UNITED STATES AIR FORCE

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN

JOINT BASE ANACOSTIA-BOLLING

2021–2025

(See INRMP signature pages for plan approval date)

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN

JOINT BASE ANACOSTIA-BOLLING

MARCH 2021

Prepared for
Joint Base Anacostia-Bolling
11th Civil Engineer Squadron
United States Air Force
Washington, DC

Original Version Approved in March 2021 prepared by
Environmental Research Group, LLC
Baltimore, MD

Adapted in December 2021 for the 11th Civil Engineer Squadron
to United States Air Force Standardized Template by
Center for Environmental Management of Military Lands
Colorado State University
Fort Collins, CO

ABOUT THIS PLAN

This installation-specific Environmental Management Plan (EMP) is based on the United States Air Force's (USAF) 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); USAF Playbooks; federal, state, and local requirements; Biological Opinions; and permits are referenced.

Certain sections of this INRMP begin with standardized, USAF-wide "common text" language that address USAF 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 USAF-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 Environmental Directorate Business Rule 08, *EMP 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.

This version of the template is current as of 06/26/2020 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 refer to the eDASH EMP Repository to ensure they have the most current version.

Installation INRMP

Record of Review—The INRMP is reviewed and updated annually to reflect natural resource management and conservation practices that have occurred, including those driven by changes in applicable regulations. IAW the Sikes Act and Air Force Manual (AFMAN) 32-7003—*Environmental Conservation*, the INRMP is required to be reviewed for operation and effect no less than every five 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 five 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 (AFMAN 32-7003).

Annual reviews and updates are accomplished by the installation 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 upon updates are then made to the document, at a minimum updating the work plans.

INRMP APPROVAL/SIGNATURE PAGES

FIVE YEAR REVIEW AND UPDATE OF THE

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN

2021–2025

Joint Base Anacostia-Bolling

Washington, DC

APPROVAL

This Integrated Natural Resources Management Plan (INRMP) fulfills the requirements for the INRMP in accordance with the Sikes Act (16 United States Code [USC] §670a *et seq*.), as amended; Department of Defense Instruction 4715.03—*Department of Defense Natural Resources Conservation Program*; and AFMAN 32-7003—*Environmental Conservation*. This document was prepared and reviewed in coordination with the Department of Interior, acting through the Director of the United States Fish and Wildlife Service; and the Director, District of Columbia Department of Energy & Environment in accordance with the 2013 Memorandum of Understanding for a Cooperative Integrated Natural Resources Management Program on Military Installations. By their signatures below, or an enclosed letter of concurrence, all parties grant their concurrence with and acceptance of the following document.

We approve the implementation of the activities in this five-year Review and Update of the INRMP for Joint Base Anacostia-Bolling as supporting the military mission while sustaining natural resources for future generations. This plan has been prepared pursuant to the Sikes Act Improvement Act of 1998 (16 USC § 670a *et seq*., as amended through 2014).

NOTE: The Navy version of this INRMP, approved in March 2021, was updated to the Air Force template in December 2021. Signatures for each version are provided.

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN

JOINT BASE ANACOSTIA-BOLLING

APPROVAL

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By their signatures below, or an enclosed letter of concurrence, all parties grant their concurrence with and acceptance of the following document.

Approving Official – Joint Base Anacostia Bolling

M. J. Zuhlsdorf 22 Mar 21

MICHAEL J. ZUHLSDORF, Colonel, USAF **Date**
Commander, Joint Base Anacostia-Bolling

LEBLANC.RYAN.LOUIS.1264063929 Digitally signed by LEBLANC.RYAN.LOUIS.1264063929 Date: 2021.02.24 08:20:41 -05'00'

RYAN L. LEBLANC, Lieutenant Colonel, USAF **Date**
Commander, 11th Civil Engineer Squadron, Joint Base Anacostia-Bolling

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Adrian Dascalu **Date**
Natural Resources Program Manager
Naval Facilities Engineering Systems Command Washington, Naval District Washington

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN

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By their signatures below, or an enclosed letter of concurrence, all parties grant their concurrence with and acceptance of the following document

Concurring Agency – U.S. Fish and Wildlife Service

GENEVIEVE PULLIS Digitally signed by GENEVIEVE PULLIS
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Genevieve LaRouche **Date**
Field Supervisor
U.S. Fish and Wildlife Service
Chesapeake Bay Field Office

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN

JOINT BASE ANACOSTIA-BOLLING

APPROVAL

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By their signatures below, or an enclosed letter of concurrence, all parties grant their concurrence with and acceptance of the following document

Concurring Agency – District of Columbia Department of the Energy & Environment

Brian D. K

11/23/2020

Brian King **Date**
Director
District of Columbia Department of Energy & Environment

Approving Officials—Joint Base Anacostia-Bolling

LOGAN.CATHERINE.M.1056620350

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Catherine M. Logan, Colonel
United States Air Force
Commander, 11th Wing
Joint Base Anacostia-Bolling

Date

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Steven J. Schuldt, Lieutenant Colonel
United States Air Force
Commander, 11th Civil Engineer Squadron
Joint Base Anacostia-Bolling

Date

EXECUTIVE SUMMARY

There are approximately 25 million acres of land under DoD jurisdiction in the United States. To ensure mission capability and readiness, DoD installations require realistic training and testing conditions, as well as the ability to continue to develop and implement new technologies and communications systems. In turn, this means conserving, protecting, restoring, and enhancing the natural resources that fall under DoD stewardship and are crucial to supporting its mission. At the same time, DoD installations must comply with federal regulations for protecting, conserving, restoring, and enhancing natural resources. To balance the need to use natural resources with the need to protect them, it is crucial to develop an integrated program of natural resources management. Therefore, IAW the Sikes Act (16 USC § 670a *et seq.*, as amended; hereafter, Sikes Act), each DoD installation that encompasses significant natural resources is required to prepare and maintain an INRMP. The INRMP implementation authority is 32 Code of Federal Regulations (CFR), Part 190—*Natural Resources Management Program* for the Department of Defense, and INRMP development guidance and procedures are provided in DoDI 4715.03 and AFMAN 32-7003.

This INRMP was prepared for Joint Base Anacostia-Bolling (JBAB), a 966-acre USAF base in the southeastern quadrant of Washington, District of Columbia (DC). It is a long-term planning document that provides the framework for and guides implementation of the installation's natural resources program to ensure consistency with and "no net loss" in the installation's military mission while also providing for conservation, rehabilitation, and sustainable, multipurpose use of the natural resources on JBAB. In accordance with the Sikes Act, and as set forth in the 2013 Memorandum of Understanding for a Cooperative Integrated Natural Resources Management Program on Military Installations, this INRMP was prepared in cooperation with the Secretary of the Department of Interior, acting through the Director of the USFWS, and the Director of the DC's Department of Energy & Environment (DOEE), acting through the Director of the DC Fisheries and Wildlife Division. This coordinated effort ensures that the INRMP reflects mutual agreement among these parties concerning conservation, protection, and management of the flora, fauna, and abiotic natural resources at JBAB. Ongoing DOEE and USFWS involvement will ensure continued mutual agreement and cooperation in managing JBAB's natural resources.

The effectiveness of this INRMP will be evaluated annually in cooperation with the appropriate field-level office of the USFWS and the DOEE. Evaluation of the successes and issues resulting from INRMP implementation will be facilitated by the Annual INRMP Review and the bi-annual Enterprise Environmental, Safety & Occupational Health (EESOH-MIS) data call (see AFMAN 32-7003 at https://usafa.isportsman.net/files/Documents%2FAFMAN%2032-7003%2C%20Environmental%20Conservation%2C%2020%20Apr%2020.pdf). Herein, resource-specific program elements have been developed and described to address relevant natural resource issues at JBAB. Existing conditions, including baseline survey data, as well as current management practices and recommended management actions, if applicable, have been described for each program element. Management program elements described in this INRMP are listed below.

- Forest Management
- Landscape and Urban Forest Management
- Wetlands Management
- Soil and Water Management
- Floodplain Management
- Fish and Wildlife Management
- Migratory Bird Management
- Rare, Threatened, and Endangered Species Management

- Vegetation Management
- Invasive Species Management
- Outdoor Recreation and Environmental Awareness

Implementation of the management actions and projects identified herein for JBAB will assist the Installation Commanding Officer and NRMs to manage natural resources effectively, ensure that base lands remain available to support the military mission in good condition, and ensure compliance with relevant environmental regulations. The management actions incorporate the USAF principles of ecosystem and adaptive management, and they are consistent with USAF policy on ensuring sustainable, multiple use of natural resources on DoD property.

In early 2021, JBAB command transitioned from the Department of the Navy to the Department of the Air Force and required a conversion of the 2020 INRMP from a Navy document to a USAF document. The INRMP conversion was prepared in 2021 and, to the greatest extent possible, the original order of information and intent were preserved; however, the conversion did necessitate (1) the reorganization, deletion and addition of some material needed to satisfy USAF template intent; and (2) replacing in-text references to Navy authorities with USAF authorities.

1.0 OVERVIEW AND SCOPE

This Integrated Natural Resource 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 United States Air Force (USAF). 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 USAF adaptability in all environments. The USAF has stewardship responsibility for the physical lands on which installations are located to ensure that all natural resources are properly conserved, protected, and used in sustainable ways. The primary objective of the USAF natural resources program is to sustain, restore, and modernize natural infrastructure to ensure operational capability and no net loss in the capability of USAF lands to support the military mission of the installation. In accordance with the Sikes Act, 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.

1.1 Purpose and Scope

The Sikes Act mandates that every Department of Defense (DoD) installation with significant natural resources develop an INRMP to guide and implement a program of natural resource management. The INRMP is a living planning document that integrates the installation's need to comply with federal natural resource laws and ensure the conservation and restoration of natural resources while continuing to achieve the installation's military mission.

In accordance with the Sikes Act and Air Force Manual (AFMAN) 32-7003—*Environmental Conservation*, this INRMP serves as the framework and planning tool for implementing the natural resources management program at the 966-acre Joint Base Anacostia-Bolling (JBAB) installation in southwestern DC. Although this INRMP is concerned primarily with natural resources management in the undeveloped natural areas of JBAB, it also applies to natural resources in landscaped and developed areas, such as the installation's support, training, and airfield operations; supply and storage; and recreational areas.

AFMAN 32-7003 provides USAF-specific guidance for developing and implementing natural resource management programs and their associated INRMPs at USAF installations. As such, this INRMP provides guidance for maintaining healthy, sustainable ecosystems; ongoing compliance and consistency with all federal mandates relevant to land and natural resources stewardship for conserving species, natural biotic communities, abiotic environments, and ecosystem services; ongoing access to the installation's land, air, and water resources for realistic military testing, training, and deployment; and ongoing access to installation facilities and equipment needed for research, development, and communications. This INRMP also addresses the installation's cultural resources to the extent that natural resources management would affect them, and it provides for ongoing educational and recreational opportunities for DoD personnel, including active-duty and service-disabled personnel, their dependents and guests, and the general public (Department of Defense Instruction [DoDI] 4715.03—*Natural Resources Conservation Program*).

The INRMP is organized into 15 chapters, the overall objectives of which are as follows.

- Identify authorities, roles, and responsibilities for USAF natural resources programs and INRMPs, including significant federal and local laws and regulations relevant to natural resources management at JBAB; USAF manuals, directives, and instructions; and the responsible parties and

stakeholders concerned with natural resources management at JBAB and facilitating coordination among stakeholders.
- State JBAB's management philosophy and objectives of the natural resources program at JBAB.
- Provide an overview of JBAB, including its history, current mission, units, and facilities.
- Describe the natural resources needed to achieve the installation's mission and the natural resource-based constraints on the installation's mission and its potential expansion.
- Describe the natural resources present at JBAB, including their historical and existing biological and physical conditions and desired future conditions, both on base and in the surrounding area.
- Identify key natural resource management issues and concerns, including known effects and potential future effects of the installation's activities on natural resources, both on base and in the surrounding area.
- Outline JBAB's training needs for natural resources personnel.
- Specify goals and objectives for natural resources at JBAB and outline projects and management actions for attaining those goals and objectives over the current five-year INRMP period while ensuring no net loss in the capability of base lands, air, and water to support the military mission.
- Tabulate work plans, including scheduling priorities and funding sources, for effective implementation of the INRMP and natural resources projects and management actions.

The INRMP also briefly explains the requirements and/or procedures for the USAF environmental management system (EMS), recordkeeping, and INRMP implementation. Last, it provides the references and other supplementary information needed to support INRMP development and use. Each chapter provides the context-relevant information, references, and/or data available for fostering environmental stewardship, achieving and maintaining compliance with natural resource laws and policies, ensuring no net loss to JBAB's mission capabilities, and integrating natural resource conservation management with JBAB's mission needs.

1.1.1 INRMP Working Group

The INRMP Working Group was responsible for the development and coordination of this INRMP in the USAF template and update and included the following individuals.

- Erica Hahn, July 2020 through present—JBAB, Natural Resources Program Manager
- Madison Cox, October 2021 through present—JBAB, Natural Resources Program Manager
- Matt Nowakowski, October 2020 through present—Air Force Civil Engineer Center (AFCEC)
- Center for Environmental Management of Military Lands, Colorado State University

1.2 Management Philosophy

USAF policy on natural resources management, as summarized from AFMAN 32-7003, is to manage natural resources in support of and consistent with the base mission, while protecting and enhancing those resources for multiple use, sustainable yield, and biological integrity. This INRMP is a long-term planning document that affirms JBAB's commitment to conserve and protect its natural resources while carrying out the missions of its assigned units. It supports the JBAB mission by providing implementation guidelines for identifying, managing, enhancing, and monitoring natural resources needed for achieving the military mission and by setting management goals and objectives for those resources and integrating them with the installation's requirements for military mission operations/support. In addition, the INRMP ensures

regulatory compliance, thus minimizing natural resources constraints on the installation's military mission while minimizing negative effects of the installation's activities on its vital natural resources.

The INRMP was developed using an interdisciplinary approach based on existing information of the biotic and abiotic environments, including assessments of flora and fauna, wetlands and floodplains, stormwater and contamination, soils and erosion, and invasive exotic species; environmental management practices; and mission activities at JBAB. Information was obtained from a variety of documents, databases, interviews with installation personnel, on-site observations, and communications with both internal and external stakeholders. The natural resources management issues and concerns, as well as the associated management goals, objectives and projects, are developed through analysis of all the information gathered, and then they are reviewed by JBAB personnel involved with or responsible for natural resources management. Coordination and correspondence with the stakeholders for annual reviews and five-year updates or revisions have been and will continue to be documented (see Appendix B), satisfying a portion of the requirements of 32 Code of Federal Regulations (CFR) 989—*Environmental Impact Analysis Process (EIAP)*.

DoDI 4715.03 requires that natural resources programs on DoD lands apply the principles of ecosystem management for natural resources under DoD stewardship and control. The goals of this strategy are to maintain and restore or enhance the sustainability and biological diversity of terrestrial and aquatic ecosystems while supporting sustainable economies, human use, and the environment required for realistic military training operations. An ecosystem management approach encourages management decisions to be made at the community or ecosystem level rather than at the single-species level. Maintaining or enhancing and restoring ecosystem quality, integrity, and connectivity benefits natural communities, individual species, and human quality of life. For urban bases like JBAB, the most appropriate overall management strategy is to protect, enhance, and restore the remaining natural ecosystems to help improve their function while continuing to support the military mission. The basic USAF principles and guidelines of ecosystem management are as follows.

- Preserve, maintain, and/or restore the integrity, including processes and functions, of natural ecosystems across their natural ranges, where practical and consistent with the DoD mission. Processes include, but are not limited to, natural disturbances and hydrological regimes.
- Adapt to changing conditions and requirements.
- Integrate human social and economic interests with environmental considerations.
- Collaborate with other DoD components, outside agencies and organizations, and private property owners to implement a regional approach to ecosystem management and restoration.
- Involve all interested parties (stakeholders) with respect to identifying management goals.
- Provide opportunities for outdoor recreation, agricultural and forest production, and other practical use of the lands and resources, as long as they do not impose ecosystem damage or impair the installation's ability to accomplish its DoD mission.

In addition to using an ecosystem management approach, land-use decisions and practices must be based on scientifically sound research and recognized conservation practices and procedures. To meet natural resource goals and objectives also requires ongoing resource monitoring with standardized protocols, and adaptive management strategies must be applied to update management actions or projects if/when monitoring data indicate that management goals and objectives are not being met. Similarly, management strategies are updated if there are adverse effects of mission activities on natural resources or vice versa, or if there are changes in mission requirements or regulations governing natural resources management.

1.2.1 Partnerships

Developing and maintaining partnerships with natural resource agencies—including federal, DC, and nearby state entities, as well as local/regional conservation organizations and academic institutions—is an important part of ecosystem management. Partnerships can make expertise available to DoD's natural resources personnel for accomplishing set goals and objectives. Cooperating with conservation groups and volunteers on natural resources projects also fosters good community relationships and allows the volunteers to become invested in the area's natural resources. To assist with and leverage ecosystem-level management actions, there are many groups and agencies potentially available with which the JBAB Natural Resources Program could form significant partnerships, including but not limited to those listed below.

- The United States Fish and Wildlife Service (USFWS) is a primary stakeholder in the development and review of this INRMP and provides assistance in matters that concern the conservation, protection, and management of fish and wildlife species.
- The DOEE Natural Resources Administration assists in matters that concern the conservation, protection, and management of fish and wildlife species, and it provides information and guidance related to threatened and endangered species.
- The Naval Research Laboratory (NRL) immediately adjacent to JBAB supports the goal of preserving the Potomac River's natural beauty while maintaining its shoreline in accordance with the NRL's INRMP.
- The Sustainable Sites Initiative (https://www.sustainablesites.org/) creates and tests guidelines for sustainable land development and management practices and has provided a sound basis for sustainable design recommendations at JBAB.
- The National Capital Planning Commission (NCPC) developed *Extending the Legacy: Planning America's Capital for the 21st Century*. As part of the Extending the Legacy plan, JBAB supports the goal of preserving the natural beauty of the Anacostia and Potomac Rivers waterfront and plans to preserve the installation's shoreline through open space and recreational use and incorporate green space throughout the installation.
- The Chesapeake Bay Program has helped to support natural resources restoration initiatives.
- The Alliance for the Chesapeake Bay provides assistance in meeting the mandates of the Agreement of Federal Facilities on Ecosystem Management in the Chesapeake Bay.
- The Anacostia Watershed Society works to protect and restore the Anacostia River and its watershed through clean-up efforts, shore recovery, and honoring its heritage.
- The Interstate Commission on the Potomac River Basin enhances, protects, and conserves the water and associated lane resources of the Potomac River and its tributaries through regional and interstate cooperation.

1.3 Authority

The primary federal environmental laws that serve as the legal drivers for natural resources management at JBAB include, but are not limited to, those listed below.

- Sikes Act of 1960 (16 United States Code [USC] § 670 *et. seq.*)
- Endangered Species Act of 1973 (ESA; 16 USC §1531 *et seq.*)
- Migratory Bird Treaty Act of 1918 (MBTA; 16 USC 703–712)

- National Environmental Policy Act of 1969 (NEPA; 42 USC § 4321 *et seq.*)
- National Historic Preservation Act of 1966 (NHPA; 54 USC § 300101 *et seq.*)
- Clean Water Act of 1972 (CWA; 33 USC § 1251 *et seq*.)
- Clean Air Act of 1970 (CAA; 42 USC § 7401 *et seq*.)
- Federal Noxious Weed Act of 1975 (7 USC § 2801 *et seq*.)
- Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA; 42 USC § 9601 *et seq*.)

A number of environmental Executive Orders (EOs) also mandate major aspects of natural resources management, including but not limited those listed below.

- EO 13508—Chesapeake Bay Protection and Restoration
- EO 13751—Invasive Species
- EO 11990—Protection of Wetlands
- EO 11988—Floodplain Management

A more comprehensive, annotated list of laws, EOs, directives, instructions, manuals, and guidelines that are relevant to natural resources management on DoD properties is provided in Appendix A. Annotated Summary of Key Legislation Related to Design and Implementation of the INRMP.

The Sikes Act, DoDI 4715.03, and AFMAN 32-7003 are the main legal authorities for developing and implementing the INRMP and providing guidance for managing wildlife and natural resources on DoD lands. JBAB prepared and implemented its 2020 update of the JBAB INRMP IAW the Sikes Act and the other applicable legal drivers when JBAB was still under Department of the Navy (DoN) command (DoN 2015a). Shortly thereafter, JBAB underwent a lead transfer to USAF command, and the 2020 JBAB INRMP was adapted to comply with the USAF INRMP template and realign it with authorities relevant to USAF installations. This 2021 iteration of the JBAB INRMP, therefore, is the USAF-adapted version of the 2020 JBAB INRMP, which ensures compliance with not only the Sikes Act and applicable DoD directives and instructions, but also AFMAN 32-7003 and applicable USAF directives, and instructions.

1.3.1 Sikes Act, AFMAN 32-7003, and DoD/USAF Instructions and Directives

Section 101(a)(1)(B) of the Sikes Act requires that each DoD installation prepare, implement, and maintain (through annual reviews and 5-year reviews/updates) an INRMP unless the Secretary of the installation's DoD branch determines that the absence of significant natural resources on the installation makes preparation of such a plan inappropriate. INRMPs must address natural resources management on lands and near-shore areas that are

- owned by the United States (U.S.) and administered by the DoD;
- used by the DoD via license, permit, or lease under which the DoD has been assigned management responsibility;
- withdrawn from the public domain for use by the DoD and for which the DoD has been assigned management responsibility; and/or
- on-base DoD lands or facilities leased and occupied by non-DoD entities.

To the extent appropriate and applicable, the Sikes Act requires the INRMP to guide, plan, and provide for

- fish and wildlife management, land management, forest management, and fish- and wildlife-oriented recreation;
- fish and wildlife habitat enhancement or modifications;
- wetland protection, enhancement, and restoration, where necessary to support fish, wildlife, and/or plants;
- integration of and consistency among the various activities conducted under the plan;
- establishment of specific natural resources management goals and objectives and time frames for proposed actions;
- sustainable public use of natural resources to the extent that the use is not inconsistent with the needs of fish and wildlife resources;
- public access to the installation that is necessary or appropriate for use described in the element above, subject to requirements necessary for maintaining the installation's mission and military security and for ensuring personnel and visitor safety;
- enforcement of natural resources laws (including regulations);
- no net loss in the capability of installation lands to support the military mission of the installation; and,
- other such activities that the DoD determines appropriate.

As also required by the Sikes Act, this INRMP has been developed cooperatively between the installation, the USFWS, the Fisheries and Wildlife Division of the DOEE, and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries). Development IAW the Sikes Act helps to ensure that the USAF has continued access to land, air, and water resources necessary for conducting realistic military training and testing while also ensuring the long-term ecological integrity of natural resources on the installation.

DoDI 4715.03—*Natural Resources Conservation Program* establishes the procedures for developing, integrating, and maintaining an integrated program of managing natural resources (including biotic and abiotic resources) for multiple use. This includes establishing and updating policy and assigning roles and responsibilities for overseeing INRMP development and approvals, annual reviews and 5-year revisions, and implementation. Compliance and other issues are addressed in the INRMP via the guidance provided by public laws, EOs, Directives, and Instructions, including but not limited to DoDI 4715.03; AFMAN 32-7003; and Air Force Policy Directive (AFPD) 32-70—*Environmental Considerations in Air Force Programs and Activities* (with changes, July 2018; previously titled *Environmental Quality*).

AFMAN 32-7003 implements AFPD 32-70 and supports AFI 32-7001—*Environmental Management*. It also provides guidance and direction on conserving and managing not only natural resources at USAF installations, but also the base's cultural resources, which can be affected by natural resource management.

AFPD 32-70 discusses general issues associated with environmental quality. This includes compliance with applicable regulations, preventing pollution and appropriate methods for cleaning up polluted sites, and conservation of natural resources.

Please refer to Appendix A. Annotated Summary of Key Legislation Related to Design and Implementation of the INRMP, which provides annotated summaries in a comprehensive list of laws, DoDIs, AFIs, AFMANs, and other regulations and policies used to authorize, guide, design, and implement natural resource programs and their associated INRMPs. All applicable guidance documents, laws, and regulations

should be reviewed as they and/or management need changes. Table 1-1 annotates the principal local and installation-specific laws, regulations, and/or policies.

Table 1-1. Primary district and installation-specific laws, regulations, and policies that affect or could affect natural resources management at Joint Base Anacostia-Bolling.

