsibility Description
Installation Wildland Fire Program Manager	Planning and coordination of prescribed fire actions and wildfire rehabilitation.
Pest Manager	Lead applicator for pesticides; aids in reduction of pests and nonnative plant control, especially in Bird/Wildlife Aircraft Strike Hazard (BASH) areas. Coordinates with NRM to ensure Installation Pest Management Plan (IPMP) and INRMP are mutually supportive.
Range Operating Agency	Manages small arms range, with oversight by 42d Security Forces Squadron and 42d Civil Engineer Squadron (42 CES) to ensure environmental compliance. The 42 CES/CEIE performs inspections for solid waste management, HazMat, water quality, and other aspects as appropriate.
National Environmental Policy Act/ Environmental Impact Analysis Process Manager	Reviews and coordinates for INRMP preparation. Signatory of the INRMP, per the Sikes Act (16 U.S. Code [USC] § 670a (a)(2)), DoD Instruction (DoDI) 4715.03, and DAFMAN 32-7003. Advises on protocols and need for surveys of special-status species and assesses potential impacts from base projects and activities.
U.S. Department of Agriculture, Forest Service	May support wildland fire functions and advise on forestry management, if applicable.
USFWS	Reviews and coordinates for federally listed species and Sikes Act compliance, issues depredation permits, and assists with INRMP preparation. Signatory of the INRMP per the Sikes Act (16 USC § 670a(a)(2)), DoDI 4715.03, and DAFMAN 32-7003.
Alabama Department of Conservation and Natural Resources	Reviews and coordinates for state-listed species, hunting and fishing, and INRMP preparation. Signatory of the INRMP per the Sikes Act (16 USC § 670a(a)(2)), DoDI 4715.03, and DAFMAN 32-7003.
Alabama Forestry Commission	May provide support/advise on Urban Forestry management and forest health issues.
Civil Engineer (42 CES/CL)	Responsible for providing the Civil Engineer Environmental Flight with oversight and management assistance to ensure the INRMP is implemented and executed. Serves as designated Government employee responsible for inherently governmental functions of natural resource management.
Legal Office (42 ABW/JA)	Ensures that the implementation of INRMP objectives meets all of the Sikes Act, DoD, and DAF regulatory and statutory requirements that pertain to natural resources management.
Environmental Manager (42 CES/CEIE)	Provides support to MAFB and its associated properties for environmental issues such as hazardous material and hazardous waste management, air emissions, water quality, cultural resources management and other environmental requirements.

Table 4-1. General roles and responsibilities

Office/Organization/Job Title	Installation Role/Responsibility Description
Safety Officer (42 ABW/SE)	In conjunction with the Flight Safety Representatives at MAFB, the Safety Officer is responsible for implementing all activities presented in this Plan that pertain to the BASH Reduction Program.
Public Affairs Office (42 ABW/PA)	Reviews and coordinates/approves documents for public release. Assists as needed with public review process for INRMP, National Environmental Policy Act/EIAP process, and any other public notification, comments, or responses related to natural resources.
Environment Safety, and Occupational Health Council (ESOHC)	Active leadership within the ESOHC is critical for the overall success of the MAFB INRMP. The ESOHC consists of squadron- and unit-level commanders whose operations may impact environmental resources on MAFB properties. The ESOHC is chaired by the Wing or Vice Commander. Specifically, the ESOHC is responsible for the following: • Establishes overall policy for the natural resources program at MAFB • Provides support of INRMP goals and objectives • Represents their organizations at the MAFB ESOHC management review process and conduct periodic internal reviews of their organization

[a] Listing is not in order of hierarchical responsibility

5.0 TRAINING

DAF 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.

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

Training records are maintained IAW the Recordkeeping and Reporting section of this plan. Below are key natural resources management-related training requirements and programs:

Installation-specific Training

MAFB requires all installation personnel to take EMS Awareness Training.

6.0 RECORDKEEPING AND REPORTING

6.1 Recordkeeping

The installation maintains required records IAW Air Force Instruction 33-322, *Records Management and Information Governance Program*, and disposes of records IAW the Air Force Records Management System records disposition schedule. 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. Most required records are maintained in the base Environmental Office, 42 CES/CEIE, or on the MAFB eDASH site, according to the approved file plan.

6.2 Reporting

The installation NRM is responsible for responding to natural resources-related data calls and reporting requirements. The NRM and supporting Air Force Civil Engineer Center (AFCEC) Natural Resources Media Manager and Subject Matter Specialist should refer to the Environmental Reporting Playbook for guidance on execution of data gathering, quality control/quality assurance, and report development.

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.

The guiding philosophy of this INRMP is to manage the natural resources present on MAFB property using an ecosystems approach (Section 1.2). Ecosystem management provides a framework to link the military mission to local, regional, and global ecological integrity. Sustaining ecosystem integrity is the best way to protect and enhance biodiversity, ensure sustainable use, and minimize the effort and cost of management. Ecosystem management is based on clearly stated goals and objectives and associated activities and projects. This INRMP identifies goals and objectives and presents the means to accomplish them, as well as the methodologies to monitor results.

This section summarizes each technical area of natural resources management. In a given section, relevant management strategies, practices, guidelines, BMPs, and priorities will be presented.

7.1 Fish and Wildlife Management

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Applicability Statement

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

Program Overview/Current Management Practices

The current INRMP will serve as MAFB's wildlife management plan. Wildlife management program plans will be integrated and coordinated with land use, installation landscape activities, and species of concern, outdoor recreation, pest management, and water management programs. Wildlife resources at MAFB are managed using concepts of multiple use and sustained yield IAW the military mission. There is no hunting on MAFB properties. The primary goal of this plan is to maintain, develop, and restore, as necessary, a diverse viable habitat that supports wildlife populations and is consistent with the military mission. Secondary and tertiary objectives may include the establishment of Watchable Wildlife Areas, a natural interpretive garden to increase awareness of local flora and fauna, and interpretive stations on existing and future walking trails. Additionally, development of interpretive materials describing the natural history and uniqueness of indigenous and non-indigenous species will benefit the mission. This will provide installation personnel with a sense of appreciation for the local regimes and their impact on the environment.

Fish and wildlife management at MAFB properties will focus on maintaining and restoring natural habitat that is favorable for indigenous fish and wildlife in a manner consistent with the military mission and all applicable laws and regulations. Information pertaining to fish and wildlife species known or with the potential to occur at MAFB is summarized in Sections 2.3.4 and 7.4. In addition to general fish and wildlife management, there are additional management needs associated with minimizing BASH-related risk at MAFB since the military mission involves flight operations. Information on the BASH program can be found in Section 7.12.

7.1.1 Management Strategies for Wildlife

Wildlife management involves manipulating various aspects of an ecosystem to benefit chosen wildlife species. Management of habitats is generally focused on benefitting native species, particularly rare species and game species. The NRM will manage the wildlife and its habitat on MAFB property by implementing the strategies listed below:

- Evaluate possibilities and potential benefits of traditional silvicultural practices that have a positive effect on wildlife populations, such as prescribed burning and forest thinning. Create wildlife openings in forested areas that lack adequate cover. These openings are created by removing the most merchantable trees and felling and leaving non-merchantable trees. Large mast-producing trees are left standing within the openings. The felled trees provide immediate cover within the branches and treetops. Subsequent growing seasons encourage thick cover that is excellent for wildlife.
- Maintain intact, healthy habitat and enhance or restore degraded habitat, without increasing BASH risk.
- Minimize BASH risk by deterring hazardous birds and other wildlife from the airfield and its critical zone.
- Maintain populations of wildlife away from the airfield on MAFB by minimizing negative impacts and by providing healthy, diverse habitat and corridors for wildlife to move between those habitats.
- Conduct periodic fish surveys to determine species diversity, relative abundance, population abundance, age class structure, and size structure to assess available prey species in MAFB's lakes. Surveys would help determine proper fisheries management and stocking of the lakes in the future to benefit desirable wildlife species on the installation while maintaining or improving the existing fishery.
- Implement yearly lake-fertilization program, as advised by ADCNR, Alabama Cooperative Extension Service, or other partner agencies to increase lake productivity.
- Install artificial habitat structures to attract fish and provide cover for forage species.
- Manage invasive aquatic vegetation to maintain properly balanced aquatic ecosystem.
- No exotic plants or animals will be introduced on MAFB property without written approval.
- Hunting is prohibited on MAFB property. However, "hazing" and depredation on the airfield will be conducted as necessary, IAW the 42 ABW/SE BASH Plan, to ensure permitting requirements are met.
- Develop and implement MAFB Recreational Fishing Plan (recreational fishing is further addressed in Section 7.2).
- Preserve snags and large trees (away from the airfield) for cavity-nesting species, unless removal is required for safety or mission considerations.
- Continue acoustic monitoring for bat populations on the installation to ensure minimal impacts from the military mission or installation developments.
- Protect riparian forest and wetlands, as many indigenous and rare species are dependent on them.
- Consider prescribed burns to enhance native prairie grassland habitat, as compatible with airfield management practices and wildland fire management plans.
- Minimize the amount of herbicide used for invasive species control, particularly in or around surface waters and wetlands, by using mechanical methods to the extent possible to avoid impacts to fish and wildlife habitat.

- Maintain grass heights between 7 and 14 inches in the airfield impact area during the growing season to discourage assembly of small, flocking birds.
- Remove invasive aquatic plants and algae from waterbodies should be conducted as needed. If necessary, consideration should be given to planting shade trees around water sources to prevent excessive heating of water due to warmer than normal temperatures.
- Minimize stagnant water in and around cantonment areas to reduce mosquito-related infections.
- Restrict tick populations in urban settings by keeping lawns mowed and preventing overabundances of hosts such as deer, feral hogs, and rodents.

7.2 Outdoor Recreation and Public Access to Natural Resources

Installation Supplement

Applicability Statement

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

Program Overview/Current Management Practices

The goal of MAFB is to maintain a program that will provide quality outdoor recreation facilities for its military, civilians, and dependents, while protecting the outdoor recreation resources from overuse and damage. The quality of the outdoor recreational experience will be achieved by the development, management, and maintenance of the improved, semi-improved, and unimproved multi-use lands on base. Rules and regulations regarding the use of natural resources for dispersed outdoor recreation are provided in Table 1-2.

The 42 ABW/CES, 42 ABW/FSS, 42 SFS, and other installation agencies cooperate to provide quality outdoor recreation to base personnel and dependents. The 42 SFS ensures that recreation facilities are protected from vandalism and abuse and that their use has minimal impact to security. The 42 ABW/FSS provides coordination and integration of recreation facilities and activities on base.

Outdoor recreation and public access management should ensure that MAFB resources are managed and conserved so that assigned personnel will have maximum opportunities to satisfy their outdoor recreation needs. Recreation fosters social interaction, excitement, mental and physical relaxation, and educational/enrichment opportunities. The need for outdoor recreation resources and opportunities at MAFB is very similar to that expressed throughout the surrounding region. Preferred outdoor recreation activities for both MAFB and off-base populations include walking, bicycling, canoeing/kayaking, picnicking, jogging/running, and swimming.

MAFB is a closed installation with restricted public access to MAFB natural resources, outdoor recreation areas, and facilities. This policy is a necessary requirement of base security to ensure successful completion of military missions. Safety considerations must be made when developing dispersed outdoor recreation opportunities in natural resource management areas. Wildlife may be found just about anywhere on base and participation in dispersed outdoor recreation activity carries with it the inherent risk of an encounter.

Privately owned motorized and off-road vehicles (ORVs) such as four-wheelers, ATVs, dirt bikes, and go-carts are restricted to street use and are not allowed within the natural areas of MAFB. The only authorized ORV use on base is related to military security and training. ORV use in natural resource areas degrades habitat, creates air and soil erosion, and conflicts with natural resource management goals and objectives (e.g., protection of wetland areas, restoration of native prairies, wildlife habitat enhancement, watchable

wildlife programs, maintenance of grasslands to encourage and increase ground nesting neotropical migratory bird populations on the installation).

Lake Martin Recreation Area provides cabins, picnic sites, and a swimming area for DoD Common Access Card (CAC) holders (Figure 7-1). Reservations are required for cabins and group picnic sites on a first-come, first-served basis, with priority for military personnel. The usage or number of users per area is based on the carrying capacity of the area. The installation population is notified of outdoor recreational opportunities by special briefings, newspaper articles, flyers, pamphlets, and public websites. Interpretive signage highlighting recreational opportunities, including fishing and 42 ABW/FSS equipment rentals, should be installed to increase outdoor recreation participation. Signage detailing behaviors to prevent the spread of aquatic invasive species should be installed at recreational waterbodies. Signage outlining extreme heat exposure-related illnesses, prevention, and first aid response techniques may be needed to ensure safety of recreationists, especially with warm temperatures seen in recent years. The existing paths on the closed golf courses should be converted to recreational jogging paths to increase outdoor recreation opportunities on MAFB.

Figure 7-1. Lake Martin Recreational Area provides several amenities for DoD Common Access Card holders

Fishing Program

Recreational fishing is permitted at the 2 small base lakes on the western edge of the base, Lakes 1 and 2 (Figure 7-2). Lakes 1 and 2 were constructed in 1960, and Lake 2 was renovated in 1979 and 2023. The lakes are utilized by Canada geese, ducks, beavers from the adjacent off-base West End Ditch, river otters (*Lontra canadensis*) from the Alabama River, and native reptiles and amphibians, including an abundant turtle population. Much of the wildlife utilizes shelter in the adjacent West End Ditch. The area surrounding these 2 lakes is kept largely cleared to minimize BASH concerns near the airfield. The 2 western lakes contain sportfish, including largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), redear sunfish (*Lepomis microlophus*), brown bullhead (*Ameiurus nebulosus*), and channel catfish (*Ictalurus punctatus*). Gar have also been introduced in the lakes, presumably due to backwater flooding of Lake 1. Although flooding has occasionally introduced other species, this is a rare occurrence for Lakes 1 and 2. Therefore, recreational fishing populations can normally be maintained in these western lakes, but the lakes have been stocked occasionally as funding is available. These species provide several types of recreational angling opportunities.

The primary factors in the lakes' ability to produce optimum sustainable fish crops are depth, fertility, food source, cover, species mix, and proper harvest. Suitable water supply (springs or surface runoff) and easy access also contribute to the desirable recreational characteristics of the lakes. In October 2013, a survey was performed on Lakes 1 and 2, including an electrofishing sample to stun the fish and observe a sample of the fish population. The southernmost lake (Lake 1) averages 5 to 6 feet deep, which should be sufficient to buffer the stressful effects of seasonal air temperature extremes, rapid air temperature changes, and excessive sunlight penetration. This lake appears to be fertile, supporting a balance of sport fish species, with bass and bream predominating. The average depth of Lake 1 is suitable for the production of the featured fish species. Additional underwater structures for fish habitat and reproduction would improve this lake, and stocking of additional fish was recommended. In spring 2014, threadfin shad (*Dorosoma petenense*) were stocked in the pond to provide a food source, and in fall 2014, additional adult bass were stocked.

Procedures and acceptable sportfish species for stocking should be reviewed for compliance with environmental regulations and guidelines such as EO 11987 (*Exotic Organisms*). After a lake has been stocked, fishing may be prohibited for a period of time. After that, fishing will be permitted as catch-and-release until the population is considered stable and has a sufficient number of large adults, as determined by the NRM.

The northernmost lake (Lake 2) is only 2 to 3 feet deep over much of its area. Bass, bullhead catfish, channel catfish, and suckermouth catfish (*Hypostomus plecostomus*) were present. However, periodic early summer fish kills, presumably due to oxygen depletion during lake turnover, seem to indicate that this lake was not deep enough or sufficient to support an expanding fish population. Lake 2 is not recommended for management as a fishing pond. In 2023, Lake 2 was dredged and deepened to reduce fish kills in the summer and permit active management of the lake.

Recreational fishing is also allowed at the 3 larger lakes along River Road (Lakes 4, 11, and 12). These lakes are located within the floodplain adjacent to the Alabama River. They primarily function as stormwater retention ponds but offer recreational fishing opportunities. An elevated road separates these lakes from the Alabama River. Two 30-inch, elevated gated culverts pass under the road and allow controlled water flow. These culverts prevent fish passage when the river and lakes are at normal water levels, but fish can use the culverts if water levels are high. The yearly inundation by flood waters of the

Alabama River precludes an effective fish management program in these lakes. The present practice of allowing anglers to use these lakes should continue.

All 5 of these lakes are open recreational areas, which are accessible to all personnel with base access. All anglers aged 16 and older who wish to fish on base are required to obtain a base fishing permit ($4.00/month or $14.00/year), and anglers fishing in Lakes 4, 11 or 12, or the Alabama River must possess a valid State of Alabama Fishing license. State fishing licenses and base fishing permits are available at the Maxwell Equipment Checkout and Outdoor Recreation office in Building 1461. The appropriate fees are submitted to the State of Alabama for the state fishing licenses. The Air Force Services Agency retains a small administrative fee for issuing fishing permits through the Outdoor Recreation office. The remainder of the base fishing permit fees are deposited into the DAF account for fish and wildlife management (57-5095) and are used for conservation and outdoor recreation efforts on MAFB as funds are available.

When fishing permits are issued through the Services Outdoor Recreation Office, anglers are informed of fishing policies. If any incidents of non-compliance are suspected or encountered, Security Forces are contacted. If necessary, Security Forces contact the appropriate Alabama Department of Conservation and Natural Resources personnel for any potential enforcement action.

The focus of the fishing program is to:

- Continue to allow recreational fishing in the larger base lakes (Lakes 1, 2, 4, 11, and 12)
- Control invasive species at Lakes 1 and 2
- Improve habitat for sport fish and fish spawning in Lakes 1 and 2. Restock sport fish as appropriate and as funding is available
- Develop Recreational Fishing Plan
- Maintain bank access and monitor and control bank erosion as needed

Figure 7-2. Maxwell Air Force Base (AFB) provides several recreational opportunities, including multiple lakes to fish

7.2.1 *Golf* E*nvironmental Management Program*

The Cypress Tree Golf Course at MAFB is comprised of 2 (currently closed) 18-hole courses, 3 putting greens, a chipping green, and a driving range. The River Course (East Course), which lies along the river at the eastern border of the base, primarily within the 100-year floodplain, was permanently closed and is now managed as an open green space and training area. The golf course environmental management program does not apply to the River Couse (East Course). The University Course (West Course) lies northwest of Chennault Circle, partially within the 100-year floodplain and is temporarily closed. The University Course greens have recently been refurbished. If the University Course (West Course) is reopened, regular maintenance may resume. Golf course maintenance will be integrated within the INRMP to ensure they are both mutually supportive and no conflicts occur.

Regular maintenance tasks performed on the golf course that may impact natural resources may include:

- Applying insecticides, herbicides, and fertilizers
- Mowing grass at different heights and directions
- Aerifying and top-dressing greens
- Thinning grass
- Watering/irrigating coordinated on a timely basis with the application of pesticides and fertilizers
- Planting trees, pruning tree limbs, and removing dead trees
- Improving drainage of playing areas

Some of the goals of Golf Course Grounds Management are as follows:

- Provide for attractive, unobstructed views across the course and down the fairways.
- Supply an adequate amount of water for irrigation to sustain and enhance the growth of vegetation while not misusing water resources.
- Achieve proper fertilization, irrigation, suggested planting, and weed/brush control on a timely basis with respect to weather and the onset of the golf season.
- Require the mowing of roughs and pruning of trees to maintain aesthetic qualities.

When active and open, the course is mowed and irrigated on a daily basis and fertilized monthly. The golf course superintendent tracks and reports fertilizer, pesticide, herbicide, and fungicide use. The Cypress Tree Golf Course Pest Management Plan is contained within the 42 ABW Pest Management Plan discussed in Section 7.11. Additional information regarding golf course maintenance and management can be obtained through the 42 ABW/FSS.

7.2.1.1 *Golf Course Environmental Management (GEM) Plan*

In June 2008, the Golf Course Environmental Management (GEM) Plan was created with assistance from the Air Force Center for Engineering and the Environment. The stated golf course environmental policy is "to employ only those management practices that minimize or eliminate the potential for negative impacts to the environment and the surrounding community, ensure compliance with all appropriate regulations, and to regularly reevaluate our processes to achieve the highest standards of environmental excellence."

Currently, the GEM Plan is not being used since both golf courses were closed. However, if the University Course (West Course) is reopened, the GEM Plan will be integrated with the INRMP to ensure that they are both mutually supportive and no conflicts occur. MAFB's GEM Plan is incorporated into this plan by reference.

Some of the objectives highlighted in the GEM Plan include the following:

- Maintain compliance with all appropriate regulations for preservation of wetlands, floodplains, and water quality, and ensure that all waterbodies continue to be free of pollutants due to golf course management practices.
- Minimize or eliminate the potential for BASH concerns as a result of golf course management practices.
- Eliminate the use of potable water for irrigating any of the golf course grounds.
- Prevent introduction and establishment of invasive species to reduce their impact on the environment, economy, and health of the United States.
- Protect customers, employees, and installation personnel at all times from preventable health and safety hazards, including mosquitoes that may carry harmful pathogens.

A project was completed in 2013 to upgrade the pumping station along the Alabama River to allow for irrigation of the golf course from the river. This has greatly reduced the use of potable water for golf course irrigation. Currently, there is no limit on water withdrawal from the river.

7.3 Conservation Law Enforcement

Installation Supplement

Applicability Statement

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

Program Overview/Current Management Practices

Enforcement of the fish and wildlife rules and regulations is an important part of a successful natural resources program. MAFB anglers are provided with Fishing Regulations information, and additional information can be found at the ADCNR website (www.outdooralabama.com). The 42 SFS provides enforcement support. MAFB does not specifically employ natural resources law enforcement personnel or game wardens, as it is deemed unnecessary due to the restricted access and minimal violation potential. The 42 SFS and the NRM enforce DAF and installation policies and procedures for protecting natural resources, including the fishing programs. If a wildlife violation is identified, 42 SFS will contact the appropriate state or federal agency and detain the offender(s) until an enforcement officer arrives. ADCNR game wardens and USFWS agents have access to MAFB property for enforcement of state and federal wildlife laws and regulations.

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

Installation Supplement

Applicability Statement

This section applies to DAF installations that have T&E species on DAF property. This section is applicable to this installation.

Program Overview/Current Management Practices

The ESA (Public Law [P.L.] 3-205) requires military installations to protect and conserve federally listed T&E plants and animals and their habitats. When practical, species proposed for listing will be given the same protection as species that are already listed. Although installations are not obligated under the ESA

to do so, DAFMAN 32-7003 encourages protection of state-listed species to the maximum extent practicable.

7.4.1 Federal Special-Status Species Management

MAFB is required to manage for federally listed and, when practical, candidate and proposed species. Failure to protect federally listed species could lead to an ESA violation, which could negatively impact training land availability. Details regarding potentially occurring federally listed species and their management are provided below. Two federally listed species, the wood stork and Alabama map turtle, have been known to occur on MAFB property. Two species proposed to be listed, the tricolored bat and alligator snapping turtle, are known to occur on the installation. A third proposed species, the monarch butterfly, has not been surveyed but is likely to occur on the installation. The bald eagle, federally protected by the BGEPA, is known to occur near the installation with uncommon, confirmed sightings. While the alligator snapping turtle and tricolored bat are also state listed, they are not discussed in Section 7.4.2 to reduce redundancy.