Installation-Specific Policies (including State and/or Local Laws and Regulations)	
Wildlife Protection Act of 2010 (District of Columbia [DC] Code § 8-2201 *et. seq.*)	Requires for-profit operators of wildlife control to obtain a license to perform wildlife-control actions in the DC; operators also must use only control methods prescribed by the DC Department of Energy and Environment (DOEE); Species of Greatest Conservation Need must not be controlled without written DOEE permission.
2015 DC Wildlife Action Plan (WAP)	Provides the framework for conserving, sustaining, and protecting the wildlife and habitats of the DC. The WAP's adaptable approach allows natural resource managers/agencies and private landowners to adapt methods as needed to address changing conditions and emerging threats; provides metrics for assessing management actions to conserve wildlife and habitats; and is integral to the Sustainable DC 2.0 Plan (https://sustainable.dc.gov/sdc2) and other DC plans designed to protect and enhance DC's natural ecosystems. The WAP is available at https://doee.dc.gov/service/2015-district-columbia-wildlife-action-plan.
DC Municipal Regulation and DC Register, Title 19, Chap. 15—Fish and Wildlife	Covers DC's regulations on fishing and hunting, urban agriculture and apiculture, wildlife protection, and related regulations. Available at https://www.dcregs.dc.gov/Common/DCMR/RuleList.aspx?ChapterNum=19-15
DC Municipal Regulation and DC Register, Title 20, Chapter 2-3—Air Pollution Control Act of 1984	Enforceable regulation to prevent or minimize emissions into the atmosphere and thereby protect and enhance the quality of the District's air resources (see https://doee.dc.gov/publication/dcmr-title-20-air-pollution-control-act-1984).
DC Municipal Regulation and DC Register, Title 21, Chapter 21–15—Discharges to Wastewater System	Enforceable regulation governing wastewater processing, biosolids and discharges to the wastewater system (see https://www.dcregs.dc.gov/Common/DCMR/RuleList.aspx?ChapterNum=21-15&ChapterId=336).
DC Municipal Regulation and DC Register, Title 21, Charter 5—Water Quality and Pollution	Enforceable regulation governing stormwater management and sediment and erosion control (see https://www.dcregs.dc.gov/Common/DCMR/RuleList.aspx?ChapterNum=21-5).

1.3.2 National Environmental Policy Act and INRMP Compliance

According to NEPA, it is federal policy to preserve important natural resources of our national heritage, and all federal agencies must take into consideration the potential environmental consequences of proposed actions in their decision-making process. The objectives of NEPA are to ensure that the government makes informed decisions, the public is included in the decision-making process, and all reasonable alternatives for an action are considered.

NEPA is a procedural law that requires review and compliance with other laws. These other laws include, but are not limited to, the CAA; CWA; Coastal Zone Management Act of 1972 (CZMA); MBTA; NHPA; Marine Protection, Research and Sanctuaries Act of 1972; Pollution Prevention Act of 1990; and the ESA. For example, DoD installations must endeavor to minimize negative effects of mission-based and other base activities on migratory birds, and it must address effects of installation activities on migratory birds, in both the INRMP and NEPA documents, as applicable and appropriate.

DoDI 4715.03 stipulates that DoD installations should follow procedures for formal NEPA consultation and documentation, as well as legal review. To ensure NEPA's effectiveness as a decision-making tool, the NEPA processes should be initiated as early as possible when identifying a proposed action so that a carefully considered and reasonable range of alternatives can be developed for achieving the objectives of the proposed action.

Section 102 of the NEPA indicates that all federal agencies must address the following environmental planning requirements.

- Use a systematic, interdisciplinary approach to ensure the consideration of natural resources and the environment when planning and making decisions.
- Prepare a detailed statement (i.e., an Environmental Impact Statement or Environmental Assessment [EA]) for major federal actions significantly affecting the quality of the environment.
- Study, develop, and describe appropriate alternatives to actions that use or impact natural resources or the environment.
- Recognize the worldwide and long-range character or environmental problems.
- Initiate and use ecological information in the planning and development of resource-oriented projects.

As indicated in Section 2.10 of AFMAN 32-7003, NEPA is implemented by the Council on Environmental Quality (CEQ) in 40 CFR, Parts 1500–1508, *CEQ Regulations for Implementing the Procedural Provisions of NEPA*), and by the DoD in 32 CFR, Part 989, *Environmental Impact Analysis Process*, which specifies DoD compliance with NEPA. It requires DoD components to consider environmental concerns during project planning and execution, ensuring that decisions are fully informed and take into account both the relevant effects on natural resources and public concerns/comments. Because the CEQ considers the INRMP a "major federal action," the INRMP requires a NEPA analysis. Generally, annual reviews/updates and 5-year revisions are covered under the INRMP's original NEPA documentation *unless* there have been any major changes in the base's mission or the scope of the natural resources program.

The NEPA process may be used to meet the DoD's public review requirements for INRMPs and to document the decision to formally implement this INRMP; however, the NEPA process will satisfy public comment requirements stipulated in the Sikes Act only if the public is provided a meaningful opportunity to comment on the draft INRMP as part of the NEPA process. Absent some extraordinary circumstance,

the public should be afforded a minimum of 30 days to review and comment on the draft INRMP, whether as part of the NEPA process or through some other process.

An EA was originally developed for the implementation of the 2015 JBAB INRMP along with a finding of no significant impact. Individual projects and actions identified in the INRMP may require further NEPA documentation, which will be assessed prior to the decision to implement.

1.3.3 Compliance and Stewardship

The Air Force Civil Engineer Center (AFCEC) is responsible for managing USAF natural resource compliance, restoration, sustainability, and NEPA programs. As such, AFCEC provides environmental technical assistance and advice to USAF installations, their major commands, higher headquarters, and interagency partners. Environmental compliance requirements are management actions driven by federal and state (or DC) regulations, EOs, and Memoranda of Agreement or Memoranda of Understanding (MOUs). The USAF's goal, however, is to go beyond compliance to integrate environmental stewardship with USAF operations, acquisitions, and base management. As such, AFCEC develops implementation approaches for addressing not only environmental compliance, but also for building sustainability and restoration programs founded on science and experience.

DoDI 4715.03 defines stewardship as ". . . the management of resources entrusted to DoD care in a way that preserves and enhances the resources and their benefits for present and future generations." Environmental stewardship programs and projects are those that enhance the base's natural resources, promote proactive conservation measures, and support investments that demonstrate the USAF's environmental leadership and proactive environmental stewardship. It is DoD policy to demonstrate stewardship of natural resources in its trust by protecting and enhancing those resources to ensure that they can support the military mission, conserve and restore biodiversity, and sustain ecosystem services.

This INRMP identifies both compliance and stewardship projects that help to meet JBAB's natural resources management goals and objectives (see Section 8.0 Management Goals and Objectives). Top priority is given to projects required for meeting compliance criteria. Stewardship efforts that rely on volunteer labor and enjoy the support of the military community, or have available alternate funding sources, are also likely to be implemented.

1.3.4 Mitigation Measures

The purpose of mitigation is to reduce or eliminate potential negative impacts of an action on affected resources. CEQ regulations (40 CFR §1508.20) identify mitigation measures as

- avoiding the impact altogether by not taking a certain action or parts of an action;
- minimizing impacts by limiting the degree or magnitude of the action and its implementation;
- rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- reducing or eliminating the impact over time through preservation and maintenance operations during the life of the action; and,
- compensating for the impact by replacing or providing substitute resources or environments.

Regulations established by CEQ state that all relevant, reasonable mitigation measures that could alleviate the environmental effects of an action must be identified, even if they are outside the jurisdiction of the lead agency or the cooperating agencies. This serves to alert agencies or officials who can implement these extra measures and encourage them to do so.

1.3.5 Consultation Requirements

> *Consultation guidance can be found in the USFWS Endangered Species—Consultation Handbook at* https://www.fws.gov/endangered/esa-library/pdf/esa_section7_handbook.pdf *and on the NOAA Fisheries Consultations: Endangered Species Act Consultations web site at* https://www.fisheries.noaa.gov/topic/consultations#endangered-species-act-consultations.

All federal agencies, including DoD, must comply with the numerous environmental laws and mandates designed to prevent or minimize the negative impacts of government activities on human health and the environment. Many of these laws, such as the ESA, Bald and Golden Eagle Protection Act (BGEPA), CWA, CZMA, MBTA, Marine Mammal Protection Act (MMPA), and Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), require consultation with one or more designated federal regulatory agencies, such as the USFWS, NOAA Fisheries or the United States Army Corps of Engineers (USACE), if a federal action has the potential to adversely impact a regulated resource. Specific agency guidance should be reviewed prior to any consultation actions.

1.4 Integration with Other Plans

INRMP revisions and concurrence with the final plan must be coordinated through the installation chain of command and the Environmental Element Chief, Cultural Resources Program Manager, NEPA Program Manager, Stormwater Program Manager, Planning Section, Operations Flight, and Air Operations Officer. The installation's Natural Resource Manager (NRM) must ensure that the INRMP, the JBAB Installation Master Plan (IMP) (and the Installation Development Plan [IDP] once it is developed), Transportation Management Program, Stormwater Pollution Prevention Plan (Tab 1—Stormwater Pollution Prevention Plan), Encroachment Action Plan, CERCLA/Resource Conservation and Recovery Act (RCRA) cleanup plans, Bird/Wildlife Air-Strike Hazard (BASH) plan (Tab 7—Bird/Wildlife Aircraft Strike Hazard (BASH) Plan), Integrated Pest Management Plan (IPMP; Joint Base Anastasia-Bolling and Naval Facilities Engineering Command 2017), Landscape Planning (Tab 3—Landscape Planning), Accident Potential Zone (APZ) program, Military Munitions Response Program, Anacostia Installation Appearance Plan and Bolling Architectural Compatibility Guide, Integrated Cultural Resource Management Plan (ICRMP; Tab 8—Integrated Cultural Resources Management Plan), and any other plans that may affect natural resources, are mutually supportive and not in conflict.

1.4.1 Operations Planning and Review

This INRMP not only guides implementation of JBAB's natural resources program, it serves as a key component of the JBAB IMP, which has provided 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. Other current base planning documents, and the land-use goals and objectives for these plans as they relate to natural resources issues, have been incorporated into this INRMP as well. This INRMP has been reviewed by the Installation Commanding Officer, Base Civil Engineer (BCE), and Facility Planning to ensure support of the base mission and operations.

1.4.1.1 JBAB Installation Development Plan

When JBAB was under DoN command, it developed an IMP (DoN 2014a) to support the installation's mission readiness and quality of life. This working document has provided direction for JBAB's long-term development and it is integrated with and supports the INRMP. After transitioning to USAF leadership,

JBAB began to develop an USAF-compliant IDP that is scheduled for completion and approval by the Installation Commander in February 2022. The new IDP will be integrated into the 2022 INRMP annual update/review. Under USAF leadership, each installation is also required to develop District Plans, which are more detailed and focus on a portion of the installation that is geographically defined by roadways and parcels and have a uniform theme or a common mission purpose. The JBAB IDP will define the four industrial sectors, listed below.

- Historic Bolling District
- Sentinel of the Capital District
- Historic Anacostia District
- Housing and Community Support District

1.4.1.2 Transportation Management Program

The JBAB Transportation Management Program supports the IMP (and will support the new IDP once it is approved in 2022) to comply with federal regulations, respond to the fluctuating internal and external contexts, and ensure that mission-critical activities are accomplished. Overall goals of the JBAB Transportation Management Program are to promote more efficient employee commuting patterns by enhancing mobility and transportation options, mitigating potential future traffic impacts related to JBAB's growth and development, and improving air quality by seeking to reduce and/or shorten the number of single-occupancy vehicle trips (DoN 2014b).

1.4.1.3 Stormwater Pollution Prevention Plan

In compliance with provisions of the CWA (33 USC 1251 *et seq*., as amended), JBAB is covered by four Multi-Sector General Permits for Stormwater Discharges Associated with Industrial Activity—one for each of JBAB's four industrial sectors—and an associated Stormwater Pollution Prevention Plan. The permits specify the locations and levels of effluent discharges into stormwater associated with JBAB's industrial activities. The permits are effective from 09 July 2021 through 28 February 2026. The remainder of JBAB is governed by the District of Columbia-held DC MS4-permit.

1.4.1.4 Encroachment Action Plan

The AFCEC Planning and Integration Directorate oversees the USAF encroachment management program. The JBAB Encroachment Action Plan (EAP) identifies and quantifies potential encroachment issues affecting JBAB and establishes a plan for mitigating those issues. Originally, the EAP was prepared to comply with the Chief of Naval Operation's Encroachment Management Program for proactively preventing encroachment that may impact the base's ability to accomplish its mission, and before NSF Anacostia and Bolling Air Force Base (AFB) were joined into one base in 2010, the 2009 EAP developed for the Naval Support Activity (NSA) Washington included Naval Support Facility (NSF) Anacostia (DoN 2010c). The EAP identified eight encroachment challenges that would have either moderate or significant impacts on JBAB's ability to accomplish its mission: urban development; competition for air, land, and sea space; ordnance (unexploded ordnance [UXO]/munitions); safety arcs and footprints; water quality; interpretation of environmental regulations; interagency coordination; and legislative initiatives that restrict operations. See Section 2.1.5.1 Encroachment of this INRMP for detailed discussions of encroachment concerns at JBAB.

Because JBAB is now under USAF leadership, JBAB will update this effort through an encroachment study called a Compatible Use Plan. This effort will likely occur in fiscal year (FY) 2022 or later.

1.4.1.5 Environmental Response Program Management Action Plan

Through its Installation Restoration Program, the USAF identifies, investigates, cleans, and restores sites contaminated in association with past USAF activities, as mandated by the CERCLA of 1980 (42 USC § 9601 *et seq*., as amended) and the RCRA of 1976 (42 USC § 6901 *et seq*., as amended). The USAF authority for addressing environmental contamination arises from AFPD 32-70—*Environmental Quality* and is implemented through AFI 32-7020—*Environmental Restoration Program*.

JBAB recognizes that adverse impacts to its natural resources may result from the release of hazardous substances, pollutants, and contaminants into the environment, including releases during restoration of contaminated sites. When NSF Anacostia was under DoN command, the Navy's Environmental Restoration Program (ERP) detailed the status of the base's ERP and identified specific program issues to effectively investigate and plan cleanup strategies. The ERP Management Action Plan provided the complete historical background of ERP sites and laid out a comprehensive strategy for funding and employing necessary response actions. The USAF Installation Restoration Program has since acquired responsibility for identifying contaminant management and releases under CERCLA and RCRA, as well as releases under related provisions and reporting, such as those for the United States Environmental Protection Agency (USEPA) and the DOEE.

When appropriate, the installation's NRM will provide the following assistance to the ERP Remedial Program Manager.

- Identify potential impacts to natural resources caused by the release of these contaminants.
- Make recommendations regarding cleanup strategies and site restoration.
- Suggest that sampling and testing be accomplished to avoid impacting sensitive or critical areas.
- Recommend site restoration practices that are outlined in this INRMP.

The ERP Management Action Plan for historic Bolling AFB was completed in 2009. Formal plan updates are accomplished annually by the base's Remedial Program Manager, contractors, and the Service Center, and from Air Force Restoration Information Management System data. The ERP constraints are discussed in more detail in Section 2.4.1 Natural Resource Constraints to Mission and Mission Planning.

1.4.1.6 Bird-Wildlife Air Strike Hazard Program

The JBAB BASH Plan is a plan implemented to reduce the potential for collisions between aircraft and birds or other wildlife. The BASH program is designed to control birds and to provide increased levels of safety during critical phases of flight. The plan establishes specific procedures to reduce known and future bird hazards. The current BASH Plan is a Navy document, but Wing Safety is developing USAF BASH plan and setting up a bi-annual BASH Working Group.

1.4.1.7 Accident Potential Zone Program

There are two helicopter pads at JBAB that fall under its APZ Program.

1.4.1.8 Integrated Pest Management Plan

The JBAB IPMP (Joint Base Anastasia-Bolling and Naval Facilities Engineering Command 2017) describes the installation's integrated pest management (IPM) program, including the program's requirements, the necessary resources for pest monitoring and control, and the program's administrative, safety, and environmental requirements. The IPMP is currently undergoing an update and is anticipated to be complete in early 2022.

1.4.1.9 Grounds Maintenance Plan

The Grounds Maintenance Plan for JBAB is currently being updated in conjunction with the Grounds Maintenance contract.

1.4.1.10 Military Munitions Response Program

The DoD's Military Munitions Response Program (MMRP) is an element of the ERP and was instituted to address the potential safety hazards associated with munitions and explosives of concern (MEC). MECs include UXO, discarded military munitions, and munitions constituents in concentrations high enough to pose an explosion hazard or potential environmental contamination. Eligible MMRP sites include closed ranges and munitions disposal sites. Similar to the ERP, the MMRP is carried out in a manner consistent with CERCLA. Site inventories are undertaken under MMRP to determine whether a remedial investigation/feasibility study is required, whether an immediate response is needed, or whether the site qualifies for no further action. The site inventory is also used to complete prioritization protocol for each munitions response site and improve cost to complete estimates. Constraints from the MMRP are discussed in Section 2.1.5.1 Encroachment.

1.4.1.11 Anacostia Installation Appearance Plan and Bolling Architectural Compatibility Guide

The JBAB Installation Appearance Plan (IAP) creates a unified visual environment by providing the design standards to help build compatible facilities and a quality environment. The IAP is organized around the following six topics of base appearance: site planning, architecture, streetscape, landscape architecture, photovoltaic panel siting and design, and signage. Key site planning includes promoting walkability between buildings, reducing parking to accommodate only the minimum number of vehicles required, minimum setbacks for new buildings, and grid streets to promote efficiency. The IAP promotes an environment that fosters civic beauty, enhances pride and professionalism, protects natural and cultural resources, preserves the existing architectural fabric, and improves the overall quality of life for personnel and the public (DoN 2015b). After JBAB came under USAF command, it initiated development of the Installation Facility Standards, which will replace the JBAB IAP and some other documents. This effort is projected to be complete by the end of 2021.

1.4.1.12 Integrated Cultural Resource Management Plan

There are cultural resources at JBAB in the form of buildings, structures, and archeology that are eligible or potentially eligible for the National Register of Historic Places (NRHP). All federal agencies are required to follow the guidelines set forth in the NHPA and must work with the District of Columbia Historic Preservation Office (DCHPO) to ensure that the integrity of historical assets are maintained. Section 106 of the NHPA requires federal agencies to consider the impacts that proposed projects, activities, or management actions, including those related to natural resources, would have on historic properties. An update to the JBAB ICRMP was completed in 2020 (DoN 2020) to provide guidance for cultural resources management activities and compliance with the NHPA, Native American Graves Protection and Repatriation Act, Archaeological Resources Protection Act, American Indian Religious Freedom Act, DC regulations, AFI 90-2002—*Air Force Instructions with Federally Recognized Tribes*, and other DoD guidance on cultural resource protection regulations.

The ICRMP is a component of the installation master plan and serves as the commander's decision document for cultural resources management actions and specific compliance procedures. It integrates the entirety of the installation cultural resources program with ongoing mission activities, enables the ready identification of potential conflicts between the installation's mission and cultural resources, and identifies

compliance-driven actions necessary to maintain the availability of mission essential properties and acreage.

The JBAB ICRMP is currently being updated to a USAF-compliant version, which is scheduled for completion by the end of calendar year 2021.

1.4.1.13 Comprehensive Plan for the National Capital Area

The Comprehensive Plan for the National Capital (Council of the District of Columbia 2016), which was prepared by the NCPC, provides policies and maps for the physical development of the DC, and addresses the social and economic issues that affect development. Within the plan, the DC is divided into 10 Planning Areas and depicts JBAB within the Lower Anacostia Waterfront/Near Southwest and Far Southeast and Southwest Planning Areas (Figure 1-1). The Lower Anacostia Waterfront/Near Southwest Planning Area encompasses three square miles of land on both sides of the Anacostia River. The Far Southeast/Southwest Planning Area is east of Anacostia Freeway and south of Good Hope Road/Naylor Road and encompasses about 10.1 square miles.

As part of the Comprehensive Plan for the National Capital, the Lower Anacostia Waterfront/Near Southwest Planning Area would be transformed from primarily industrial, transportation, and government uses to one of new mixed-use neighborhoods, workplaces, civic spaces, parks, and restored natural areas. The DC plan, *Extending the Legacy—Planning America's Capital for the 21st Century*, shifts the perceived center of the city to the Capital and directs development of federal projects, such as museums, memorials, and office buildings, outward to all quadrants of the city. The Memorials and Museums Master Plan ensures that preeminent sites for museums and commemorative works are available for future generations within the national capital while protecting the National Mall and existing museums and memorials.

As part of the Anacostia Waterfront Initiative, the Anacostia Riverwalk Trail is being developed to provide pedestrians and bicyclists access between the National Mall and the Tidal Basin, and Bladensburg Marina Park in Maryland. Approximately 12 miles of the planned 20-mile trail are complete. A portion of the trail has been developed to run parallel to JBAB on the east side of the base. The South Capitol Street Corridor is being redesigned and enhanced under the Anacostia Waterfront Framework Plan. As part of the enhancement, a new bridge was constructed to accommodate multimodal transportation and incorporate attractive and functional urban designs. The new bridge replaces the existing Frederick Douglass Bridge and, as discussed in Section 2.1.5.1 Encroachment, is not expected to decrease land holdings in the northern portion of the base.

The JBAB EAP found that the above-mentioned plans could yield both positive and negative impacts for JBAB. The plans could result in increased numbers of residents and employees in the area, as well as new uses and improved services for DoD employees in an area where services are currently limited. JBAB is further encouraged to participate in the development of area plans for the surrounding neighborhoods to ensure that DoD interests are represented in all processes that have the potential to directly or indirectly influence JBAB.

Figure 1-1. Comprehensive Plan for the National Capital Area Elements (source: Council of the District of Columbia).

2.0 INSTALLATION PROFILE

Office of Primary Responsibility (OPR)	The 11th Civil Engineer Squadron, Environmental Element has overall responsibility for implementing the natural resources management program and is the lead organization for monitoring compliance with applicable federal, state, and local regulations.
Natural Resources Manager/Point of Contact (POC)	Erica Hahn, NEPA/Natural Resources/Cultural Resources Program Manager 11th Civil Engineer Squadron Joint Base Anacostia-Bolling 370 Brookley Ave., SW Washington, District of Columbia 20032 (202) 284-4548 (office); (301) 503-1504 (cell) erica.hahn@us.af.mil Maddie Cox, Environmental Management System/Cultural Resources/Natural Resources Program Manager 11th Civil Engineer Squadron Joint Base Anacostia-Bolling 370 Brookley Avenue, SW Washington, DC 20032 (202) 284-4548 (office); (540) 220-1585 (cell) madison.cox.1@us.af.mil
State and/or local regulatory POCs (Include agency name for Sikes Act cooperating agencies)	Craig Koppie, Field Supervisor United States Fish and Wildlife Service Chesapeake Bay Field Office Brian King, Associate Director Fisheries and Wildlife Division District of Columbia Department of Energy & Environment
Total acreage managed by installation	966 acres (includes the leased CSX Transportation railroad)
Total acreage of wetlands	Approximately 3.3 miles of shoreline along the Anacostia and Potomac Rivers; the only wetlands present on base are non-jurisdictional, unnatural ones comprising the stormwater system.
Total acreage of forested land	Negligible, primarily individual trees and small copses of trees planted for aesthetics/landscaping
Does installation have any Biological Opinions? (If yes, list title and date, and identify where they are maintained)	Construction and Operation of a Charter School on Joint Base Anacostia-Bolling, Washington, DC, Programmatic Biological Opinion regarding the northern long-eared bat (*Myotis septentrionalis*), 05 January 2016 (see Appendix C). This was a general BO for all federal agencies and was not specific to JBAB.
Natural Resources Program Applicability (Place a checkmark next to each program that must be implemented at the installation. Document applicability and current management practices in Section 7.0)	☒ 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

The Installation Commanding Officer for JBAB serves as the principle leader to provide policy, guidance, and resources for INRMP development, revision, and implementation and related NEPA documentation. The Installation Commanding Officer also represents the USAF on issues and resolves high-level conflicts regarding INRMP development and implementation. The NRPM manages the natural resources program at the base level and coordinates implementation of the INRMP. The NRPM is supported by AFCEC and is supervised by the Environmental Element Chief. The NRPM sits within the 11th Civil Engineer Squadron, Installation Management Flight, Environmental Element (11 CES/CEI/CEIE).

2.1 Installation Overview

2.1.1 Location and Area

Installation/GSU Location and Area Descriptions

Installation / Geographically Separated Unit	Main Use/ Mission	Acreage	Addressed in INRMP?	Describe Natural Resource Implications
Main Base	Mission/administration, airfield operations, industrial, base-support functions, and housing	966	Throughout	Limited natural resources; primarily watershed and flood zone, stormwater quality concerns, listed species known to occur in the area, and landscaping species/management
CSX Transportation Railroad Easement or Ownership	CSX owns 3.65 acres of land (fee simple) within the JBAB boundary for which JBAB has an easement	3.65	Sections 2.4.1.3.1 and 2.4.1.6.2	

JBAB is located in Anacostia, a neighborhood in southwestern Washington, District of Columbia (Figure 2-1 and Figure 2-2). This 966-acre installation is bounded by the Anacostia and Potomac Rivers on the west; Interstate 295, South Capitol Street, the neighborhood of Congress Heights, and the St. Elizabeths Complex on the east; the NRL and Bellevue Naval Housing on the south, and South Capitol Street and Poplar Point on the north (Figure 2-2).

Figure 2-1. Location of Joint Base Anacostia-Bolling.

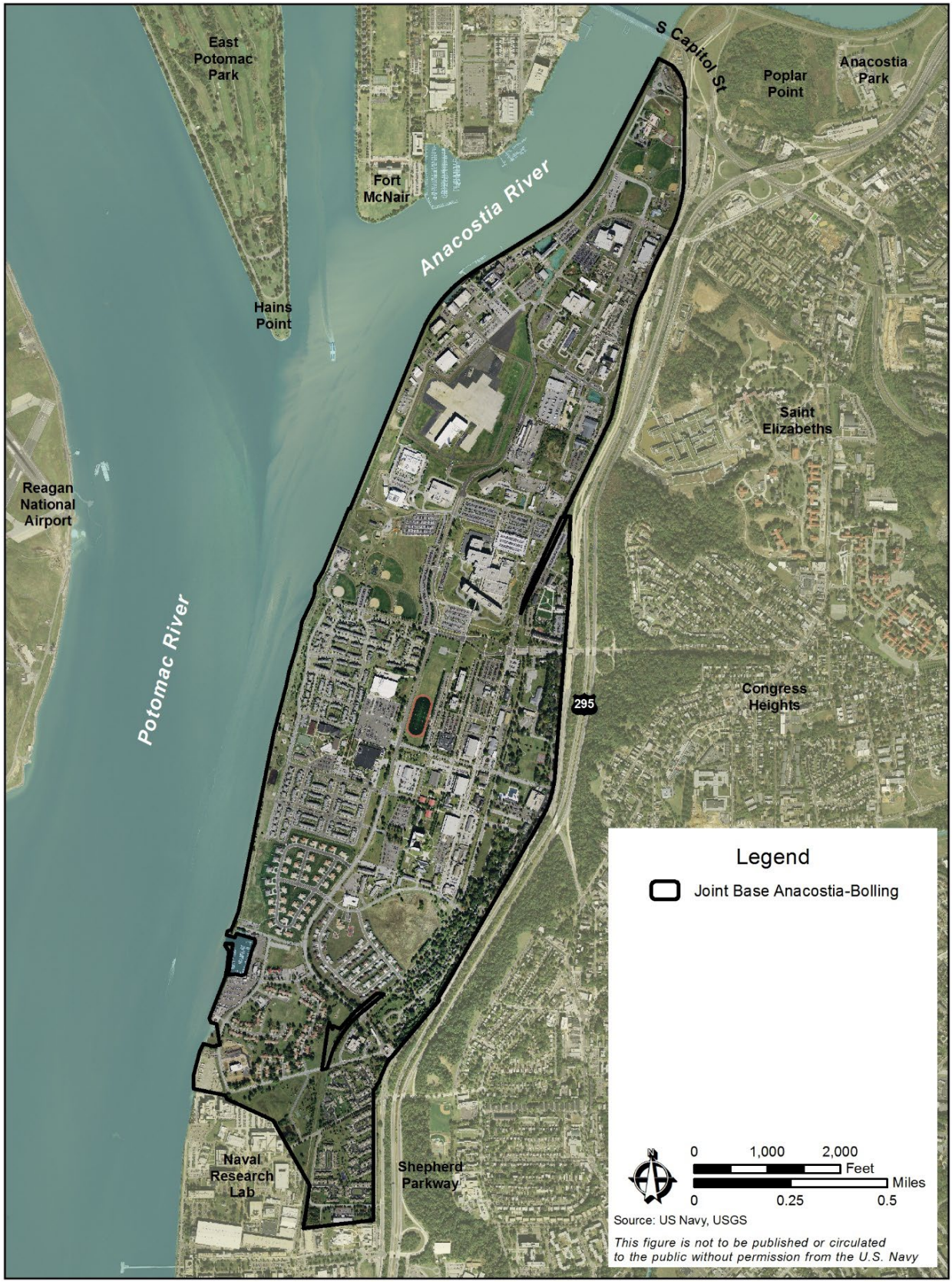

Figure 2-2. Joint Base Anacostia-Bolling boundary and the surrounding area.

The installation has no geographically separated units, although there is a 3.65-acre, fee simple easement granted to JBAB by the CSX Transportation railroad. The CSX tracks parallel the upper two-fifths of the base's eastern boundary from where they cross South Capitol Street until they enter JBAB near Brookley Avenue and Duncan Street, where the easement is located (also see Figure 2-12 and Figure 2-13). From there, the tracks roughly parallel the lower three-fifths of the eastern boundary, ranging from approximately zero to 1,000 feet (averaging about 500 feet) from the eastern boundary until the tracks exit JBAB on the western side of the base's southern-most tip. The JBAB population includes a total of approximately 17,000 military and civilian members.

2.1.2 Installation History

Giesboro Calvary Depot circa 1864.
Source: Library of Congress

The earliest records of human occupancy in the JBAB area indicate that there were Nacochtank settlements along the Potomac and Anacostia Rivers (DoN 2020). During the Civil War, this area was the site of the Giesboro Calvary depot (Bolling AFB 2001). The property remained largely farmland and was owned by various private landowners until the early 20th century. In the early 1900s, the land on which JBAB currently sits was purchased by the Department of the Army. In 1917, the Navy requested use of the land located on the Anacostia River mud flats for testing early-model seaplanes (DoN 2014a). The Army authorized Navy usage with the understanding that the Army would have joint use. In the 1930s, the Army Air Corps purchased land immediately south of the old airfield (which later would become Bolling AFB) and gave full control of the airfield to the Navy, at which point the site became Naval Air Station (NAS) Anacostia. Both Bolling AFB and NAS Anacostia became aviation testing, evaluation, and training facilities.

By the late 1950s, most of the flight operations at both Bolling AFB and NAS Anacostia were relocated to Andrews AFB, Maryland as a result of increased commercial aviation in the DC area. All flight operations at NAS Anacostia ended in 1962 with the exception of the Marine Helicopter Squadron 1 (HMX-1), the Executive Flight Detachment for the United States President. At this time, NAS Anacostia was renamed NSF Anacostia.

From 1962 to 2010, NSF Anacostia was under the command of NSA Washington, which also included Washington Naval Yard, NSF Naval Research Laboratory, and NSF Suitland. Facilities at NSF Anacostia were used to support overflow from the Washington Naval Yard and non-Navy Missions (DoN 2014a). Bolling AFB was the only AFB in the DC and it provided administrative, logistical, and base-level support to DoD, Headquarters USAF, and other USAF personnel assigned to activities in the DC and surrounding area. In addition, there were several tenants at Bolling AFB, including the Defense Intelligence Analysis Center, the Navy Center for Artificial Intelligence, and other Pentagon-level USAF units. In 2005, Base Realignment and Closure (BRAC) legislation called for consolidating NSF Anacostia and Bolling AFB; thus, JBAB was established on 01 October 2010 under the command of Naval District Washington (NDW) (DoN 2014a). In 2020, JBAB was reassigned to USAF command. Figure 2-3 shows base boundaries for Bolling AFB and NSF Anacostia prior to the BRAC unification.

Figure 2-3. Bolling AFB and NSF Anacostia boundaries prior to Base Realignment and Closure unification.

2.1.3 Military Missions

The JBAB mission is to "Ready the Base…Enable Partner Capabilities…Build on Our Heritage." Specifically, JBAB is responsible for providing personnel administration and assistance, medical care, housing, transportation for distinguished visitors and high-ranking personnel, other logistical support, and various types of force support to personnel assigned in the DC area (Department of the Air Force 2021). Both the Air Force Honor Guard and the Navy Ceremonial Guard are assigned to JBAB. These units represent their respective service in a variety of ceremonies, provide final military funeral honors, and train other units of the base level honor guard. Also housed at JBAB is the USAF Band, which is the premier USAF musical organization that attends numerous national and international concert tours and entertains troops deployed overseas.

Of the tenant units located at JBAB (Table 2-1), the HMX-1 Squadron's mission is to provide helicopter transportation support to the President and the White House Communication Agency (WHCA) supports all critical communications for the President. The Defense Intelligence Agency (DIA) provides military intelligence to various DoD agencies. The United States Coast Guard is responsible for maritime security and safety operations for the National Capital Region along portions of the Potomac and Anacostia Rivers. The Joint Air Defense Operations Center (JADOC) that supports integrated air defenses for the National Capitol Region is also located at JBAB.

Table 2-1. Listing of *major* tenants and natural resources responsibility.

Tenant Organization	Natural Resources Responsibility
Defense Intelligence Analysis Center	11th Civil Engineer Squadron (11 CES)
Navy Criminal Investigative Services (NCIS)	11 CES
White House Communication Agency (WHCA)	11 CES
Marine Helicopter Squadron 1 (HMX-1)	11 CES
Defense Intelligence Agency (DIA)	11 CES
The Joint Air Defense Operations Center (JADOC)	11 CES
United States Coast Guard	11 CES
Other Pentagon-level USAF units	11 CES

2.1.4 Natural Resources Needed to Support the Military Mission

The Sikes Act states that an INRMP shall provide for no net loss in the capability of military base lands to support the base's military mission, but DoD facilities also must comply with federal laws pertaining to conserving and protecting cultural and natural resources. Therefore, mission requirements and considerations have been integrated into this INRMP and the capability to support the mission is a natural resources priority. Natural resources activities that reduce soil erosion; protect rare species to prevent them from becoming federally listed; protect and restore land and waterways from invasive nonnative species infestation; and promote the protection and enhancement of wetlands and floodplains help to achieve no net loss of the JBAB mission. Although JBAB is an urban installation, natural areas and engineered best management practices (BMP) serve to support mission capability by treating stormwater runoff and reducing impacts of flash flooding. Open space areas are used for active and passive recreation.

2.1.5 Surrounding Communities

JBAB lies within both the Lower Anacostia Waterfront/Near Southwest and the Far Southeast and Southwest planning areas of Washington, DC (Figure 1-1). Primary land uses within both planning areas include road rights-of-way, federal facilities, and permanent open spaces (Table 2-2, Figure 2-2). Land use to the east of JBAB is primarily residential mixed with some industrial and institutional uses and permanent open spaces. The St. Elizabeths Campus, which is in the process of being converted into a high-security campus for the Department of Homeland Security, lies directly east of JBAB. To the north is the Frederick Douglas Memorial Bridge, which connects the Anacostia neighborhood with downtown DC areas, and across the Anacostia River from the base are two DoD facilities, Fort McNair and the Washington Navy Yard. Ronald Reagan Washington National Airport lies to the west of JBAB across the Potomac River.

Table 2-2. Land use in the planning areas (see Figure 1-1) surrounding Joint Base Anacostia-Bolling (source: Council of the District of Columbia 2006).

Land Use	Lower Anacostia Waterfront/Near Southwest		Far Southeast and Southwest	
	Acres	Percent of total	Acres	Percent of total
Road Rights-of-way	477.5	25.3	906.1	19.4
Single Family Detached Homes	7.3	0.0	163.8	3.5
Single Family Attached Homes/Row Houses	30.5	1.6	327.8	7.0
Low-rise Apartments	106.1	5.6	555.2	11.9
High-rise Apartments	25.6	1.4	43.7	0.9
Commercial	122	6.0	62.8	1.3
Industrial	42.2	2.2	5.5	0.1
Local Public Facilities	46.7	2.5	441.1	9.4
Federal Facilities (excluding parks)	408.6	21.7	1067.3	22.8
Institutional	22.4	1.2	117.4	2.5
Permanent Open Space	532.8	28.3	729.0	15.6
Rail, Utilities and Communications	11.1	0.6	74.5	1.6
Vacant	50.9	2.7	188.2	4.0
Total	1,883.7	100.0	4,682.4	100.0

2.1.5.1 Encroachment

Encroachment and mission sustainability for USAF installations is addressed by the USAF Mission Sustainment Program. Program guidelines and procedures needed to preserve current and future mission capabilities at USAF installations are provided in AFI 92-2001—*Mission Sustainment* (issued 31 July 2019), which revises the earlier version of 92-2001—*Encroachment Management Program* (issued 03 September 2014) and consolidates several other USAF encroachment-related documents. AFI 92-2001 defines encroachment as "Any deliberate action by a governmental or non-governmental entity or individual that does, or is likely to inhibit, curtail, or impede current or future military activities within the installation complex and/or mission footprint; or any deliberate military activity that is, or is likely to be incompatible with a community's use of its resources." It also redefines "encroachment management" as "mission sustainment," "encroachment challenges" as "mission-sustainment hazards," and "management actions" as "encroachment control."

Encroachment issues may be internal, external, or both. Internal encroachment issues at JBAB that may impede mission performance, as identified in the base's EAP and summarized below, include noise, competition for air and land space and other scarce resources, air quality, UXO/munitions, safety arcs and

footprints, frequency spectrum, and water quality. Other internal constraints include measures associated with ERP and anti-terrorism/force protection (AT/FP). Several external encroachment issues that also threaten JBAB's capacity to fully maximize its mission potential include airborne noise from Reagan Washington National Airport; competition for air, land, and sea space; maritime issues; interagency coordination; and legislative initiatives.

When NSF Anacostia and Bolling AFB were still separate entities, the NSA Washington EAP identified 11 specific encroachment issues having potential minimal, moderate, or significant impact at JBAB, as listed below (DoN 2010c) those that pertain to JBAB are discussed in Section 2.4.1 Natural Resource Constraints to Mission and Mission Planning.

- Competition for air, land, and sea space—Significant
- Ordnance-UXO/munitions—Significant
- Water quality—Significant
- Interagency coordination—Moderate
- Interpretation of environmental regulations—Moderate
- Legislative initiatives that restrict operations—Moderate
- Safety arcs and footprints—Moderate
- Urban development—Moderate
- Airborne noise—Minimal
- Frequency spectrum—Minimal
- Maritime issues—Minimal

2.1.5.1.1 Encroachment Partnering

The key encroachment challenges identified in the NSA Washington EAP that relate to the JBAB INRMP are discussed in Section 2.4.1 Natural Resource Constraints to Mission and Mission Planning. Coordination with various state, federal, and local agencies and entities that approve DoD plans; enforce environmental regulations; and oversee the external development and zoning processes is often required to meet regulatory requirements and maintain community relations. Frequent encroachment partners include those listed below.

- DOEE
- District of Columbia Department of Transportation (DDOT)
- DCHPO
- Metropolitan Washington Council of Governments
- NCPC
- National Park Service (NPS)
- USACE
- USFWS
- Washington Metropolitan Area Transit Authority

Under USAF command, encroachment issues affecting JBAB will be managed through AFCEC's Mission Sustainment Program. It remains unknown, however, when this transition will take place. In the meantime, encroachment issues affecting all of the NSA Washington sites, including JBAB, are managed through the Chief of Naval Operations' Encroachment Management Program (OPNAVINST 11010.40, 27 March 2007). The NSA Washington EAP identifies, quantifies, and creates a plan for mitigating potential

encroachment challenges and allows the Commanding Officer of NSA Washington to take a proactive approach in preventing encroachment that may impact the Navy's mission capability (DoN 2010a). The EAP is a three-step process to (1) collect information from Navy, community, and other sources; (2) assess and identify the factors driving the encroachment; and (3) develop strategies and an action plan to mitigate potential encroachments. Internal and external encroachments discussed below provide an awareness to support integrated planning of activities, including natural resources.

2.1.6 Local and Regional Natural Areas

The region surrounding JBAB is highly developed, although there are myriad natural areas and parks scattered throughout the region that range widely in size and degree of isolation or connectivity from JBAB and other parks or natural areas. Within the DC area alone, there are more than 30 NPS units. NPS parks adjacent or nearly adjacent to JBAB include the Shepherd Parkway directly east of JBAB, Anacostia Park approximately one-half mile northeast of JBAB across South Capitol Street and the Suitland Parkway, the National Mall and its associated Memorial Parks across the Anacostia River from JBAB, and East Potomac Park and Golf Course just northeast of the JBAB across the confluence of the Potomac and Anacostia Rivers. Farther out within two to five miles of JBAB there are many larger parks, such as Arlington National and Washington National Cemeteries, plus many smaller cemeteries; the United States National Arboretum, under jurisdiction of the United States Department of Agriculture (USDA) Agricultural Research Service; more large NPS parks, including Rock Creek Park, Foundry Branch Valley Park, Theodore Roosevelt Island, Kenilworth Park and Aquatic Gardens, and Oxon Cove Park and Oxon Hill Park; as well as many municipal and county parks and country clubs/golf courses, the largest of which is the one at East Potomac Park. See Section 1.2.1 Partnerships above for information about partnerships with local and regional land-management and conservation entities.

2.2 Physical Environment

2.2.1 Climate

The climate zone where JBAB is located is classified as humid subtropical (Köppen classification Cfa), which is characterized by a warm, temperate climate with hot, humid summers and short, cool, and humid winters (Kottek et al. 2006). Average temperatures range from a high of 83.4 degrees Fahrenheit (°F) in July to an average low of 29.1 °F in February (NOAA 2020; Table 2-3). The highest recorded temperature at the National Arboretum, which is approximately four miles north of JBAB, was 106 °F in July 2011 and the lowest was 5 °F in January 2014 (NOAA 2020). Annual precipitation averages 43.4 inches, with the heaviest rainfall occurring from May through September. Snowfall in the area is usually light, with an average of about 15.8 inches per year. Climate data for Maryland indicate that, over the past 30 years, the climate has become wetter and hotter, resulting in more runoff and longer heat waves (Maryland Department of Natural Resources 2013). In Maryland, August and September 2011 were the wettest in 117 years of recordkeeping, and the months of July in 2010, 2011, and 2012 were the hottest on record across much of the state.

Table 2-3. Weather Data Recorded at National Arboretum, Maryland[1] (2000–2020 [source: NOAA 2020]).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Avg. Max. Temp (°F)	41.2	45.7	55.8	62.0	72.8	79.1	83.4	81.8	75.8	64.9	53.1	51.8	61.8
Avg. Min. Temp (°F)	29.7	29.1	39.8	52.5	61.4	71.7	75.3	75.1	67.1	56.1	44.3	33.5	53.5
Avg. Total Precip (inches)	3.11	2.84	3.70	3.34	4.04	3.97	4.23	4.51	3.84	3.35	3.22	3.26	43.41
Avg. Total Snowfall (inches)	5.2	5.5	2.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.6	2.4	1.32
Avg. Snow Depth (inches)	0.5	0.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	2.1

[1] The National Arboretum, Maryland, is approximately four miles north of JBAB.

2.2.1.1 Climate Projections

Under an agreement that CEMML has with AFCEC, CEMML will be conducting a climate modeling project for JBAB and, when those projections are completed, they will be integrated with the JBAB INRMP.

2.2.1.2 Climate Model Results

The CEMML climate modeling results for JBAB will be incorporated into the JBAB INRMP once they are finalized.

2.2.2 Landforms

Based primarily on soil type and geology, landscapes can be divided into physiographic regions or provinces. JBAB is located completely within the Coastal Plain physiographic province (Figure 2-4). The Coastal Plain extends from the Fall Zone, which is the boundary between the metamorphic rocks of the Piedmont and the sedimentary rocks of the Coastal Plain that traverses the DC in a southwest–northeast direction, east to the Atlantic Ocean (Maryland Geological Survey 2012). The Coastal Plain province is characterized by gently rolling hills and valleys underlain by sediments, with sand and gravel aquifers inter-layered with silt and clay confining units (United States Geological Survey [USGS] 2013).

The region where JBAB is located is characterized as hilly upland containing narrow stream divides, incised streams, and well-drained loamy soils. Elevations are less than 400 feet with local relief ranging from 25 to 225 feet. Stream margins are generally swampy and contain stained water (i.e., water the color of tea caused by tannins, which stain water as it flows through peaty soils and decaying plants).

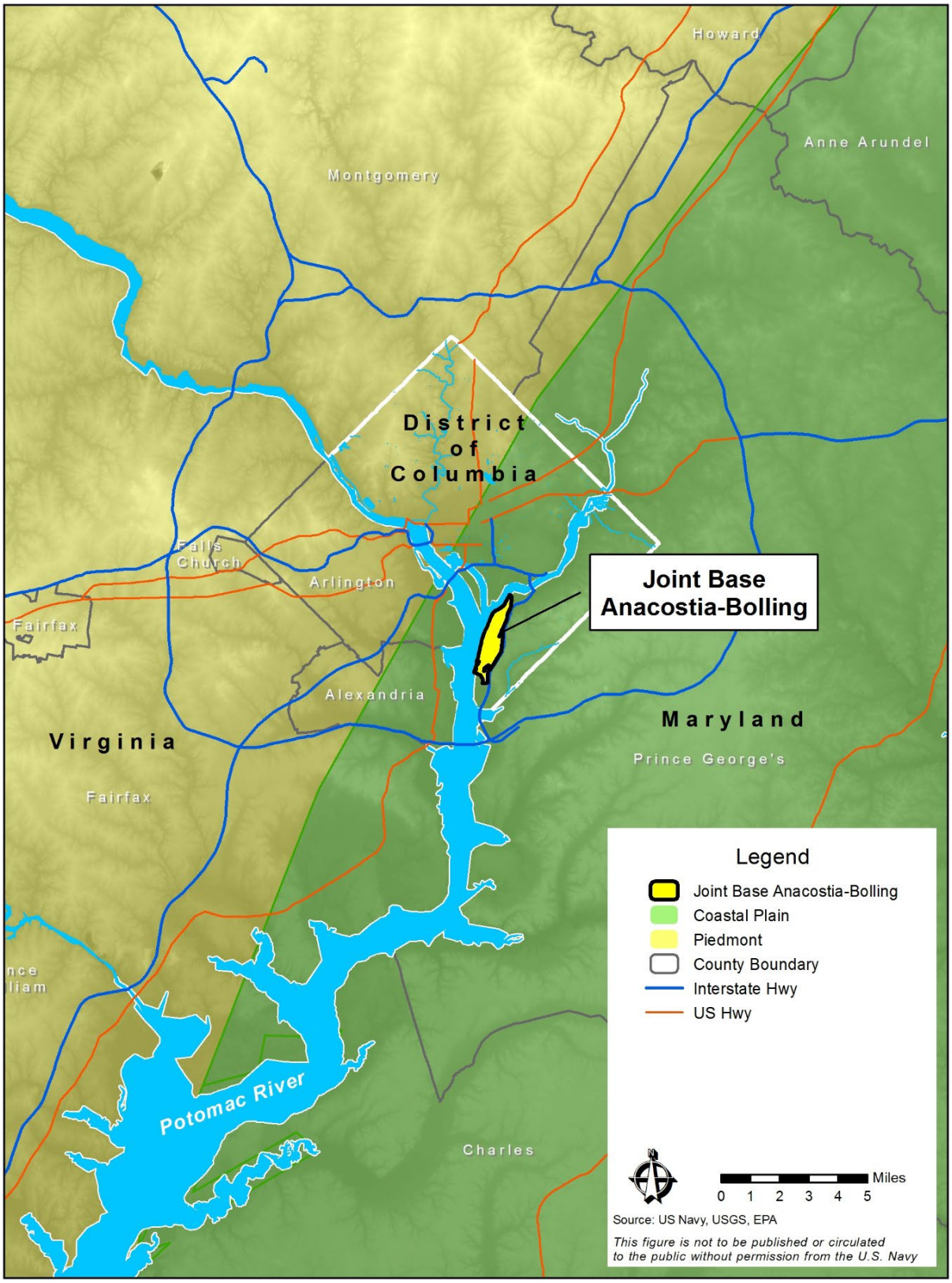

Figure 2-4. Physiographic provinces in and around the District of Columbia.

2.2.3 Geology and Soils

The most recent soil survey for the DC was conducted by the USDA Natural Resources Conservation Service (NRCS) in 2020. Eight soil series were identified at JBAB, the majority (86.4 percent) of which are soil complexes that have been recently disturbed, altered, or have an urban component as a result of urbanization and other human activities (Figure 2-5; Table 2-4) Sources of disturbance include building-site preparation, road-building activities, disposal sites, formerly contaminated soils, preparation of recreational areas, and wetland infilling. The remaining 13.6 percent of soils on JBAB include those listed below.