Wood Stork

The wood stork is a long-legged wading bird with white and black plumage, a short black tail, a dark gray head and neck, and a thick black bill that slightly curves. Nesting is restricted to Florida, Georgia, and South Carolina. After breeding, these birds will migrate northward to the Atlantic and Gulf coasts. Their habitat includes freshwater and estuarine wetlands, and they nest in cypress or mangrove swamps.

The wood stork is not known to breed in Alabama, although there is evidence suggesting that the species has bred in Macon County (Dusi and Dusi 1968). In September 2017, MAFB confirmed sightings of the wood stork in wetland areas along River Road. These observations are likely from post-breeding dispersal from colonies in Florida, Georgia, and South Carolina. There are accounts of post-breeding aggregations of more than 50 storks in Alabama, with a few reports of aggregations of more than 100 birds. These dispersing individuals are likely searching for foraging sites, which may include natural wetlands and artificial water habitats. Preferred feeding areas typically support water depths of less than 19.7 inches (often 3.9 to 11.8 inches) and are generally open (i.e., sparse tree canopy). Major food sources are aquatic organisms, mostly fish (Coulter et al. 1999). Based on the general sightings of many bird enthusiasts and ornithologists, July and August seem to support some of the larger numbers of post-breeding aggregations in Alabama, relative to other months. As there have been no additional observations of the species and it is not known to breed in Alabama, the wood stork is considered a transient species for MAFB.

The installation has provided awareness training to airfield personnel, base leadership, and Unit Environmental Coordinators to protect these birds if seen on MAFB property. If a wood stork is discovered on MAFB property, the observer should not disturb the bird and should immediately notify the NRM. Appropriate notifications will be made through the MAFB chain of command that human activity should cease until all storks exit the area. If the frequency of sightings increases, formal surveys may be recommended in the future. MAFB will protect foraging, nesting, and roosting habitat, consistent with the USFWS' Habitat Management Guidelines for the Wood Stork in the Southeast Region (USFWS 2010). MAFB may implement other management strategies from the Guidelines document as applicable. Another useful document containing management guidelines is the USDA Natural Resources Conservation Service (2021) South Carolina Conservation Planning Guidance, Wood Stork document.

Tricolored Bat

The tricolored bat is widely distributed throughout the eastern United States. These bats use a wide variety of forest community types. In summer, they roost in live and dead leaf clusters of living or recently dead deciduous trees, Spanish moss, bony beard lichen, pine needles, eastern red cedar, and human-made structures such as bridges and the undersides of porch roofs (USFWS 2022). Summer forest habitat is not considered limiting for this species (USFWS 2022). In winter, they hibernate predominantly in caves and mines, although in the southern United States, they will hibernate in culverts (USFWS 2022). White-nose syndrome is the primary threat to this species, with declines of 90 to 100% in affected populations. The tricolored bat was proposed as endangered under the ESA in 2022, but a determination has not yet been reached as of January 2025. This species was detected on MAFB in the 2019 DAF Bat Acoustic Survey and during stationary acoustic monitoring in 2023 and 2024. MAFB may implement various management and conservation strategies when not in conflict with the mission. Numerous conservation strategies and other useful information are included within the Northern Long-eared Bat and Tricolored Bat Assisted Determination Key (USFWS 2024*b*). Conservation measures may include the following:

- Protect trees during the summer, when bats are known to roost in foliage (except where public or worker safety concerns exist).
- Avoid disturbance around roosting or hibernacula locations.
- Alterations to prescribed fire timing, technique, or locations to reduce impacts to bats or habitat.
- Alterations to artificial lighting to reduce impacts to bats or habitat.
- Mitigating exposure of bats to water-borne contaminants.
- Consideration of building construction and maintenance to reduce impacts to bats.

Additional tricolored bat information, tools, and guidance documents is available from the USFWS at https://www.fws.gov/species/tricolored-bat-perimyotis-subflavus.

Alligator Snapping Turtle

The alligator snapping turtle is North America's largest freshwater turtle species. It is proposed for listing as threatened under the ESA and is an ADCNR Priority 3 species. They are distributed in the greater Mississippi River watershed, as far north as Iowa, and the Gulf coastal rivers east of the Mississippi River. The gulf coastal plain, which MAFB resides in, supports the highest densities of the species. Alligator snapping turtle is generally found in deeper water of large rivers or their major tributaries, but they can also be found in other waterbodies such as swamps, lakes, and small streams. The species is usually bottom dwelling, surfacing periodically to breathe. They prefer sites with aquatic structures such as woody debris and submerged vegetation versus sites with more open water. Individuals do not reach sexual maturity until 11 to 21 years. Gravid females leave the water in spring, from late April to early June, and travel 2 to 200 (typically ≤ 20) yards inland to lay eggs in nests dug in sandy soil (DoD Partners in Amphibian and Reptile Conservation [PARC] 2021, USFWS 2021). After 100 to 140 days of incubation, hatchlings emerge in fall. Threats include pollution to waterways, draining of wetlands, collection, harm from fishing and recreational activities, removal of submerged woody debris, and nest depredation by mammals and birds (DoD PARC 2021).

The USFWS collaborated with MAFB to conduct trapping for alligator snapping turtle. Five individuals were captured in 2024 within Lakes 4, 11, and 12. Additionally, 1 depredated nest site was located. MAFB may conduct future surveys for the alligator snapping turtle in cooperation with the USFWS. DoD PARC (2021) recommends the Best Management Practices below to support the alligator snapping turtle on military sites. These practices will also benefit the 2 other special-status turtle species with the potential to occur on the installation, the Alabama map turtle and black-knobbed map turtle.

- Delineate suitable streams and intact vegetated riparian zones. Consider using signage at stream access points to discourage leaving behind fishhooks, fishing line, and nets, and to leave a number for reporting observations of poaching.
- Develop fact sheets and outreach tools to inform the public about this at-risk species, including that collection of alligator snapping turtles in Alabama is illegal.
- Determine if and where alligator snapping turtles are nesting on the base and address terrestrial nest-predators including raccoons, foxes, coyotes, opossums, and crows.
- Survey existing populations with federal and state partners.
- Maintain natural vegetated riparian zones to a minimum distance of 50 yards to support nesting activities and protect from vehicular and other damaging activities.
- Remove nonnative aquatic species including water hyacinth and Alligator weed.
- Retain snags, logs, rocks, and other natural in-stream structures while removing unnatural debris (fishing gear, tires, trash, etc.).

Figure 7-3. Alligator snapping turtle trap and capture sites on Maxwell Air Force Base (MAFB)

Alabama Map Turtle

The Alabama map turtle is listed as threatened under the ESA due to its close appearance to the federally threatened Pearl River map turtle (50 CFR Part 17), and it is considered an ADCNR Priority 3 species. Species listed under a similarity of appearance are "not biologically endangered and are not subject to section 7 consultation." Species listed under a similarity of appearance may "be protected by the take prohibitions of section 9 under the ESA, where they overlap with the listed entity they were listed to protect" (USFWS 2025). It is characterized as a shy, medium-sized turtle whose range is mostly confined to Alabama but also includes surrounding states. It is carnivorous and prefers rivers and streams with sandy or muddy bottoms. Basking sites are essential to this species. These turtles are an integral part of the habitats in which they live because they control populations of their prey and are a food source themselves. This species has not been observed on the installation but was observed along the river bank near the installation in 2021. Management strategies discussed for the alligator snapping turtle will also benefit and protect this species.

Monarch Butterfly

The monarch butterfly was proposed to be listed as threatened under the ESA by the USFWS in December 2024 (USFWS 2024*a*). The species has not been confirmed on the installation, but MAFB is within the spring breeding grounds of the Eastern population. The installation is also host to native milkweed (*Asclepias* spp.), which is the larval food source for the species.

The DoD's 7(a)(1) Conservation Strategy for the Monarch Butterfly (Texas A&M Natural Resources Institute 2024*a*) serves as a guide to help military installations collectively manage and monitor success toward the conservation of the monarch. As directed by the Conservation Strategy, 42 CES/CEIE plans to survey for the species to help guide future management actions. The Monarch Joint Venture Integrated Monarch Monitoring Project is used widely at DoD installations for monitoring monarchs and their habitat (Texas A&M Natural Resources Institute 2024*a*). The 42 CES/CEIE will also ensure that the BMPs described in the DoD's 7(a)(1) Conservation Strategy for the Monarch Butterfly are used when management activities occur that could impact monarchs or their habitat.

Bald Eagle

Bald eagles, which were delisted from the ESA in 2007, remain protected under the BGEPA. Bald eagles are known to nest near MAFB property, and individual eagles may use the installation in a transient manner or to forage along adjacent waters. There are no documented nesting locations on MAFB property. The following management strategies for bald eagles are recommended:

- Continue informal surveys by NRM and USDA representative to monitor for potential occurrences or nesting sites on MAFB property.
- Encounters with bald eagles should be avoided, both within the vicinity of a nest and as part of BASH risk reduction activities.
- Modifications to aerial structures and electrical transmission lines should incorporate proven design techniques that discourage bald eagle use and eliminate or reduce bald eagle hazards.
- Limit use of pesticides as described in the IPMP (Tab 3—Integrated Pest Management Plan (IPMP)) to limit indirect impacts to eagles.

7.4.2 Other Federal and State Special-Status Species

There are 3 federally listed species and 1 state-listed priority species that have not been observed on the installation but occur in Montgomery, Elmore, or Tallapoosa counties. MAFB has surveyed for these

species in past, and they have the potential to occur on the installation, which may have an impact on the military mission. When funding is available, surveying for these species will continue and they will be considered in management actions when appropriate.

Alabama Canebrake Pitcher Plant

The Alabama canebrake pitcher plant is a federally threatened carnivorous herb whose historical range includes Alabama. Its trap leaves function as capsules that drown insects in a mixture of rainwater and enzymes in the pitcher. It grows in hillside seeps, bogs, and close to streams in longleaf pine forests in central Alabama, especially those that are open and fire maintained. The Alabama canebrake pitcher plant has not been identified on MAFB property; therefore, no specific management plan is required at this time. However, the species has potential to occur adjacent to the installation (Figure 7-4). Periodic surveys, both formal and informal, should continue to monitor for favorable habitat and the potential presence of this species; if these plants are found, an overall assessment and ecosystem management strategy should be developed.

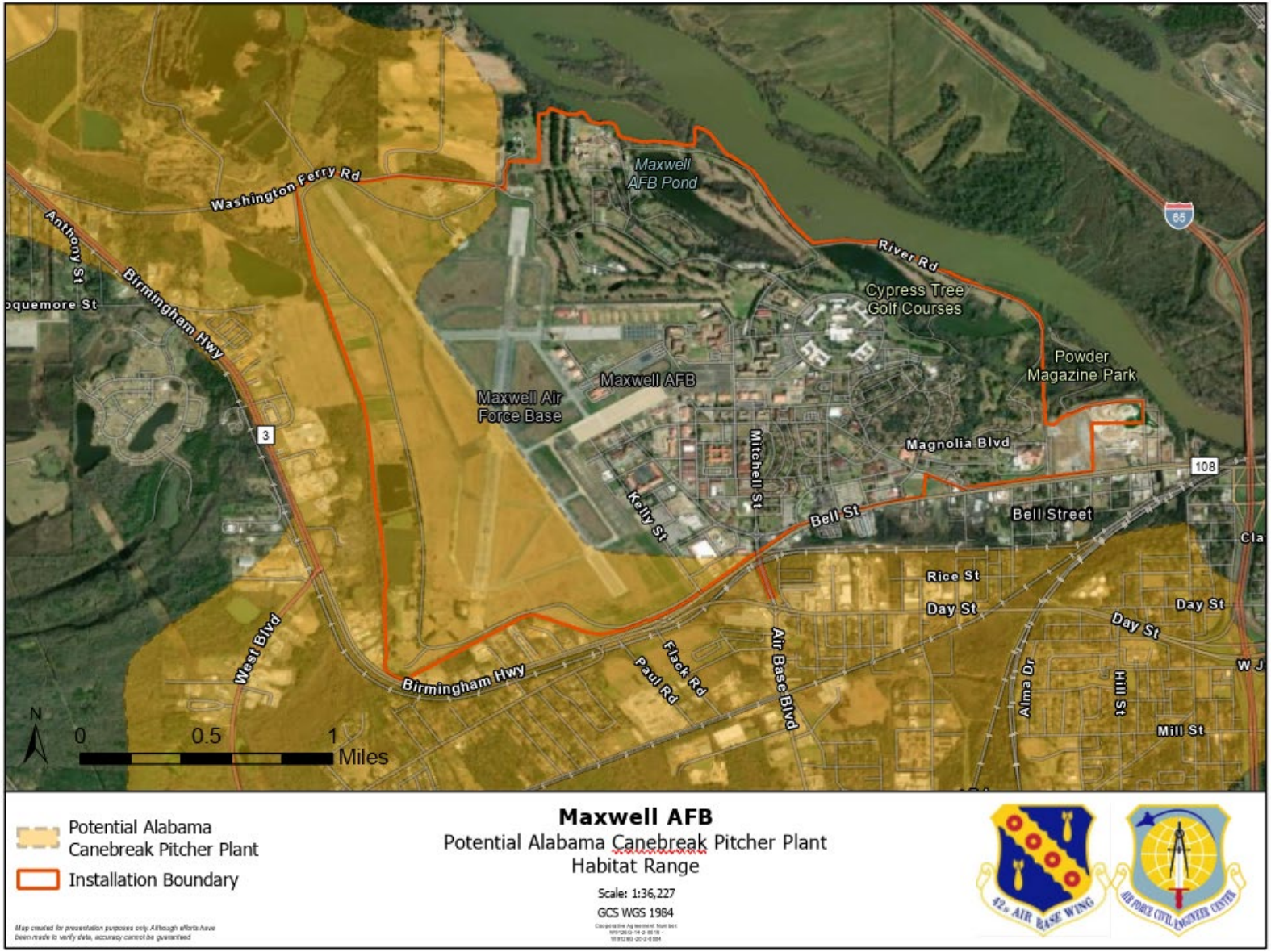

Figure 7-4. Alabama canebreak pitcher plank habitat surrounds Maxwell Air Force Base (AFB)

Georgia Rockcress

The Georgia rockcress (*Arabis georgiana*) is a federally endangered perennial herb that inhabits shaded areas along streams throughout Georgia and Alabama, growing where the soil has recently eroded and other plants have been excluded by unfavorable soil conditions. It can often be found growing in the shadows of red cedar, black oak, sugar maple (*Acer saccharum*), chestnut oak, and oak leaf hydrangea (*Hydrangea quercifolia*). This species has not been identified on MAFB through previous surveys; therefore, no specific management plan is required at this time. Periodic surveys, both formal and informal, should continue to monitor for favorable habitat and the potential presence of this species.

Northern Long-eared Bat

The northern long-eared bat (*Myotis septentrionalis*) is a federally endangered medium-sized bat with noticeably long ears. and it feeds in the understory of forested areas, to eating moths, flies, and other small insects. During the winter, it will find caves in which to hibernate in, and it migrates to wooded areas for in summer to roost in living and dead trees. Its range is much of the eastern and north-central United States and parts of Canada. However, the 2019 DAF Bat Acoustic Survey and stationary acoustic surveys in 2023 and 2024 have not indicated the presence of the Northern long-eared bat at MAFB. Periodic surveys, both formal and informal, should continue to monitor for the potential presence of this species. No specific management plan is needed at this time.

Nongame Birds

Alabama Administrative Code 220-2-.92, *Protected Nongame Species* protects all nongame birds in the state of Alabama with the exception of crows, and nonnative species. Compliance with this administrative code will be facilitated partially by MAFB's compliance with the MBTA. The Alabama Wildlife Action Plan contains pertinent information about nongame bird life history and management information that may be useful for MAFB.

Black-knobbed Map Turtle

The black-knobbed map turtle is a ADCNR Priority 3 species and is under review by the USFWS for a potential listing on the ESA. It is a smaller turtle whose carapace has broad, rounded, black, knoblike vertebral projections. It can be found throughout Alabama and Mississippi in sandy and clay-bottomed streams with moderate currents and plenty of basking sites. It feeds on insects, mollusks, and fish.

7.4.3 Pollinator Conservation

MAFB has not conducted targeted invertebrate surveys; any invertebrate species documentation stems from opportunistic sightings during other faunal surveys. The DAF Pollinator Conservation Reference Guide (USFWS 2018) provides specific pollinator conservation measures and strategies that can be implemented by the DAF. It supplements existing policy and instructions to guide DAF on pollinator conservation actions under the Presidential Memorandum, "Creating a Federal Strategy to Promote the Health of Honey Bees and Other Pollinators" (20 June 2014) and related Federal Pollinator Health Strategy. It further provides Technical Guides as reference materials for pollinators of conservation concern (e.g., ESA-listed species, birds of conservation concern).

Projects to increase pollinator habitat on the installation, like those described in Objective 5.5, will contribute to monarch butterfly and pollinator conservation as a whole. Some areas of MAFB, including unimproved (natural) areas, buffers, recreation areas, and rights-of-way are more suitable for pollinator habitat conservation due to their current use and/or habitat condition. Semi-improved and landscaped areas

should also implement pollinator conservation wherever practicable IAW the Department of Defense Policy to Use Pollinator-Friendly Management Prescriptions (Office of the Under Secretary of Defense to the Assistant Secretaries, 05 September 2014).

7.4.4 Migratory Bird Treaty Act

The MBTA prohibits, unless permitted by regulations, the pursuit, hunting, take, capture, killing or attempting to take, capture, kill, or possess any migratory bird included in the Migratory Bird Treaty, including any part, nest, or egg of any such bird (16 USC § 703). The DoD has an MOU with the USFWS, pursuant to EO 13186, which outlines a collaborative approach to promote the conservation of migratory bird populations. This MOU specifically pertains to natural resource management activities, including but not limited to habitat management, erosion control, forestry activities, invasive weed management, and prescribed burning. The MOU also pertains to installation support functions, operation of industrial activities, construction and demolition activities, and hazardous waste cleanup. This and other MOUs are available at https://www.denix.osd.mil/nr/legislationandpolicy/lawsandstatutes/sikesact/. In February 2007, the USFWS finalized regulations for issuing incidental take permits to the DoD. If any of the Armed Forces determine that a proposed or an ongoing military readiness activity may result in a significant adverse effect on a population of migratory bird species, they must confer and cooperate with the USFWS to develop appropriate and reasonable conservation measures to minimize or mitigate identified significant adverse effects (50 CFR Part 21). MAFB will protect nesting migratory birds, if possible, given airfield constraints. Currently, no activities at MAFB are expected to impact any species of migratory birds.

Partners in Flight

The DoD Partners in Flight (PIF) program consists of natural resources personnel from military installations across the United States that work collaboratively with partners throughout the Americas to conserve migratory and resident birds and their habitats on DoD lands. PIF sustains and enhances the military mission through proactive, habitat-based conservation and management strategies that maintain healthy landscapes and training lands. Additionally, PIF works beyond installation boundaries to facilitate cooperative partnerships, determine the current status of bird populations, and prevent the listing of additional birds as T&E species. DoD PIF provides a scientific basis for maximizing the effectiveness of resource management, enhancing the biological integrity of DoD lands, and ensuring continued use of these lands to fulfill military training requirements.

Alabama provides critical habitat to migrant birds crossing the Gulf of America in spring and fall. Over 2 billion birds cross the Gulf of America each spring and fall (Horton et al. 2019). Safe habitats in states bordering the Gulf are critical for the birds to replenish their energy following their long, nonstop flights in spring and before embarking on such flights in fall. Alabama may be particularly important in fall, supporting the highest densities of fall migrants of any state in the United States (Horton et al. 2023).

Migrating, breeding, and wintering birds face numerous threats, including light pollution and outdoor cats (*Felis catus*). Light pollution confuses migrating birds, which typically migrate at night, causing them to lose their sense of direction. It can also become an attractant, causing birds to fly into structures and poles, and can impact the timing of breeding. DoD PIF (2022) established BMPs to minimize avian mortality from artificial light at night. These include using warm-spectrum (Correlated Color Temperature ≤3,000 K) lights, implementing nightly or seasonal blackouts, installing shields to direct light towards the ground, and using the minimum light intensity required. While light pollution is considered an indirect threat because it does not directly kill birds, direct threats are things such as predation and collision-induced mortality. Deaths from cat predation take the largest toll, resulting in billions of birds killed in the United States annually, and dwarfing other direct threats from building windows, automobiles, etc. (Loss et al. 2015).

DoD PIF has developed outreach materials describing the problems caused by outdoor cats on military bases (https://www.denix.osd.mil/dodpif/denix-files/sites/37/2018/03/cats-awol_2013-1.pdf).

7.5 Water Resource Protection

Installation Supplement

Applicability Statement

This section applies to DAF installations that have water resources. This section is applicable to this installation.

Program Overview/Current Management Practices

A complete summary of water resources on MAFB property is provided in Section 2.2.4. Water resource management needs to consider land and water management actions at MAFB in terms of impact on the quality and quantity of groundwater and surface water within the watershed. The watershed (or drainage basin) is a topographically defined area that drains to a particular point on the landscape (usually a waterbody, wetland, or point along a stream or ditch).

Management practices focus on an installation's effect on regional watersheds. The effects on the watershed stemming from the installation are primarily from stormwater runoff from MAFB. The stormwater can be affected by direct impacts from discharge from operations runoff and from nonpoint source pollution such as runoff from yards and other surfaces. Management practices for water resource protection include monitoring of groundwater and surface water. When possible, monitoring programs and management activities will be part of existing cooperative programs with regional government or private organizations.

Any material that enters waterways and groundwater affects the quality of the waters on or leaving MAFB. Materials carried in stormwater runoff from developed areas could include fuel, oil, grease, coolant, and metals that accumulate on pavement from vehicles and aircraft; de-icing chemicals applied to roadways, runways, and aircraft; and fertilizers and pesticides applied to landscaped areas and other treated surfaces. Other potentially included materials are uncontained hazardous substances such as solvents from normal use and contaminants migrating from Environmental Restoration Program sites. Industrial and sanitary wastewater discharges are managed by collection and treatment prior to discharge into surface waters.

MAFB's Environmental Office requires the implementation of numerous BMPs to reduce impacts to water resources. These BMPs are listed within the MAFB Stormwater Management Plan (MAFB 2022*b*) and MAFB maintains and remains in compliance with NPDES Stormwater and Wastewater Discharge Permits. These BMPs that must be implemented during all ground-disturbing activities to prevent soil erosion and protect surface waters on MAFB property. These instructions are provided to MAFB Civil Engineering (CE) personnel and contractors for proposed site-disturbing activities. Quality assurance and environmental personnel monitor compliance.

The responsibility of watershed management does not fall entirely on operational personnel. Grounds contractors, privatized family housing residents, facility managers maintaining landscaped areas, and general construction contractors, in addition to the operational personnel, must all take responsibility to prevent soil erosion, maintain or enhance soil fertility on improved grounds, and protect surface waters from nonpoint pollutants including sediments, pesticides, excess nutrients, and other surface contaminants.

In addition to monitoring water resources for direct impacts from the installation, water resources should be monitored for weather-related changes and natural hazards impacts. High temperatures during heat waves and hot summers, such as those that occurred from 2016 to 2020, could have a negative impact on

water quality, particularly in lentic systems. As average water temperatures increases in lentic systems, dissolved oxygen content will decrease, possibly reducing habitat quality particularly for larval amphibians and aquatic macroinvertebrates. Increasing water temperatures can also increase the chances of algal blooms occurring, further depleting dissolved oxygen content and habitat quality (Paerl et al. 2011).

7.6 Wetland Protection

Installation Supplement

Applicability Statement

This section applies to DAF installations that have existing wetlands on DAF property. This section is applicable to this installation.

Program Overview/Current Management Practices

Wetlands play an important role in the ecosystem, improve water quality, and control flooding. EO 11990 requires all federal agencies to provide leadership in the protection of wetlands in managing federal lands and conducting federal activities and programs affecting land use.

The wetlands on MAFB, Gunter Annex, and Lake Martin Recreation Area were surveyed in 1994 and 2009 by the MAFB Environmental Office and again in 2021 by CCR Environmental, contracted by Vectrus Systems Corporation. The results of the surveys provided acreage size, hydrologic indicators to determine if soil, flora, or water conditions met the definition of a wetland, and descriptions of the vegetation habitat type found in each wetland area. These results assisted in wetlands management, improvement, and protection. As a part of the management system, the wetlands will be routinely monitored for changes in vegetation, hydrology, and size. Management practices to improve the quality of or expand wetlands focus on wetlands that are connected to other wetlands or watersheds extending beyond the base boundary. In addition to these practices, wetlands on the installation are protected through the NEPA process, which considers possible impacts to wetlands through installation actions and developments.

7.6.1 Management Strategies

In general, water resources will be managed through conservation and impact avoidance. The following guidelines will be implemented to ensure compliance and to protect and enhance water resources on MAFB:

- Consult with the USACE prior to initiating projects with the potential to disturb water resource. Apply for an appropriate permit when regulated waters, including wetlands and associated buffers, will be impacted.
- Do not allow vehicles within known wetland areas.
- Restrict vehicles from within 30 feet of water resources, except where established crossings and roads exist.
- Maintain riparian management zones around water resources, including at least 100-foot vegetated buffer along streams where practicable.
- Implement management controls to limit unavoidable erosion with the riparian management zones.
- Avoid disturbance of wetlands and aquatic habitats where practicable.
- Manage invasive species to promote desirable native species.
- Plan development to avoid wetland and floodplain impacts to the maximum extent possible and mitigate unavoidable impacts on wetland and floodplain functions.
- Review operations and maintenance programs that potentially affect water resources and develop procedures and guidelines to avoid the loss of function.

- Do not enhance wetlands or other water resources in the Air Operations Areas and ensure any mitigation occurs outside of those areas.

Wetland ecosystems are naturally resilient, provide linear habitat connectivity, link aquatic and terrestrial ecosystems, and create thermal refugia for wildlife. Wetland systems are vulnerable to changes in the quantity and quality of their water supply, and it is expected that altered hydrological regimes will have a pronounced effect on wetlands.

7.7 Grounds Maintenance

Installation Supplement

Applicability Statement

This section applies to DAF installations that perform ground maintenance activities that could impact natural resources. This section is applicable to this installation.

Program Overview/Current Management Practices

Given that large parts of MAFB and Gunter Annex are landscaped, the management and design of those areas have significant implications for water quality, BASH risk, and native species. The following recommended landscaping practices should benefit the environment and generate long-term savings in costs and maintenance time. The use of native plants not only protects biodiversity and provides wildlife habitat, but it can also reduce demands for fertilizer, pesticides, and irrigation and their associated costs.

The following are general recommendations to promote environmentally beneficial landscaping:

- Maintain and protect the health, environmental quality, aesthetic value, and ecological balance of the military community.
- Design landscaping to be suitable to the specific site and appropriate for the use and operation of the facility.
- Maintain the grounds on MAFB properties in a prioritized manner according to the location's visibility and amount of traffic.
- Provide greater maintenance on grounds with high visibility and/or traffic.
- Improve the appearance of the installation and its facilities by preserving natural terrain and vegetation and using appropriate new plantings.
- Follow principles that encourage conservation, plant health, and use the list of approved trees and shrubs for planting on the installation, found in Appendix B.
- Avoid planting trees and shrubs listed in Appendix C.
- Implement water-efficient practices, use efficient irrigation systems and recycled water, and use landscaping to conserve energy.
- Limit turf areas where practical to reduce water use and maintenance requirements.
- Use wood mulch instead of rock mulch, when practical.
- Prevent expansion of nonnative plants into native plant areas by using regionally native plants for landscaping, where practicable. Reuse landscape trimmings on site, as appropriate.
- Use porous pavement, when possible, to support water infiltration.
- Do not use seed-bearing or fruiting plants that provide food for wildlife and wildlife habitat in areas near the airfield.
- Prevent nonpoint pollution from the application of fertilizers.
- Ensure new landscaping complies with Anti-Terrorism/Force Protection standards.

MAFB lands are classified and subsequently managed using 3 land use categories: improved land, semi-improved land, and unimproved land. Of the total areas managed by MAFB, the main installation and Gunter Annex are primarily composed of improved land; Lake Martin Recreation Area is primarily semi-unimproved, with sections of semi-improved land; and the Vigilant Warrior Training Site is classified as mostly unimproved. The land types are characterized as follows:

Improved lands—This classification includes areas that have been developed for administration, housing, other building projects, and organized recreation (golf courses, ball fields, etc.). Vegetation on improved lands requires constant maintenance to ensure survival in the local arid climate. On MAFB and Gunter Annex, the major turf grass is a combination of Bermudagrass, St. Augustine grass, and bahiagrass. Improved lands are regularly mowed and irrigated throughout the year and aerated as needed. Weeds and brush are controlled with herbicides, as required. Trees and shrubs are pruned at least annually.

Semi-improved lands—Semi-improved lands on MAFB, Vigilant Warrior Training Site, and Lake Martin Recreation Area usually include areas that are proximate to runways, airfields, fence lines, parking ramps, and minimally developed spaces such as open storage areas. Most semi-improved lands are not grass seeded; those areas with grass are irrigated and mowed during the growing season. Mowing also controls weeds and brush, which is important for reducing fire hazard fuels. Trees and shrubs are pruned when needed.

Unimproved lands—Grounds are not classified as improved or semi-improved and usually not mowed more than once a year. These include areas such as timber and forest lands, lakes, ponds and swamps, areas in airfields beyond the safety zone, and similar areas requiring limited or no maintenance.

Additionally, all improved and semi-improved areas of the base should be continually evaluated for possible conversion to lower levels of grounds maintenance. Reduced mowing or elimination of maintenance should be considered in semi-improved areas to allow these areas to convert to native habitat (unimproved areas). Overall grounds maintenance expenses can also be reduced by converting improved grounds to semi-improved grounds.

In addition to these more general landscaping practices, the installation should seek alternative processes such as natural landscaping, rain gardens, drainage swales, cisterns, permeable paving, or shallow depressions to help manage stormwater on site and improve water quality in adjacent waterbodies. Rain gardens or depressions are generally strategically placed to capture stormwater from impervious services (e.g., parking lots) and are typically bowl-shaped depressions filled with organic matter and native plants. These depressions improve the water quality of the stormwater runoff, while allowing for slow infiltration into the groundwater.

7.7.1 General Maintenance

Grounds maintenance that occurs on MAFB and Gunter Annex is provided primarily by the Federal Prison Camp. Federal Prison Camp inmate support includes grass cutting, bush-hogging, or other mechanical vegetation control, tree pruning, shrub trimming, fertilization, tree/shrub planting, and other related activities. In addition, the MAFB and Gunter Annex Federal Prison Camp scope of work specifies other related activities. The Federal Prison Camp inmates perform limited chemical pest control. Grounds maintenance is performed on approximately 1,947 acres of improved and semi-improved grounds on MAFB and Gunter Annex. Improved ground areas covered by this contract include lawns in the main cantonment, parade grounds, athletic fields, and road shoulders along major thoroughfares. Semi-improved grounds such as the airfield, antenna farms, ammunition storage areas, secondary road shoulders, and drainage ditch banks are maintained at a somewhat lower level. For roadside maintenance throughout the

installation, it is recommended that a grass height of at least 10 inches be maintained along roadways, where feasible.

All of the turf in common or community areas of the installations is also maintained by Federal Prison Camp inmates. Privatized Family Housing personnel utilize a local contractor to maintain their own lawn areas. Civil Engineering pest management personnel are responsible for weed, insect, and disease control in all turf areas maintained under the grounds contract.

Mowing is performed as needed to maintain a grass height between 2.5 to 4 inches in improved areas. In semi-improved areas, except on the airfield, the grass is maintained at heights between 6 and 18 inches. On the airfield, the height is maintained between 7 and 14 inches, IAW the BASH Plan, to discourage birds from using the airfield. Turf establishment or reestablishment is primarily through the use of hydromulching or sodding. The limited amount of turf areas on unimproved ground, such as rights-of-way, is mowed to maintain the grass height between 8 and 24 inches.

Lake Martin Recreation Area grounds maintenance is mostly performed by recreation area staff, but they are assisted by Federal Prison Camp inmate support. Grounds maintenance at the Vigilant Warrior Training Site is performed by site staff.

Air Force and Federal Prison Camp employees administering grounds maintenance should ensure that maintenance personnel are qualified to do the work and are familiar with the regulations and policies outlined in various plans, including this INRMP.

7.8 Forest Management

Installation Supplement

Applicability Statement

This section applies to DAF installations that maintain forested land on DAF property. This section is not applicable to this installation.

Program Overview/Current Management Practices

7.9 Wildland Fire Management

Installation Supplement

Applicability Statement

This section applies to DAF installations with unimproved lands that present a wildfire hazard and/or installations that utilize prescribed burns as a land management tool. This section is not applicable to this installation.

Program Overview/Current Management Practices

7.10 Agricultural Outleasing

Installation Supplement

Applicability Statement

This section applies to DAF installations that lease eligible DAF land for agricultural purposes. This section is not applicable to this installation.

Program Overview/Current Management Practices

7.11 Integrated Pest Management Program

Installation Supplement

Applicability Statement

This section applies to DAF installations that perform pest management activities in support of natural resources management (e.g., invasive species, forest pests). This section is applicable to this installation.

Program Overview/Current Management Practices

MAFB has an Integrated Pest Management (IPM) Program implemented by the CE Operations Flight (Tab 3—Integrated Pest Management Plan (IPMP)). IPM is the use of multiple techniques in a compatible manner to avoid damage and minimize adverse environmental affects while controlling target pests. The goal of IPM is to utilize non-chemical procedures to control pests, including invasive plant and animal species. Pest management goals include assessment of pest species' impacts on installation natural resources and identification of the most effective method to control them. The MAFB IPMP includes a summary of pest species and control measures to ensure that pest and disease vectors do not adversely affect military operations (Tab 3—Integrated Pest Management Plan (IPMP)). Pest management records will be maintained in the Enterprise Environment, Safety, and Occupational Health Management System. The IPMP is reviewed annually by the Installation Pest Management Coordinator, Installation Environmental Coordinator, Senior Installation Engineer, Installation Medical Officer, Installation Commander, and AFCEC/COSC Pest Management Consultant. The IPMP is updated every 5 years and was last updated in 2024.

MAFB only uses pesticides that are approved by the U.S. Environmental Protection Agency (U.S. EPA) and AFCEC/COSC. Low-toxicity pesticides are applied to infested areas when necessary. Herbicides are used to control weed growth, especially around the runways and taxiways. Vertebrates such as opossums and birds are controlled through the use of trapping devices, whereas rats may also be controlled by poisons, as necessary. Exotic nuisance plant species are treated with herbicide and/or mechanically removed. Use of herbicides with Imazapyr as an active ingredient is not allowed on any MAFB properties (Tab 3—Integrated Pest Management Plan (IPMP)).

7.11.1 Invasive Species

Invasive species are nonnative plants and animals that harm the environment, economy, or human health (EO 13112). The State of Alabama has identified numerous invasive plant species (Alabama Invasive Plant Council 2012). A survey conducted in 2021 on MAFB identified 22 invasive plant species (Figure 7-5; Table 2-8; Texas A&M Natural Resources Institute 2022). Chinese tallow is the most widespread invasive species on MAFB, and controlling new infestations of Chinese tallow is a management priority. Other priority terrestrial invasive species include silk tree, bamboo, trifoliate orange, kudzu, thorny olive, and English ivy. Taro, water hyacinth, and alligatorweed are aquatic invasive species that are also management priorities.

Invasive plant species such as kudzu and Chinese tallow tree benefit from ecosystem stressors and become more prevalent on the installation if not properly managed. This will likely have a negative impact on specialist wildlife species that have historically depended on specific native plant communities for their survival (Dukes and Mooney 1999). Shifting environmental conditions could create open niches for

nonnative invasive species to expand onto MAFB, emphasizing the importance of effective invasive plant species management.

Invasive insect species on MAFB include the red imported fire ant (*Solenopsis invicta*) and southern pine beetle (*Pinus taeda*). Red imported fire ants impact the health of humans and wildlife with their sting. Their mounds create a tripping hazard, impacting outdoor activities. Southern pine beetles are impacting pine trees on Vigilant Warrier. Insect pest species on MAFB include mosquitoes, cockroaches, fleas, ticks, bees, wasps, hornets, and termites, which can interfere with mission operations and are managed IAW the IPMP.

Invasive animal species on MAFB include feral cats, European starlings (*Sturnus vulgaris*), house sparrows (*Passer domesticus*), and pigeons (*Columba livia domestica*). European starlings and pigeons pose a BASH risk. Feral and free-roaming cats pose a threat to native species. Section 7.11.3 provides additional nuisance wildlife and disease information.

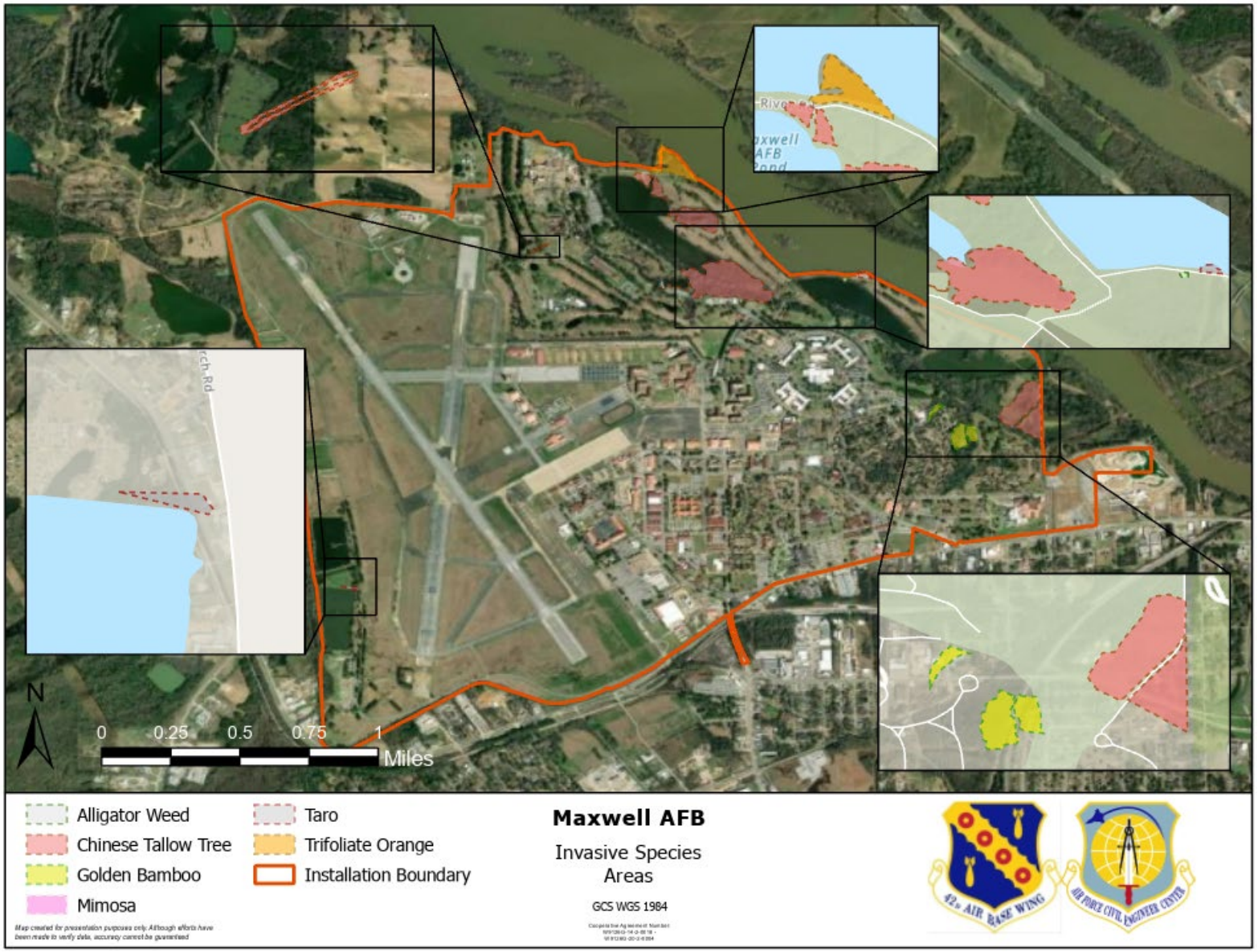

Figure 7-5. Invasive species locations on Maxwell Air Force Base (AFB)

7.11.2 Management Strategies for Invasive Species

Management of invasive species is necessary on MAFB to prevent impacts to natural resources and maintain military lands and facilities in usable condition. In addition, mosquitos and ticks are pests that carry diseases that can impact humans, which could threaten the military mission. Invasive species management should prioritize early detection and rapid response to manage infestations most effectively. The NRM will implement BMPs to prevent the introduction and spread of invasive species on MAFB and take measures to control them in an economically and environmentally sound manner.

Invasive and exotic species control can hinder an installation's efforts to reduce pesticide use. Therefore, it is important to prevent the initial spread of invasive species and address the spread of such species as early as possible to reduce the amount of required herbicide and pesticide applications and reduce the costs associated with treatment. The MAFB NRM should evaluate the threat of invasive species, as well as the environmental impacts and permitting requirements of herbicide usage, if applicable, prior to implementing any eradication and/or control program.

General invasive species management strategies:

- Implement BMPs to minimize land disturbances that favor invasion of nonnative species and revegetate disturbed areas with native species.
- Native rock material should be used instead of non-indigenous rock when practical for maintenance or construction projects.
- Utilize mulches from MAFB or certified-weed free sources to facilitate the establishment of native ground cover on impoverished soils.
- Maintain biodiversity and undisturbed habitat to maximize resilience against and competition with invasive species.
- Control invasive and exotic species and noxious weeds through early detection, isolation of infested areas, and control of individual plants with physical, chemical, or mechanical means, depending on the species.
- Favor basal application and spot treatment and avoid aerial or broadcast application of pesticides to prevent adverse impacts to native plants and wildlife.
- Do not use invasive, nonnative species in landscaping.
- Continue to reseed exposed soils using a certified weed-free native grass mix.
- Continue to educate users, maintenance staff, and others, as relevant, on invasive species.

The MAFB Invasive Species Management Plan should be updated every 5 years to remain current and maximize its ability to guide the prevention and control of invasive species. Invasive species management on MAFB is focused on treating invasive species along the river corridor from north to south since there are fewer invasive species and smaller infestations in the north. It is imperative to conduct annual surveys to identify invasive species and implement management of newly identified and small infestations for the most effective control. Annual invasive plant management is also needed to maintain pond margins, lake shores, and Alabama riverbanks.

Invasive species prevention on MAFB includes educating base agencies and populations on invasive species prevention and management. Protocols should be implemented to inspect and clean vehicles, including watercraft, to prevent the introduction of invasive species on MAFB.

Chinese tallow management on MAFB is focused on containment and control versus complete eradication. Chinese tallow identified in new locations should be immediately controlled to prevent it from spreading.

In all areas treated for invasive species, foliar herbicide treatment should be used to control Chinese tallow seedlings. Chinese tallow control was completed in 2021 and 2022 to eliminate Chinese tallow from 2 forested wetlands at the south end of River Road, a forested wetland at the eastern edge of the larger base lake, and areas extending southward from the northern boat ramp (Figure 7-6). Mechanical removal with cut-stump herbicide treatment should be used to control Chinese tallow in public access, recreation, and operational use areas. Herbicide hack and squirt treatment should be used in areas where Chinese tallow is not likely to pose a safety hazard.

Bamboo control is attainable at 3 sites through removal and repeated herbicide treatments. Continued management should be implemented to control bamboo on these sites, including any new infestations. Areas near the Alabama River and the creek under the newer/replaced pedestrian bridge require additional surveys and treatments, and distinctions are needed between invasive, nonnative bamboo and river cane that is native to the region. Silk trees have been removed and treated in all previous work areas. A large-scale intensive removal effort targeting the eastern end of River Road should be implemented to reduce the silk tree seed bank and prevent it from spreading. Management of trifoliate orange, water hyacinth, and taro was conducted in 2022. The 2024 Annual Update of the Invasive Species Management Plan details future invasive species management plans through 2029, including locations that should be targeted for management (Texas A&M Natural Resources Institute 2024*b*).

Aquatic invasive species management on MAFB prioritizes the removal and treatment of new infestations as soon as they are identified. Waterbodies are monitored to detect any new aquatic invasive species infestations. Water hyacinth was manually removed from western base lakes. Taro was treated with herbicide in 2022 at the western base lakes and Alabama River. Additional taro infestations have been identified and control should be implemented. Alligatorweed has been managed by alligatorweed flea beetles (*Agasicles hygrophila*) in the past, and CE Pest Management is programmed to obtain and release beetles annually to manage infestations (Texas A&M Natural Resources Institute 2024*b*).

Current red imported fire ant eradication programs, such as those of Auburn University's Entomology Integrated Pest Management (Morehart et al. 2021), provide recommendations to manage red imported fire ants on MAFB. The goal of red imported fire ant management on MAFB is to keep their abundance below the level that causes damage to a particular area or impacts the mission. CE Pest Management will conduct imported red fire ant management in compliance with their IPMP, using bait to kill the queen for small infestations and insecticide broadcast spraying for larger infestations.

Annual surveys should be conducted to identify trees impacted by the southern pine beetle and document trees that pose a hazard to training. Trees posing a training hazard should be removal annually to maintain training safety and prevent the spread of southern pine beetle.