- Dunning soils (Dn) occur on 5.0 percent of JBAB
- Keyport soils (Ke) occur on about 1.6 percent of JBAB
- Melvin silt loam (Mp) make up approximately 5.8 percent of the soils on JBAB
- Muirkirk soils (Mv) are found on 1.2 percent of JBAB

Land that has the best combination of physical and chemical characteristics for the production of food, livestock forage or feed, fiber, and oilseed crops, as well as for use as pastureland, rangeland, forestland, or other land is classified as prime farmland (NRCS n.d.[a]). None of the soils found at JBAB meet the criteria to be classified as soils found in prime farmland; however, Dunning, Keyport, and Melvin soils are soils found on lands classified as farmland of statewide importance.

Soil erosion is a natural geologic process. It occurs when soil is removed through the action of wind or water at a rate that is greater than the rate at which it is deposited or formed. Soil erosion can become a major problem when human disturbance causes it to happen faster than it would under natural conditions. The erodibility index of a soil-map unit is the basis for identifying highly erodible land, and a soil-map unit with an erodibility index of eight or more is a highly erodible. The erodibility index of the soils mapped at JBAB range from three to five; therefore, no soil-map units at JBAB are classified as highly erodible (NRCS 2013).

2.2.4 Hydrology

The term watershed refers to the catchment area or drainage basin of a particular waterway. JBAB is located within the 831,484-acre Middle Potomac-Anacostia-Occoquan subbasin (hydrologic unit code 02070010), which lies within the 9,401,798-acre Potomac River watershed (Figure 2-6) (USEPA 2013). The Anacostia River empties into the Potomac River, which in turn empties into the Chesapeake Bay. JBAB sits immediately adjacent to the Anacostia and Potomac Rivers, within the transition zone between riverine and estuarine conditions of the Potomac River where water levels are influenced by tides.

Tidal elevation in this area varies from a mean low-water elevation of -0.43 feet (North American Vertical Datum [NAVD] of 1988) to a mean high-water elevation of 2.38 feet (NAVD; as measured at the Washington Navy Yard, the closest NOAA monitoring station, which is about 0.35 miles north and across the Anacostia River from Joint Base Anacostia-Bolling) (NOAA 2010). Approximately 3.3 miles of shoreline along the Anacostia and Potomac Rivers are controlled by a seawall and levee, and embankments along the southern shoreline of JBAB are lined with riprap; therefore, the intertidal zone along the shoreline has been modified or hardened along its length.

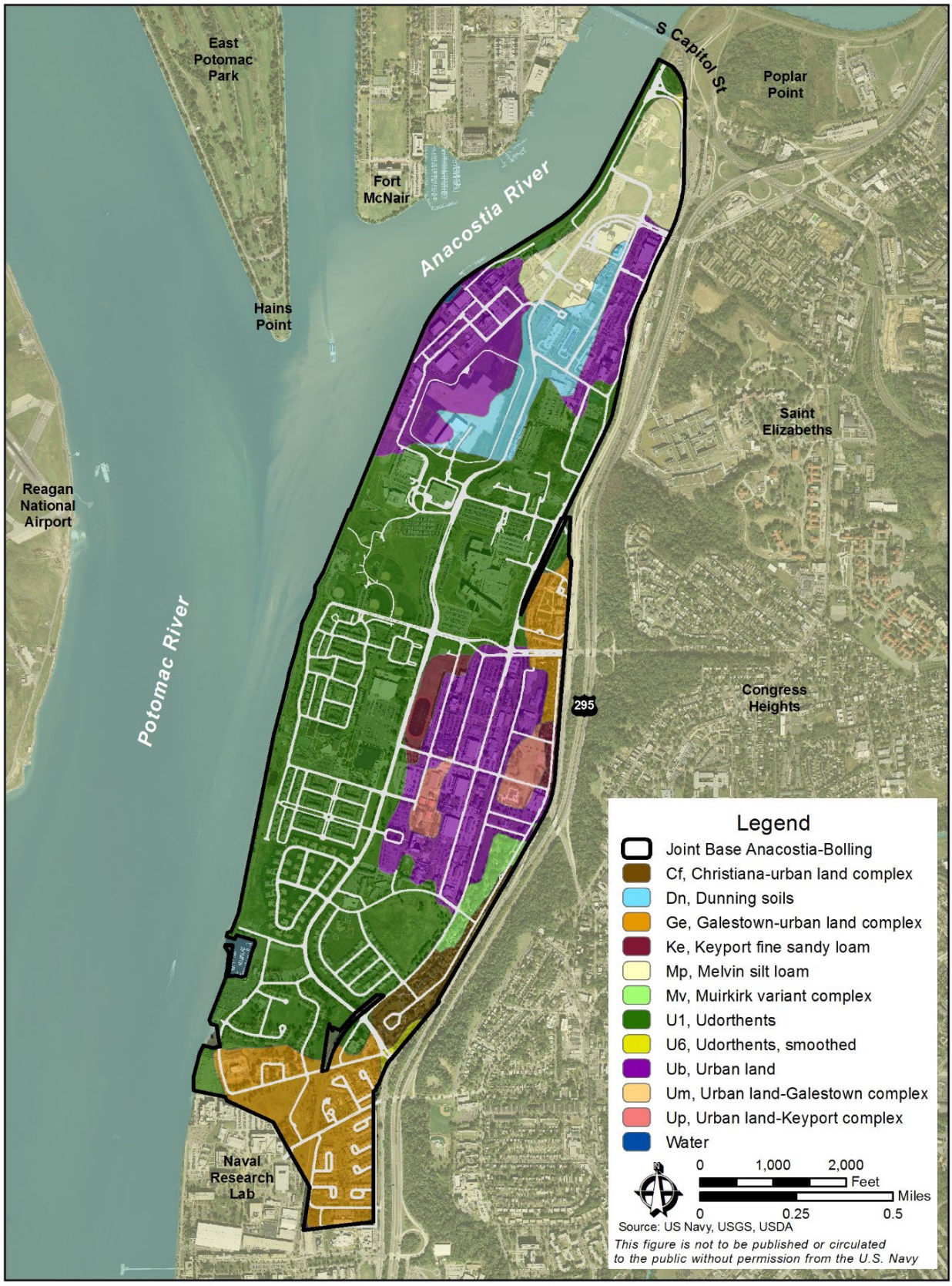

Figure 2-5. Soils at Joint Base Anacostia-Bolling.

Table 2-4. Soil series and descriptions for Joint Base Anacostia-Bolling (source: NRCS n.d.[b], 2006).

Series	Soil Unit Symbol	Acres	Description
Christiana	Cf	20.0	This series consists of deep, well-drained soils with a silty clay or clay B horizon and a thick, red or variegated, clayey C horizon. They formed in a thin mantle of silty material over much older deposits of plastic clay. Soil complex CfB is found on 0 to 8 percent slopes and CfC is found on 8 to 15 percent slopes.
Dunning	Dn	48.9	Dunning soils are deep, and poorly drained to very poorly drained. They have a silty clay loam or silty clay B horizon and a thick, black or grayish, stratified C horizon. Dunning Soils are found on 0 to 3 percent slopes
Galestown	Ge	100.2	Galestown soils are deep loamy sand that are somewhat excessively drained. They have a loamy sand or sand B horizon and a loamy sand to sand with gravelly analog C horizon. Galestown-Urban land complex GeB is found on 0 to 8 percent slopes
Keyport	Ke	15.3	This series are moderately well drained, deep silt loam soils. The B horizon ranges from silty clay loam or clay loam to silty clay or clay while the C horizon is typically ranges from clay to loamy sand. Keyport series soils fine sandy loam on 0 to 8 percent slopes
Melvin	Mp	56.4	Melvin silt loam, 0 to 2 percent slopes. The Melvin series consists of fine-silty, mixed, nonacid, mesic Typic Fluvaquents that are deep and poorly drained. They formed in recently deposited alluvium or dredged material on flood plains of the Anacostia and Potomac Rivers.
Muirkirk	Mv	12.0	The Muirkirk series consists of very deep, well drained to somewhat excessively drained, moderately slow to slowly permeable soils on uplands. They formed in a coarse textured mantle and the underlying older clayey sediments. Muirkirk variant complex (MvC) is found on 8 to 15 percent slopes.
Udorthents	U1	492.1	This soil consists of extremely heterogeneous fill material that has been placed on uplands, terraces, and floodplains. The source of fill varies, as does its thickness. Because these soils are so variable, an on-site investigation is necessary to determine the potential uses for these areas.
	U6	6.3	This soil consists of heterogeneous fill material for roads. The source of fill varies, as does its thickness. Because these soils are so variable, an on-site investigation is necessary to determine the potential uses for these areas.
Urban	Ub	194.1	Urban Land soils are impervious surfaces covered with asphalt, concrete, or buildings.
	Up	18.1	Urban land-Keyport complex, 0 to 8 percent slopes
	Um	0.1	Urban land-Galestown complex, 0 to 8 percent slopes
Water	Water	2.5	Water

Figure 2-6. Middle Potomac-Anacostia-Occoquan Subbasin (hydrologic unit code [HUC] 02070010).

2.3 Ecosystems and the Biotic Environment

2.3.1 Ecosystem Classification

Ecoregions are defined as areas of relative homogeneity in ecological systems and their components (Woods et al. 1999). The classifications of these areas are crucial for structuring and implementing ecosystem-management strategies across federal and state agencies and nongovernmental organizations responsible for different resource types within the same geographical areas. Using the USEPA's hierarchical system based on biotic and abiotic features, JBAB is located in the Chesapeake Rolling Coastal Plain subdivision (Level IV) of the Southeastern Plains (Level III) (Figure 2-7) (Woods et al. 1999, 2012).

2.3.2 Vegetation

2.3.2.1 Historical Vegetation Cover

Historically, vegetation in the JBAB areas was composed primarily of Oak-Hickory-Pine forest. Extensive urbanization and residential development in the Washington-Baltimore area, however, has been intensive. Low-intensity agriculture has been scattered throughout the region since early settlement.

2.3.2.2 Current Vegetation Cover

More than 373 acres of the JBAB land area is developed with buildings and other structures, roadways and parking areas, and other impermeable surfaces. The other 593 acres have vegetated landcover consisting primarily of turf grasses, recreational fields, and trees and shrubs for landscaping. There are some small copses of trees as well. An area of approximately 16 acres west of Duncan Street and south of Angell Street once contained base housing, and is maintained through periodic mowing; however, in disturbed areas such as this, without human intervention, invasive and nuisance species often compete with native species, take over the habitat, and change or alter the ecosystem.

An invasive species can be a plant, animal, or other organism. EO 13751 defines an invasive species as one (1) that is alien to the ecosystem under consideration and, (2) likely to cause economic or environmental harm or harm to human, animal, or plant health when introduced into an ecosystem where it is not native. The introduction of invasive species occurs primarily because of human actions. Invasive plants are those capable of thriving in areas beyond their natural ranges; typically, they are adaptable, aggressive, and have high-level reproductive capacities. Their vigor, combined with the absence of natural enemies, often leads to population outbreaks. During the development of the INRMP in 2015, 18 invasive plant species were observed during a site visit (2015 INRMP). Subsequently, invasive plant surveys were conducted in 2016 and 2017. The species identified are discussed in Section 7.11.1 Invasive Species—Surveys and Management Strategies, Objectives, and Actions.

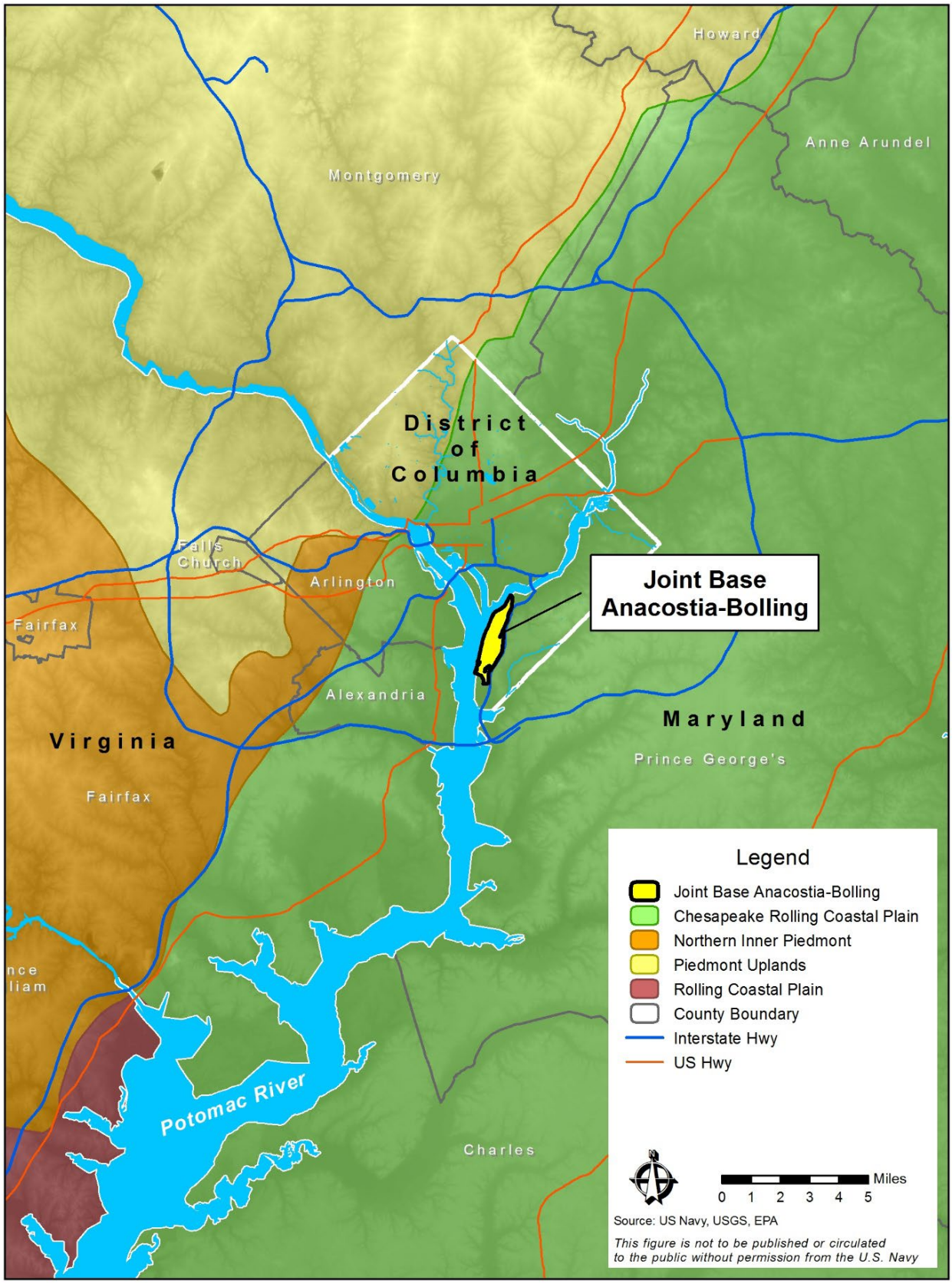

Figure 2-7. Level III ecoregions in and around the District of Columbia.

Because of JBAB's proximity to the Anacostia and Potomac Rivers, actions that occur on base have the potential to impact the flora of these rivers and the Chesapeake Bay. There are 15 species of submerged aquatic vegetation (SAV; grasses in this case) endemic to the Chesapeake Bay and its tributaries (Hurley n.d.). These underwater grasses provide habitat for juvenile fish, shellfish, and invertebrates; they provide an important food source for waterfowl; and they contribute to nutrient absorption and water oxygenation. Since the 1960s, acreage of SAV in the Chesapeake Bay has declined substantially, which has been linked to poor water clarity resulting from increased suspended sediments and persistent algal blooms (United States Department of the Interior and USGS 2007). Between 1990 and 2019, however, SAV cover in the Upper Potomac Segment increased from 1,536 to 1,573 hectares. This is largely attributed to the reduction of nutrients and sediments from water-quality initiatives in the DC area and the reduction of nitrogen effluents entering the river from the DC water-treatment plant. According to the Virginia Institute of Marine Science's SAV report for 2019, there are no SAV beds along the JBAB shoreline (Virginia Institute of Marine Science 2020).

2.3.2.3 Future Vegetation Cover

CEMML is under agreement with AFCEC to develop climate models for JBAB, which will be completed by September 2022. Part of that exercise will be to project future climate (temperature, precipitation) for two future decades, each under two emissions levels, as described in Section 2.2.1.1 Climate Projections and Section 2.2.1.2 Climate Model Results. In turn, CEMML will develop this section with information about how future climate projections may be expected to affect natural vegetation communities at JBAB.

2.3.2.4 Turf and Landscaped Areas

The turf and landscaping plants at JBAB include both native and introduced species. Trees line several streets, and are planted elsewhere either individually or as small groves in some of the open areas. Turf grasses, which are used for landscaping (i.e., lawns) and recreational areas (e.g., sports fields, playgrounds, parks), are mowed regularly. Shrubs are used primarily for ornamental purposes at building entrances and along their foundations.

2.3.3 Fish and Wildlife

A planning-level survey of JBAB was completed in January 2017, but to date, the only formal faunal surveys conducted at JBAB have been bat surveys and a pollinator survey. A bat survey was conducted in May 2016 with the use of acoustic recordings and mist netting at three locations. The final report was approved in January 2017 (Marstell-Day et.al. 2017). Among the three JBAB detector sites, the survey confirmed 43 bat passes and six bat species, including big brown bat (*Eptesicus fuscus*), eastern red bat (*Lasiurus borealis*), hoary bat (*Lasiurus cinereus*), silver-haired bat (*Lasionycteris noctivagans*), evening bat (*Nycticeius humeralis*), and tricolored bat (*Perimyotis subflavus*). (Marstell-Day et.al. 2017) An acoustic and capture bat survey was conducted at JBAB in June 2019. Four bat species were confirmed to be present on the installation: big brown bat (*Eptesicus fucus*), hoary bat (*Lasiurus cinereus*), silver-haired bat (*Lasionycteris noctivagans*), and tri-colored bat (*Perimyotis subflavus*). No species were physically captured; rather, all species confirmations were derived from acoustic data. No federally or endangered species were detected over the duration of the study.

The pollinator survey was conducted between May and September of 2019 and included both active netting efforts and the use of passive traps. The final report was approved in May 2020 (Marstel-Day and VT Conservation Management Institute 2020). The survey results confirmed the presence of 19 butterfly species and 20 bee species. In addition to the bees that were identified to the species level, there were 43 individual bees that were identified to the genus level: *Bombus*, *Melissodes*, *Lasioglossum*, and *Megachile*

spp. Common pollinator species observed at JBAB included peck's skipper (*Polites peckius*), cabbage white (*Pieris rapae*), orange sulfur (*Colias eurytheme*), and golden sweat bee (*Augochlorella aurata*).

Mammals potentially expected at JBAB are primarily species adapted to urban settings of the mid-Atlantic Coastal Plain, such as raccoon (*Procyon lotor*), eastern cottontail rabbit (*Sylvilagus floridanus*), squirrel specie (*Sciurus* spp.), groundhog (*Marmota monax*), and Virginia opossum (*Didelphis virginiana*), all of which have been observed in nearby Anacostia Park and Shepherd Parkway (DoN 2015a). Several herptile species also may be present, including frogs and toads (Order Anura), snakes (Order Squamata, Suborder Serpentes), and turtles (Family Emydidae). Although the Potomac and Anacostia Rivers do not flow through JBAB, they are immediately adjacent to the installation's boundary; thus, some common aquatic species that may be found in the JBAB marina include blueback herring (*Alosa aestivalis*), bluegill (*Lepomis macrochirus*), channel catfish (*Ictalurus punctatus*), small and largemouth bass (*Micropterus* spp.), striped bass (*Morone saxatilis*) and yellow perch (*Perca flavescens*) (DOEE n.d.).

Both migratory and year-round resident species of birds can be expected both at and around JBAB. In the US, all native migratory birds are protected under the MBTA, and federal agencies are further directed by EO 13186—*Responsibilities of Federal Agencies to Protect Migratory Birds* to implement conservation measures for migratory birds IAW MOUs between federal agencies. For example, an MOU between the DoD and the USFWS outlines a collaborative approach to promote the conservation of migratory bird populations (DoD and USFWS 2006).

DC is located within the Atlantic Flyway, one of four major flight routes used by migratory birds in North America (USFWS 2011a). Indeed, the *Official List of the Birds of District of Columbia* includes the 331 species documented within the DC since 1842 (Maryland/District of Columbia Records Committee of the Maryland Ornithological Society 2012), and 40 percent of the species that migrate along the Atlantic Flyway are species of conservation need (National Audubon Society 2013). The Chesapeake Bay is also an important wintering location for a number of avian species (USFWS 2011a). Avian species identified at nearby Anacostia Park and Shepherd Parkway include doves and pigeons (Family Columbidae); various passerines, including crows, sparrows, finches, wrens, catbird, flycatchers, and northern cardinal (Order Passeriformes); raptors, such as hawks, falcons, and eagles (Order Falconiformes); wading birds, such as herons and egrets (Family Ardeidae); ducks and geese (Order Anseriformes), including Canada goose (*Branta canadensis*); and shorebirds, such as killdeer (*Charadrius vociferous*) and various gull and tern species (Family Laridae) (NPS 2013a). In addition, there are two active bald eagle (*Haliaeetus leucocephalus*) nests located within three miles of JBAB. Bald eagles are protected under the MBTA and the BGEPA of 1940 (16 USC §§668–668d).

Nonnative species, such as house sparrow (*Passer domesticus*), European starling (*Sturnus vulgaris*), rock pigeon (*Columba livia*), and mute swan (*Cygnus olor*), all generally considered nuisance species, have been observed at JBAB. Native species observed at JBAB and considered a nuisance include Canada goose, feral cat (*Felis catus*), rats (*Rattus* spp.), and groundhog.

The USFWS issues permits to qualified applicants for the following types of activities: falconry, raptor propagation, scientific collecting, special purposes (rehabilitation, educational, migratory game bird propagation, and salvage), take of birds causing human safety or other issues, taxidermy, and waterfowl sale and disposal (USFWS 2017a). Migratory bird permit policy is developed by the USFWS Division of Migratory Bird Management and the permits themselves are issued by the Regional Bird Permit Offices. The regulations governing migratory bird permits are provided in 50 CFR Part 13 (General Permit Procedures) and 50 CFR Part 21 (Migratory Bird Permits). JBAB does not currently hold USFWS permits

for taking or other purposes. In FY 2021, JBAB contracted with USDA Wildlife Services to perform goose management, therefore the depredation permit was held by USDA.

2.3.4 Threatened and Endangered Species and Species of Concern

Species with special federal or state (DC) status may occur on or in close proximity to JBAB. Species with special status may include those designated as endangered, threatened, candidate (for listing), rare, species of greatest conservation need (SGCN), or other status requiring protection and/or conservation/restoration management. Table 2-5 provides the list of federally listed and candidate species/species under review that may occur on or in close proximity to JBAB. Some species-specific surveys for rare, threatened, and endangered species have been conducted on JBAB, as indicated in the species-specific sections that follow.

Table 2-5. Federally threatened, endangered, and candidate/under review species for the District of Columbia (sources: United States Fish and Wildlife Service 2020b; National Oceanic and Atmospheric Administration 2020b).

Common Name	Scientific Name	Federal Listing Status	Critical Habitat at JBAB?
Atlantic sturgeon	*Acipenser oxyrinchus*	Endangered	No
Shortnose sturgeon	*Acipenser brevirostrum*	Endangered	No
Hay's spring amphipod	*Stygobromus hayi*	Endangered	No
Northern long-eared bat	*Myotis septentrionalis*	Threatened	No
Yellow lance	*Elliptio lanceolate*	Threatened	Proposed
Monarch butterfly	*Danaus plexippus*	Candidate	N/A
Chesapeake logperch	*Percina bimaculate*	Under Review	N/A
Golden-winged warbler	*Vermivora chrysoptera*	Under Review	N/A
Northern red-bellied cooter	*Pseudemys rubriventris*	Under Review	N/A
Wood turtle	*Glyptemys insculpta*	Under Review	N/A

See the 2015 DC Wildlife Action Plan (WAP), Chapter 2, for a full list of SGCN in the DC region (at https://doee.dc.gov/sites/default/files/dc/sites/ddoe/service_content/attachments/03%202015%20Wildlife ActionPlan%20%20Ch2%20SGCN.pdf) and the USFWS list of bird Species of Conservations Concern (at https://www.fws.gov/migratorybirds/pdf/management/birds-of-conservation-concern-2021.pdf).

2.3.4.1 Monarch Butterfly

On 26 August 2014, the Center for Biological Diversity petitioned the USFWS to list the monarch butterfly (*Danaus plexippus*) as threatened under the ESA (76 Federal Register [FR] 67652). In December 2020, the USFWS finding was that it is warranted but precluded due to higher priorities, so it now has candidate species status. Monarchs lay their eggs only on plants of the family Apocynaceae (dogbane), specifically in the milkweed subfamily Asclepiadoideae, genus *Asclepias* (L.) and related genera, and the caterpillars feed exclusively on the milkweed plants. Adults, however, feed on nectar from a wide range of flowers, including milkweeds (https://www.biologicaldiversity.org/species/invertebrates/monarch_butterfly/). The 2019 pollinator survey documented monarch butterflies and caterpillars at JBAB.