European starlings and pigeons are controlled in compliance with the BASH Plan as needed to reduce BASH risk. European starling control is a joint effort between CE, the Base Safety/BASH Program, and USDA. Feral and free-roaming cats also pose a threat to native species and should be controlled by MAFB Pest Management. Section 7.11.3 provides additional nuisance wildlife and disease information.

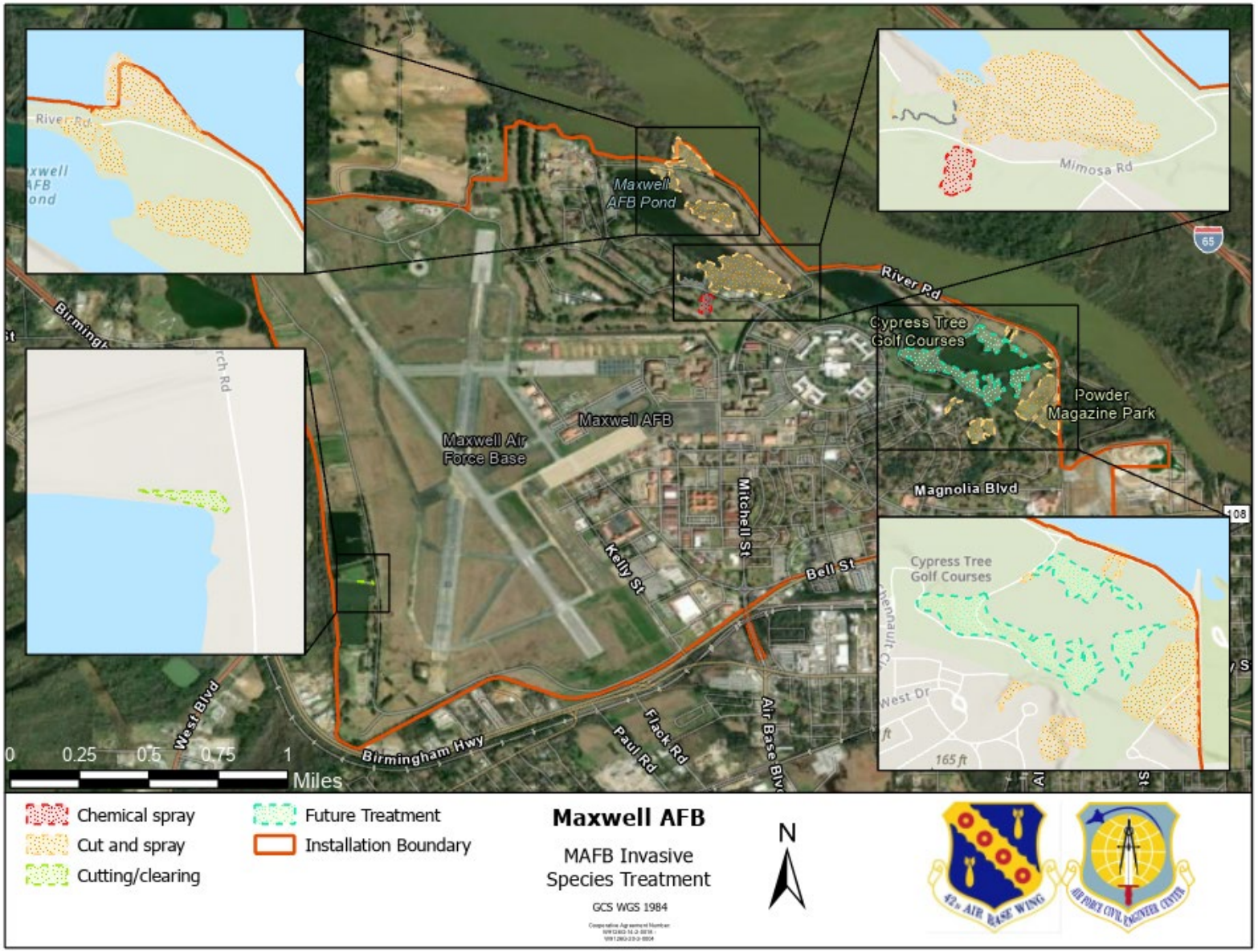

Figure 7-6. Invasive species treatment locations on Maxwell Air Force Base (AFB), with an emphasis on Chinese tallow tree

7.11.3 *Nuisance Wildlife and Diseases*

Nuisance wildlife problems will be evaluated by the NRM in conjunction with base pest management personnel, if appropriate. Any solutions to nuisance wildlife problems will follow the IPMP (Tab 3—Integrated Pest Management Plan (IPMP)) and BASH Plan (Tab 1—Bird/Wildlife Aircraft Strike Hazard (BASH) Plan). Nuisance wildlife control shall comply with DAFMAN 32-7003 (*Environmental Conservation*) and appropriate regulatory authorities (AFI 32-1053).

The Canada goose (*Branta canadensis*) is among the main nuisance species and BASH threats on the airfield. In the past, large numbers of geese have created health and safety hazards on the airfield and closed golf courses and the Family Camping and picnic area. During their annual molting period in the early summer, USDA will assist with the removal, if needed. Raptors are also considered nuisance species and may present BASH threats. Removal of nuisance raptor species must be approved in writing by the 42 CES/CEIE Environmental Office (Tab 3—Integrated Pest Management Plan (IPMP)).

Other than those that present a BASH risk, nuisance species such as stray dogs, raccoons, squirrels, snakes, opossums (*Didelphis virginiana*), foxes, armadillos (*Dasypus novemcinctus*), beavers (*Castor canadensis*), and various species of rodents are typically controlled by MAFB Pest Management. Larger animals such as coyotes (*Canis latrans*), white-tail deer, and American alligators are controlled by the USDA or another state or federal agency, in coordination with 42 ABW/SE and NRM personnel.

Diseases affecting fish and wildlife may occur on the installation. Any large-scale fish and wildlife deaths and unnatural behavior occurring on the installation will be reported, recorded, and investigated by the NRM in conjunction with USFWS, USDA, and ADCNR, as needed.

7.12 Bird/Wildlife Aircraft Strike Hazard (BASH)

Installation Supplement

Applicability Statement

This section applies to DAF installations that maintain a BASH program to prevent and reduce wildlife-related hazards to aircraft operations. This section is applicable to this installation.

Program Overview/Current Management Practices

The MAFB wing staff and operations group implement a BASH Plan (Tab 1—Bird/Wildlife Aircraft Strike Hazard (BASH) Plan), which has established specific procedures intended to reduce known and future hazards from birds, including the development of a Bird Hazard Working Group (BHWG). The BHWG is chaired by the Vice Wing Commander and is responsible for developing, implementing, and updating the BASH Plan and reviewing BASH incidents. The NRM also participates in the BHWG.

Birds can be encountered up to altitudes of 30,000 feet and higher. However, most birds fly close to the ground, and more than 95% of all reported incidents in which an DAF aircraft has struck a bird have been below 3,000 feet above ground level. Approximately half of these bird strikes occur in an airfield environment, and approximately a quarter occur during low-altitude training. Strike rates significantly increase as altitude decreases, partly due to the greater number of low-altitude missions, but mostly because birds are commonly active close to the ground. Any gain in altitude represents a substantially reduced threat of a bird-aircraft strike. The potential exists for future bird strikes if current procedures to minimize risk are not continued.

At MAFB, there are several common birds that may pose a hazard to aircraft and personnel: gulls (*Larus* spp.), hawks, owls, falcons (*Falco* spp.), blackbirds, starlings, Eastern towhee (*Pipilo erythrophthalmus*), pigeons, doves, ducks, geese, woodpeckers, crows (*Corvus* spp.), wild turkeys, sparrows/house sparrows, chickadees (*Poecile* spp.), meadowlarks (*Sturnella neglecta*), killdeer (*Sturnella neglecta*), tufted titmice (*Baeolophus bicolor*), and common grackles (*Quiscalus quiscula*). Migratory waterfowl (ducks, geese, and swans) also pose a threat to low-flying aircraft. Waterfowl vary considerably in size, from 1 to 2 pounds for ducks, 5 to 8 pounds for geese, and up to 20 pounds for most swans. The normal migratory seasons are spring and fall. Waterfowl present an increased hazard during the migratory season; however, Canada geese have become year-round residents in Alabama's favorable climate and congregate near ponds found on and near MAFB. Waterfowl typically migrate at night and generally fly between 1,500 and 3,000 feet above ground level during the fall migration and between 1,000 and 3,000 feet above ground level during spring migration. Other large avian species, such as turkey vultures (*Cathartes aura*), pose a threat to military aircraft. In addition, bats contribute to air strikes at MAFB, thus, artificial bat boxes are prohibited.

To minimize the BASH-related risk on MAFB, the 42 AFB/SE will attempt to deter animals from foraging or roosting in areas near or adjacent to the low-level flying routes and attract wildlife to areas away from those routes. This approach has been chosen due to the relative abundance and diversity of wildlife species present on MAFB and the low likelihood of excluding all wildlife species that pose a significant threat to the safety of the flying mission.

The potential for BASH has been reduced by an effective BASH plan (Tab 1—Bird/Wildlife Aircraft Strike Hazard (BASH) Plan), which was developed and maintained by the MAFB Flight Safety office, 42 ABW/SE, in coordination with the installation NRM. The BASH plan was last updated in 2024. The BASH plan includes close management of the grass height in and around the airfield to reduce flocking of birds, monitoring, reporting of flocks by all airfield users, and the MAFB Bird Hazard Warning System, along with Bird Watch Condition (BWC) codes for air crews. Habitat modification, non-lethal hazing, and use of pyrotechnics are all employed IAW the BASH Plan. If those means are not effective in controlling nuisance wildlife presenting a BASH risk, MAFB maintains a USFWS Airport Depredation Permit and an Alabama State Wildlife Control Permit to manage nuisance wildlife.

BWC codes are used for the rapid dissemination of information on wildlife activity in the airspace and provide recommendation procedures to reduce the hazard. The BWC is reported to aircrew, including specific information such as wildlife species, location, and number. Airfield statuses of "BWC Severe" and "BWC Moderate" will be reported on the Automated Terminal Information Service by Airfield Management or Wing Safety to reduce the BWC status to "BWC Low". Flocks are also monitored throughout the normal flight zones, avoiding particular areas of high risk using deconflicting flight patterns (i.e., avoiding direct overflight) whenever feasible. The BASH Plan also mandates the use of the Bird Strike Threat calculator in mission planning, which was developed to be used in conjunction with Avian Hazard Advisory System/Bird Avoidance Model to predict bird strike threat risk.

Due to the proximity to 2 major avian migratory routes, the Mississippi Flyway on the west and the Atlantic Flyway to the east, waterfowl and blackbirds are the greatest potential aircraft strike hazards at MAFB. A mammal sighting log is maintained and includes the number of species, their location, direction of travel, and record of runway intrusions. Birds and mammals are dispersed from the airfield utilizing pyrotechnics, propane cannons, repellents, trapping, depredation, and/or vehicles whenever they pose a hazard to aircraft operations. Airfield management and the USDA representative are responsible for the dispersal of wildlife. Sixteen remotely controlled bird-scare propane cannons have been placed around the airfield to help in bird dispersal. Airfield management or Flight Safety personnel controls these cannons. Under "Moderate" or "Severe" BWCs, pyrotechnics may be used. These practices have proven adequate in most situations.

As long as current threat reduction practices continue to be employed on the airfield, waterfowl and blackbird populations currently pose minimal conflict with airfield operations. However, the Bird Avoidance Model graphs will be relied upon by the BASH program to predict waterfowl migration hazards, despite lower hazards. Raptors and blackbirds pose year-round hazards. Migratory birds are protected by the MBTA and managed by the USFWS. To maintain compliance with the MBTA, the base has a USFWS bird depredation permit IAW 50 CFR, parts 13 and 21.41.

All construction projects will be reviewed by the BHWG or 42 ABW/SE for any BASH-related impacts. Projects that disturb the grounds must include a restoration plan and ensure that the site is returned to pre-construction condition and include landscape that deters wildlife.

7.13 Coastal Zone and Marine Resources Management

Installation Supplement

Applicability Statement

This section applies to DAF installations that are located along coasts and/or within coastal management zones. This section is not applicable to this installation.

Program Overview/Current Management Practices

7.14 Cultural Resources Protection

Installation Supplement

Applicability Statement

This section applies to DAF installations that have cultural resources that may be impacted by natural resource management activities. This section is applicable to this installation.

Program Overview/Current Management Practices

Important historical cultural resource items are present at MAFB. Very little information on these cultural resources is made public to prevent any intentional destruction or collection of cultural artifacts. These resources will be managed on a case-by-case basis when development or disturbance of the specific areas of interest are proposed. The installation Cultural Resources Manager will review all plans for their possible effects on the cultural resources, and the State Historic Preservation Officer will be consulted in the event that a base project could potentially affect cultural resources.

To protect these resources and to integrate cultural resources management into the planning and implementation of construction, training, and land use, an ICRMP has been prepared and is reviewed annually by CES/CEIE, with any major revisions required every 5 years (Tab 2—Integrated Cultural Resources Management Plan (ICRMP)).

To support the MAFB mission and comply with the National Historic Preservation Act and Alabama State Historic Preservation Office, the ICRMP cites relevant historic preservation laws with which the DAF must comply, presents useful information for determining the significance of the installation's cultural resources, summarizes the installation's inventory of known cultural resources, identifies the potential for discovery of additional significant resources, describes present and anticipated near-term land uses, identifies potential threats to cultural resources and activities regulated by or exempted from regulation by the ICRMP, and provides standard operating procedures and prioritized action plans and programs for cultural resources management.

The ICRMP and general protection of cultural resources were considered during preparation of this INRMP. It is the NRM's responsibility to coordinate natural resource activities and actions with the Cultural Resources Manager.

7.14.1 Archaeological Resources

One protected archaeological site on MAFB is eligible for listing in the National Register of Historic Places (NRHP). This site is located near the Alabama River and is preserved IAW the MAFB ICRMP (Tab 2—Integrated Cultural Resources Management Plan (ICRMP)). This site is managed and monitored to ensure that it is not disturbed. There are no significant natural resources associated with this site; therefore, there are no foreseeable conflicts between natural and cultural resource management plans and/or activities.

7.14.2 MAFB Historic Housing Districts and Buildings

MAFB has numerous historic buildings and military family housing areas that are registered with the NRHP. There are 250 buildings/structures that are either listed, eligible for listing, or recommended eligible for listing in the NRHP. Most of the listed buildings (150 of 152) are part of the Senior Officer's Quarters Historic District. The mature trees, street signs, sidewalks, and lights are essential components of the district streetscapes. Mature oaks are complementary to the historic neighborhood and must be preserved as elements of these districts.

In August 2013, USACE (2013) conducted a Historic Landscape Survey of MAFB to evaluate, inventory, and document the landscape features and make recommendations for their preservation and maintenance, establishing the installation's importance to military history and heritage. As part of the evaluation criteria for the NRHP, MAFB used a Multiple Resource Areas nomination that emphasized the landscape associated with the Senior Officer's Quarters Historic District and the Non-Commissioned Officer's area. The Senior Officer's Quarters are similar in style and are described as French Provincial, with stucco walls, tile roofs, corner quoins, curved boulevards, and large lawns. MAFB's Senior Officer's Quarters are preserved examples of the construction style of the 1927 Army Air Corps 5-Year Expansion Program and the tradition of historic integrity (Figure 7-7).

In 2007, MAFB family housing and land was privatized, with the owner being responsible for the maintenance, repair, historical integrity, and management of the communities for 50 years. Measures should be established between 42 CES/CEIE, the 42 ABW contracting office, and the housing contractor to ensure that the tree canopy and landscaping are properly maintained and replenished to ensure that the streetscapes are preserved in character with the historic districts.

Chennault Circle (often referred as "Academic Circle"), named in honor of Lt. Gen Chennault, is also considered and managed as a historic district on the installation. The circular layout is unique, and the Circle contains many of the major academic facilities of Air University and its schools. Significant features include the layout of the campus, concentric rings of sidewalks, landscaped green spaces, and buildings facing the central library. Trees on Chennault Circle contribute to the park-like campus atmosphere and should be managed IAW historic and urban tree conservation policy and recommended guidelines.

Figure 7-7. Senior Officer Housing built in the 1920s still houses leadership today

7.15 Public Outreach

Installation Supplement

Applicability Statement

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

Program Overview/Current Management Practices

Due to heightened security requirements on MAFB, Gunter Annex, and Vigilant Warrior Training Site, the general public is not typically allowed access to these locations. However, MAFB recreational areas and facilities are available to personnel, as described in Section 7.2. These individuals can benefit from MAFB fishing programs and watchable wildlife areas.

Conservation of natural resources is a priority for MAFB's mission, as the installation is located in an ecologically important area. Information regarding recycling programs on MAFB properties, as well as water conservation initiatives, is made available to MAFB personnel to better educate them about initiatives to conserve resources. The CES/CEIE provides literature on MAFB natural resources and conservation in general at newcomer orientation. The installation's NRM frequently visits personnel to educate them on natural resources conservation and management. Key announcements pertaining to natural resources programs and events are coordinated through the Public Affairs Office for inclusion in the base newspaper, Base Bulletin, and website. Outreach and education programs for kindergarten through eighth grade should be implemented to highlight natural resources and their management on MAFB. Some public involvement programs that could be developed and implemented on MAFB include but are not limited to the following:

- Develop watchable wildlife programs (https://www.outdooralabama.com/watchable-wildlife).
- Develop volunteer programs supporting natural resources conservation, including the following:
    - Conduct restoration work, including planting of native vegetation to preserve soil and water (https://alconservationdistricts.gov/about/)
    - Implement invasive animal and plant species early detection, eradication, and control programs (https://www.se-eppc.org/alabama/)

7.16 Natural Hazards

Installation Supplement

Applicability Statement

This section applies to DAF installations that have identified natural hazard risks, vulnerabilities, and adaptation strategies using authoritative region-specific region-specific climate science, climate projections, and existing tools. This section is applicable to this installation.

Program Overview/Current Management Practices

Natural hazards have the potential to reduce mission readiness, including by impacting natural resources and their ability to support installation resilience. The natural hazards with the greatest impacts at MAFB include:

- Extreme thunderstorms, which can bring heavy rain, hail, and potential flooding
- Tropical storms and hurricanes, which are generally weakened by the time they reach the MAFB area but may still yield significant rainfall and high winds and result in flooding
- Tornadoes, especially during the late spring and early summer, which are generally accompanied by extreme thunderstorm activity
- Extreme heat events, which may be enhanced by high humidity and may be a part of multi-day heatwaves
- Drought, which, although rare, can emerge rapidly during periods of high temperature
- Wildfires, which, although rare and generally small in size, are a notable risk factor during extended drought periods and due to altered vegetation and fuel availability

Alabama has experienced impacts from 116 weather-related disaster events since 1980, including 16 droughts, 58 severe storms, 26 tropical cyclone events, and two flooding events (NCEI 2025). These extreme events can damage infrastructure, cause treefall at exposed sites, hasten erosion in drainage channels, stress vegetation communities and wildlife, and intensify wear and tear on stormwater infrastructure. They can also directly impact mission activities; for example, MAFB had to temporarily pause installation operations in March 2025 due to severe weather at the installation including heavy rain, high winds, and lightning (Ebensberger 2025).

Tornadoes are a natural occurrence in Alabama, with an average of 43 touching down each year, but recent years have seen a greater frequency (Gensini and Brooks 2018, Runkle et al. 2022). Although there has been a seasonal shift from summer to winter occurrences in neighboring states, Alabama has not observed the same shifts in tornado seasonality (Coleman et al 2024). Regardless, tornadoes are an extreme hazardous weather event that, in addition to impacting wildlife habitat, can disrupt installation operations, cause economic or infrastructure loss, and injure installation personnel. Tornadoes can threaten mission activities, with some military installations cancelling training or closing the installation for a period of time from tornado impacts (Na-Yemeh et al. 2024).

Tropical cyclone events frequently impact Alabama, including further in-land areas such as MAFB, with a hurricane making landfall once every six years on average (Runkle et al. 2022). Hurricane Helene and Francine impacted Alabama during a three-week period in September 2024, resulting in over $80 billion in damages (NCEI 2025). Hurricanes pose a great threat to military installations through impacts on natural resources, flooding, personnel safety, infrastructure damage, and operations pauses. For example, Tyndall AFB suffered extreme damage by Hurricane Michael in 2018, resulting in over $5 billion in damages and installation operations are still recovering (McNair 2023).

State-wide destructive flooding is an infrequent natural hazard but regional flooding may occur more frequently (NCEI 2025). Riverine flooding along the Alabama River has impacted installation infrastructure, operations, and natural resources in the past (City of Montgomery 2017). This flooding is most likely to occur in tandem with other natural hazards including severe thunderstorms and tropical cyclone events. The installation property along the Alabama River could be eroded, destroyed, or otherwise impacted by riverine flooding. This may result in the destruction of habitat for both the protected alligator snapping turtle and wood stork, as well as habitat for other wildlife. In turn, habitat reductions, especially for T&E species, could lead to changes in regulatory requirements on base.

Extreme heat events can also impact installation resilience and mission readiness. The period of 2016 to 2020 was the warmest 5-year interval that has been observed historically for this region. High temperatures are associated with high cooling costs at facilities and heat-related wear on equipment and infrastructure. Higher than normal temperatures also exacerbate heat-related illness and make it more difficult for personnel to work outdoors, further hindering readiness and efficacy of planned projects. Warmer temperatures, especially during spring and fall, may create favorable conditions for invasive species, which often take advantage of longer growing seasons. Warmer overall temperatures will also create increased opportunities for various pest insects such as mosquitos and ticks due to expansion of the annual period of insect breeding viability, potentially posing health risks for both wildlife and personnel through the increased prevalence and variety of insect-borne diseases found at the installation. Long periods of high temperatures also pose indirect threats to fish and wildlife, such as shifts in the temporal availability of food resources for migratory birds, loss of habitat due to changes in vegetation, and increased nonnative invasive species populations

Heat waves also increase drought potential, even in years with above-average rainfall. Drought can negatively impact military installations in numerous ways. Effects from drought include heightened physiological stress in plants and animals, leading to increased susceptibility to pests and pathogens and increased risk of vegetation mortality and die-off events. Alabama has experienced several significant droughts since 2000 with the most recent occurring in in 2023. The frequency of droughts has remained steady over the past century and are impactful to the region (NIDIS 2025). Drought is likely to be most impactful to MAFB through threats to protected species on the installation. For example, droughts have negatively impacted bats through decreased water availability, reduced prey, and reduced reproductive success, which could impact the tri-colored bat (Cappelli et al. 2021). Two other protected species on the installation, the alligator snapping turtle and wood stork, inhabit water or wetland habitats that would be significantly impacted by drought.

Preparing for and mitigating natural hazards will require the installation to assess current operations and procedures to identify vulnerabilities to weather events and their secondary effects. Once these vulnerabilities are identified, natural hazard considerations will need to be integrated across all organizational levels to manage associated risks. Natural hazard mitigation will also require collaboration with internal and external stakeholders to ensure that the installation’s mission is not compromised (DoD 2021).

7.17 Geographic Information Systems (GIS)

Installation Supplement

Applicability Statement

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

Program Overview/Current Management Practices

Geographic Information Systems (GIS) is a useful management tool that facilitates creating, storing, analyzing, and managing spatial data and associated attributes. GIS allows managers to examine ecosystem components by representing each component as a layer in a spatial format. Layers may be viewed individually for continuity or uniqueness, or several layers can be viewed simultaneously to identify relationships.

Data management support through the use of GIS is critical to the success of this INRMP. Spatial data collected on T&E species, plants, cultural resources, roads, culverts, and other elements of the natural resource program are used to create maps that help facilitate planning activities that have the potential to impact management programs. GIS is a vital tool for assisting land managers with making decisions and monitoring results of management and mission activities, plays a critical role in planning actions for current and future years, and maps out useful information for everyday work plans. GIS layers can be used to depict important management areas of concern and potential conflicts with proposed military actions and can assist the NRM in conflict resolution and mission enhancement and sustainment.

The 42 CES/CEIE collects and maintains GIS data specific to program needs and responsibilities. This information is shared as needed with installation personnel to support the decision process and allow for no net loss of military missions.

Natural resources data from MAFB and its associated properties are developed and maintained by the AFCEC Installation Support System Environmental GIS Support Analyst and stored both locally and on the base network. All data are maintained and displayed using ArcGIS. This software package allows the MAFB NRM to create theme-related shape files, digitize maps, store data, and compile reports or analyses for natural resources management. Several existing key natural resources layers include:

- Delineated Floodplain and Wetland Areas
- Waterbodies
- Land Cover
- Invasive Species
- T&E Habitat Locations
- T&E Sightings
- Recreation Areas

In addition, MAFB should not only maintain a natural resources management database in GIS, but also track progress toward goals. To accomplish this, MAFB should continue to consult with AFCEC for information on the appropriate format and software to be used. Maps should be prepared at a scale that is practical for the size of the installation and should be reviewed regularly. GIS maps should be compatible with base comprehensive planning maps. GIS and other relevant information on species and habitat should be shared with the State Natural Heritage database, The Nature Conservancy's local office, and the USFWS. Finally, MAFB should ensure that at least 3 or 4 people are trained in the use of GIS receivers and field

computers. Table 7-1 provides a summary of natural resource GIS data currently available for MAFB properties.

Table 7-1. Summary of natural resource Geographic Information System (GIS) data available for Maxwell Air Force Base

GIS Data	Source	Year Updated
Riparian Areas	Maxwell Air Force Base (MAFB)	2005
Watersheds	U.S. Army Corps of Engineers	2016
Land Cover	Center for Environmental Management of Military Lands (CEMML)	2024
Soils	Natural Resources Conservation Service (U.S. Department of Agriculture)	2002*
Nature Trails	CEMML	2016
Fire Area (natural)	MAFB and CEMML	2016
Wildland/Urban Interface	Southern Group of State Foresters	2017
Bird & Bat Survey Stations	MAFB and CEMML	2017
Fishing	MAFB and CEMML	2016
Forest Stand	MAFB and CEMML	2005
Noxious & Invasive Species	MAFB and CEMML	2023
Wood stork Locations	U.S. Fish and Wildlife Service	2017
Aerial Imagery	Multiple Sources	—

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. In cases where off-installation land uses may jeopardize DAF missions, this section may list specific goals and objectives aimed at eliminating, reducing, or mitigating the effects of encroachment on military missions. These natural resources management goals for the future have been formulated by the preparers of the INRMP from an assessment of the natural resources, current condition of those resources, mission requirements, and management issues previously identified. Below are the integrated goals for the entire natural resources program.

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

Installation Supplement—Management Goals and Objectives

GOAL 1 MAINTAIN A NATURAL RESOURCE MANAGEMENT PROGRAM THAT SUPPORTS THE 42D AIR BASE WING (42 ABW) MISSION WHILE COMPLYING WITH LAWS, REGULATIONS, AND POLICIES.

Objective 1.1 Maintain Natural Resources Program and staff to support all projects.

Project 1.1.1 Prepare budget necessary to implement natural resources management plans, per Department of the Air Force Manual (DAFMAN) 32-7003, Sections 3.64 and 3.65.

Project 1.1.2 Maintain and improve Geographic Information System (GIS) data and access to these data by Maxwell Air Force Base (MAFB) personnel in accordance with (IAW) Air Force Instruction (AFI) 32-10112.

Project 1.1.3 Ensure all staff complete required training courses, following the guidelines of DAFMAN 32-7003, Section 3.76.

Objective 1.2 Maintain a Sikes Act-compliant Integrated Natural Resources Management Plan (INRMP) in cooperation with the U.S. Fish and Wildlife Service (USFWS) and the Alabama Department of Conservation and Natural Resources (ADCNR).

Project 1.2.1 Per the Sikes Act and DAFMAN 32-7003, Sections 3.7 and 3.8, conduct required INRMP annual reviews with cooperative agencies.

Project 1.2.2 Per DAFMAN 32-7003, Sections 3.5.2., 3.7, and 3.8, oversee INRMP updates based on annual reviews, in consultation with operative agencies.

Objective 1.3 Support the 42 ABW Safety Office (42 ABW/SE) Bird/Wildlife Strike Hazard (BASH) Plan, per DAFMAN 32-7003, Section 3.62.

Project 1.3.1 Maintain landscapes to support BASH risk reduction IAW Department of Air Force Instruction (DAFI) 91-202 and DAFMAN 32-7003, Section 3.63.

Project 1.3.2 Eliminate wildlife attractants and other strategies to mitigate wildlife IAW DAFMAN 32-7003, Section 3.63.

Project 1.3.3 Review proposed base activities and requests to ensure that they do not conflict with BASH risk reduction goals.

Project 1.3.4 Assist with U.S. Department of Agriculture (USDA) removal of Canada Geese as needed.

Project 1.3.5 Survey deer populations annually with support from the USDA.

Project 1.3.6 Maintain federal migratory bird depredation permit IAW the Migratory Bird Treaty Act (MBTA, Code of Federal Regulations 21.6) and DAFMAN 32-7003, Section 3.63.2.2.1.

Project 1.3.7 Maintain Alabama State wildlife permits for BASH concerns and nuisance wildlife.

Objective 1.4 Continue to cooperate with other agencies and local landowners on regional land and natural resources management efforts.

Project 1.4.1 Maintain correspondence with USFWS and State of Alabama regarding updates to federal and state lists of threatened and endangered (T&E) species and species of concern, per DAFMAN 32-7003, Section 3.39.

Project 1.4.2 Maintain appropriate state and federal permits to enable necessary wildlife control.

GOAL 2 MANAGE WATER RESOURCES WITH NO NET LOSS OF ACREAGE, FUNCTIONS, AND VALUES.

Objective 2.1 Protect water quality by minimizing sediment loss and erosion.

Project 2.1.1 Identify and monitor sites at MAFB that are prone to erosion, focusing on areas upstream of major waterbodies, where erosion could contribute to sediment and nutrient loading.

Project 2.1.2 Based on the findings from Project 2.1.1, prioritize and implement measures to reduce erosion, encourage infiltration, and reduce nutrient runoff into major waterbodies, IAW the Clean Water Act (CWA), Section 319.

Project 2.1.3 Minimize nonpoint source pollution through implementation of Best Management Practices, following existing spill prevention and hazardous materials management protocols IAW the CWA, Section 402.

Project 2.1.4 Identify potentially erosive shorelines at Lake Martin Recreation area and collaborate with the U.S. Army Corps of Engineers (USACE) to minimize erosion and sediment loss at those locations.

Project 2.1.5 Develop a comprehensive operation and management plan for improving and maintaining highly erodible and degraded roads and trails at Vigilant Warrior Training Site.

Project 2.1.6 Implement the plan described in Project 2.1.5 by performing annual trail maintenance at the Vigilant Warrior Training Site.

Objective 2.2 Comply with all laws and regulations pertaining to wetlands, streams, floodplains, and regulated waterbodies by maintaining or enhancing riparian management zones around water resources.

Project 2.2.1 Coordinate with USACE and Alabama Department of Environmental Management to continue to review ongoing and proposed activities that are likely to impact wetlands or other water resources, identifying mitigation options IAW DAFMAN 32-7003, Section 3.18.1.

Project 2.2.2 Per DAFMAN 32-7003, Section 3.17, update wetland and other water resources mapping and delineations as needed.

Project 2.2.3 Replant native vegetation in disturbed riparian areas to reduce runoff and siltation and to enhance resilience to flood impacts.

Objective 2.3 Avoid destruction, loss, or degradation of wetlands and reduce the risk of floodplain loss.

Project 2.3.1 To the maximum extent possible, prohibit dredging, filling, and development in wetlands IAW DAFMAN 32-7003, Sections 3.18.2 and 3.20.7.

Project 2.3.2 Per DAFMAN 32-7003, Sections 3.20 and 3.23.1, ensure compliance with the Environmental Impact Analysis Process and National Environmental Policy Act requirements to evaluate potential impacts on floodplains.

GOAL 3 MANAGE VEGETATION TO PROMOTE A DIVERSITY OF NATIVE SPECIES USING COST-EFFECTIVE AND SUSTAINABLE METHODS.

Objective 3.1 Maintain forested areas to retain ecological integrity while ensuring that management does not negatively impact nesting migratory birds, bats, or the military mission.

Project 3.1.1 Survey for pine beetle-impacted trees at Vigilant Warrior on an annual basis and document trees posing a hazard to training, per DAFMAN 32-7003, Section 3.48.1.

Project 3.1.2 Conduct annual removal of pine trees that pose a training hazard on the Vigilant Warrior Training Site.

Project 3.1.3 Contact the USDA Forest Service state and/or federal office to perform biological evaluations and endorsements for hazard trees at Vigilant Warrior to receive potential funding for removal and management, per Public Law 95-313, *Cooperative Forestry Assistance Act of 1978*, and Title 16 U.S. Code (USC) § 2104.

Project 3.1.4 Per DAFMAN 32-7003, Section 3.58.3, develop an Urban Forestry Management Plan, including an initial survey and database of urban tree data, management plan and program, and associated budget for annual tree maintenance, removal, and replacement needs.

Project 3.1.5 Provide consultations and guidelines on projects that will impact base trees and update urban tree database as changes are made.

Project 3.1.6 Conduct feasibility study for reforestation of pine tracts on closed golf courses, per DAFMAN 32-7003, Section 3.44.4.

Objective 3.2 Manage airfield environments so that trees and other vegetation do not violate airfield clearance specified in Uniform Facilities Criteria 3-260-01.

Project 3.2.1 Remove any trees penetrating the Airspace Imaginary Surfaces at MAFB and base defense zone IAW DAFMAN 32-7003, Section 3.6

Objective 3.3 Monitor and manage invasive species through early detection and eradication or sustained management to remove or reduce invasive species IAW Executive Orders (EOs) 13112 and 13751.

Project 3.3.1 Annually survey and map invasive plant species, monitor for new invasive species, and document increases in populations of existing invasive species, per compliance with DAFMAN 32-7003, Section 3.61.1.

Project 3.3.2 Implement annual management of newly identified and priority invasive plant species and conduct post-management monitoring to determine if additional management is required.

Project 3.3.3 Annually implement and review the Integrated Pest Management Plan.

Project 3.3.4 Monitor areas that were previously managed for Chinese tallow and implement additional management to control remaining infestations.

Project 3.3.5 The MAFB Civil Engineering Pest Shop should coordinate with the USACE to obtain alligatorweed flea beetles and release them at base lakes that have alligatorweed.

Project 3.3.6 Conduct annual invasive plant species management to maintain pond margins, lake shores, and Alabama riverbanks.

Project 3.3.7 Annually implement Invasive Species Management Plan and update it every 5 years.

Project 3.3.8 Review any invasive species-related plans and projects to ensure they follow pollinator protections described in the U.S. Air Force Pollinator Conservation Reference Guide, Section 3.

GOAL 4 PROVIDE AND MAINTAIN OUTDOOR RECREATION OPPORTUNITIES AND EDUCATIONAL INITIATIVES IN CONJUNCTION WITH THE 42 ABW FORCE SUPPORT SQUADRON (42 ABW/FSS) TO HIGHLIGHT NATURAL RESOURCES ON MAFB IAW THE SIKES ACT, 16 USC 670A(A)(3)(A).

Objective 4.1 Enhance opportunities for outdoor exercise IAW DAFMAN 32-7003, Section 3.32.

Project 4.1.1 Convert the existing River Golf Course paths to recreational jogging paths.

Objective 4.2 Create educational opportunities to increase awareness of natural resources and recreational opportunities on MAFB.

Project 4.2.1 Conduct kindergarten through eighth grade education and outreach programs to highlight natural resources and their management on MAFB, IAW DAFMAN 32-7003, Section 3.70.3.

Project 4.2.2 Develop outreach materials and interpretive signage that highlight recreational opportunities on MAFB, including fishing opportunities and 42 ABW/FSS equipment checkout.

Project 4.2.3 Continue internal environmental awareness activities to minimize impacts to natural resources by MAFB personnel and visitors.

Objective 4.3 Improve recreational fisheries at MAFB, IAW DAFMAN 32-7003, Section 3.32.

Project 4.3.1 Manage vegetation to maintain properly balanced aquatic ecosystems.

Project 4.3.2 Use herbicidal, biological, and/or mechanical treatments to control the spread of aquatic weeds in the base lakes annually.

Project 4.3.3 Install artificial structures to attract fish and provide cover for forage species.

Project 4.3.4 Fertilize western recreational lakes to increase lake productivity, as funding from recreational fishing program allows.

Project 4.3.5 Install signage at recreational waterbodies on MAFB, which detail actions that users should take to prevent the spread of aquatic invasive species.

GOAL 5 SUPPORT BIODIVERSITY CONSERVATION IAW DoD INSTRUCTION (DoDI) 4715.03 AND THE 42 ABW MISSION BY MANAGING FOR POPULATIONS OF FISH AND WILDLIFE, INCLUDING T&E AND NUISANCE SPECIES.

Objective 5.1 Monitor and manage for populations of T&E bat species, including state species of concern IAW the Endangered Species Act (ESA).

Project 5.1.1 Conduct acoustic surveys for bats every 5 years IAW DAFMAN 32-7003, Section 3.39, following the NABat protocol or in consultation with the USFWS and/or ADCNR; enter survey results into NABat database.

Project 5.1.2 Conduct mist-net surveys as needed to identify T&E bats to species and to determine breeding status, in consultation with USFWS and/or ADCNR.

Project 5.1.3 If roosting areas or maternity colonies are identified during surveys, protect and maintain habitats in consultation with USFWS and/or ADCNR.

Objective 5.2 Monitor and manage for populations of T&E bird species, including state species of concern, IAW the ESA, MBTA, and EO 13186.

Project 5.2.1 Conduct summer and winter bird surveys every 5 years for all species IAW DAFMAN 32-7003, Section 3.39, to determine species' population sizes and habitat use and to provide occurrence information for special-status species. Upload survey results into the Avian Knowledge Network.

Project 5.2.2 Conduct wood stork surveys annually to determine potential presence and foraging areas. If occurrences become more frequent, consult with USFWS and/or ADCNR for any needed management actions.

Project 5.2.3 Evaluate installation activities for potential impacts to potential wood stork foraging habitats and implement needed protections in consultation with the USFWS and/or ADCNR.

Project 5.2.4 Support populations of forest-dependent special-status bird species by avoiding tree removal during nesting periods.

Project 5.2.5 Review all demolition/construction projects and military activities for potential impacts to special-status species by following guidelines and obtaining appropriate permits, as required.

Project 5.2.6 Trap and remove feral cats as they are observed or reported, per DAFMAN 32-7003, Section 3.61.3.

Project 5.2.7 Follow DoD Partners in Flight guidance to measure and reduce artificial light at night.

Objective 5.3 Monitor and manage for populations of T&E amphibian and reptile species, including state species of concern, IAW the ESA.

Project 5.3.1 Conduct a basewide inventory of amphibians and reptiles every 5 years for all species IAW DAFMAN 32-7003, Section 3.39, to determine species' population sizes and habitat use and to provide occurrence information for special-status species. Ensure survey methods and results are documented. Report survey findings to DoD Partners in Amphibian and Reptile Conservation.

Project 5.3.2 Conduct surveys for alligator snapping turtle at potential habitats in cooperation with USFWS as needed.

Project 5.3.3 If any amphibian and reptile special-status species are found, determine appropriate management actions in consultation with the USFWS and/or ADCNR.

Objective 5.4 Monitor and manage for populations of T&E fish and mollusk species, including state species of concern, IAW the ESA.

Project 5.4.1 Conduct a basewide inventory of fish and mollusk species every 5 years IAW DAFMAN 32-7003, Section 3.39, to determine species' population sizes and habitat use and to provide occurrence information for special-status species. Ensure survey methods and results are documented.

Project 5.4.2 If any fish and mollusk special-status species are found, determine appropriate management actions in consultation with the USFWS and/or ADCNR.

Objective 5.5 Convert improved or semi-improved areas and enhance pollinator habitats away from the airfield to comply with the ESA, MBTA, National Strategy to Promote the Health of Honey Bees and Other Pollinators, and DAFMAN 32-7003, Section 3.63.

Project 5.5.1 Increase habitat for the monarch butterfly, a candidate species for ESA listing, by supplementing natural areas at the Senior Officer Quarters and closed lower golf course with native milkweed species.

Project 5.5.2 Work with the Pollinator Partnership to establish an annual survey protocol for monarch butterflies.

Project 5.5.3 Annually implement the monarch butterfly survey.

Project 5.5.4 Work with the Pollinator Partnership to develop pollinator habitat on the closed lower golf course that improves resilience to flooding while supporting diverse pollinators, including the monarch butterfly and Mitchell's satyr (a special-status species).

Project 5.5.5 Work with the Pollinator Partnership to develop and implement pollinator habitat for the Senior Officer Quarters that improve awareness while supporting diverse pollinators, including the monarch butterfly and Mitchell's satyr.

Project 5.5.6 As directed in the 2014 "Department of Defense Policy to Use Pollinator-Friendly Management Prescriptions", review grounds maintenance guidelines to ensure they follow pollinator protections described in the U.S. Air Force Pollinator Conservation Reference Guide, Section 2B.

9.0 INRMP IMPLEMENTATION, UPDATE, AND REVISION PROCESS

9.1 Natural Resources Management Staffing and Implementation

The Natural Resources Program at MAFB properties is administered by the Natural Resource Management team. Responsibilities of this team in regard to implementation of this INRMP include:

- Providing oversight and coordination with other agencies
- Using professionally-trained natural resources management personnel with a degree in the natural sciences to develop and implement the INRMP
- Developing and implementing programs to ensure the inventory, delineation, classification, and management of all applicable natural resources, including forests, wetlands, listed species, sensitive or unique habitats, and other natural resource areas of special interest
- Providing for the training of natural resources personnel, including the Civil Engineer Corps Officers School Natural Resources Compliance course
- Maintaining natural resources management records
- Reviewing environmental documents (e.g., environmental impact assessments, remedial action plans) and construction designs and proposals to ensure adequate consideration of natural resources, while ensuring that the technical guidance presented in this INRMP is adequately considered
- Evaluating impacts of military missions and providing guidance to military personnel regarding natural resources
- Coordinating with the cultural resources program and Section 106 compliance
- Coordinating with local, state, and federal governmental and civilian conservation organizations relative to the MAFB natural resources management program
- Implementing and executing DAFMAN 32-7003

Natural Resources Management responsibilities among MAFB organizations are outlined in Section 4.0. Implementation of this INRMP also involves the combined efforts of agencies outside of the 42 ABW, including the U.S. Forest Service (forest inventory and management recommendations), USACE (wetland delineation), and USFWS (cooperating agency, INRMP signatory agency). At the state level, the ADCNR assists in development and implementation of the INRMP and is also a signatory agency for the INRMP. The Alabama Natural Heritage Program and The Nature Conservancy have conducted surveys and assessments of natural resources on MAFB.

MAFB has an NRM that has been appropriately trained through the Civil Engineer Corps Officers School Natural Resources Compliance course. Additional sources of temporary labor, hired with term limitations (i.e., AFCEC environmental support or interns), could be utilized to augment current staff. Outside agency reimbursable hires and Guardsman, Reservists, or Active-Duty DAF personnel assigned to MAFB on temporary duty are additional sources of supplemental labor. Implementation of a number of projects discussed in this INRMP will require active outside assistance. The outside assistance should comply with the Sikes Act and could come from state and federal agencies, private consortiums and organizations, universities, and contractors. Using these resources is the most efficient and cost-effective method for acquiring expertise on a temporary basis. Some parties will be reimbursed for their assistance, as agreed based on an MOU and contractual agreements, whereas others will supply their assistance IAW cooperative agreements. The INRMP Working Group should assess the level of additional resources necessary to fully implement this INRMP during the annual review process (Section 9.3) and determine the extent to which outside assistance will be required.

9.2 Monitoring INRMP Implementation

Monitoring of INRMP implementation is necessary to facilitate the legal requirements of the Sikes Act for review for operation and effect. These Sikes Act implementation criteria do not necessarily measure the effectiveness of an INRMP in accomplishing the mission while conserving natural resources. MAFB's INRMP implementation will be monitored for meeting the legal requirements of the Sikes Act as well as for other mission and biological measures of effectiveness.

The ultimate successful implementation of this INRMP is realized when there is no net loss in the capability of MAFB training lands to support the military mission while providing effective natural resources management. Project initiation is a measure that is used to monitor INRMP implementation, but it does not give the total picture of the effectiveness of the natural resources management program. Natural resources management is not the sum total of projects, interagency coordination, or program funding and staffing. Natural resources management at the MAFB is a program and a philosophy that guides the DAF's approach to land use. A significant portion of INRMP implementation is done through internal coordination in regard to training site operations and land use decision-making. This type of implementation cannot be measured by project implementation or funding levels. It is evidenced by such things as the ability to continually train, sustainable land use, ongoing regulatory compliance, retention of species diversity, retention of surface water quality, and the acknowledgement of sustainable natural resources management by partnering conservation agencies and other interested organizations and individuals.

In order to monitor and evaluate the effectiveness of the INRMP implementation, the following will be reviewed as applicable and discussed within the context of the annual review and/or a formal review of operation and effect:

- Impacts to/from the military mission
- Conservation program budget
- Staff requirements
- Program and project implementation
- Trends in species and habitat diversity as evidenced by recurring biological surveys, land use changes, and opinions of natural resource experts
- Compliance with regulatory requirements
- Feedback from military trainers, the USFWS, ADCNR, and others

Some of these areas may not be looked at every year due to lack of data or pertinent information. The effectiveness of the INRMP as a mission-enabling conservation tool will be decided by mutual agreement of the USFWS and the ADCNR during annual reviews and/or reviews for operation and effect.