2.3.4.2 Hay's Spring Amphipod

The Hay's spring amphipod (*Stygobromus hayi*) is a small, aquatic habitat-obligate amphipod known to exist in only five springs along Rock Creek. It lives under leaf litter in groundwater outlets that feed low-gradient creeks (NatureServe 2013, USFWS 2020a). The requisite habitat is not found on JBAB.

2.3.4.3 Yellow Lance

The yellow lance (*Elliptio lanceolate*) is a freshwater mussel that inhabits small- to medium-sized rivers in parts of Maryland, Virginia, and North Carolina, including the Potomac River basin. The USFWS has proposed critical habitat for the yellow lance, but it does not include the population known to occur in the Potomac River basin (USFWS 2019).

2.3.4.4 Atlantic and Shortnose Sturgeon

In the Chesapeake Bay system, the shortnose and Atlantic sturgeons (*Acipenser brevirostrum* and *A. oxyrinchu*, respectively) are listed by NOAA as endangered (DOEE 2006, NOAA 2014b). There are few documented occurrences of shortnose sturgeon in the Potomac River (USFWS 2009) but, in 2009, a radio-tagged female was documented as far upstream as Chain Bridge, roughly six miles upstream due north of JBAB. The study conducted by the USFWS, USGS, and NPS indicated that there is adequate foraging, wintering, and spawning habitat for shortnose sturgeon in the Potomac River (USFWS 2009). Atlantic sturgeon also have been documented in the Potomac River, approximately as far north as the Nice Bridge on Route 301 (NOAA 2015), although there is no current evidence of Atlantic sturgeon spawning in the Potomac or Anacostia rivers (NOAA 2014a). In August 2017, the Potomac River was included in the final Critical Habitat for the Chesapeake Bay Distinct Population Segment (82 FR 39160). In response to comments made by the DoN during the rulemaking process, NOAA confirmed that JBAB is not encompassed within the critical habitat (see page 2, yellow-highlighted text in Appendix D).

2.3.4.5 Chesapeake Logperch

On 20 April 2010, the USFWS was petitioned to list the Chesapeake logperch (*Percina bimaculate*) under the ESA. To date, no decision has been made on listing the species (76 FR 59835). The Chesapeake logperch is a small fish found primarily in larger waterways. Historically, the species occurred in the Chesapeake Bay watershed, including the Potomac River basin but has since been extirpated there and only occurs in a small area of the Susquehanna River basin (Pennsylvania Fish and Boat Commission 2015). To date, there has been no survey for Chesapeake logperch at JBAB; however, the species' occurrence there is unlikely.

2.3.4.6 Wood Turtle

On 11 July 2012, the USFWS was petitioned to list the wood turtle (*Glyptemys insculpta*) under the ESA. To date, no decision has been made on listing the species (80 FR 56423). Wood turtles are terrestrial but require moist habitats and hibernate in aquatic ecosystems (Virginia Department of Wildlife Resources 2020). They occupy a wide variety of habitats, including forested floodplains and nearby slopes, fields in various stages of succession, wet meadows, and farmland. A primary habitat requirement is water, usually a creek or stream (Virginia Herpetological Society 2020b). To date, there has been no wood turtle survey at JBAB; however, it is unlikely the species would occur at JBAB due to development and the lack of preferred habitat.

2.3.4.7 Northern Red-bellied Cooter

On 20 April 2010, the USFWS was petitioned to list the northern red-bellied cooter (*Pseudemys rubriventris*) under the ESA. To date, no decision has been made on listing the species (76 FR 59835).

These turtles occur primarily in freshwater lakes, ponds, and blackwater swamps. They also are known to inhabit small creeks and large rivers. Their preferred habitat includes emergent and submerged freshwater plants, basking sites near deep water, and a soft substrate in which to overwinter (Virginia Herpetological Society 2020a). To date, there has been no northern red-bellied cooter survey at JBAB; however, there is potential for the species to inhabit the area along the Potomac River at JBAB.

2.3.4.8 Northern Long-Eared Bat

On 04 May 2015, the northern long-eared bat (*Myotis septentrionalis*) was listed as threatened under the ESA. The species occurs throughout the eastern US. In winter, northern long-eared bats typically hibernate in caves and abandoned mines and, in summer, they roost in tree cavities, under exfoliating bark, and in fabricated structures. These bats often forage in forests immediately surrounding roost sites. Isolated trees are considered suitable roosting habitat if the trees themselves have the right characteristics and are less than 1,000 feet from the next nearest suitable roosting tree within a woodlot or wooded fencerow (USFWS 2014). A final USFWS rule—under the authority of section 4(d) of the ESA—provides measures necessary and advisable for conserving the northern long-eared bat (80 FR no. 63). The acoustic bat survey conducted at JBAB in 2016 and 2019, however, yielded no recordings of northern long-eared bats. During the 2017 survey, software program outputs were used to initially identify recordings for later manual analysis to confirm species presence. Both the 2017 and 2019 bat surveys included both acoustic and capture surveys.

2.3.4.9 Golden-Winger Warbler

On 10 February 2010, the USFWS was petitioned to list the golden-winged warbler under the ESA. To date, no decision has been made on listing the species (76 FR 31920). The golden-winged warbler is a small songbird that prefers medium-sized tracts (10–50 hectares) of predominantly early successional growth found in deciduous woodland gaps, including wetland margins, old fields, and powerline corridors (USFWS 2002). They breed mostly in the Great Lakes region and parts of the Appalachian Mountains, and they spend the nonbreeding season in Central and South America (Cornell Laboratory of Ornithology 2019). There is the potential for golden-winged warblers to stopover at JBAB during their spring and fall migrations; to date, however, there has been no golden-winger warbler survey at JBAB.

2.3.4.10 Other Sensitive Species

As of late 2021, the most current version of the DC WAP (DOEE 2015) listed 205 SGCN for the DC region (see Table 2 on pages 25–30 in Section 2.5—*SGCN Designations* at https://doee.dc.gov/sites/default/files/dc/sites/ddoe/service_content/attachments/03%202015%20WildlifeActionPlan%20%20Ch2%20SGCN.pdf). Listed species include mammals, birds, herptiles, fish, and a variety of invertebrates, including insects, mollusks, crustaceans, and sponges. The WAP also lists 32 species recently removed from the WAP list of SGCN.

In January 2017, the rusty patched bumble bee (*Bombus affinis*) was listed as endangered under the ESA (82 FR 3186). The species' historical range included the DC. This bee inhabits primarily native grasslands of the Northeast and upper Midwest, but it has been observed and collected in a variety of habitats, including prairies, woodlands, marshes, agricultural landscapes, and residential parks and gardens. The bees emerge from hibernation early in spring and are among the last species to go into hibernation in the fall. They gather pollen and nectar from a variety of flowering plants, and they need a constant supply and diversity of flowers blooming from April through September. Nesting sites are underground cavities such as rodent burrows, or aboveground in clumps of grasses (USFWS 2016). Following the species' ESA listing, the USFWS developed Section 7 implementation guidance for the bee, which states that consultation should occur when and where the species is likely to be present, but this is not necessary for the entirety of its historical range (USFWS 2017b). IAW the guidance, consultation for JBAB would not be required, as no

population is known to exist nearby, and a pollinator survey conducted at JBAB in 2019 did not yield any records of the rusty patched bumble bee.

NOAA Fisheries has identified essential fish habitat (EFH) in major estuaries, bays, and rivers along the northeastern coast of the US. Although there is no EFH designation for waters adjacent to JBAB, effluent from the installation could impact EFH in downstream waters. In the Potomac River or Chesapeake Bay, EFH has been designated for the following species.

- Windowpane flounder (*Scopthalmus aquosus*)—EFH for juvenile and adult windowpane flounder includes bottom habitats with a substrate of mud or fine-grained sand (NOAA 1998).
- Bluefish (*Pomatomus saltatrix*)—EFH for juvenile and adult bluefish includes all major estuaries between Penobscot Bay, Maine, and St. Johns River, Florida, and pelagic waters (NOAA 2013a).
- Summer flounder (*Paralicthys dentatus*)—EFH for juvenile and adult summer flounder includes the demersal (i.e., bottom) waters over the continental shelf and inshore shallow coastal and estuarine waters (NOAA 2013b).
- Additionally, there are EFH designations in mixed- to full-salinity zones in the Chesapeake Bay for five species: clearnose skate (*Raja eglanteria*), little skate (*Leucoraja erinacea*), winter skate (*Leucoraja ocellata*), Atlantic herring (*Clupea harengus*), and red hake (*Urophycis chuss*) (NOAA 2013c).

As previously discussed, no avian surveys have been conducted on JBAB, or previously on NSA Anacostia and Bolling AFB. It is reasonable to assume that the avian species documented at nearby Anacostia Park (see https://www.mbr-pwrc.usgs.gov/Infocenter/Nps/anac.htm) and Shepherd Parkway also may occur at JBAB (e.g., foraging, nesting, migratory stopover), although a more up-to-date (real-time) and comprehensive resource for avian species present in the DC area is available on the eBird web site at https://ebird.org/region/US-DC-001. Some avian species documented in Anacostia Park and Shepherd Parkway are listed by the USFWS (USFWS 2021) as Birds of Conservation Concern (see https://www.fws.gov/migratorybirds/pdf/management/birds-of-conservation-concern-2021.pdf) and/or are listed by the DOEE as SGCN (USFWS 2021).

2.3.5 Wetlands and Floodplains

Wetland delineations for JBAB were conducted in 2016 (Tab 2—Wetland Delineation Report and Jurisdictional Determination). The USACE determined that there are no jurisdictional wetlands and all "wetland" features at JBAB were part of the stormwater system (i.e., engineered best management practices [BMPs]) rather than part of a natural system.

A floodplain is an area likely to be inundated by a flood with a specified degree of frequency. In any one year, a 100-year floodplain is an area that has a one percent chance of flooding, whereas a 500-year floodplain has a 0.2 percent chance of flooding. Approximately 30 percent (290 acres) of JBAB is located within the 100-year floodplain Special Flood Hazard Area of Zone AE (Figure 2-8). An additional 130 acres of JBAB are situated within the 500-year floodplain (Federal Emergency Management Administration 2010). Section 7.5.6 Floodplain Management—Strategies and Objectives describes floodplain management at JBAB.

During FY 2021, Colorado State University developed enhanced floodplain models for JBAB, which have been incorporated into the existing floodplain GIS layer housed on the GeoPortal, Air Force Geospatial Integration Management System. The models include JBAB's 500-year and 100-year floodplains as independent layers. The final report and story map were completed in March 2021. The modeling approach employed by Colorado State University was accepted and approved by FEMA.

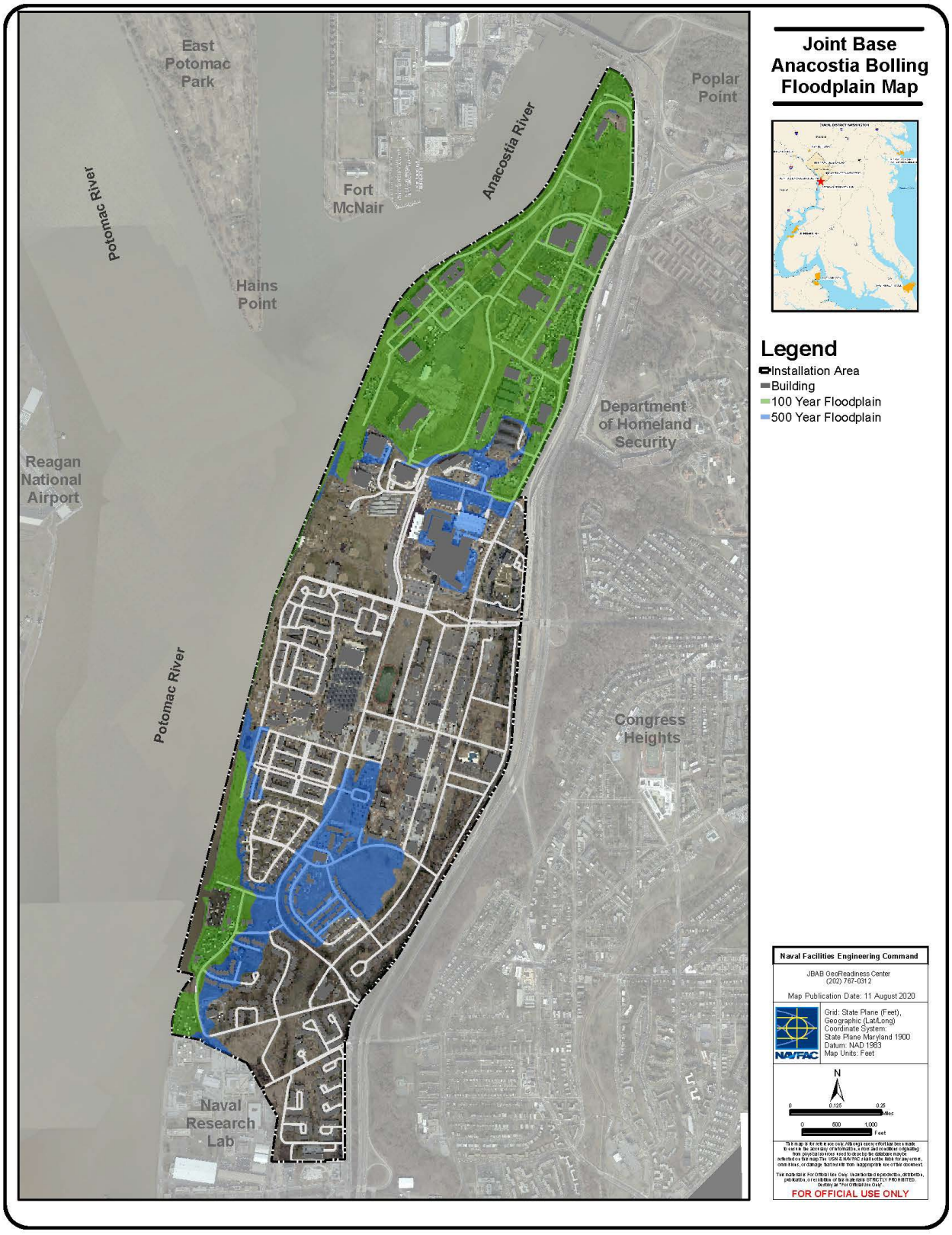

Figure 2-8. Floodplains of Joint Base Anacostia-Bolling.

2.3.6 Other Natural Resource Information

2.3.6.1 Ecosystem Services

An ecosystem is a dynamic, natural complex of living organisms interacting with each other and their physical environment (DoDI 4715.03). Ecosystem services are the environmental processes that provide goods or services beneficial to human health and livelihood. They include clean air and water, timber, flood attenuation, fish and wildlife habitat, carbon sequestration, pollination of crops and native plants, and scenic landscapes, which provide cultural services, such as spiritual, recreational, and cultural benefits.

The benefits of ecosystem services in a DoD context are focused on sustaining healthy landscapes needed for effective military testing and training, with management of ecosystem services aimed at positively contributing to the long-term sustainability of the military mission. It is DoD policy to consider all benefits provided by ecosystems before engaging in activities that may have a negative impact on the services they provide. IAW the Sikes Act, all DoD activities under natural resources conservation programs must further work to guarantee DoD continued access to its land, air, and water resources for realistic military training and testing and to sustain the long-term ecological integrity of the resource base and the ecosystem services it provides, (DoDI 4715.03).

Because nearly all of JBAB's land is highly developed, there is minimal opportunity for providing comprehensive ecosystem services. As discussed above, the wetland delineations conducted in 2016 revealed no jurisdictional wetlands and, although formal surveys for threatened and endangered species have yet to be conducted on JBAB, there is no or only limited habitat at JBAB suitable for federally listed species known to occur in the DC area. Rather, most of the habitat present at JBAB is suitable for wildlife species adapted to urban environments (Table 2-6). The absence of wetlands and habitat for rare, threatened, and endangered species at JBAB means that the need for off-base ecosystem services, such as mitigation banking, in-lieu fee programs, conservation banking, or recovery crediting, are not likely to be needed for any actions that might occur on JBAB. The most valuable ecosystem services provided at JBAB are those provided by its vegetated areas. They (1) help to absorb precipitation and slow runoff, thereby reducing flooding and erosion potential; (2) capture moisture that helps to recharge groundwater supplies; (3) are important to nutrient cycling in the soil; (4) filter pollutants that may otherwise enter surface waters; (5) provide some wildlife habitat; (6) sequester carbon and help to reduce greenhouse gases contributing to climate change; and (7) mediate the heat-island effects of the urban environment. The small copses and ornamental trees on base also contribute positively to the atmosphere, as trees not only absorb carbon dioxide, they also produce oxygen—a single mature tree can produce enough oxygen to two people for a year (Helmenstine n.d.), and an aesthetically pleasing environment can help to enhance and support the morale of DoD personnel (AFMAN 34-101, *Air Force Morale, Welfare, and Recreation (MWR) Programs and Use Eligibility*).

2.4 Mission and Natural Resources

2.4.1 Natural Resource Constraints to Mission and Mission Planning

One of the primary goals of natural resources management at JBAB is to preserve and sustain conditions compatible with the military mission. This INRMP provides management recommendations for sustainable land uses that support the military mission by maintaining an environment in which personnel can continue to provide the administrative and logistical support to the USAF and JBAB's tenants. Managing JBAB's natural resources for sustainability also helps to conserve those resources and comply with environmental laws and regulations

Table 2-6. Habitat types at Joint Base Anacostia-Bolling.

Habitat Type	Description	Acres
Urban Landscape	Composed of both improved and natural areas managed for human use; includes structures, parking lots, roads, recreational areas, and yards.	931
Grasslands/ Managed Meadows	Primarily composed of grasses and occasionally scattered shrubs and trees. Managed meadows are similar to grasslands but are managed through activities such as mowing.	34
Ponds and Pools	Impoundments that typically contain water year round; may contain submerged and/or emergent aquatic vegetation that can support bird, fish, invertebrate, herpetofauna, and mammal species.	1.27

2.4.1.1 Sustainability Challenges at JBAB

Maintaining sustainability includes conserving and/or protecting natural resources (e.g., water, energy, construction materials). JBAB's location along the Potomac and Anacostia Rivers and within the Chesapeake Bay Watershed presents considerable sustainability challenges, especially with regard to reducing stormwater runoff and protecting water quality from sedimentation and nonpoint-source pollution. The JBAB IMP places a high importance on using low-impact development (LID) practices promulgated in Section 438 of the Federal Energy Independence and Security Act of 2007, which mandates that federal agencies reduce stormwater runoff from federal development and redevelopment projects by minimizing hard-surface footprints and using vegetation in landscaping (including green roofs) to attenuate stormwater runoff, thereby protecting the quality of water resources and diminishing flooding potential. Per DCMR, major projects as defined by DC, are required to implement stormwater BMPs to address stormwater runoff, and projects that disturb more than 50 square feet are required to follow DC's Erosion and Sediment Control Plan requirements JBAB has outlined several objectives for decreasing building construction/operation costs and reducing pollution through such programs as Leadership in Energy and Environmental Design and the Sustainable Sites Initiative. Adhering to the strategies outlined in the JBAB IMP and implementing projects proposed in the INRMP will increase the sustainability of natural resources, both on and off JBAB.

2.4.1.2 Internal Encroachment

2.4.1.2.1 Floodplain

Internal encroachments are actions at JBAB that may limit or negatively impact the operations or the mission of the base. Military operations and activities at JBAB are limited by a number of constraining factors (DoN 2014a). Natural resources constraints to the military mission primarily involve the 100-year floodplain (Figure 2-8). Any actions taken should be consistent with EO 11988—*Floodplain Management* and other applicable federal and DoD guidance. Prior to any actions being taken on the floodplain, planners should consider their potential to unnecessarily increase or transfer flood risks that could adversely impact human health, safety, and welfare, as well as property, natural resources, or floodplain functions (Federal Interagency Floodplain Management Task Force 2012).

2.4.1.2.2 Cultural Resources

Cultural resources include, but are not limited to, buildings, structures, districts, archeological sites, historic landscapes, and objects of historical significance eligible for or included on the NRHP (Bolling AFB 2010,

DoN 2010b). The NAS Anacostia Historic District has 16 contributing historical resources and 1 non-contributing historical resource. The period of significance for the NAS Anacostia Historic District (Figure 2-9) is 1917–1962, and it is eligible for the NRPH due to its association with flight testing, naval activities, and importance as a naval air station in the DC. In addition, there are two buildings eligible for NRHP listing on the former Anacostia Annex (DoN 2020). In the Bolling AFB Historic District (Figure 2-10), there are 64 contributing buildings and 8 non-contributing or unevaluated buildings (DoN 2015b). Adherence to the NHPA requirements may increase costs associated with development and renovation projects.

2.4.1.2.3 Other Constraints

Other constraints on the military mission and land use at JBAB are due to operational, environmental, and safety constraints (Figure 2-11, Figure 2-12, and Figure 2-13). At JBAB, these restrictions include clear zones and accident potential zones for the HMX-1 Squadron and the Air Force helipad; Explosive Safety-Quantity Distance (ESQD) arcs of the NSA Washington armory and associated ready service magazines and an NDW working dog kennel; WHCA antenna look angles; and the restricted access areas surrounding the DIA, HMX-1, JADOC, White House Communications, ERP sites, and Munitions Response Areas (MRAs).

Other constraints at JBAB include air accident zones, AT/FP setbacks, environmental restoration sites, floodplains, easements, and the historic districts, all of which are germane to the installation's current condition and use. These constraints may limit the actions that could be taken for the conservation, rehabilitation, and sustainable multipurpose use of natural resources at JBAB. Although actions are still possible in these areas, these constraints present challenges to actions that will need to be addressed during the site approval process and subsequent design and installation. Additional coordination with the DCHPO, DOEE, and other regulators also may be required to minimize environmental, cultural, and operational impacts. JBAB also has a CERCLA program to clean up identified ERP sites, as detailed in Sections 1.4.1.5 Environmental Response Program Management Action Plan, 1.4.1.10 Military Munitions Response Program, and 2.4.1.3.6 Legislative Initiatives that Restrict Operations.

2.4.1.3 External Encroachment

External encroachment is any non-DoD action planned or executed that inhibits, curtails, or has potential to impede the performance of DoD activities. JBAB is bounded on each side by interstate highways and local roads, natural features, and developed land (see Figure 2-2), and these encroachments represent external constraints to the military mission. External constraints discussed below provide an awareness to support integrated planning of activities on base, including natural resources management activities. The following external encroachment challenges affecting JBAB were identified in the 2009 EAP.

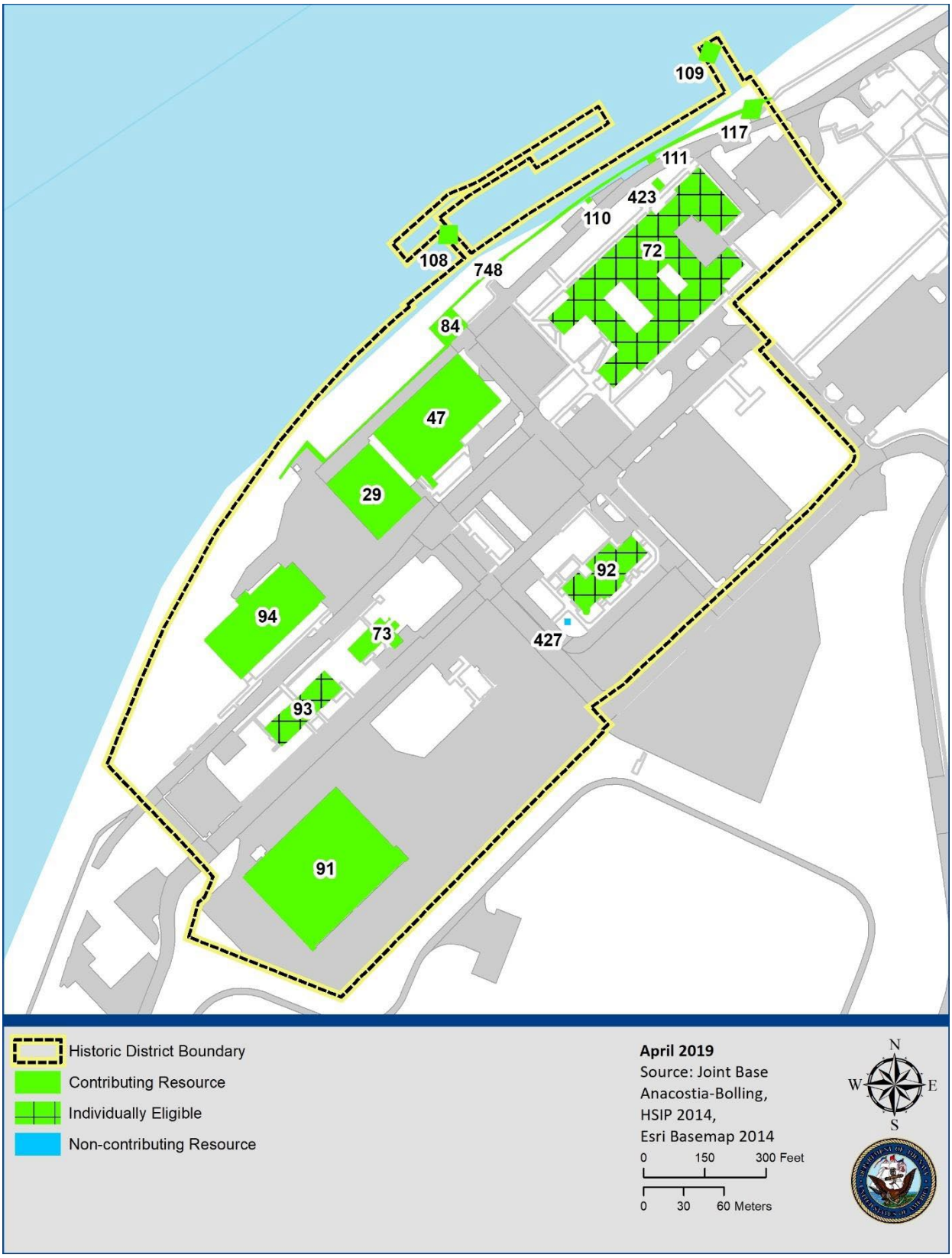

Figure 2-9. Naval Air Station Anacostia Historic District (source: DoN 2020).