9.2.1 DAF and DoD INRMP Implementation and Monitoring

The DAF uses the Defense Environmental Programs Annual Report to Congress (DEPARC) to monitor Sikes Act compliance. DEPARC is the automated system used to collect installation environmental information for reporting to DoD and Congress, including information on enforcement actions, inspections, and other performance measures for high-level reports and quarterly reviews. DEPARC also helps the DAF track fulfillment of DoD Measures of Merit requirements.

The Deputy under Secretary of Defense's Updated Guidance for Implementation of the Sikes Act updated Conservation Metrics for preparing and implementing INRMPs. Progress toward meeting these measures of merit is reported in the annual report to Congress. DEPARC reporting requirements currently include answers to these questions:

- Are the installation plans, programs, and budgets for actions that support INRMP goals and objectives?
- Was the INRMP "fully implemented" during the previous execution year?
- Were all funds allocated for INRMP implementation (Environmental Quality, Reimbursable, and other funds) executed for the intended purpose?
- Is there adequate participation/collaboration from USFWS during the Annual INRMP review and major revisions?
- Is there adequate participation/collaboration from the state fish and wildlife agency during the Annual INRMP Review and major revisions?
- Is the INRMP consistent with the goals of the State Wildlife Action Plan, Candidate Conservation Agreements, and other regional ecosystem management agreements for which DoD/DAF is signatory?
- Are communications with USFWS and state fish and wildlife agency documented?
- Does the installation have on-site DAF natural resources management staff employed in the GS-0400 Biological Sciences Job Series?
- Is there a sufficient number of natural resources staff to adequately implement INRMP goals and objectives?
- Are the capabilities of the DAF natural resources team enhanced through use of volunteers, cooperative agreements with non-governmental organizations, on-site contractor support, or Interagency Agreements with other federal or state agencies?
- Does the installation have adequate conservation law enforcement capability through employment of a credentialed conservation law enforcement officer or through interagency agreement with another agency?
- Is there adequate participation/collaboration from the Operations Group, Range and Airspace managers, Community Planners, Tenant Organizations, and other organizations in INRMP updates and revisions to ensure that mission needs are addressed?
- Does the INRMP support unrestricted use of the installation?
- Has there been a net loss of operations area, airspace, or training lands? Is there a deficiency in capacity, size, or arrangement of the installation natural infrastructure to support the current mission and foreseeable future needs?
- Name the federally listed species present on the installation.
- List the state-protected species present on the installation.
- Have surveys for the presence of potentially-occurring, federally listed species, or suitable habitat within the historic range of a listed species been conducted on the installation?
- Does the INRMP adequately address potentially occurring listed species and/or potentially suitable habitat within the historic range of a listed species?
- Have listed species locations or potentially suitable habitats within the historic range of a listed species been mapped and included as part of the Environmental Functional Data Set and Geodatabase?
- Does the INRMP provide adequate conservation measures for identified listed species and their habitat, as mutually agreed upon by USFWS and the state fish and wildlife agency during the INRMP Annual Review or major revision coordination?
- Has critical habitat for listed species been designated on the installation?
- Have all major ecosystems (i.e., vegetative communities/habitats) been surveyed and mapped on the installation?

- Does the INRMP address the desired future condition for ecosystems, habitats, and communities to sustain current and future mission activities and achieve natural resources management goals and objectives?
- Are native habitat restoration projects to support INRMP goals and objectives being planned, programmed, budgeted, and executed?
- Does the INRMP provide for adequate control of invasive and exotic species?
- Does the INRMP address the availability of outdoor recreational opportunities (e.g., hunting, fishing, and other dispersed outdoor recreation) on the installation?
- Does the INRMP address the availability of outdoor recreation opportunities for the public and establish access and usage categories for installation areas IAW mission and security requirements (i.e., Open, Restricted, Off-Limits)?
- For each outdoor recreation access category (Open, Restricted, Off-Limits), does the INRMP address and justify allowable access to those areas by category of participant (e.g., Active-duty military, military dependents, DoD civilians, military retirees, DoD Defense contractors, general public)?
- Does the INRMP address program management for hunting, fishing, and other outdoor recreation, and the role of the installation NRM?

9.2.2 Priorities and Scheduling

The Office of Management and Budget considers funding for the preparation and implementation of this INRMP, as required by the Sikes Act, to be a high priority. However, the reality is that not all of the projects and programs identified in this INRMP will receive immediate funding. Therefore, projects need to be funded consistently, with timely execution to meet future deadlines. Projects are generally prioritized with respect to compliance. Highest-priority projects are projects related to recurring or current compliance, and these are generally scheduled earliest. As such, these projects have been placed into the following priority-based categories:

- Level 0 is a natural resource requirement for maintaining compliance (Operations and Services) or for successful natural resources management.
- A Level 1 natural resource requirement is a non-recurring action needed to correct a non-conformance or out-of-compliance condition with a supported driver in the programmed year.
- A Level 2 natural resource requirement is a non-recurring natural resources requirement for activities and projects programmed in a fiscal year for which compliance is mandatory and necessary to prevent non-compliance beyond the program year.
- Level 3 natural resources requirements are activities and projects that are not explicitly required by an applicable legal driver but needed to enhance the environment beyond statutory compliance to achieve overall INRMP goals and objectives.

The prioritization of the projects is based on need, legal drivers, and ability to further implementation of the INRMP.

Recurring requirements include projects and activities needed to cover the recurring administrative, personnel, and other costs that are necessary to meet applicable compliance requirements (federal and state laws, regulations, Presidential EOs, and DoD policies) or which are in direct support of the military mission. Recurring costs include manpower, training, supplies, hazardous waste disposal, operating recycling activities, permits and fees, testing, monitoring and/or sampling and analysis, reporting and record keeping, maintenance of environmental conservation equipment, and compliance self-assessments.

Current compliance includes projects and activities that are needed because an installation is currently or will be out of compliance if projects or activities are not implemented in the current program year. Examples include:

- Environmental analyses, monitoring, and studies required to assess and mitigate potential effects of the military mission on conservation resources
- Planning documents
- Baseline inventories and surveys of natural and cultural resources (historical and archaeological sites)
- Biological Assessments, surveys, or habitat protection for a specific listed species
- Mitigation to meet existing regulatory permit conditions or written agreements
- Wetland delineations in support of subsequent jurisdictional determinations and consequent permitting
- Efforts to achieve compliance with requirements that have deadlines that have already passed
- Initial documenting and cataloging of archaeological materials

Maintenance requirements include needed projects and activities that are not currently out of compliance but shall be out of compliance if projects or activities are not implemented in time to meet an established deadline beyond the current program year. Examples include:

- Compliance with future requirements that have deadlines
- Compliant conservation and GIS mapping
- Efforts undertaken IAW non-deadline specific compliance requirements of leadership initiatives
- Wetlands enhancement, in order to achieve enhancement or no net loss of existing degraded wetlands
- Public education programs on the importance of protecting natural resources

Lower-priority projects include those that enhance conservation resources of the installation mission or are needed to address overall environmental goals and objectives but are not specifically required under regulation or EO and are not of an immediate nature. These projects are generally funded after those of higher priority are funded. Examples include:

- Community outreach activities, such as Earth Day and Historic Preservation Week activities
- Educational and public awareness projects, such as interpretive displays, oral histories, nature trails, wildlife checklists, and conservation teaching materials
- Biological assessments, surveys, or habitat protection for a non-listed species
- Restoration or enhancement of cultural or natural resources when no specific compliance requirement dictates a course or timing of action
- Management and execution of volunteer and partnership programs

9.2.3 Funding

Implementation of this INRMP is subject to the availability of annual funding. Funding sources for specific projects can be grouped into 3 main categories by source: federal DAF funds, other federal funds, and non-federal funds. When projects identified in the Plan are not implemented due to lack of funding or other compelling circumstances, the installation will review the goals and objectives of this INRMP to determine whether adjustments are necessary. The following discussion of funding options is not all-inclusive of funding sources. Many funding sources rely on a variety of grant programs, so award criteria and amounts

can change considerably from one year to another. Funding through grant programs can occur as a one-time award, annually, or across multiple years.

The AFCEC/CR Environmental Quality fund is the primary source of funding to support the management of natural resources at MAFB. This budget is managed by AFCEC/TDNC and AFCEC/CZOW. AFCEC/CR Environmental Quality provides funding for natural resource surveys, environmental monitoring projects, and compliance-related projects. The Legacy Resource Management Program provides financial assistance to DoD efforts to conserve natural and cultural resources on federal lands. Legacy projects could include regional ecosystem management initiatives, habitat preservation efforts, archeological investigations, invasive species control, and/or flora or fauna surveys. Project proposals are submitted to the Legacy program (https://www.denix.osd.mil/legacy/) during their annual funding cycle.

There are also grant and assistance programs administered by other federal agencies that could be accessed for natural resources management at MAFB. Examples include funds associated with the CWA and T&E species.

Other non-federal funding sources that could be considered include the Public Lands Day Program, which coordinates volunteers to improve the public lands they use for recreation, education, and enjoyment, and the National Environmental Education & Training Foundation, which manages, coordinates, and generates financial support for the program (https://www.neefusa.org/npld).

State and local agencies are also a great source of additional resources. The MAFB NRM may consider entering into cooperative or mutual aid agreements with states, local governments, non-governmental organizations, and other individuals.

9.3 Annual INRMP Review and Update Requirements

The INRMP requires annual review, IAW DoDI 4715.03 and DAFMAN 32-7003, to ensure the achievement of mission goals, verify the implementation of projects, and establish any necessary new management requirements. If the installation mission or any of its natural resources management issues change significantly after the creation of the original INRMP, a major revision to the INRMP is required. The need to accomplish a major revision is normally determined during the annual review with USFWS, the appropriate state agency, and NOAA (if required). The NRM documents the findings of the annual review in an Annual INRMP Review Summary and provides copies to the USFWS and the ADCNR. If any agency declines to participate in an on-site annual review, the NRM submits the INRMP for review along with the Annual INRMP Review Summary document to the agency via official correspondence and requests return correspondence with comments/concurrence.

In lieu of conducting the more formal 5-year review and update, annual INRMP review meetings among the NRM, USFWS, and ADCNR may be conducted. This meeting takes place in person with representatives from each agency. Individuals may telephone or video call if they cannot attend in person. During this meeting, the NRM updates the external stakeholders with the end-of-the-year execution report and coordinates future work plans and any necessary changes to management methods, etc. All parties review the INRMP and begin preliminary collaborative work on updating the INRMP (new policies, procedures, impacts, mitigations, etc.) as applicable.

At this annual meeting, the need for updates or revisions will be discussed. If updates are needed, the NRM will initiate the updates and, after the agreement of all 3 parties, they will be added to the INRMP. If it is determined that major changes are needed, all 3 parties will provide input and an INRMP revision will be initiated, with NRM acting as the lead coordinator. Once INRMP updates/revisions are completed, the

NRM, USFWS and ADCNR sign the annual review. Signature by the installation commander (or designee) is also required by this method of annual review to avoid the need to perform the 5-year update process.

If the formal annual review meetings and signature process is not used, a determination during the fourth-year annual review will be jointly made to continue implementation of the existing INRMP with updates or to proceed with a revision. If the parties feel that the annual reviews have not been sufficient to evaluate operation and effect and they cannot determine if the INRMP implementation should continue or be revised, a formal review for operation and effect will be initiated. The determination on how to proceed with INRMP implementation or revision will be made after the parties have had time to complete this review.

As part of the annual review, the MAFB NRM will specifically:

- Invite feedback from USFWS and ADCNR on the effectiveness of the INRMP
- Inform USFWS and ADCNR which INRMP projects and activities are required to meet current natural resources compliance needs
- Document specific INRMP action accomplishments from the previous year

Information for the annual reviews comes from the MAFB environmental staff, the NRM, cooperating agencies, and project files as applicable. Natural resources data, and program and project information are available to cooperating agencies.

9.3.1 Review for Operation and Effect

Not less than every 5 years, the INRMP will be reviewed for operation and effect to determine if the INRMP is being implemented as required by the Sikes Act and contributing to the management of natural resources at MAFB. The 5-year review is required if the formal annual review process detailed above is not implemented. Unless delegated, the 3 cooperating parties will conduct the review, represented by the Commander responsible for the INRMP, the Regional Director of the USFWS, and the Director of the ADCNR. While these are the responsible parties, technical representatives generally are the personnel who actually conduct the review.

The review for operation and effect will either conclude that the INRMP is meeting the intent of the Sikes Act and needs only an update for implementation to continue or that it is not effective in meeting the intent of the Sikes Act and must be revised. The conclusion of the review will be documented in a jointly executed memorandum, meeting minutes, or another way that reflects mutual agreement.

If only updates are needed, they will be done in a manner agreed to by all parties. The updated INRMP will be reviewed by the local USFWS field office in Alabama and an ADCNR representative. Once concurrence letters or signatures are received from USFWS Regional Director and the ADCNR Director, the update of the INRMP will be complete and implementation will continue. Generally, the environmental impact analysis will continue to be applicable to updated INRMPs and a new analysis will not be required.

If a review of operation and effect concludes that an INRMP must be revised, there is no set time to complete the revision. The existing INRMP remains in effect until the revision is complete and USFWS and ADCNR concurrence on the revised INRMP is received. The NRM will endeavor to complete such revisions within 18 months, depending on funding availability. Revisions to the INRMP will go through a more detailed review process, similar to development of the initial INRMP, to ensure that MAFB military mission, USFWS, and ADCNR concerns are adequately addressed and that the INRMP meets the intent of the Sikes Act.

9.3.2 National Environmental Policy Act

The initial step in compliance with NEPA for any activity that might impact the environment is for the NRM to complete Air Force (AF) Form 813: *Request for Environmental Impact Analysis*. The form is prepared to aid in the development of the assessment, providing information on the proposed action and its alternatives, purpose, and potential environmental effects. This allows the proponent to identify potential environmental impacts early and facilitates a determination on whether an EA or Environmental Impact Statement might be required for a specific action. The EIAP is the process by which federal agencies facilitate compliance with environmental regulations. The primary legislation affecting these agencies' decision-making process is NEPA (42 USC § 4321 et seq.). The Air Force NEPA regulation is 32 CFR 989. NEPA requires that any organization using federal monies, proposing work on federal lands, or requiring a federal permit considers potential environmental consequences of proposed actions. The law's intent is to protect, restore, or enhance the environment through well-informed decisions.

The Council on Environmental Quality (CEQ) was established under NEPA for the purpose of implementing and overseeing federal policies as they relate to the NEPA process. The adoption of an INRMP can be considered a major federal action as defined by Section 1508.18 of the CEQ regulations. This requires an analysis of potential environmental impacts for the implementation of an INRMP, although a complete EA is not necessarily required, as individual actions and projects for an INRMP typically undergo their own separate NEPA analysis.

CEQ regulations require intergovernmental notifications prior to making any detailed statement of environmental impacts. Through the Interagency and Intergovernmental Coordination for Environmental Planning (IICEP) process, MAFB notifies relevant federal, state, and local agencies and allows them sufficient time to make known their environmental concerns specific to a Proposed Action. Comments and concerns submitted by these agencies during the IICEP process are subsequently incorporated into the analysis of potential environmental impacts. This coordination fulfills requirements under EO 12372, *Intergovernmental Review of Federal Programs*, and AFI 32-7060, *IICEP*. Furthermore, public participation in decision-making on new proposals is also required. Consideration of the views and information of all interested persons promotes open communication and enables better decision-making. Agencies, organizations, and members of the public with a potential interest in the Proposed Action, including minority, low-income, disadvantaged, and Native American groups, are urged to participate.

The EIAP for the implementation of MAFB's first INRMP in 2018 was conducted IAW the NEPA, *CEQ Regulations for Implementing the Procedural Provisions of the National Environmental Policy* (40 CFR § 1500-1508), and 32 CFR Part 989. The EIAP and decision-making process for the Proposed Action (implementation of that INRMP) involved an examination of all pertinent environmental issues. Impact evaluation of the 2018 MAFB INRMP determined that no significant environmental impacts would result from implementation of the Proposed Action or any identified alternative. This determination was based on thorough review and analysis of existing resource information, and coordination with knowledgeable, responsible personnel from the MAFB and other relevant local, state, and federal agencies. The EIAP for the implementation of the 2019 MAFB INRMP did not include an analysis of effects for individual actions or projects. Individual actions or projects that have the potential to impact the environment will be analyzed separately IAW the NEPA process. A new EIAP is not required for this INRMP update.

If a future action or project has the potential to impact the environment, the initial step in compliance with NEPA is to complete AF Form 813. Some sections are prepared by the proponent and other sections are prepared by the Environmental Management Office (42 CES/CEIE). If the action is not covered by a categorical exclusion, an EA is prepared to determine if there are potential significant impacts. If potential

significant impacts are identified, either while completing AF Form 813 or during the EA, then an Environmental Impact Statement is prepared. The majority of natural resources management actions in this INRMP are covered by categorical exclusions.

10.0 ANNUAL WORK PLANS

Installation Supplement

The INRMP Annual Work Plans are included in this section. These projects are listed by fiscal year, including the current year and 4 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 DAF framework. Priorities are defined as follows:

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

Table 10-1. Annual work plans (current year to 4 years out)

Resource Category	Goal	Objective	Occurrence	FY	Office of Primary Responsibility	Funding Source	Priority Level	PB28 Code *	Standard Title*	Project Number	Description
Administrative	1	1.1	Annual	All	42 CES/CEIE	N/A	HIGH	INRP	Interagency/Intraagency, Government, Sikes Act	1.1.1	Prepare budget necessary to implement natural resources management plans, per Department of the Air Force Manual (DAFMAN) 32-7003, Sections 3.64 and 3.65.
Administrative	1	1.1	Annual	All	42 CES/CEIE	N/A	HIGH	INRP	Interagency/Intraagency, Government, Sikes Act	1.1.2	Maintain and improve Geographic Information System (GIS) data and access to these data by Maxwell Air Force Base (MAFB) personnel in accordance with (IAW) Air Force Instruction (AFI) 32-10112.

Table 10-1. Annual work plans (current year to 4 years out)

Resource Category	Goal	Objective	Occurrence	FY	Office of Primary Responsibility	Funding Source	Priority Level	PB28 Code *	Standard Title*	Project Number	Description
Administrative	1	1.1	Annual	All	42 CES/CEIE	N/A	HIGH	INRP	Interagency/Intraagency, Government, Sikes Act; Recordkeeping, Other	1.1.3	Ensure all staff complete required training courses, following the guidelines of DAFMAN 32-7003, Section 3.76.
Administrative	1	1.2	Annual	All	42 CES/CEIE	N/A	HGH	INRP	Interagency/Intraagency, Government, Sikes Act	1.2.1	Per the Sikes Act and DAFMAN 32-7003, Sections 3.7 and 3.8, conduct required INRMP annual reviews with cooperative agencies.
Administrative	1	1.2	Annual	All	42 CES/CEIE	N/A	HIGH	INRP	Interagency/Intraagency, Government, Sikes Act	1.2.2	Per DAFMAN 32-7003, Sections 3.5.2., 3.7, and 3.8, oversee INRMP updates based on annual reviews, in consultation with operative agencies.

Table 10-1. Annual work plans (current year to 4 years out)

Resource Category	Goal	Objective	Occurrence	FY	Office of Primary Responsibility	Funding Source	Priority Level	PB28 Code *	Standard Title*	Project Number	Description
Forestry	1	1.3	Annual	All	42 ABW/SE	N/A	HIGH	INRP	Interagency/Intraagency, Government, Sikes Act; Mgt, Habitat	1.3.1	Maintain landscapes to support Bird/Wildlife Aircraft Strike Hazard (BASH) risk reduction IAW Department of Air Force Instruction (DAFI) 91-202 and DAFMAN 32-7003, Section 3.63.
Forestry	1	1.3	Annual	All	42 ABW/SE	N/A	HIGH	INRP	Mgt, Habitat	1.3.2	Eliminate wildlife attractants and other strategies to mitigate wildlife IAW DAFMAN 32-7003, Section 3.63.
Administrative	1	1.3	Annual	All	42 ABW/SE	N/A	HIGH	INRP	Interagency/Intraagency, Government, Sikes Act	1.3.3	Review proposed base activities and requests to ensure that they do not conflict with BASH risk reduction goals.

Table 10-1. Annual work plans (current year to 4 years out)

Resource Category	Goal	Objective	Occurrence	FY	Office of Primary Responsibility	Funding Source	Priority Level	PB28 Code *	Standard Title*	Project Number	Description
Wildlife	1	1.3	Annual	All	42 ABW/SE	N/A	MEDIUM	INRP	Mgt, Nuisance Wildlife	1.3.4	Assist with U.S. Department of Agriculture (USDA) removal of Canada Geese as needed.
REMOVED	----	---------	----------	----	----------	--------	---------	------	----------	--------	REMOVED
Wildlife	1	1.3	Annual	All	42 ABW/SE	N/A	HIGH	INRP	Mgt, Nuisance Wildlife	1.3.6	Maintain federal migratory bird depredation permit IAW the Migratory Bird Treaty Act (Code of Federal Regulations 21.6) and DAFMAN 32-7003, Section 3.6.
Wildlife	1	1.3	Annual	All	42 CES	N/A	HIGH	INRP	Mgt, Nuisance Wildelife	1.3.7	Maintain Alabama State wildlife permits for BASH concerns and nuisance wildlife.

Table 10-1. Annual work plans (current year to 4 years out)

Resource Category	Goal	Objective	Occurrence	FY	Office of Primary Responsibility	Funding Source	Priority Level	PB28 Code *	Standard Title*	Project Number	Description
Administrative	1	1.4	Annual	All	42 CES	N/A	HIGH	T&E	Interagency/Intraagency, Government, Sikes Act	1.4.1	Maintain correspondence with U.S. Fish and Wildlife Service (USFWS) and State of Alabama regarding updates to federal and state lists of threatened and endangered (T&E) species and species of concern, per DAFMAN 32-7003, Section 3.39.
Wildlife	1	1.4	Annual	All	42 CES	N/A	HIGH	INRP	Mgt, Nuisance Wildlife	1.4.2	Maintain appropriate state and federal permits to enable necessary wildlife control.

Table 10-1. Annual work plans (current year to 4 years out)

Resource Category	Goal	Objective	Occurrence	FY	Office of Primary Responsibility	Funding Source	Priority Level	PB28 Code *	Standard Title*	Project Number	Description
Habitat	2	2.1	Annual	All	42 CES/CEIE	N/A	MEDIUM	INRP	Mgt, Habitat	2.1.1	Identify and monitor sites at MAFB that are prone to erosion, focusing on areas upstream of major waterbodies, where erosion could contribute to sediment and nutrient loading.
Habitat	2	2.1	As needed	2027	42 CES/CEIE	N/A	MEDIUM	INRP	Mgt, Habitat	2.1.2	Based on the findings from Project 2.1.1, prioritize and implement measures to reduce erosion, encourage infiltration, and reduce nutrient runoff into major waterbodies, IAW the Clean Water Act (CWA), Section 319.