Figure 2-10. Bolling Air Force Base Historic District (source: DoN 2020).

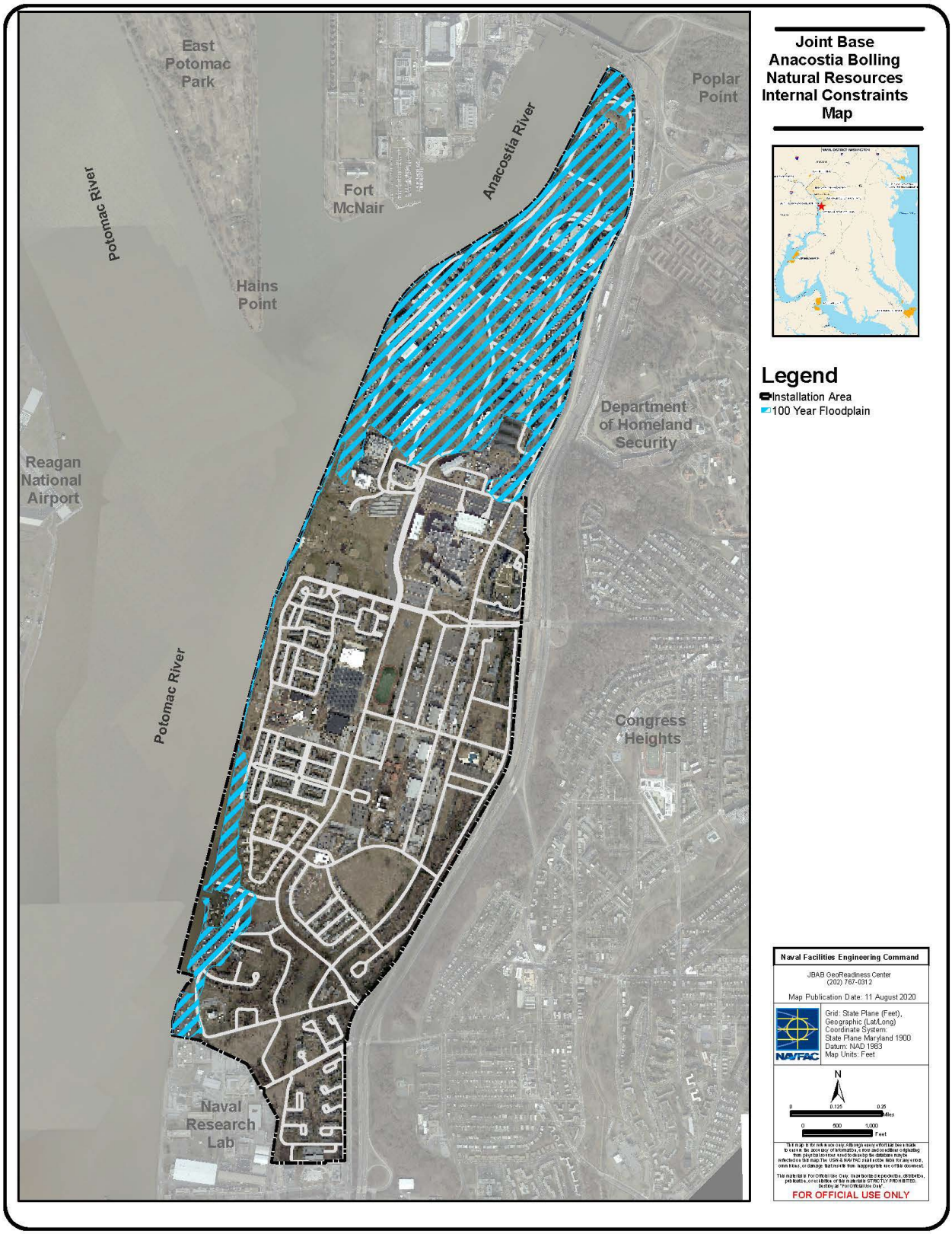

Figure 2-11. Internal constraints on natural resources at Joint Base Anacostia-Bolling.

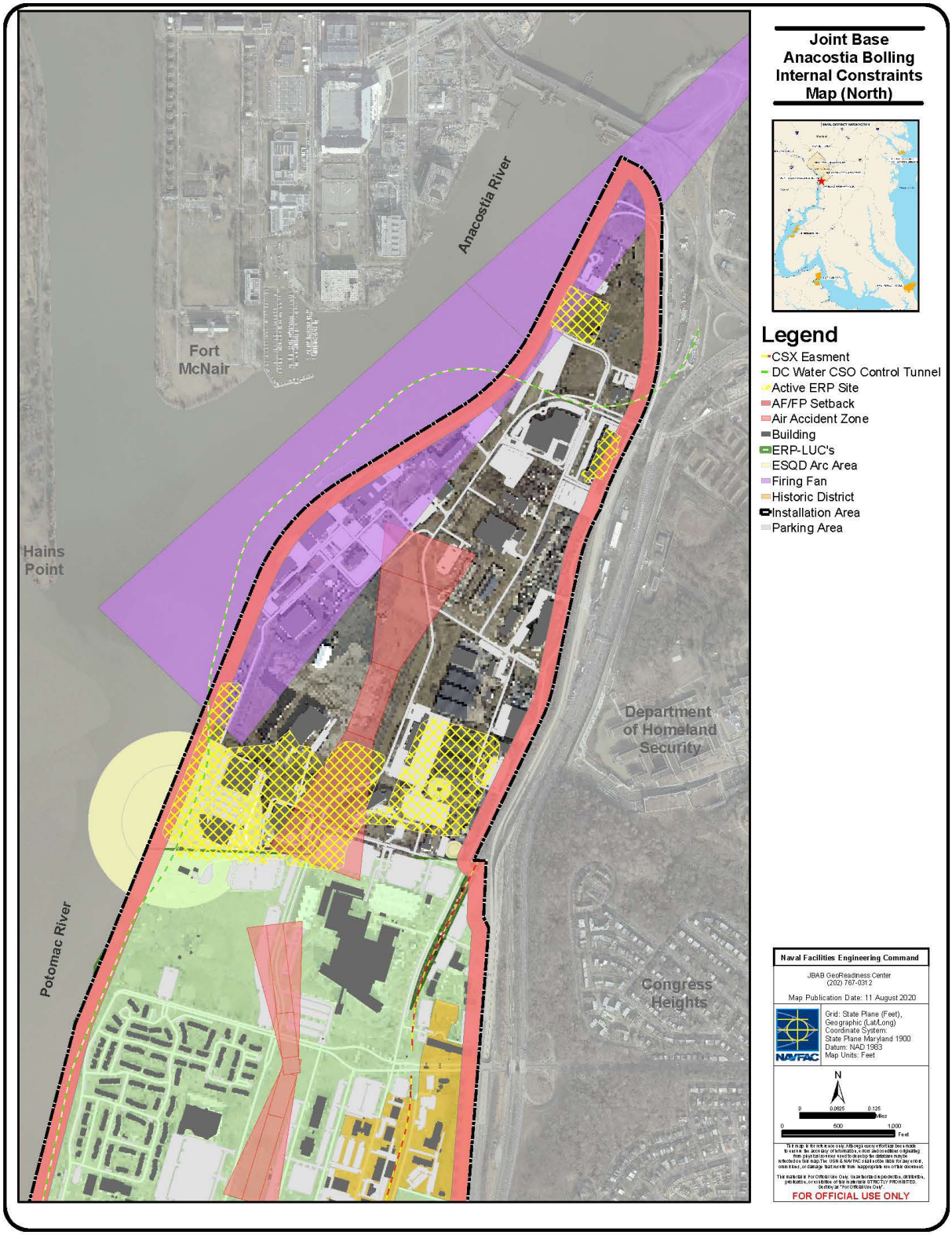

Figure 2-12. Other internal constraints at Joint Base Anacostia-Bolling, northern portion. (CSX=CSX Transportation; DC=District of Columbia, CSO=combined sewer overflow, ERP=Environmental Restoration Program, AT/FP=antiterrorism/force protection, LUC=land-use control, ESQD=Explosive Safety-Quantity Distance.

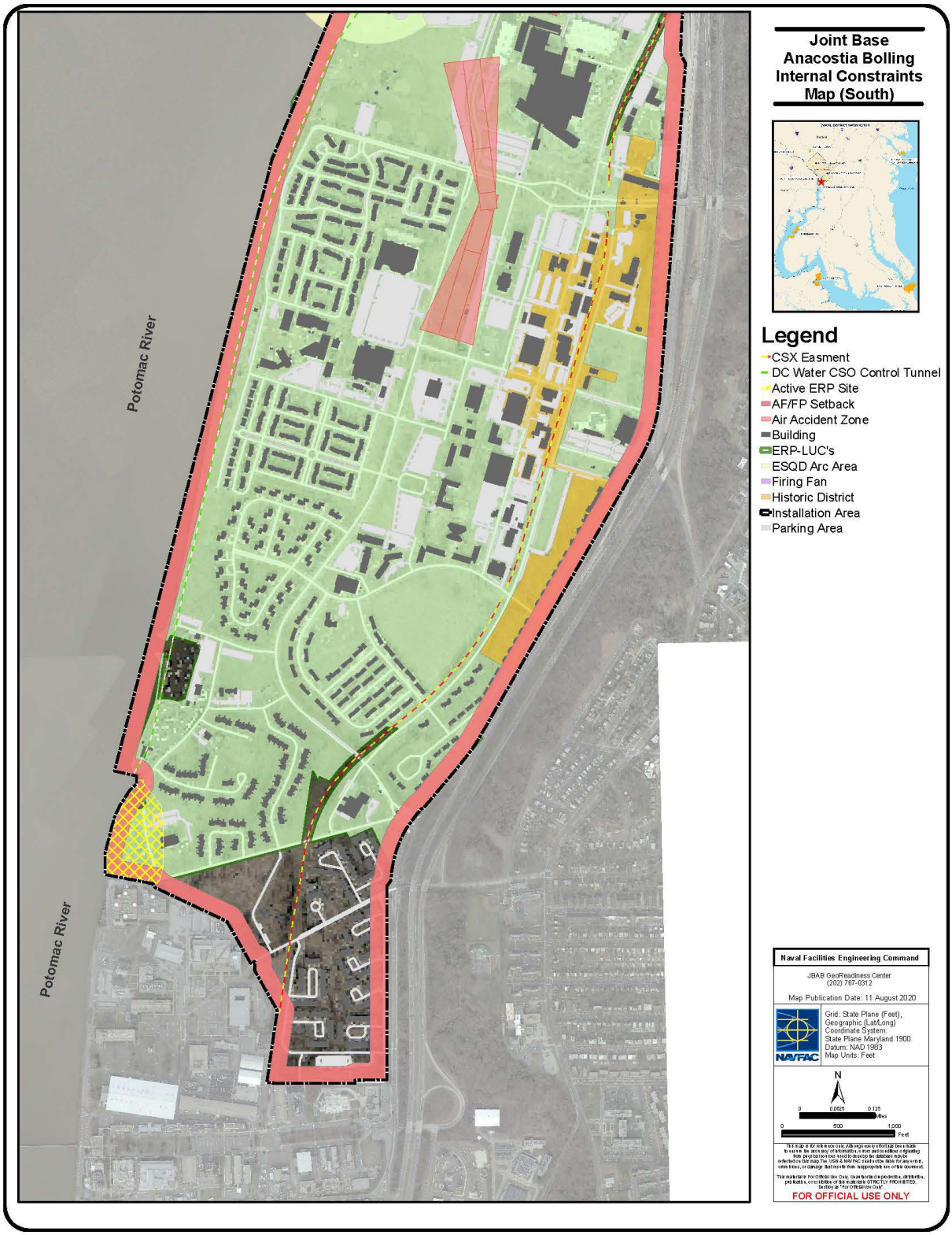

Figure 2-13. Other internal constraints on Joint Base Anacostia-Bolling, southern portion. (CSX=CSX Transportation; DC=District of Columbia, CSO=combined sewer overflow, ERP=Environmental Restoration Program, AT/FP=antiterrorism/force protection, LUC=land-use control, ESQD= Explosive Safety-Quantity Distance.

2.4.1.3.1 Urban Development

Plans and policies in the DC are encouraging mixed-use and high-density development, and are especially focused on revitalizing neighborhoods along the Anacostia River as part of the Anacostia Waterfront Framework Plan (Council of the District of Columbia 2006). From 2005 to 2025, the population of the Southeast and Southwest and the Lower Anacostia Waterfront/Near Southwest Planning Districts, where JBAB is located, was projected to grow from 78,700 to 114,900, an increase of 46 percent. The majority of growth was projected to occur in the Lower Anacostia Waterfront/Near Southwest Planning District, with the number of households expected to more than double from 8,100 to 17,500. Much of that growth was expected to be moderate- to high-density residential development along the Washington Channel and Near Southeast. The number of households in the Southeast and Southwest Planning District was projected to increase from 22,800 in 2005 to 30,100, primarily in refurbished or replaced vacant and abandoned housing areas. USAF officials collaborate with public and private partners to address the use or development of real property near JBAB to help to limit encroachment and other constraints on the military mission and training operations.

There are several small area plans and initiatives in the Lower Anacostia Waterfront/Near Southeast and the Southeast/Southwest District Area Elements. Projects in these areas include (1) conversion of Poplar Point to a mixed-use neighborhood, (2) revitalization of Berry Farms/Park Chester/Wade Road to a mixed-income neighborhood with the construction of 1,470 residential units, (3) construction of the consolidated offices of the Department of Homeland Security on the 176-acre St. Elizabeths site, (4) redevelopment of 107 acres of the St. Elizabeths site to a mixed-use neighborhood, (5) redevelopment of Bellevue, and (6) construction and investment surrounding the Anacostia Metrorail and Anacostia Streetcar stations. A portion of the streetcar system will connect the Anacostia Metrorail Station to the Anacostia-Bolling Firth Sterling gate. In addition, DDOT is designing a replacement for the South Capitol Street Bridge, the realignment of which is expected to be completed in late 2021. The realignment seems to impact the northern portion of JBAB from a traffic oval just north of JBAB and the bicycle/pedestrian roadway along the northeastern portion of JBAB.

The CSX Transportation railroad tracks parallel the upper two-fifths of the base's eastern boundary from where they cross South Capitol Street until they enter JBAB near Brookley Avenue and Duncan Street, where the easement is located. From there, the tracks roughly parallel the inside of the lower three-fifths of the eastern JBAB boundary, ranging from within 0 to nearly 1000 feet (averaging about 500 feet) of the eastern boundary until the tracks exit JBAB on the western side of the base's southern-most tip (Figures Figure 2-12 and Figure 2-13).

2.4.1.3.2 Airborne Noise

The Ronald Reagan Washington National Airport is located west of JBAB across the Potomac River. On occasion, air traffic must use the runway that requires a southeastern approach, directly above military housing. The noise from this air traffic potentially impacts the quality of life for the residents.

2.4.1.3.3 Competition for Air, Land and Sea Space

Construction of streetcar lines would terminate at the Firth Sterling Gate. DDOT requested an easement to place a pole for the streetcar within the JBAB perimeter. JBAB granted permission to install the pole if the perimeter wall was increased to meet AT/FP requirements.

2.4.1.3.4 Maritime Issues

The Potomac Water Taxi Service currently operates between Georgetown and The Wharf in DC, the National Harbor in Maryland, and Alexandria in Virginia. Routes to Diamond Teague are available during baseball and soccer games. There are opportunities to expand water taxi service to Navy Yard and Poplar Point and to create new routes between several locations in Prince William County and the DC. In addition, public boating traffic is increasing on the Anacostia and Potomac Rivers, which may pose additional security risks resulting from more people having direct views of JBAB from the water.

2.4.1.3.5 Interagency Coordination

Both federal and DC departmental actions and requirements impact JBAB. Developing and maintaining positive relationships with DC and federal agencies is key to ensuring that the USAF stays informed about current regulations, development projects, and policies that could impact operations before they are implemented. To facilitate interagency coordination, the Community Planners within the 11 CES represent JBAB in meetings with and establish/maintain relationships with external entities, identify emerging encroachment issues, and implement mitigation strategies as needed.

2.4.1.3.6 Legislative Initiatives that Restrict Operations

Major laws that could impact JBAB include the NHPA and CERCLA. In addition, recent legislative orders push for greater accountability of federal agencies for energy conservation, water quality, and other sustainability issues. Many of these orders would require DoD Installations to take action in sufficient time to meet target dates set forth in the legislation. Examples of this guidance include but are not limited to the

- Energy Independence and Security Act of 2007 that is designed to increase energy efficiency and renewable energy sources, and Section 438 of the act that sets goals for managing stormwater through the use of on-site natural features and previous surfaces to protect water quality;
- Energy Policy Act of 2005 that sets goals for federal agencies to reduce energy consumption and increase the proportion of renewable energy used;
- Federal Leadership in High Performance and Sustainable Buildings Memorandum of Understanding for federal agencies to voluntarily commit to federal leadership in the design, construction, and operation of high-performance and sustainable buildings; and
- AFCEC storm water management required for the USAF construction program (see https://www.af.mil/News/Article-Display/Article/112898/storm-water-management-required-for-air-force-construction-program/) features and previous surfaces to protect water quality).

There are other environmental laws and mandates, which are not specifically discussed in the 2009 EAP, designed to prevent or minimize the negative impacts of government activities on human health and the environment and with which the DoD must comply. Many of these laws require coordination with various state and federal regulators if a federal action has the potential to adversely impact a regulated resource. These requirements are discussed in Section 1.3 Authority.

2.4.1.4 Other Constraints

Operations or mission activities at JBAB could be impacted by policies, regulations, and initiatives established by both the federal and DC governments. Due to the complex regulatory environment of the National Capital Region, proactive communication and coordination is needed to ensure that JBAB interests are represented in all external decision-making processes and to stay informed of emerging regulations, policies, and development projects that could impact operations.

2.4.1.5 Opportunities

Overall, a large percentage of JBAB has some type of constraint on the military mission and land-use activities (see Figure 2-11, Figure 2-12, Figure 2-13, and Figure 2-14). The INRMP development and implementation process at JBAB must address various constraints to ensure compatibility with the military mission, safety, and various regulations.

2.4.1.5.1 Internal Opportunities

Areas with few or no constraints on the military mission provide the best opportunities for mission growth and change. At JBAB, roughly 38.6 percent (373 acres) of the base is covered by structures and attendant features. The remainder of the land (593 acres) is maintained in a semi-natural state with various uses and potential constraints related to natural or other resources. The largest open, undeveloped area of land at JBAB is currently used for recreation, including the sports fields, park areas, playgrounds, and bike/walking trails (Figure 2-12). In fact, the land-use class Open Space/Outdoor Recreation accounts for 114 acres at JBAB. Overall, JBAB land areas large enough for internal mission growth opportunities are limited; thus, redevelopment represents the greatest potential for internal opportunities. An example of this approach was accomplished in 2009–2010, when old housing units were demolished and replaced with new, military housing units at JBAB.

2.4.1.5.2 External Opportunities

Encroachment up to the fence line can create undue pressure on the base's ability to effectively manage natural resources. Challenges arise when buffer areas are diminished, and in some cases, ensuing management decisions by a base may be perceived negatively by the surrounding community, compounding time and effort involved in reaching a resolution. Noise and safety issues are additional concerns. Given JBAB's developed nature and current mission, any undeveloped land adjacent to the base provides a valuable buffer with regard to noise, safety, and natural resources. With the exception of external natural areas available for recreational opportunities, such as Shepherd Parkway and Anacostia Park, there are few to no additional buffer opportunities that support the military mission of JBAB.

The best potential opportunities for precluding future encroachment will involve partnering with adjacent municipalities, other federal agencies (i.e., NPS), and private landowners to avoid implementing incompatible land uses before they become established. Moreover, partnerships offer yet another opportunity to develop positive public relations with the surrounding community and illustrate DoD's commitment to environmental stewardship.

2.4.1.6 Encroachment Action Plan

The 2009 EAP identified the internal encroachment challenges affecting JBAB. Discussions of both internal and external encroachments below provide the awareness needed to support an integrated planning of activities, including those associated with managing natural resources. Under USAF leadership, the EAP will be updated via an encroachment study called the Compatible Uses Plan, but a timeline for this effort has not yet been determined.

2.4.1.6.1 Airborne Noise

As previously discussed, there are two helicopter-landing pads on JBAB: the HMX-1 helipad located on the northwest side of JBAB and a smaller, centrally located USAF helipad. The activities at HMX-1 are extensive, with up to 125 flights per week, whereas the USAF helipad is rarely used. Helicopter noise from HMX-1 operations could be disruptive to ceremonies on the Ceremonial Lawn, but the United States Marine Corps can coordinate with JBAB regarding airborne-noise concerns

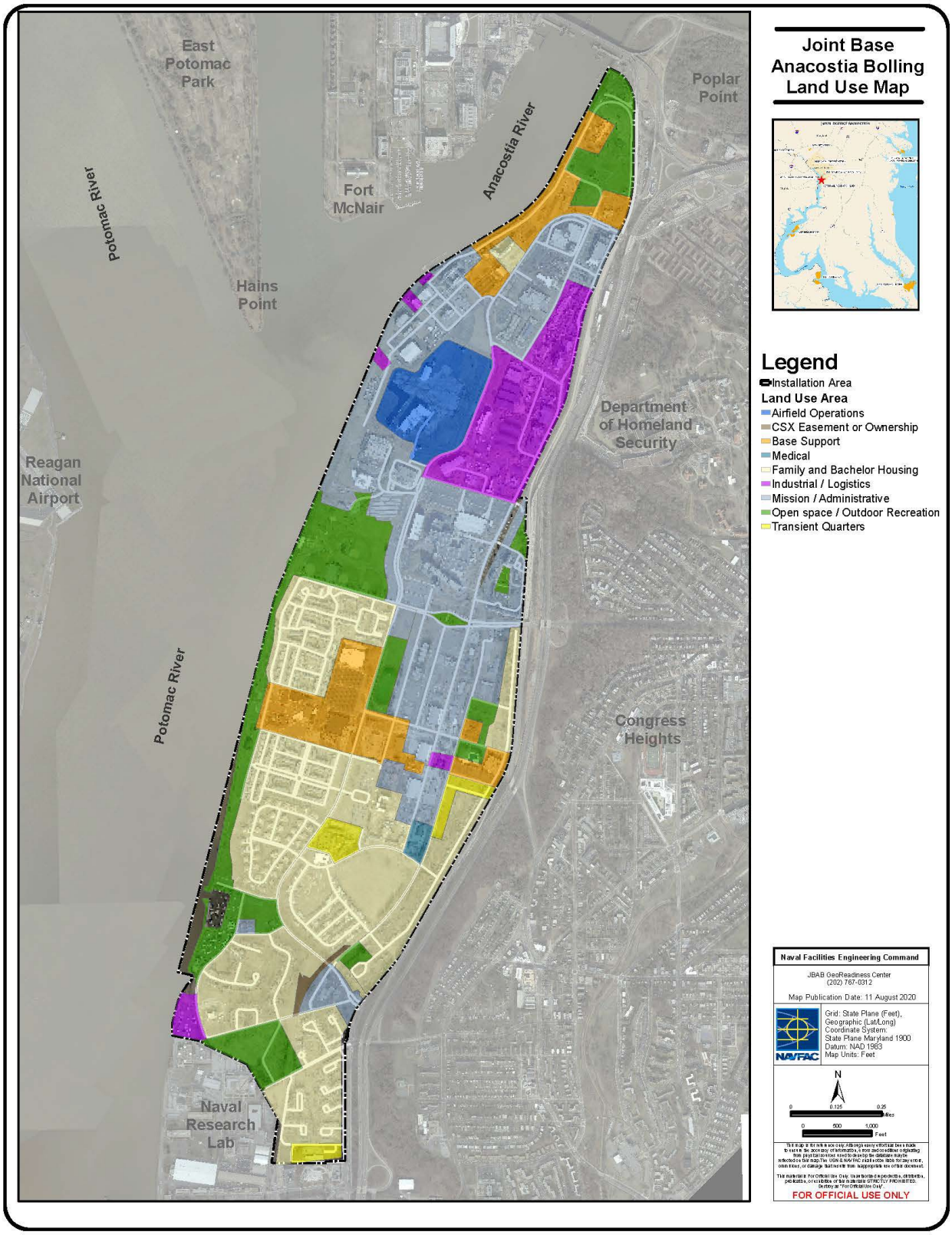

Figure 2-14. Land use at Joint Base Anacostia-Bolling.