Table 10-1. Annual work plans (current year to 4 years out)

Resource Category	Goal	Objective	Occurrence	FY	Office of Primary Responsibility	Funding Source	Priority Level	PB28 Code *	Standard Title*	Project Number	Description
Habitat	2	2.1	Annual	All	42 CES/CEIE	N/A	MEDIUM	INRP	Mgt, Habitat	2.1.3	Minimize nonpoint source pollution through implementation of Best Management Practices, following existing spill prevention and hazardous materials management protocols IAW the CWA, Section 402.
Habitat	2	2.1	Annual	2026	42 CES/CEIE	N/A	LOW	INRP	Mgt, Habitat	2.1.4	Identify potentially erosive shorelines at Lake Martin Recreation area and collaborate with the U.S. Army Corps of Engineers (USACE) to minimize erosion and sediment loss at those locations.

Table 10-1. Annual work plans (current year to 4 years out)

Resource Category	Goal	Objective	Occurrence	FY	Office of Primary Responsibility	Funding Source	Priority Level	PB28 Code *	Standard Title*	Project Number	Description
Forestry	2	2.1	Once	2025	42 CES/CEIE	N/A	HIGH	INRP	Interagency/Intraagency, Government, Sikes Act; Mgt, Habitat	2.1.5	Develop a comprehensive operation and management plan for improving and maintaining highly erodible and degraded roads and trails at Vigilant Warrior Training Site.
Forestry	2	2.1	Once	2026	42 CES/CEIE	N/A	HIGH	INRP	Mgt, Habitat	2.1.6	Implement the plan described in Project 2.1.5 by performing annual trail maintenance at the Vigilant Warrior Training Site.

Table 10-1. Annual work plans (current year to 4 years out)

Resource Category	Goal	Objective	Occurrence	FY	Office of Primary Responsibility	Funding Source	Priority Level	PB28 Code *	Standard Title*	Project Number	Description
Wetlands	2	2.2	As Needed	All	42 CES/CEIE	N/A	HIGH	WTLD	Interagency/Intraagency, Government, Sikes Act;	2.2.1	Coordinate with USACE and Alabama Department of Environmental Management to continue to review ongoing and proposed activities that are likely to impact wetlands or other water resources, identifying mitigation options IAW DAFMAN 32-7003, Section 3.18.1.
Wetlands	2	2.2	As Needed	2027	42 CES/CEIE	N/A	MEDIUM	WTLD	Interagency/Intraagency, Government, Sikes Act; Monitor Wetlands	2.2.2	Per DAFMAN 32-7003, Section 3.17, update wetland and other water resources mapping and delineations as needed.

Table 10-1. Annual work plans (current year to 4 years out)

Resource Category	Goal	Objective	Occurrence	FY	Office of Primary Responsibility	Funding Source	Priority Level	PB28 Code *	Standard Title*	Project Number	Description
Habitat	2	2.2	As Needed	2028	42 CES/CEIE	42 CES/CEIE	LOW	INRP	Mgt, Habitat	2.2.3	Replant native vegetation in disturbed riparian areas to reduce runoff and siltation and to enhance resilience to flood impacts.
Wetlands	2	2.3	As Needed	All	42 CES/CEIE	N/A	HIGH	WTLD	Interagency/Intraagency, Government, Sikes Act	2.3.1	To the maximum extent possible, prohibit dredging, filling, and development in wetlands IAW DAFMAN 32-7003, Sections 3.18.2 and 3.20.7.

Table 10-1. Annual work plans (current year to 4 years out)

Resource Category	Goal	Objective	Occurrence	FY	Office of Primary Responsibility	Funding Source	Priority Level	PB28 Code *	Standard Title*	Project Number	Description
Administrative	2	2.3	As Needed	All	42 CES/CEIE	N/A	HIGH	INRP	Interagency/Intraagency, Government, Sikes Act	2.3.2	Per DAFMAN 32-7003, Sections 3.20 and 3.23.1, ensure compliance with the Environmental Impact Analysis Process and National Environmental Policy Act requirements to evaluate potential impacts on floodplains.
Forestry	3	3.1	Annual	All	42 CES/CEIE	N/A	Medium	INRP	Mgt, Habitat; Mgt, Nuisance Wildlife	3.1.1	Survey for pine beetle-impacted trees at Vigilant Warrior on an annual basis and document trees posing a hazard to training, per DAFMAN 32-7003, Section 3.48.1.

Table 10-1. Annual work plans (current year to 4 years out)

Resource Category	Goal	Objective	Occurrence	FY	Office of Primary Responsibility	Funding Source	Priority Level	PB28 Code *	Standard Title*	Project Number	Description
Forestry	3	3.1	Annual	All	42 CES/CEIE	42 CES/CEIE	Medium	INRP	Mgt, Habitat	3.1.2	Conduct annual removal of pine trees that pose a training hazard on the Vigilant Warrior Training Site.
Forestry	3	3.1	Bi-annual	All	42 CES/CEIE	N/A	MEDIUM	INRP	Interagency/Intraagency, Government, Sikes Act; Mgt, Habitat	3.1.3	Contact the USDA Forest Service state and/or federal office to perform biological evaluations and endorsements for hazard trees at Vigilant Warrior to receive potential funding for removal and management, per Public Law 95-313, *Cooperative Forestry Assistance Act of 1978*, and Title 16 U.S. Code (USC) § 2104.

Table 10-1. Annual work plans (current year to 4 years out)

Resource Category	Goal	Objective	Occurrence	FY	Office of Primary Responsibility	Funding Source	Priority Level	PB28 Code *	Standard Title*	Project Number	Description
Forestry	3	3.1	Annual	2026	42 CES/CEIE	42 CES/CEIE	HIGH	INRP	Mgt, Habitat	3.1.4	Per DAFMAN 32-7003, Section 3.58.3, develop an Urban Forestry Management Plan, including an initial survey and database of urban tree data, management plan and program, and associated budget for annual tree maintenance, removal, and replacement needs.
Froestry	3	3.1	Annual	All	42 CES/CEIE	N/A	HIGH	INRP	Interagency/Intraagency, Government, Sikes Act; Mgt, Habitat	3.1.5	Provide consultations and guidelines on projects that will impact base trees and update urban tree database as changes are made.

Table 10-1. Annual work plans (current year to 4 years out)

Resource Category	Goal	Objective	Occurrence	FY	Office of Primary Responsibility	Funding Source	Priority Level	PB28 Code *	Standard Title*	Project Number	Description
Forestry	3	3.1	Once	2027	42 CES/CEIE	AFCEC	MEDIUM	INRP	Interagency/Intraagency, Government, Sikes Act; Mgt, Habitat	3.1.6	Conduct feasibility study for reforestation of pine tracts on closed golf courses, per DAFMAN 32-7003, Section 3.44.4.
Forestry	3	3.2	Annual	All	42 CES/CEIE	42 CES	HIGH	INRP	Interagency/Intraagency, Government, Sikes Act; Mgt, Habitat	3.2.1	Remove any trees penetrating the Airspace Imaginary Surfaces at MAFB and base defense zone IAW DAFMAN 32-7003, Section 3.6

Table 10-1. Annual work plans (current year to 4 years out)

Resource Category	Goal	Objective	Occurrence	FY	Office of Primary Responsibility	Funding Source	Priority Level	PB28 Code *	Standard Title*	Project Number	Description
Habitat	3	3.3	Annual	All	42 CES/CEIE	N/A	HIGH	INRP	Mgt, Invasive Species	3.3.1	Annually survey and map invasive plant species, monitor for new invasive species, and document increases in populations of existing invasive species, per compliance with DAFMAN 32-7003, Section 3.61.1.
Habitat	3	3.3	Annual	All	42 CES/CEIE	N/A	HIGH	INRP	Interagency/Intraagency, Government, Sikes Act; Mgt, Invasive Species	3.3.2	Implement annual management of newly identified and priority invasive plant species and conduct post-management monitoring to determine if additional management is required.

Table 10-1. Annual work plans (current year to 4 years out)

Resource Category	Goal	Objective	Occurrence	FY	Office of Primary Responsibility	Funding Source	Priority Level	PB28 Code *	Standard Title*	Project Number	Description
Administrative	3	3.3	Annual	All	42 CES/CEIE	N/A	HIGH	INRP	Interagency/Intraagency, Government, Sikes Act; Mgt, Nuisance Wildlife	3.3.3	Annually implement and review the Integrated Pest Management Plan.
Habitat	3	3.3	Annual	All	42 CES/CEIE	AFCEC	HIGH	INRP	Mgt, Habitat	3.3.4	Monitor areas that were previously managed for Chinese tallow and implement additional management to control remaining infestations.
Habitat	3	3.3	Annual	All	42 CES/CEIE	N/A	MEDIUM	INRP	Interagency/Intraagency, Government, Sikes Act; Mgt, Habitat	3.3.5	The MAFB Civil Engineering Pest Shop should coordinate with the USACE to obtain alligatorweed flea beetles and release them at base lakes that have alligatorweed.

Table 10-1. Annual work plans (current year to 4 years out)

Resource Category	Goal	Objective	Occurrence	FY	Office of Primary Responsibility	Funding Source	Priority Level	PB28 Code *	Standard Title*	Project Number	Description
Habitat	3	3.3	Annual	All	42 CES/CEIE	42 CES/AFCEC	MEDIUM	INRP	Mgt, Invasive Species; Mgt, Habitat	3.3.6	Conduct annual invasive plant species management to maintain pond margins, lake shores, and Alabama riverbanks.
Species	3	3.3	Annual	28	42 CES/CEIE	N/A	HIGH	INRP	Mgt, Invasive Species	3.3.7	Annually implement Invasive Species Management Plan and update it every 5 years.
Species	3	3.3	Annual	All	42 CES/CEIE	N/A	MEDIUM	INRP	Interagency/Intraagency, Government, Sikes Act; Mgt, Invasive Species	3.3.8	Review any invasive species-related plans and projects to ensure they follow pollinator protections described in the U.S. Air Force Pollinator Conservation Reference Guide, Section 3.

Table 10-1. Annual work plans (current year to 4 years out)

Resource Category	Goal	Objective	Occurrence	FY	Office of Primary Responsibility	Funding Source	Priority Level	PB28 Code *	Standard Title*	Project Number	Description
Habitat	4	4.1	Once	2028	42 CES/CEIE	42 CES	LOW	INRP	Mgt, Habitat	4.1.1	Convert the existing River Golf Course paths to recreational jogging paths.
Outreach	4	4.2	Annual	All	42 CES/CEIE	N/A	MEDIUM	INRP	Interagency/Intraagency, Government, Sikes Act	4.2.1	Conduct kindergarten through eighth grade education and outreach programs to highlight natural resources and their management on MAFB, IAW DAFMAN 32-7003, Section 3.70.3.

Table 10-1. Annual work plans (current year to 4 years out)

Resource Category	Goal	Objective	Occurrence	FY	Office of Primary Responsibility	Funding Source	Priority Level	PB28 Code*	Standard Title*	Project Number	Description
Outreach	4	4.2	As Needed	2025	42 CES/CEIE	42 CES	MEDIUM	MNRA	Interagency/Intraagency, Government, Sikes Act; Outreach	4.2.2	Develop outreach materials and interpretive signage that highlight recreational opportunities on MAFB, including fishing opportunities and 42d Air Base Wing Force Support Squadron (42 ABW/FSS) equipment checkout.
Administrative	4	4.2	As Needed	ALL	42 CES/CEIE	N/A	HIGH	INRP	Interagency/Intraagency, Government, Sikes Act	4.2.3	Continue internal environmental awareness activities to minimize impacts to natural resources by MAFB personnel and visitors.

Table 10-1. Annual work plans (current year to 4 years out)

Resource Category	Goal	Objective	Occurrence	FY	Office of Primary Responsibility	Funding Source	Priority Level	PB28 Code *	Standard Title*	Project Number	Description
Habitat	4	4.3	As Needed	All	42 CES/CEIE	42 CES	MEDIUM	INRP	Management, Habitat	4.3.1	Manage vegetation to maintain properly balanced aquatic ecosystems.
Habitat	4	4.3	Annual	All	42 CES/CEIE	42 CES	HIGH	INRP	Management, Habitat;	4.3.2	Use herbicidal, biological, and/or mechanical treatments to control the spread of aquatic weeds in the base lakes annually.
Habitat	4	4.3	Once	2026	42 CES/CEIE	42 CES	MEDIUM	INRP	Management, Habitat	4.3.3	Install artificial structures to attract fish and provide cover for forage species.
Habitat	4	4.3	Once	2025	42 CES/CEIE	42 FSS Fishing Permit Fees	MEDIUM	INRP	Management, Habitat	4.3.4	Fertilize western recreational lakes to increase lake productivity, as funding from recreational fishing program allows.

Table 10-1. Annual work plans (current year to 4 years out)

Resource Category	Goal	Objective	Occurrence	FY	Office of Primary Responsibility	Funding Source	Priority Level	PB28 Code *	Standard Title*	Project Number	Description
Administrative	4	4.3	Once	2025	42 CES/CEIE	42 CES	MEDIUM	INRP	Supplies, CN	4.3.5	Install signage at recreational waterbodies on MAFB, which detail actions that users should take to prevent the spread of aquatic invasive species.
Species	5	5.1	Once	2029	42 CES/CEIE	N/A	HIGH	INRP; T&E	Interagency/Intraagency, Government, Sikes Act; Mgt, Species	5.1.1	Conduct acoustic surveys for bats every 5 years IAW DAFMAN 32-7003, Section 3.39, following the NABat protocol or in consultation with the USFWS and/or Alabama Department of Conservation and Natural Resources (ADCNR); enter survey results into NABat database.

Table 10-1. Annual work plans (current year to 4 years out)

Resource Category	Goal	Objective	Occurrence	FY	Office of Primary Responsibility	Funding Source	Priority Level	PB28 Code *	Standard Title*	Project Number	Description
Species	5	5.1	Once	2029	42 CES/CEIE	N/A	HIGH	T&E	Interagency/Intraagency, Government, Sikes Act; Mgt, Species	5.1.2	Conduct mist-net surveys as needed to identify T&E bats to species and to determine breeding status, in consultation with USFWS and/or ADCNR.
Habitat	5	5.1	Annual		42 CES/CEIE	N/A	HIGH	INRP; T&E	Interagency/Intraagency, Government, Sikes Act; Mgt, Habitat	5.1.3	If roosting areas or maternity colonies are identified during surveys, protect and maintain habitats in consultation with USFWS and/or ADCNR.

Table 10-1. Annual work plans (current year to 4 years out)

Resource Category	Goal	Objective	Occurrence	FY	Office of Primary Responsibility	Funding Source	Priority Level	PB28 Code *	Standard Title*	Project Number	Description
Species	5	5.2	Once	2029	42 CES/CEIE	N/A	HIGH	INRP	Interagency/Intraagency, Government, Sikes Act, Mgt, Species	5.2.1	Conduct summer and winter bird surveys every 5 years for all species IAW DAFMAN 32-7003, Section 3.39, to determine species' population sizes and habitat use and to provide occurrence information for special-status species. Upload survey results into the Avian Knowledge Network.

Table 10-1. Annual work plans (current year to 4 years out)

Resource Category	Goal	Objective	Occurrence	FY	Office of Primary Responsibility	Funding Source	Priority Level	PB28 Code *	Standard Title*	Project Number	Description
Species	5	5.2	Annual	All	42 CES/CEIE	N/A	HIGH	T&E	Interagency/Intraagency, Government, Sikes Act; Mgt, Habitat; Mgt, Species	5.2.2	Conduct wood stork surveys annually to determine potential presence and foraging areas. If occurrences become more frequent, consult with USFWS and/or ADCNR for any needed management actions.
Habitat	5	5.2	Annual	All	42 CES/CEIE	N/A	HIGH	T&E	Interagency/Intraagency, Government, Sikes Act; Mgt, Habitat	5.2.3	Evaluate installation activities for potential impacts to potential wood stork foraging habitats and implement needed protections in consultation with the USFWS and/or ADCNR.

Table 10-1. Annual work plans (current year to 4 years out)

Resource Category	Goal	Objective	Occurrence	FY	Office of Primary Responsibility	Funding Source	Priority Level	PB28 Code *	Standard Title*	Project Number	Description
Species	5	5.2	Annual	All	42 CES/CEIE	N/A	HIGH	T&E	Mgt, Habitat; Mgt, Species	5.2.4	Support populations of forest-dependent special-status bird species by avoiding tree removal during nesting periods.
Species	5	5.2	Annual	All	42 CES/CEIE	N/A	HIGH	T&E	Mgt, Habitat; Mgt, Species	5.2.5	Review all demolition/construction projects and military activities for potential impacts to special-status species by following guidelines and obtaining appropriate permits, as required.

Table 10-1. Annual work plans (current year to 4 years out)

Resource Category	Goal	Objective	Occurrence	FY	Office of Primary Responsibility	Funding Source	Priority Level	PB28 Code *	Standard Title*	Project Number	Description
Species	5	5.2	Annual	All	42 CES/CEIE	N/A	HIGH	INRP	Mgt, Nuisance Wildlife	5.2.6	Trap and remove feral cats as they are observed or reported, per DAFMAN 32-7003, Section 3.61.3.
Habitat	5	5.2	Annual	All	42 ABW/SE	N/A	HIGH	INRP	Interagency/Intraagency, Government, Sikes Act; Mgt, Habitat	5.2.7	Follow DoD Partners in Flight guidance to measure and reduce artificial light at night.

Table 10-1. Annual work plans (current year to 4 years out)

Resource Category	Goal	Objective	Occurrence	FY	Office of Primary Responsibility	Funding Source	Priority Level	PB28 Code *	Standard Title*	Project Number	Description
Species	5	5.3	Once	2026	42 CES/CEIE	AFCEC	HIGH	INRP	Interagency/Intraagency, Government, Sikes Act; Mgt, Species	5.3.1	Conduct a basewide inventory of amphibians and reptiles every 5 years for all species IAW DAFMAN 32-7003, Section 3.39, to determine species' population sizes and habitat use and to provide occurrence information for special-status species. Ensure survey methods and results are documented. Report survey findings to DoD Partners in Amphibian and Reptile Conservation.

Table 10-1. Annual work plans (current year to 4 years out)

Resource Category	Goal	Objective	Occurrence	FY	Office of Primary Responsibility	Funding Source	Priority Level	PB28 Code *	Standard Title*	Project Number	Description
Species	5	5.3	Annual	All	42 CES/CEIE	N/A	HIGH	INRP	Interagency/Intraagency, Government, Sikes Act; Mgt, Species	5.3.2	Conduct surveys for alligator snapping turtle at potential habitats in cooperation with USFWS as needed.
Species	5	5.3	Annual	All	42 CES/CEIE	N/A	HIGH	T&E	Interagency/Intraagency, Government, Sikes Act; Mgt, Species	5.3.3	If any amphibian and reptile special-status species are found, determine appropriate management actions in consultation with the USFWS and/or ADCNR.

Table 10-1. Annual work plans (current year to 4 years out)

Resource Category	Goal	Objective	Occurrence	FY	Office of Primary Responsibility	Funding Source	Priority Level	PB28 Code *	Standard Title*	Project Number	Description
Species	5	5.4	Once	2026	42 CES/CEIE	AFCEC	HIGH	INRP	Mgt, Species	5.4.1	Conduct a basewide inventory of fish and mollusk species every 5 years IAW DAFMAN 32-7003, Section 3.39, to determine species' population sizes and habitat use and to provide occurrence information for special-status species. Ensure survey methods and results are documented.

Table 10-1. Annual work plans (current year to 4 years out)

Resource Category	Goal	Objective	Occurrence	FY	Office of Primary Responsibility	Funding Source	Priority Level	PB28 Code *	Standard Title*	Project Number	Description
Species	5	5.4	Annual	All	42 CES/CEIE	N/A	HIGH	T&E	Interagency/Intraagency, Government, Sikes Act; Mgt, Species	5.4.2	If any fish and mollusk special-status species are found, determine appropriate management actions in consultation with the USFWS and/or ADCNR.
Speceies	5	5.5	Once	2027	42 CES/CEIE	42 CES	MEDIUM	T&E	Mgt, Habitat	5.5.1	Increase habitat for the monarch butterfly, a candidate species for ESA listing, by supplementing natural areas at the Senior Officer Quarters and closed lower golf course with native milkweed species.

Table 10-1. Annual work plans (current year to 4 years out)

Resource Category	Goal	Objective	Occurrence	FY	Office of Primary Responsibility	Funding Source	Priority Level	PB28 Code *	Standard Title*	Project Number	Description
Species	5	5.5	Once	2026	42 CES/CEIE	N/A	MEDIUM	T&E	Interagency/Intraagency, Government, Sikes Act; Mgt, Species	5.5.2	Work with the Pollinator Partnership to establish an annual survey protocol for monarch butterflies.
Species	5	5.5	Annual	All	42 CES/CEIE	N/A	MEDIUM	T&E	Mgt, Species	5.5.3	Annually implement the monarch butterfly survey.

Table 10-1. Annual work plans (current year to 4 years out)

Resource Category	Goal	Objective	Occurrence	FY	Office of Primary Responsibility	Funding Source	Priority Level	PB28 Code *	Standard Title*	Project Number	Description
Species	5	5.5	Once	2027	42 CES/CEIE	N/A	MEDIUM	INRP	Interagency/Intraagency, Government, Sikes Act; Mgt, Habitat	5.5.4	Work with the Pollinator Partnership to develop pollinator habitat on the closed lower golf course that improves resilience to flooding while supporting diverse pollinators, including the monarch butterfly and Mitchell's satyr (a special-status species).

Table 10-1. Annual work plans (current year to 4 years out)

Resource Category	Goal	Objective	Occurrence	FY	Office of Primary Responsibility	Funding Source	Priority Level	PB28 Code *	Standard Title*	Project Number	Description
Species	5	5.5	Once	2026	42 CES/CEIE	N/A	MEDIUM	INRP	Interagency/Intraagency, Government, Sikes Act; Mgt, Habitat	5.5.5	Work with the Pollinator Partnership to develop and implement pollinator habitat for the Senior Officer Quarters that improve awareness while supporting diverse pollinators, including the monarch butterfly and Mitchell's satyr.

Table 10-1. Annual work plans (current year to 4 years out)

Resource Category	Goal	Objective	Occurrence	FY	Office of Primary Responsibility	Funding Source	Priority Level	PB28 Code *	Standard Title*	Project Number	Description
Species	5	5.5	Annual	All	42 CES/CEIE	N/A	HIGH	INRP	Interagency/Intraagency, Government, Sikes Act; Mgt, Habitat	5.5.6	As directed in the 2014 "Department of Defense Policy to Use Pollinator-Friendly Management Prescriptions", review grounds maintenance guidelines to ensure they follow pollinator protections described in the U.S. Air Force Pollinator Conservation Reference Guide, Section 2B.