2.4.1.6.2 Competition for Air, Land, and Sea Space

The DC Water Department constructed a combined sewage overflow control tunnel that traverses JBAB (see https://www.dcwater.com/projects/blue-plains-tunnel-project). The Navy granted an easement at JBAB for that portion of the tunnel (DoN 2010c). The easement granted the DC Water Department the ability to construct, operate, and maintain the tunnel for 50 years, which could restrict future land development along the waterfront.

The CSX Transportation railroad tracks that traverse JBAB have not been used since September 2001. JBAB leadership has considered abandoning the easement and purchasing the CSX parcels so that future development at this location will not be impaired (DoN, 2014a). Any future construction near the tracks would require coordination with CSX.

This constraint category also includes the federal AT/FP minimum standoff standards for security on all DoD-inhabited facilities. The standards are intended to minimize the likelihood of mass casualties from terrorist attacks against DoD personnel in buildings where they work and live and are documented in the Unified Facilities Criteria 4-010-01—*DoD Minimum Antiterrorism Standards for Buildings* (with change 1, 19 August 2020). For new construction and additions to existing buildings, the AT/FP requires a minimum standoff distance of 20 feet (6 meters) from the installation's perimeter when there is 30-foot (9-meter) or greater clear zone outside the perimeter (i.e., there must be a minimum aggregate of 50 feet). These standards must be considered in any planning effort, as they could have major impacts on the overall design of new or additions to older buildings.

2.4.1.6.3 Ordnance-UXO/Munitions

Past discoveries of Civil War era UXO on the northern portion of JBAB, as well as potential future discoveries and their remediation, would require that exclusion zones (EZs) be established. EZs are only active during UXO-response activities to remove UXOs, MECs, or Material Potentially Presenting an Explosives Hazard. EZs extending off the installation could pose potential public safety concerns and complicate public relations for JBAB, and construction near EZs can be more costly compared to that away from EZs. Prior to initiating construction, UXO surveys may be required in the area where UXO presence is possible. EZs also extend vertically, which could impact airborne operations.

2.4.1.6.4 Safety Arcs and Footprints

Safety arcs, or ESQD arcs, are the prescribed minimum setbacks between explosives storage or handling facilities and exposed locations (e.g., inhabited buildings, public transportation routes) to provide the specified level of protection. ESQD arcs are determined by the type and amount of explosives present and the level of protection offered by the storage or handling facility (e.g., earth-covered structures, berms). ESQD arcs become an encroachment issue when they extend off base.

2.4.1.6.5 Water Quality

As the understanding of stormwater effects on watershed health increases, future federal and DC sustainability initiatives could require greater oversight and enforcement of water-quality goals. Because nearly one-third of the JBAB area sits in a 100-year floodplain and shares approximately three miles of shoreline along the Anacostia and Potomac Rivers, water-quality concerns at JBAB are significant (see Section 2.2.4 Hydrology.

2.4.1.6.6 Environmental Restoration Program

There are 26 ERP sites at JBAB (DoN 2014a), all but four of which are closed. One of the four sites, located south of JBAB and leased to Naval Research Laboratory, consists of a parking lot that serves as a cap for a dredge spoil landfill. The remaining three sites have been consolidated into a single groundwater investigation across the installation. It should be noted, however, that any future construction or soil-intrusion projects should make allowances to dispose of potentially hazardous soil from JBAB, even if the site is closed by the ERP.

There are also four Munitions Sites at JBAB, all of which were closed. Although unlikely to occur, any future finds of UXO and associated remediation could result in future encroachment issues (DoN 2010a).

2.4.2 Land Use

JBAB's 966 acres are predominantly developed, with large areas dedicated to residential, commercial, industrial, federal, and institutional uses along with the associated infrastructure (Figure 2-12) (DoN 2014a). The northern half of JBAB contains facilities dedicated to mission/administration, airfield operations, industrial, and base support functions. The southern half contains the majority of base support and housing functions (Figure 2-14). Secure-mission facilities at JBAB include the WHCA, HMX-1 facilities, DIA, and JADOC. There are two airfield (helicopter) operations on JBAB; the largest is the HMX-1 operation, while the smaller operation consists of a helicopter pad that is centrally located on JBAB. The Air Force Honor Guard campus is located on the eastern edge of JBAB just north of the Arnold Gate. JBAB does not have training lands that cover large natural resource areas.

2.4.3 Current Major Mission Impacts on Natural Resources

The following section describes potential impacts to natural resources at JBAB. This INRMP outlines projects and management processes to minimize such impacts on natural resources and conservation efforts.

2.4.3.1 Air Pollution

JBAB has a Title V (major) permit for several air discharge point sources from boilers, paint booths, and multiple emergency generators. A detailed tracking and accounting system known as the Air Program Information Management System (APIMS) is used to identify and track sources of air pollution. There are no significant non-point sources of air pollution from the base with the exception of pollution typical of urban areas associated with vehicles.

2.4.3.2 Water Pollution

JBAB has a wastewater permit for on base grease traps and oil water separators servicing various uses. JBAB also has a multi sector general permit for four (4) industrial sectors and associated outfalls. Historical use and/or releases of various chemicals or petroleum products have impacted the subsurface at the base.

2.4.3.3 Noise Pollution

Aside from aircraft operations, there are no other significant noise sources at the base. Land close to JBAB is subject to high noise levels associated with its urban setting and close proximity to a major commercial airport.

2.4.3.4 Hazardous Materials/Wastes

Hazardous materials used or stored on base include various organic solvents, chlorine, Freon, paints, thinners, oils, lubricants, compressed gases, pesticides, herbicides, nitrates, chromates, stripping materials, waste oils, waste paint-related materials, and other miscellaneous wastes. A detailed tracking and

accounting system known as the Air Force Enterprise Environmental, Safety, and Occupational Health Management Information System (EESOH-MIS) is used to identify potentially hazardous materials and ensure that organizations are approved to use specific materials.

Several hazardous waste Initial Accumulation Points (IAPs) are located throughout the base. The main hazardous waste facility (permitted for 90-day storage) is located at a secure facility within JBAB. There are two 90-day storage facilities at JBAB located at Building 41 and 121/122. Wastes are collected from the satellite IAPs and transported to the main storage facility by contractors who support the 11 CES Environmental Element staff. Defense Logistics Agency (DLA) is responsible for the final disposition of hazardous wastes.

Waste oil and used cooking oil is accumulated at sites throughout the base and is periodically picked up by an outside contractor for recycling. Waste antifreeze, tires, batteries, and fluorescent bulbs are also picked up by outside contractors for recycling or proper disposal.

2.4.4 Potential Future Mission Impacts on Natural Resources

There are no projected future changes in mission that would impact the installation natural resources. Any change in military mission and/or materials use would be fully evaluated under NEPA. Such evaluations would assess the potential impact to the installation and nearby (off-base) natural areas. Contingency plans would be developed as applicable to ensure natural resource protection. Currently, hazardous materials used to accomplish the mission at JBAB present one of the highest potential impacts to installation natural resources. Due to the materials handling, storage and disposal procedures implemented at JBAB, and the proven record of prompt response to accidental releases or disposal from unforeseen conditions or accidents, it is unlikely that pollution impacts would occur.

3.0 ENVIRONMENTAL MANAGEMENT SYSTEM

The USAF environmental program adheres to the EMS framework and its cycle of Plan, Do, Check, Act for ensuring mission success. EO 13834—*Efficient Federal Operations*; DoDI 4715.17—*Environmental Management Systems*; AFI 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.

Office/Organization/Job Title (Listing is not in order of hierarchical responsibility)	**Installation Role/Responsibility Description**
Installation Commander	Planning and management of base resources, including natural resources, is the responsibility of the Wing Commander. The INRMP represents a key component of the planning process. The Wing Commander ensures that an INRMP is developed and maintained. The specific responsibilities of the Wing Commander are listed below. • Approve the INRMP. • Certify INRMP 5-year update. • Ensure that all unit commanders are knowledgeable in their areas of responsibility as outlined in the INRMP. • Provide appropriate funding and staffing to ensure implementation of the INRMP. • Control access to, and use of, installation natural resources.
Air Force Civil Engineer Center (AFCEC) Natural Resources Media Manager/ Subject Matter Expert/Subject Matter Specialist	Coordinates with installation NRM/points of contact (NR POC) to • identify changes and provide technical assistance to each respective base's program; • make changes to execution strategy (to include accomplishing in-house) and/or execution agent; provides and manages contracts/agreements; • confirm funding amounts, distribution date, and mission/situational changes that may initiate the emergent requirement process; and • administer training.
Installation Natural Resources Manager/Point of Contact	The 11th Civil Engineering Squadron, Installation Management Flight, Environmental Element (11CES/CEI/CEIE), NRM, is the focal point for all INRMP actions and issues. The NRM is responsible for providing guidance on all natural resources matters to base units and the Environmental Safety and Occupational Health Council (ESOHC), and is also responsible for the adequacy and implementation of the INRMP. Specific responsibilities of the NRM include those listed below. • Implement the INRMP and its programs to ensure the inventory, classification, and management of all applicable natural resources. • Maintain an organization with the resources available to accomplish the INRMP. • Coordinate with local, state, and federal governmental and civilian conservation organizations relative to natural resources management.

Office/Organization/Job Title (Listing is not in order of hierarchical responsibility)	Installation Role/Responsibility Description
	• Ensure the ongoing and timely coordination between mission, natural resources, environmental, legal, and master planning for current and planned land uses. • Ensure that applicable installation personnel are aware of, and comply with, procedures and requirements necessary to accomplish objectives of the INRMP, together with laws, regulations, and other measures that promote environmental quality. • Review all environmental documents (e.g., environmental assessments, environmental impact statements, and remedial action plans), construction designs, and proposals to ensure adequate protection of natural resources, and to ensure that technical guidance, as presented in the INRMP, is considered adequately. • Review mitigation measures that have been implemented or recommended for protecting natural resources. • Provide technical assistance in the implementation of this INRMP. • Serve as the office of primary responsibility (OPR) for INRMP development and review. • Manage outdoor recreation activities in undeveloped areas. • Annually review and update the INRMP, as necessary.
Installation Security Forces	The 11th Security Forces Squadron (SFS) will enforce AFI 32-7001, *Fish and Wildlife Management*, as well as the District Department of Energy and Environment (DOEE) fishing regulations.
Installation Unit Environmental Coordinators; see AFI 32-7001 for role description	See AFI 32-7001.
Installation Wildland Fire Program Manager	N/A
Pest Manager	Pest Management's responsibility for natural resources includes the control of nuisance wildlife. The primary pests of natural resources on JBAB are stray and feral domestic animals, Canadian geese, and groundhogs. Pest management also assumes responsibility for trapping and removing the occasional raccoon or other nuisance animals that take up residence in structures on the installation. Pest Management coordinates with the NR PM.
Range Operating Agency	N/A
Conservation Law Enforcement Officer (CLEO)	JBAB does not have a CLEO. The SFS serve to enforce fishing regulations if necessary on the installation.

Office/Organization/Job Title (Listing is not in order of hierarchical responsibility)	**Installation Role/Responsibility Description**
National Environmental Policy Act (NEPA)/Environmental Impact Analysis Process (EIAP) Manager	Civil Engineer EIAP Manager
National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries)	Per AFMAN 32-7003, NOAA has consultation authority for the INRMP because JBAB is a military installation which borders a marine environment. INRMP updates, revisions, and annual reviews should include NOAA.
United States Fish and Wildlife Service (USFWS)	In accordance with the Sikes Act, this INRMP must be prepared in cooperation with the USFWS to ensure proper consideration of fish, wildlife, and habitat needs. The USFWS is a co-signatory on the INRMP. The purpose of the Sikes Act is "to promote effectual planning, development, maintenance, and coordination of wildlife, fish, and game conservation and rehabilitation in military reservations" (Public Law 106-580). The USFWS provides expertise on natural resource issues, including T&E species, migratory birds, invasive species, and fisheries if necessary. In accordance with Section 7 of the ESA, JBAB consults with the USFWS to ensure that any action authorized, funded, or carried out is not likely to jeopardize the continued survival of a listed species or result in the adverse modification or destruction of its critical habitat. Coordination with the USFWS is also accomplished if species proposed for listing is likely to be jeopardized or if proposed activities could directly or indirectly harm birds protected by the Migratory Bird Treaty Act.
District of Columbia Department of Energy & Environment (DOEE)	DOEE is a co-signatory on the INRMP in accordance with the Sikes Act.

5.0 TRAINING

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

Installation Supplement—Training

Natural resources management training is provided to ensure that installation personnel, contractors, and visitors are aware of their roles in the program and the importance of their participation to its success. Training records are maintained IAW the Recordkeeping and Reporting section of this plan.

Natural resources-related training is available on several platforms on which USAF employees undergo training. Two online training courses available to natural resources program managers on e-DASH Natural Resources Overview and Conserving Wetlands. The Civil Engineer Corps Officers School offers a course entitled Natural Resources Management & Compliance.

6.0 RECORDKEEPING AND REPORTING

6.1 Recordkeeping

The installation maintains required records IAW Air Force Manual 33-363—*Management of Records*, and disposes of records IAW the Air Force Records Management System and the USAF 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.

*Installation Supplement—Recordkeeping**

JBAB follows the guidelines and recommendations set forth in AFMAN 33-363, Management of Records.

6.2 Reporting

The installation Natural Resources Manager is responsible for responding to natural resources-related data calls and reporting requirements. The Natural Resources Manager and supporting 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.

Installation Supplement—Reporting

JBAB reports natural resource management data biannually during the EESOH-MIS data call. Per AFMAN 32-7003, natural resource management accomplishments are reported via the INRMP Annual Report Summary approved by the installation commander or designee. State and federal agency partners are invited to participate in the annual review. The DOEE is the participating state agency. JBAB also coordinates with the USFWS Chesapeake Bay Office and the Greater Atlantic Fisheries Office of NOAA Fisheries. The INRMP Annual Report Summary must be posted on e-DASH and verified by AFCEC.

7.0 NATURAL RESOURCES PROGRAM MANAGEMENT

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

Installation Supplement—Natural Resources Program Management

JBAB is an urban installation and does not encompass much in the way of natural areas. Chief natural resources-related concerns include urban forestry, nuisance wildlife management, and water quality because of its proximity to the Anacostia and Potomac Rivers.

7.1 Fish and Wildlife Management

Applicability Statement

This section applies to all USAF installations that maintain an INRMP. The installation **IS** required to implement this element.

Program Overview/Current Management Practices

The conservation and enhancement of biological diversity on the public's military lands are a significant component of DoD's overall environmental and natural resources management programs. Recognizing the importance of providing ecosystems rich in species diversity to the Nation and to the military mission, the DoD formally established a policy for an ecosystem approach to natural resources management and for the conservation of biological diversity (DoDI 4715.03), which is implemented in accordance with the 2018 INRMP Implementation Manual, DoDM 4715.03. The goals of fish and wildlife management at JBAB are to (1) conserve and promote the conservation of fish and wildlife and their habitats; (2) maintain and enhance habitat for resident and migratory bird species; and, (3) balance wildlife population levels with biological and cultural carrying capacity.

Section 10.0 Annual Work Plans includes project descriptions for conducting baseline surveys of wildlife and Rare, Threatened, or Endangered (RTE) plant surveys; conducting wildlife habitat enhancements; conducting surveys of nuisance species at JBAB, including Canada goose, and developing a management plan for them; and developing educational materials about native plants and animals and the need to control nuisance wildlife and pets/feral animals.

7.1.1 District of Columbia State Wildlife Action Plan

The DC WAP is a 10-year strategic plan required for continued funding through the State Wildlife Grant Program administered by the USFWS. The 2005 DC WAP was developed with extensive input from other federal and state agencies, nongovernmental organizations, and private citizens. A DoD representative served as the Conservation Team Leader on the External Steering Committee, which acted as an advisory board to ensure that a wide range of resource conservation interests were addressed in the development and implementation of the DC WAP. Although JBAB is primarily an urban environment, to the extent practicable, natural resources management at JBAB is in line with DC wildlife goals and management guidelines.

The 2015 version of the DC WAP was prepared by the DOEE Fisheries and Wildlife Division (FWD) (DOEE 2015). The plan incorporates information on three elements.

- Distribution and abundance of fish and wildlife species and descriptions of critical habitats and habitat conditions;
- Problems facing species or habitats and conservation actions; and,
- Monitoring plans, the review cycle, coordination with conservation partners, and public participation.

The WAP focuses on species and habitats of greatest conservation need in the DC; however, it is also an action plan for the conservation of DC's wildlife.

The WAP is available online at http://ddoe.dc.gov/publication/wildlife-action-plan.

7.1.1.1 Geographic Area or Habitats of Interest

The WAP used the Northeast Lexicon and Northeastern Terrestrial Wildlife Habitat Classification System (NETHCS) to describe the physical and biological characteristics relevant to DC's wildlife conservation. Developed in 2008 by NatureServe, NETHCS uses a hierarchical system to classify habitats. Within the hierarchical system, there are three categories: Formation, Macrogroup, and Habitat System. As listed in Table 7-1, there are 7 Formation groups (Classes) at the top tier of the hierarchy, 14 Formation groups in the second tier, 35 Macrogroups in the third tier, and 143 Habitat systems in the fourth tier. The DC NETHCS hierarchy (excluding the habitat systems) is shown in Table 7-1.

Table 7-1. Washington, District of Columbia, State Wildlife Action Plan NETHCS hierarchy (source: DOEE 2015).

Formation Class	Formation Name	Macrogroup
Forests and Woodland	Southeastern Upland Forest	Longleaf Pine
	Northeastern Upland Forest	Southern Oak-Pine
		Central Oak-Pine
		Northern Hardwood & Conifer
		Plantation and Ruderal Forest
		Exotic Upland Forest
	Northeastern Wetland Forest	Southern Bottomland Forest
		Coastal Plain Swamp
		Northeastern Floodplain Forest
		Northern Swamp
	Boreal Upland Forest	Boreal Wetland Forest
		Boreal Forested Peatland
Shrubland and Grassland	Grassland and Shrubland	Glade and Savanna
		Outcrop & Summit Scrub
		Lake & River Shore
		Ruderal Shrubland & Grassland
	Coastal Scrub-Herb	Coastal Grassland & Shrubland
	Peatland	Northern Peatland
		Coastal Plain Peatland

Table 7-1. Washington, District of Columbia, State Wildlife Action Plan NETHCS hierarchy (source: DOEE 2015).

Formation Class	Formation Name	Macrogroup
		Central Appalachian Peatland
	Freshwater Marsh	Coastal Plain Pond
		Emergent Marsh
		Wet Meadow/ Shrub Marsh
		Modified/ Managed Marsh
	Salt Marsh	Salt Marsh
Polar and High Montane	Alpine	Alpine
Aquatic (in part)	Intertidal	Intertidal Shore
Sparsely Vegetated Rock	Cliff and Rock	Cliff and Talus
		Flatrock
		Rocky Coast
Agricultural	Agricultural	Agricultural
Developed	Unnamed	Maintained Grasses & Mixed Cover
		Urban/ Suburban Built
		Extractive

7.1.2 Fish and Wildlife Surveys

Comprehensive fish and wildlife surveys have not been conducted at JBAB, although bat and pollinator surveys were conducted in 2016 and 2019, respectively. There are numerous bird, mammal, herptile, and invertebrate species that have the potential to occur on JBAB (Appendix E; also see eBird web site at https://ebird.org/region/US-DC-001 for current and past sightings, including dates, numbers, and locations, of bird species in the DC area), but there are no water bodies at JBAB to support fish. In 2017, a list of herptiles having the potential to be present at JBAB was developed by reviewing the species in the area and their habitat requirements and then determining whether those requirements are met at JBAB.

7.1.3 Fish and Wildlife Management Strategies, Objectives, and Actions

JBAB has little undeveloped acreage, and it is located in a highly urbanized, densely developed area, it has limited opportunity for wildlife management. Strategies used for wildlife management include protecting migratory birds, enhancing habitat, controlling nuisance wildlife, and educating the public about wildlife issues.

To better address wildlife conservation goals, the primary objective is to obtain baseline data and current population data for the various wildlife taxa occurring at the installation. The actions taken to meet the goals of fish and wildlife management would support the goals outlined in DC's WAP, including the conservation and enhancement of priority habitats, generating interest and participation in wildlife conservation through education and outreach, and strengthening existing conservation actions.

To meet these fish and wildlife management objectives, recommended management actions are summarized below. Detailed action descriptions are located in Section 10.0 Annual Work Plans.

- Conduct comprehensive wildlife surveys at JBAB.
- Conduct complete baseline surveys for nuisance wildlife species and develop a Nuisance Species Management Plan.
- Implement the recommendations of the Nuisance Species Management Plan.
- Implement the Canada Goose Management Plan.
- Produce and distribute educational materials to keep base employees and residents informed about ongoing actions and policies regarding wildlife, bird nesting boxes, stray and feral pets, and Canada geese.

7.1.4 Bald and Golden Eagles

The BGEPA provides for the protection of bald eagles and golden eagles (*Aquila chrysaetos*). Except under certain specified conditions, the BGEPA prohibits the take, possession, sale, purchase, barter, offer to sell, purchase or barter, transport, export or import, of any bald or golden eagle, alive or dead, including any part, nest, or egg. Permits may be obtained IAW 50 CFR 22.27 if it necessary to remove or relocate active or inactive nests. No bald or golden eagles are known to nest at JBAB; however, there are known bald eagle nests within a three-mile radius of the base and they are frequently seen on JBAB. No consultation with any federal agency regarding these resources is required at this time. 10.0 Annual Work Plans includes recommended baseline avian surveys at JBAB, the results of which could affect consultation requirements under BGEPA.

7.1.5 Migratory Birds

Migratory birds represent a large, diverse group of species that breed in the U.S. and Canada and spend the nonbreeding season in southern North America, the West Indies, the Caribbean, and Central and South America. As of March 2020, 1,093 species were included on the list of migratory birds (85 FR 21282) protected by the MBTA and 122 nonnative species, such as house sparrow, European starling, rock pigeon, and mute swan, that are not protected by the MBTA.

Under the MBTA, it is unlawful to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird without a valid permit issued IAW federal regulation. An exemption to the MBTA that allows for and authorizes the DoD incidental take of migratory birds during military readiness activities was finalized in February 2007 (Federal Register Vol. 72, No. 39; 50 CFR Part 21). As directed by Section 315 of the 2003 National Defense Authorization Act, this rule authorizes such take, with limitations, that result from military readiness activities. If DoD determines that a proposed or ongoing military readiness activity may result in a significant adverse effects on a population of a migratory bird species, it must confer and cooperate with the USFWS to develop appropriate and reasonable conservation measures to minimize or mitigate the identified potential significant adverse effects.

Military readiness activities include all training and operations of the Armed Forces that relate to combat, and the adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use. Military readiness does not include the routine operation of base support functions, such as administrative offices, military exchanges, commissaries, water treatment facilities, storage facilities, schools, housing, motor pools, laundries, MWR activities, shops, mess halls, the operation of industrial activities, or the construction or demolition of facilities listed above (72 FR 8931). During annual INRMP reviews, the USAF must report any migratory bird conservation measures

that have been implemented and the effectiveness of the conservation measures in avoiding, minimizing, or mitigating take of migratory birds.

Additional protection for migratory birds on federal properties is provided by EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, of 2001. This EO encourages incorporation of comprehensive migratory bird management objectives in agency management plans and requires federal agencies to enter into an MOU on migratory birds with the USFWS. In 2006, the DoD and USFWS entered into an MOU in accordance with EO 13186.