*Natural Resources standard titles by PB28 code (excluding CZT/CZC titles); see next table

Table 10-2. Natural Resources standard titles by PB28 code (excluding CZT/CZC titles)

INRP	MMA	T&E	MNRA	WTLD
P&F, CN	Mgt, Species	Mgt, Habitat	Compliance Public Notification	Mgt, Wetlands / Floodplains
Interagency/Intraagency, Government, Sikes Act	Interagency/Intraagency, Government, Sikes Act	Mgt, Species	Plan Update, Other	Monitor Wetlands
Interagency/Intraagency, Government, Sikes Act, Conservation Law Enforcement Officer (CLEO)	Outsourced Environmental Services, CN	Mgt, Invasive Species	Recordkeeping, Other	Interagency/Intraagency, Government, Sikes Act
Outsourced Environmental Services, CN	Supplies, CN	Mgt, Nuisance Wildlife	Outreach	Outsourced Environmental Services, CN
Supplies, CN	Supplies, CN, CLEO	Interagency/Intraagency, Government, Sikes Act	—	—
Supplies, CN, CLEO	Vehicle Leasing, CN	Interagency/Intraagency, Government, Sikes Act, CLEO	—	—
Equipment Purchase/ Maintain, CN	—	Outsourced Environmental Services, CN	—	—
Vehicle Leasing, CN	—	Supplies, CN	—	—
Vehicle Fuel & Maintenance, CN	—	Supplies, CN, CLEO	—	—
Mgt, Wildland Fire	—	Equipment Purchase/ Maintain, CN	—	—
Plan Update, Integrated Natural Resources Management Plan (INRMP)	—	Vehicle Leasing, CN	—	—
Plan Update, Other	—	Vehicle Fuel & Maintenance, CN	—	—
Mgt, Habitat	—	Plan Update, Other	—	—
Mgt, Species	—	Environmental Services, CN	—	—
Mgt, Invasive Species	—	—	—	—
Mgt, Nuisance Wildlife	—	—	—	—
Recordkeeping, Other	—	—	—	—
Environmental Services, CN	—	—	—	—

11.0 REFERENCES

11.1 Standard References (Applicable to all DAF installations)

- DAFMAN 32-7003, *Environmental Conservation*
- Sikes Act
- eDASH Natural Resources Program Page
- Natural Resources Playbook
- DoDI 4715.03, *Natural Resources Conservation Program*
- AFI 32-1015, *Integrated Installation Planning*
- AFI 32-10112, *Installation Geospatial Information and Services (IGI&S)*

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12.0 ACRONYMS

12.1 Standard Acronyms (Applicable to all DAF installations)

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

12.2 Installation Acronyms

42 ABW	42d Air Base Wing
42 ABW/SE	42d Air Base Wing Safety Office
42 ABW/FSS	42d Air Base Wing Force Support Squadron
42 SFS	42d Security Forces Squadron
ADCNR	Alabama Department of Conservation and Natural Resources
ADEM	Alabama Department of Environmental Management
AETC	Air Education and Training Command
AFB	Air Force Base
AFCEC	Air Force Civil Engineer Center
AFI	Air Force Instruction
AFPD	Air Force Policy Directive
APZs	Accident Potential Zones
BASH	Bird/Wildlife Aircraft Strike Hazard
BHWG	Bird Hazard Working Group
BMP	Best Management Practice
BWC	Bird Watch Condition
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CWA	Clean Water Act
DAF	Department of the Air Force
DAFMAN	Department of the Air Force Manual
DEPARC	Defense Environmental Programs Annual Report to Congress
DoDI	Department of Defense Instruction
DoD PARC	DoD Partners in Amphibian and Reptile Conservation

EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EMS	Environmental Management System
EO	Executive Order
ESA	Endangered Species Act
ESOHC	Energy, Environment, Safety, and Occupational Health Council
GIS	Geographic Information Systems
IAW	In Accordance With
ICRMP	Integrated Cultural Resources Management Plan
IICEP	Interagency and Intergovernmental Coordination for Environmental Planning
IDP	Installation Development Plan
INRMP	Integrated Natural Resources Management Plan
IPM	Integrated Pest Management
IPMP	Integrated Pest Management Plan
MAFB	Maxwell Air Force Base
MOU	Memorandum of Understanding
MSL	Mean Sea Level
MS4	Municipal Separate Storm Sewer System
MWWSSB	Montgomery Water Works and Sanitary Sewer Board
NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
PIF	Partners in Flight
T&E	Threatened and Endangered
USACE	United States Army Corps of Engineers
USC	United States Code
USDA	United States Department of Agriculture
U.S. EPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service

13.0 DEFINITIONS

13.1 Standard Definitions (Applicable to all DAF installations)

- Natural Resources Playbook—Definitions Section

14.0 APPENDICES

14.1 Standard Appendices

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

Table 14-1. Annotated summary of key legislation related to design and implementation of the Integrated Natural Resources Management Plan (INRMP)

Legislation	Description
Federal Public Laws (P.L.s) and Executive Orders (EOs)	
National Defense Authorization Act of 1989, P.L. 101-189; Volunteer Partnership Cost-Share Program	Amends 2 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 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.

Table 14-1. Annotated summary of key legislation related to design and implementation of the Integrated Natural Resources Management Plan (INRMP)

Legislation	Description
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; (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 (U.S. EPA) authority to conduct reviews and inspections to monitor federal facility compliance with pollution control standards.
EO 12898, *Environmental Justice*	This EO requires certain federal agencies, including the DoD, to the greatest extent practicable permitted by law, to make environmental justice part of their missions by identifying and addressing disproportionately high and adverse health or environmental effects on minority and low-income populations.
EO 13112, *Invasive Species*	Prevents 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.
EO 14072, *Strengthening the Nation's Forests, Communities, and Local Economies*	This EO establishes policy to maintain, restore, and conserve the nation's forests, to include old growth and mature forests, limit international deforestation, and enhance resilience.
United States Code (USC)	
Animal Damage Control Act (7 USC § 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.

Table 14-1. Annotated summary of key legislation related to design and implementation of the Integrated Natural Resources Management Plan (INRMP)

Legislation	Description
Bald and Golden Eagle Protection Act of 1940, as amended; 16 USC § 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 USC § 7401–7671q, 14 July 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 USC § 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 cleanup 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 USC § 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 National Oceanic and Atmospheric Administration (NOAA) Fisheries and the preparation of a biological evaluation or a biological assessment may be required when such species are present in an area affected by government activities.
Federal Aid in Wildlife Restoration Act of 1937 (16 USC § 669–669i; 50 Stat. 917) (Pittman-Robertson Act)	Provides federal aid to states and territories for management and restoration of wildlife. Fund derives from sports tax on arms and ammunition. Projects include acquisition of wildlife habitat, wildlife research surveys, development of access facilities, and hunter education.
Federal Environmental Pesticide Act of 1972	Requires installations to ensure pesticides are used only in accordance with their label registrations and restricted-use pesticides are applied only by certified applicators.
Federal Land Use Policy and Management Act, 43 USC § 1701–1782	Requires management of Bureau of Land Management 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.

Table 14-1. Annotated summary of key legislation related to design and implementation of the Integrated Natural Resources Management Plan (INRMP)

Legislation	Description
Federal Noxious Weed Act of 1974, 7 USC § 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 USC §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 U.S. EPA.
Fish and Wildlife Conservation Act (16 USC § 2901–2911; 94 Stat. 1322, P.L. 96-366)	Installations are encouraged to use their authority to conserve and promote conservation of nongame fish and wildlife in their habitats.
Fish and Wildlife Coordination Act (16 USC § 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 USC § 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 USC § 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 USC § 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 USC § 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 created Regulations for Implementing the National Environmental Policy Act [40 Code of 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.

Table 14-1. Annotated summary of key legislation related to design and implementation of the Integrated Natural Resources Management Plan (INRMP)

Legislation	Description
National Historic Preservation Act, 16 USC § 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 USC § 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 USC § 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 USC § 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 USC § 401 et seq.)	Makes it unlawful for the U.S. Air Force (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 USC § 2665	Authorizes sale of forest products and reimbursement of the costs of management of forest resources.
Soil and Water Conservation Act (16 USC § 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.

Table 14-1. Annotated summary of key legislation related to design and implementation of the Integrated Natural Resources Management Plan (INRMP)

Legislation	Description
Sikes Act (16 USC § 670a–670l, 74 Stat. 1052), as amended	Provides for the cooperation of DoD, the Department 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 INRMP and public access to natural resources and allows collection of nominal hunting and fishing fees. NOTE: DAFMAN 32-7003 Sec 3.11, *INRMP Implementation*. As defined in DoD Instruction (DoDI) 4715.03, use professionally trained natural resources management personnel with a degree in the natural sciences to develop and implement the installation INRMP. Per Sec. 3.11.1, *Outsourcing Natural Resources Management,* as stipulated in the Sikes Act, 16 USC § 670 et seq., the Office of Management and Budget Circular No. A-76, *Performance of Commercial Activities*, 04 August 1983 (Revised 29 May 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 that have responsibilities for the conservation and management of natural resources.
DoD Policies, Directives, and Instructions	
DoDI 4150.07, *DoD Pest Management Program,* dated 29 May 2008	Implements policy, assigns responsibilities, and prescribes procedures for the DoD Integrated Pest Management Program.
DoDI 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.
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.

Table 14-1. Annotated summary of key legislation related to design and implementation of the Integrated Natural Resources Management Plan (INRMP)

Legislation	Description
Office of the Secretary of Defense (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, 01 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 INRMP projects, using the INRMP as a substitute for critical habitat designation, supporting military training and testing needs, and facilitating the INRMP review process.
DAF Instructions and Directives	
AFI 32-1015, *Integrated Installation Planning*, and 32 CFR Part 898, as amended	This publication establishes a comprehensive and integrated planning framework for development/redevelopment of Air Force installations. Provides guidance and responsibilities in the Environmental Impact Analysis Process (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.

Table 14-1. Annotated summary of key legislation related to design and implementation of the Integrated Natural Resources Management Plan (INRMP)

Legislation	Description
DAFMAN 32-7003, *Environmental Conservation*	Implements Air Force Policy Directive (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 DAF property in compliance with federal, state, territorial, and local standards. This Manual also implements DoDI 4710.1, *Archaeological and Historic Resources Management*. It explains how to manage cultural resources on DAF property in compliance with federal, state, territorial, and local standards.
AFI 32-10112 *Installation Geospatial Information and Services (IGI&S)*	This instruction implements Department of Defense Instruction (DoDI) 8130.01, Installation Geospatial Information and Services (IGI&S) by identifying the requirements to implement and maintain an Air Force Installation Geospatial Information and Services program and AFPD 32-10, *Installations and Facilities*.
AFPD 32-70, *Environmental Quality*	Outlines the DAF mission to achieve and maintain environmental quality on all DAF 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 DAF Environmental Office (DAF/ILEV) on 29 January 1999	Outlines the DAF interpretation and explanation of the Sikes Act and Improvement Act of 1997.

14.2 Installation Appendices

14.2.1 Appendix B. Trees approved for planting on Maxwell Air Force Base and Gunter Annex

Table 14-2. Trees approved for planting on Maxwell Air Force Base and Gunter Annex

Common Name	Scientific Name	Features and Comments
Trees		
Allegheny Chinkapin	*Castanea pumila*	A native, deciduous, large shrub or small tree. Edible chestnuts are contained in spiny burs. Nuts may attract wildlife. Susceptible to American chestnut blight.
American Beech	*Fagus gradifolia*	Slow-growing, native, large shade tree. Good fall color
American Chestnut	*Castanea dentate*	A native tree (now rare) that was almost wiped out by American chestnut blight. Edible nuts contained in spiny burs.

Table 14-2. Trees approved for planting on Maxwell Air Force Base and Gunter Annex

Common Name	Scientific Name	Features and Comments
American Elm	*Ulmus Americana*	Tall, native, deciduous shade tree. Highly susceptible to Dutch Elm disease. Plant only disease-resistant cultivars.
American Hornbeam	*Carpinus caroliniana*	A small, native, deciduous tree. Wood is extremely hard.
American Smoketree	*Cotinus coggygria*	Small, native, flowering ornamental tree. May display good fall color.
American Sycamore	*Platanus occidentalis*	Very large, native, deciduous shade tree. Distinctive white, mottled bark in winter. Grows well on Maxwell Air Force Base (MAFB).
Amur Maackia	*Maackia amurensis*	Small to medium slow-growing tree. Good for confined or urban spaces.
Ash, Green	*Fraxinus pennsylvanica*	Native; Susceptible to the emerald ash borer.
Ash, White	*Fraxinus Americana*	Native; Cultivars have superior fall color. Susceptible to the emerald ash borer
Beech, American	*Fagus grandifolia*	Large, native, deciduous tree. Edible nuts contained in burs.
Beech, European	*Fagus sylvatica*	Large, deciduous tree. Grows more easily under cultivation than the American Beech.
Birch, Sweet	*Betula lenta*	Large tree native to the eastern United States. Popular in landscapes. May experience stress in long, hot summers.
Birch, River	*Betula nigra*	Small native tree; often has multiple trunks. Distinctive curling, peeling bark. Can grow is flood plains and swamps.
Bald Cypress	*Taxodium distichum*	Large, native, deciduous tree. Grows well on MAFB.
Blackgum or Tupelo	*Nyssa sylvatica*	Medium sized, native, deciduous tree. Good scarlet fall color.
Buckeye, Ohio	*Aesculus glabra*	Medium sized, native, deciduous tree. “Horse chestnuts” are poisonous to humans.
Buckeye, Yellow	*Aesculus flava (octandra)*	Tall, oval-shaped, native, deciduous tree. More disease-resistant than Ohio buckeye. Nuts are poisonous to humans.
Camellia, most varieties	*Camellia* spp.	Large evergreen shrub or small tree. Showy late-winter or early-spring flowers. Many colors and cultivars available.
Carolina Silverbell	*Halesia tetraptera (Halesia Carolina)*	Native small to medium-size flowering tree. White flowers in early spring. Grows naturally as an understory small tree.
Cedar, Deodar	*Cedrus deodara*	Nonnative, evergreen specimen tree. Requires well-drained, fertile soil - not clay.
Catalpa, Southern	*Catalpa bignonioides*	Medium sized, native, deciduous tree. Irregular crown with sprawling branches. Fairly resistant to pests and disease.
Chinese Pistache	*Pistacia chinensis*	Excellent medium-size shade tree. Prefers full sunlight; good scarlet fall color.
Crape Myrtle	*Lagerstroemia* spp.	Popular ornamental; grows well on MAFB. Multi-stemmed, small deciduous tree. Showy flowers in coral, pink, white, or purple.

Table 14-2. Trees approved for planting on Maxwell Air Force Base and Gunter Annex

Common Name	Scientific Name	Features and Comments
Dawn Redwood	*Metasequoia glyptostroboides*	A fast-growing, large, deciduous conifer. Sheds its needles in fall.
Dogwood, Flowering	*Cornus florida*	Showy white or pink flowers in spring. Understory native tree; best in partial shade.
Eastern Redbud	*Cercis canadensis*	Native flowering shrub or small tree. Attractive magenta flowers in spring. Understory tree; best in filtered light.
Elm, American	*Ulmus americana*	Tall, native, deciduous shade tree. Highly susceptible to Dutch Elm disease. Plant only disease-resistant cultivars.
Fringetree, White	*Chionanthus virginicus*	Large, native shrub or small tree. Fluffy white blooms; excellent ornamental.
Ginkgo, **Male tree only** (Female trees are prohibited due to foul odor)	*Ginkgo biloba*	Attractive fan-shaped leaves. Brilliant yellow fall color. Resistant to disease and insects.
Hardy Rubbertree	*Eucommia ulmoides*	Medium to large deciduous tree. Glossy dark green foliage; drought-resistant. Resistant to pests and disease.
Hawthorn	*Cratagus* spp.	Thornless cultivars are acceptable. Small to medium deciduous tree. Good fall color; prone to rust diseases.
Hickory, most native varieties	*Carya* spp.	Medium to large native deciduous trees. Some species produce edible nuts.
Holly, most varieties, excluding Rotunda	*Ilex* spp.	Prefer native species or cultivars such as 'Emily Bruner,' 'Mary Nell,' 'Nellie R. Stevens' that do not revert to "Rotunda."
Japanese-Cedar	*Cryptomeria japonica*	Very large, evergreen, coniferous tree. Intolerant of poor soils.
Japanese Grey-Bark Elm	*Zelkova serrata*	Medium-sized deciduous tree. Good fall color.
Japanese Maple	*Acer palmatum*	Small tree with good fall color. Plant as an understory tree in dappled shade.
Katsura Tree	*Acer palmatum*	Medium to large shade tree. Inconspicuous flowers but good foliage color.
Loblolly-Bay	*Gordonia lasianthus*	Small to medium, native, evergreen tree. Popular as a hardy ornamental tree. Can survive in damp, acidic soils.
Loquat	*Eriobotrya japonica*	Small tree with attractive dark green foliage. Edible fruit could be a choking hazard around young children; seeds are somewhat toxic.
London Planetree	*Platanus acerifolia*	Very large, deciduous shade tree.
Magnolia, most varieties	*Magnolia* spp.	Beautiful native evergreen with glossy, dark green leaves and showy flowers. Fallen leaves and large seed pods can be a nuisance; choose location away from pedestrian traffic.
Maple, Japanese	*Acer palmatum*	Small tree with colorful foliage. Plant as an understory tree in dappled shade.
Maple, Trident	*Acer buergeranum*	Medium sized tree with good foliage color.
Oaks, most native varieties	*Quercus* spp.	Most native species grow well on MAFB. Acorns can be a nuisance, slipping hazard, or choking hazard around children. Consider placing back from pedestrian traffic.

Table 14-2. Trees approved for planting on Maxwell Air Force Base and Gunter Annex

Common Name	Scientific Name	Features and Comments
Oriental Planetree	*Platanus orientalis*	Very large, wide tree with broad leaves, making it a prized shade tree.
Osage Orange	*Maclura pomifera*	Native trees have thorns; choose thornless cultivars. Large fruit can be messy; choose location carefully.
Pecan	*Carya* spp.	Large, native, deciduous tree. Edible nuts.
Persian Ironwood	*Parrotia persica*	Large, deciduous tree. Provides stunning fall color.
Pines, most native varieties and cultivars	*Pinus* spp.	Tall, evergreen conifers. Many native varieties grow easily at MAFB.
Redbud, Eastern	*Cercis canadensis*	Native, flowering shrub or small tree. Attractive magenta flowers in spring. Understory tree; best in filtered light.
Red Bay	*Persea borbonia*	Native evergreen with glossy green leaves. Prefers light shade. Aromatic bay leaves can be used in cooking.
River Birch	*Betula nigra*	Small, native tree; often has multiple trunks. Distinctive curling, peeling bark. Can grow is flood plains and swamps.
Serviceberry	*Amelanchier* spp.	Large, native shrub or small yard tree. Showy white flowers in spring, edible berries in summer, and rich color in fall.
Sourwood	*Oxydendrum arboreum*	Small to medium-sized native tree. Grows slowly and has a fairly short life span. Sensitive to drought and high heat.
Southern Catalpa	*Catalpa bignonioides*	Medium sized, native, deciduous tree. Irregular crown with sprawling branches. Fairly resistant to pests and disease.
Southern Wax myrtle	*Myrica cerifera*	Aromatic evergreen shrub or small tree. Needs pruning to develop its shape.
Sugarberry	*Celtis laevigata*	Large, native, deciduous tree. Leaf litter inhibits seed germination and growth of some other grasses and plants.
Sweetbay	*Lauris noblis*	Aromatic, native evergreen with glossy leaves Bay leaves can be used in cooking.
Sweetgum	*Liquidambar styraciflua*	Native deciduous tree; seed pods can be a nuisance; choose location carefully.
Swamp Cottonwood	*Populus heterophylla*	Large native deciduous tree; needs moist soil
Swamp Tupelo	*Nyssa biflora*	Large native deciduous tree; requires wet site
Sycamore, American	*Platanus occidentalis*	Very large, native, deciduous shade tree. Grows well at MAFB.
Walnut, Black	*Juglans nigra*	Large, native, deciduous tree with edible nuts Nut hulls may be messy and staining; choose location carefully.
Walnut, White (Butternut)	*Juglans cinerea*	Tall, native, deciduous tree with edible nuts. Does not favor dry, compact, or infertile soil. Usually grows at higher elevations than black walnut.
White Basswood	*Tilia heterophylla Tiliaceae*	Large, native, deciduous tree. Does not tolerate very wet or very dry conditions.
Witch Hazel	*Hamamelis* spp.	Small, native tree. Grows well in low-lying rich soil.
Yellow Poplar (Tulip Poplar)	*Liriodendrum tulipfera*	Tall, fast-growing, native tree. Grows well at MAFB. Avoid very wet or very dry conditions.

14.2.2 Appendix C. Trees and shrubs prohibited from planting on Maxwell Air Force Base and Gunter Annex

Table 14-3. Trees and shrubs that are prohibited to plant on Maxwell Air Force Base and Gunter Annex

Common Name	Scientific Name	Common Name	Scientific Name
Maples	*Acer* sp.	Eastern hop-hornbeam	*Ostrya virginiana*
Tree-of-heaven	*Ailanthus altissima*	Princesstree	*Phellodendron amurense*
Silktree or Mimosa	*Albizia julibrissin*	Trifoliate orange or Hardy orange	*Poncirus trifoliate*
Camphor tree	*Cinnamomum camphora*	Poplars	*Populus* sp.
Russian olive	*Elaeagnus* sp.	Callery pear "Bradford"	*Pyrus calleryana*
Korean evodia	*Evodia danielli*	Sawtooth oak	*Quercus acutissima*
Ginkgo (female trees prohibited)	*Ginkgo biloba*	Willows	*Salix* sp.
Carolina silverbell	*Halesia carolina*	Chinese tallowtree	*Triadica sebefera*
Castor-aralia	*Kalopanax pictus*	Elms	*Ulmus*
Apples, Crabapple	*Malus* sp.	Tungoil tree	*Vernicia fordii*
Chinaberry tree	*Melia azedarach*	Mulberry	*Morus* sp.
Bamboo	*Bamboo* spp.	Privet	*Ligustrum* sp.
Barberry	*Berberis* spp.	Pyracantha, Scarlet firethorn	*Pyracantha* sp.
Cotoneaster	*Cotoneaster* spp.	Rotunda variety, Holly	*Ilex cornuta*
Gardenia	*Gardenia* sp.	Thorny olive, Autumn olive	*Elaeagnus* sp.
Honeysuckle	*Lonicera* spp.	Tropical soda apple	*Solanum viarum*
Multiflora rose	*Rose multiflora*	Yew	*Taxus* spp.
Nandina	*Nandina species*	—	—

15.0 ASSOCIATED PLANS

15.1 Tab 1—Bird/Wildlife Aircraft Strike Hazard (BASH) Plan

Controlled Unclassified Information; available upon request from NRM

15.2 Tab 2—Integrated Cultural Resources Management Plan (ICRMP)

15.3 Tab 3—Integrated Pest Management Plan (IPMP)

For Official Use Only; available upon request from NRM