7.1.6 Marine Mammals

The MMPA established a national policy to prevent marine mammal species and populations from declining beyond the point where they ceased to be a significant functioning element in the ecosystems of which they are a part. The Act set a moratorium on the taking of marine mammals in U.S. waters. The Act defines "take" as harass, hunt, capture, kill, collect, or the attempt to do so. No marine mammals are known or expected to occur at JBAB or in the immediate area; therefore, no consultations would be required under the MMPA.

7.1.7 Fish

The MSFCMA sets mandates for NOAA Fisheries, regional fishery management councils, and federal action agencies to identify and protect important marine and anadromous fish habitat. The councils, with assistance from NOAA Fisheries, are required to delineate EFH in fishery management plans or fishery management plan amendments for all managed species. Authority to implement the MSFCMA is given to the Secretary of Commerce through NOAA Fisheries. The MSFCMA requires that the EFH be identified and described for each federally managed species.

The MSFCMA requires federal agencies to consult with NOAA Fisheries on activities that may adversely affect EFH or when NOAA Fisheries independently learns of a federal activity that may adversely affect EFH. The MSFCMA defines an adverse effect as ". . . any impact which reduces quality and/or quantity of EFH [and] may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), site-specific or habitat wide impacts, including individual, cumulative, or synergistic consequences of actions. . ." (50 CFR 600.810). At JBAB, activities that could affect EFH in the marina or along the shoreline must be coordinated with NOAA Fisheries in accordance with MSFCMA.

7.1.8 Habitat Enhancement

Because JBAB is highly developed, the conservation and enhancement of any remaining natural habitat is important to protecting the base's wildlife resources. Efforts that focus on maintaining a diversity of habitat types provide the greatest benefits for wildlife. Supplemental plantings of native trees and shrubs in maintained open areas and around buildings and recreational areas as discussed in Section 7.7.2 Vegetation Management Objectives and Actions, where consistent with current and planned land uses, would help to enhance habitat diversity and achieve wildlife management objectives.

7.1.8.1 Habitat Enhancement for Cavity Nesters

The amount of habitat available for cavity-nesting birds and other wildlife species that use cavities has declined worldwide. Artificial nest boxes may be used for enhancing habitat conditions for many birds and other wildlife species, such as bats, native mice (e.g., eastern harvest mouse [*Reithrodontomys humulis*] and white-footed mouse [*Peromyscus leucopus*]), and squirrels. In summer 2020, 14 artificial nest boxes were installed at various locations around JBAB. Three wood duck boxes were placed along the waterfront,

and 11 bluebird boxes were installed throughout the interior of the installation. The bluebird boxes also may be used by similarly sized birds, such as chickadees, nuthatches, wrens, swallows, and other passerine species.

The placement of artificial nests boxes that benefit insectivorous birds and bats in urban and housing areas also would benefit residents and employees, as these taxa consume thousands of insects per day and provide enjoyment for human observers. Artificial nest boxes must be watched to prevent use by aggressive nonnative species such as house sparrows and European starlings, and they must be cleaned out and maintained before the start of each nesting season. More than a dozen bird species that potentially occur at JBAB are cavity nesters and could benefit from the placement and maintenance of artificial nest boxes (10.0 Annual Work Plans). Closing nest boxes by plugging the entrance following nesting season and reopening them in mid-March would help to limit their colonization by bees and wasps. If boxes are left open, mice may build winter nests in them. All nest boxes should be cleaned prior to the nesting season. Evicting nonnative, invasive house sparrows or European starlings observed using the nest boxes is an important measure that helps to ensure nesting success or native species. Predator guards also should be installed on all nest boxes.

7.1.8.2 Habitat Enhancement for Songbirds

Planting berry- and seed-producing herbaceous and shrub species in landscapes can benefit songbirds. Invasive species that often become established in woodlands and natural areas are commonly spread by birds (porcelain-berry [*Ampelopsis brevipedunculata*; also known as Amur peppervine], white mulberry [*Morus alba*], wineberry [*Rubus phoenicolasius*; also known as wine raspberry], oriental bittersweet [*Celastrus orbiculatus*], and multiflora rose [*Rosa multiflora*]). By replacing these invasive species with native species (see Tab 3—Landscape Planning), JBAB can provide natural food for birds and reduce the spread of undesirable plants.

7.1.8.3 Habitat Enhancement for Pollinators

In recent years, declines in populations of once common insect species have been documented. In 2014, the USFWS received a petition to include the monarch butterfly for federal listing under the ESA. Enhancing landscape plantings with native, pollinator-friendly species and larval host plants for declining butterfly species is an important part of conserving these species in urban areas. Other parts of urban and suburban landscapes that can be enhanced for pollinators include stormwater management areas, parks, and roadsides.

7.2 Outdoor Recreation and Public Access to Natural Resources

Applicability Statement

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

Program Overview/Current Management Practices

The overall goal of outdoor recreational programs at USAF installations is to provide recreational opportunities for base personnel, their dependents, and the military community—to the maximum extent possible within the constraints of the military mission and capabilities of the installation's natural resources—and to foster understanding and awareness of the environment through educational conservation programs. DoDI 1015.10 (with change 1, 6 May 2011) states that Military MWR Programs ". . . are an integral part of the military and benefits package; build healthy families and communities and provide consistently high-quality support services that are commonly furnished by other employers or State and

local governments to their employees and citizens; encourage positive individual values and aid in recruitment and retention of personnel; [and they] promote esprit de corps and provide for the physical, cultural, and social needs; general well-being; quality of life; and hometown community support of Service members and their families." Moreover, AFI 34-101, *Air Force Morale, Welfare, and Recreation (MWR) Programs and Use Eligibility*, states that, "Outdoor recreation capabilities support mission readiness through programs and facilities delivering Airmen and family resilience and readiness. Outdoor recreation also enhances teambuilding and unit cohesion and trust among Airmen." The basic components of a comprehensive outdoor recreation programs at USAF installations are detailed in AFI 34-10 at https://www.usafasupport.com/pdf/afi34-101.pdf, pages 88–89).

The objectives of outdoor recreation management at JBAB are to provide opportunities for authorized personnel, their dependents, and sponsored guests to take part in natural resource-dependent outdoor recreation; and promote natural resource conservation awareness and education. Outdoor recreation and associated facilities at JBAB are managed and operated by the Force Support Squadron (FSS), which has responsibility for managing many of the organized outdoor recreational facilities, but developed or constructed facilities, such as tennis courts, and lodging facilities, generally are not included in this definition of outdoor recreation and are not discussed in this INRMP. The outdoor recreational facilities on JBAB are open to active duty and retired military, reservists, DoD employees, family members, and contractors. Due to the security requirements and types of activities performed at JBAB, there are no public access or public opportunities for outdoor recreation.

7.2.1 Hunting and Fishing

Due to JBAB's urban nature, relatively small size, and lack of game animals, there is no hunting at JBAB. Fishing, however, is permitted and anglers must adhere to the DC licensing and regulation requirements. The DC has published regulations that limit the size and number of selected fish species that anglers are authorized to keep. All persons between the ages of 16 and 65 must obtain a license from the DOEE and it must be on their person while fishing. Fish species and catch limits can be found at the DOEE's online D.C. Fish Field Guide (https://doee.dc.gov/page/dc-fish-field-guide). The DOEE encourages anglers to practice catch and release, as consumption of certain fish from the Potomac and Anacostia Rivers raises concerns about polychlorinated biphenyls and other contaminants. Consumption of fish caught from JBAB should be limited, and anglers should regularly check the public health advisories issued by the DOEE prior to consumption of fish caught at JBAB.

The objective of the fishing program at JBAB is to increase the fishing opportunities for base personnel. This will require working with FSS to assess the potential and requirements necessary for expanding fishing access from the marina.

7.2.2 Other Outdoor Recreation

The FSS at JBAB also includes non-consumptive recreational exercise and sports activities, including walking, jogging, bicycling, baseball/softball, tennis, and volleyball, as well as pavilion areas for picnics and gatherings. JBAB has a waterfront trail (Anacostia Riverwalk Trail) that runs along the Potomac from the marina (Building 2482) to the end of Robins Road near the Child Development Center (Building 413), with a detour around the concrete levee near the Honor Guard Dormitory and Enterprise Hall (Buildings 47 and 73). The southern portion of the trail also has a number of amenities, such as lighting, seating, historical site markers, recreational fields, and communal facilities. Although it would be desirable to connect the on- and off-base portions of the trail along the riverside, security requirements preclude this action; thus, to connect the on- and off-base portions of the trail, it would have to be routed along the outside

of the eastern base perimeter. Bicycle trails are also present on base, including a portion of the waterfront trail.

Section 10.0 Annual Work Plans includes project descriptions for overall and annual maintenance of parklets.

The goal of Other Outdoor Recreation is to increase and enhance outdoor recreational activities. Actions recommended to achieve this goal are listed below.

- Maintain the educational parklets stationed around JBAB.
- Provide opportunities for volunteers to participate in INRMP.
- Schedule and coordinate organized outdoor environmental events, such as participation in the Audubon Christmas Bird Count.

7.3 Conservation Law Enforcement

Applicability Statement

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

Program Overview/Current Management Practices

According to the Sikes Act (16 USC § 670a(b)(1)(H)), installations must address in the INRMP how natural resource laws will be enforced. Conservation law enforcement is the enforcement of laws aimed at protecting natural resources (and recreation activities that depend on natural resources). Military bases with active hunting and fishing programs or with federally protected species may be served best by including conservation law as integral part of a natural resources program. Section 3.33 AFMAN 32-7003 (pages 67–68) provides details regarding conservation law enforcement, including roles, responsibilities, enforcement processes, and training requirements,

At JBAB, the base Security Department handles all law enforcement but, with such a limited base of natural resources on base, there is little need for conservation law enforcement. If a natural resource violation were to occur, state and/or federal conservation officers would be permitted access—after proper safety and security measures are taken—to enforce natural resource laws.

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

Applicability Statement

This section applies to USAF installations that have threatened and endangered species on USAF property. This section **IS** applicable to this installation.

Program Overview/Current Management Practices

The primary federal regulatory protection for threatened and endangered species on federal lands is the ESA of 1973, as amended. The ESA is federal legislation intended to provide a means for conserving the ecosystems upon which endangered and threatened species depend and provide programs for conserving those species to prevent their extinction. The law is administered by the Department of Interior USFWS and NOAA Fisheries,

> The *Endangered Species Consultation Handbook* is available on the USFWS website at https://www.fws.gov/endangered/esa-library/pdf/esa_section7_handbook.pdf.

depending on the species. The goal of threatened and endangered species management is compliance with Section 7 of the ESA, which requires all federal agencies to consult with the USFWS (and/or NOAA Fisheries) to ensure that any action that the agency authorizes, funds, or carries out is not likely to threaten the continued existence of any species listed as threatened or endangered or result in the destruction or adverse modification of habitat of such species. Currently, there are no federally listed threatened or endangered species known to occur at JBAB; therefore, no federal agency consultation regarding these resources is required at this time.

In accordance with the ESA, contemplated federal actions with potential to impact a protected species must be assessed via biological assessment to determine whether the proposed action is likely to adversely affect a listed species, proposed species, or designated critical habitat. The USFWS (or NOAA Fisheries) issues the biological opinion, which states whether the proposed action is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. The terms and conditions under which incidental take may occur may be identified by the USFWS.

The DC does not have its own government-legislated Endangered Species Program; however, the DC WAP (DOEE 2015) applies its SGCN status to all federally listed endangered species of Maryland (see Maryland Department of Natural Resources 2015) that also occur in DC. Federally listed species that occur within the DC are listed below.

- Hay's spring amphipod
- Northern long-eared bat
- Yellow lance
- Atlantic sturgeon
- Shortnose sturgeon

Habitat surveys for the Hay's spring amphipod did not identify any potential habitat. An acoustic survey conducted in 2016 did not document any northern long-eared bat recordings at JBAB. Through consultation with NOAA, it was determined that JBAB has no further actions regarding the Atlantic sturgeon. Surveys for yellow lance, shortnose sturgeon, and other sensitive species have not occurred at JBAB.

7.4.1 Threatened and Endangered Species Management Strategies, Objectives, and Actions

A strategy that maintains current floral and faunal surveys and tracks the status of rare species in DC with the USFWS and the DOEE FWD should be used. Initiating formal or informal consultation when warranted to minimize potential direct or indirect impacts to threatened, endangered, or candidate species from an action is also recommended as a management strategy for compliance with Section 7 of the ESA.

Objectives of threatened and endangered species management at JBAB include conducting and maintaining floral and faunal surveys on base. Future survey efforts conducted to acquire baseline data or to update previous survey data should take into consideration the potential presence of rare, threatened, and endangered species. Rare species lists for DC (from the DOEE FWD) and Prince George's County in Maryland (from the Maryland Department of Natural Resources Wildlife and Heritage Services) should be consulted and any potentially suitable habitat that occurs on base should be included in the survey effort. Actions required to meet these objectives are to

- conduct surveys for rare, threatened, and endangered floral species identified as having the potential to occur at JBAB;
- conduct surveys for rare, threatened, and endangered faunal species identified as having the potential to occur at JBAB;

- use survey results develop a geographic information system (GIS) layer for rare, threatened, and endangered flora and fauna; and
- conduct monitoring or follow-up surveys of endangered/threatened species and review JBAB activities/actions to determine whether they may affect species endangered/threatened and require a consultation with regulating agencies: USFWS or NOAA Fisheries.

JBAB must coordinate with NOAA Fisheries for Section 7 Consultation for any actions within the marina or along the shoreline that may impact the shortnose sturgeon.

7.4.2 Species of Greatest Conservation Need and Priority Actions

Species listed as SGCN in the DC WAP (see Chapter 2 at https://doee.dc.gov/service/2015-district-columbia-wildlife-action-plan) include Maryland species federally listed as endangered or threatened and listing candidates that also occur in DC. Chapter 3 of the DC WAP describes the other criteria used for applying SGCN status to DC species. It also was determined whether SGCN met any of the following criteria.

- Declining species
- Endemic species
- Disjunct population of a species
- Vulnerable species
- Species comprises small, localized, “at-risk” populations
- Species exists in fragmented or isolated populations
- Species has limited dispersal capabilities
- Species of special or conservation concern
- Focal species (keystone, wide-ranging, has specific needs)
- Indicator species
- State “responsibility” species (i.e., species whose range core overlaps z given state)
- Species’ conservation areas (e.g., important migratory stopover sites, bat roosts, maternity sites, etc.)

The DC SGCN designation gives priority to those species that were listed by local and regional conservation agencies and organizations, were feasible to conserve, and determined to be urban specialist species. Because of DC’s small size and geographic location, the DC FWD also prioritized species included on the lists of local and regional conservation agencies, as well as those of Maryland and Virginia. Because of the DC’s small size and limited number of habitat types and acreage, the conservation of some species is not feasible. As such, species for which conservation efforts seemed unfeasible were not listed; however, due to the DC’s large number of urban habitats, species that are well adapted to urban landscapes were given priority. In the 2015 DC WAP, there are 205 species of wildlife identified as SGCN; 37 species removed from the SCGN list and 89 species were added (DOEE 2015). Table 7-2 summarizes DC’s list of SGCN. The USFWS has a strategic plan (detailed in Section 7.5.1 USFWS Plans) that identifies several project targets for improving the Anacostia watershed and habitat for priority species in this area.

Table 7-2. Revisions to the District of Columbia's 2015 list of Species of Greatest Conservation Need (SGCN).

Taxonomic Group	SGCN 2005	SGCN 2015	Removed	Added
Birds	35	58	4	27
Mammals	11	21	2	12
Reptiles	23	17	6	0
Amphibians	16	18	2	4
Fish	12	12	4	4
Dragonflies & Damselflies	9	26	2	19
Butterflies	13	10	6	3
Bees	0	4	N/A	4
Mollusks	9	13	0	4
Crustaceans	19	22	6	9
Sponges	0	2	N/A	2
Total	**147**	**203**	**32**	**89**

7.5 Water Resource Protection

Applicability Statement

This section applies to USAF installations that have water resources. This section **IS** applicable to this installation.

Program Overview/Current Management Practices

7.5.1 USFWS Plans

The Strategic Habitat Conservation Plan for FY 2011–2016 for the Chesapeake Bay identifies focus areas, priority species, and conservation actions to guide the actions of the USFWS Chesapeake Bay Field Office (USFWS 2011b). The plan included the Anacostia Watershed focus area, which encompasses the northern end of JBAB. The conservation objectives for this focus area include restoring riparian corridors and stream habitats; improving aquatic habitat; reducing sediment, nutrients, and trash; removing barriers to fish passage; and promoting land-use policies and decisions to protect existing valuable habitat and ecosystem functions on undeveloped lands. Several of the goals and objectives that address urban forest management, invasive plant management, and restoration of disturbed areas, as outlined in their respective subsections of Section 7.0 Natural Resources Program Management, may be beneficial to the objectives of the Strategic Habitat Conservation Plan.

The Anacostia River is listed as one of the 10 most contaminated rivers in the country, and the Chesapeake Bay Program identified it as one of three areas of concern. Both the DC and the State of Maryland have listed the Anacostia River as not meeting Section 303(d) standards of the CWA and is therefore considered impaired. There are several project targets identified in the strategic plan to improve the Anacostia watershed, including stream assessments, inventory, and monitoring; developing stream restoration-monitoring protocols; preparing stream restoration plans and restoring/enhancing stream habitat; providing

technical assistance on streams; participation in technical working groups and committees; and conducting public outreach and education activities and events. The USFWS has identified the Alewife (*Alosa pseudoharengus*), American eel (*Anguilla rostrata*), bald eagle, blueback herring, Kentucky warbler (*Oporornis formosus*), prothonotary warbler (*Protonotaria citrea*), and wood thrush as the priority species in this area.

7.5.2 Local or Regional Comprehensive Community Plans

In the DC, approximately 80 percent of the land is developed; the remaining 20 percent consists of parkland, open space, and surface waters. As such, point sources are the major contributor to nutrient and sediment loading.

The DC WIP (DOEE 2013) was initiated to reduce DC pollution entering the waters of the Chesapeake Bay. The DC WIP was developed to comply with Section 117(g)(1) of the CWA and it partially fulfills requirements outlined in EO 13508, *Chesapeake Bay Protection and Restoration*. The WIP identifies the primary sources of total nitrogen, total phosphorus, and sediments entering the DC's surface waters; the reductions required to meet total maximum daily load (TMDL) limitations and water-quality standards; current actions underway to address excess nutrients and sediment; and planned future activities to comply with new loads established by TMDLs and a schedule for implementation. Within the Chesapeake Bay watershed, there are 92 impaired segment sheds, four of which are within the DC. JBAB is located in two of these segment sheds.

- Upper Potomac River, DC—This segment is referred to as POTTF_DC and represents the drainage from Rock Creek and a portion of the Potomac River within the DC.
- Anacostia River, DC—This segment is referred to as ANATF_DC and represents the drainage from the Anacostia River within the DC.

Local partners include Architect of the Capitol, Armed Forces Retirement Home, USACE, DoD, Federal Railroad Administration, General Services Administration, NPS, Smithsonian Institution, USDA, and Veterans Affairs. The DoN was an active participant in plan development and submitted programmatic milestones for meeting TMDL limitations. The milestones included conducting a base-wide BMP inventory and assessment, implementing an LID policy for stormwater management, seeking additional ways to improve stormwater management, and conducting urban nutrient management on 450 acres. Actions recommended in this INRMP to reduce soil erosion and improve water quality further support the goals and objectives of the DC Chesapeake Bay WIP.

7.5.3 Water-Quality Surveys

IAW the MSGP and its Stormwater Pollution Prevention Plan, the Stormwater Pollution Prevention Team conducts routine visual inspections on a quarterly basis (JBAB/AFCECC Washington 2021) at approved sampling locations. The quarterly inspections include visual assessments for indicators of pollutants (e.g., color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, or other obvious indicators).

7.5.4 Soil and Water Management—Strategies, Objectives, Practices, and Actions

Sound water-management practices that conserve soil and water are paramount to the overall natural resources conservation program, as these resources form the foundation that supports the remaining components of the system. Consequently, the goal of soil and water management at JBAB is to make every effort to ensure this foundation is protected from anthropogenic and natural impacts. The program is

applicable to the entire base and interacts significantly with the management of grounds/vegetation, wetlands, forest, and fish and wildlife, as well as other program elements of environmental compliance. The strategies for soil and water management at JBAB include those listed below.

- Protect the real estate from depreciation by implementing appropriate land-use practices.
- Reduce or eliminate any pollutants flowing into U.S. waters through waste disposal or erosion and sedimentation.
- Improve appearance and ecosystem function by incorporating appropriate sediment- and erosion-control BMPs.

The objectives of soil and water management at JBAB are to minimize soil erosion and reduce the potential for nonpoint source pollution from ground-disturbing activities. These activities are largely governed by Title 21 District of Columbia Municipal Regulations (DCMR), Chapter 5, Section 540—*Water Quality and Pollution.* JBAB discharges stormwater into the Potomac and lower Anacostia Rivers, both of which are classified as impaired. In addition, both rivers drain into the Chesapeake Bay, and Section 202c of EO 13508, *Chesapeake Bay Protection and Restoration*, assigns the DoD as a lead agency on the Federal Leadership Committee tasked with strengthening stormwater management practices at federal facilities and on federal lands within the Chesapeake Bay watershed and to develop best practices guidance for stormwater. As identified in the Chesapeake Bay Watershed Agreement Implementation Plans (WIPs) (DOEE 2010, 2012, 2019; Chesapeake Progress 2021), the DoD is a participating federal agency in the plans. The DC's Chesapeake Bay WIP, which includes information specific to the DoD in the DC, addresses management activities to reduce its nitrogen, phosphorous, and sediment loads (DOEE 2019). Between 2019 and 2020, JBAB conducted a comprehensive stormwater mapping effort that included an update to the number of outfalls, gathered pipe characteristics, and re-delineated drainage basin boundaries.

Soil- and water-management actions are overseen by the stormwater media manager at JBAB. Specific repair and upgrade planning actions, including installing infrastructure for stormwater management and incorporating LID techniques into stormwater management, are not described as a natural resource project in this INRMP.

7.5.4.1 Erosion and Sediment Control

In the DC, any project that includes razing or land-disturbing activity (e.g., stripping, clearing, grading, grubbing, excavating, and filling land) in an area of more than 50 square feet must submit a Soil Erosion and Sediment Control plan to the DOEE for approval, as outlined in Title 21 DCMR, Chapter 5, Section 540—*Water Quality and Pollution*. Projects are compelled to comply with DOEE inspection and a DOEE-approved Erosion and Sediment Control Plan. Regardless of size, projects may not send sediment to the stormwater system.

7.5.5 Stormwater Management Plan

In the DC, major regulated projects require a Stormwater Management Plan (SWMP) approved by the DOEE, unless exempt under Title 21 DCMR, Chapter 5. Regulated projects include substantial improvement and major land-disturbance activities. SWMPs approved by the DOEE govern the design, construction, and maintenance for regulated stormwater BMPs. The SWMP shall demonstrate compliance with Title 21 DCMR, Chapter 5.

Each SWMP submitted to the DOEE for approval must identify and specify the location of all BMPs necessary for meeting the requirements under Title 21 DCMR, Chapter 5. Reference the DC Stormwater Management Guidebook for guidance when designing a BMP and submitting a SWMP.

7.5.6 Floodplain Management—Strategies and Objectives

The goal of floodplain management at JBAB is to comply with the requirements of EO 11988, *Floodplain Management*. This EO instructs federal agencies to reduce the risk of flood losses by not building in floodplains and by restoring and preserving the natural and beneficial values provided by floodplains. EO 11988 specifically directs federal agencies to

- avoid actions located in or adversely affecting floodplains unless there is no practicable alternative;
- take action to mitigate losses if avoidance is not practicable;
- establish a process for flood-hazard evaluation based upon the 100-year base flood standard of the National Flood Insurance Program; and,
- issue implementing procedures.

As a federal entity, JBAB does not comply with DC Construction codes and is not subject to DC Department of Consumer and Regulatory Affairs (RA) requirements. Through the federal permitting process, floodplain reviewers may recommend flood protections that meet local standards, such as Title 12 DCMR—DC Construction Codes and Title 20 DCMR, Chapter 31—Flood Hazard Rules. Local floodplain regulators include the DOEE and the Department of Consumer and Regulatory Affairs. The goal of floodplain management is to reduce the risk of flood-related losses, reduce erosion, minimize water pollution, and conserve habitat by preserving floodplains. The objective of floodplain management at JBAB is to minimize the negative impact on floodplains as a result of development. Specific planning actions, such as reducing the area of impervious surfaces and development within the flood zones, are not described as natural resource projects in this INRMP.

The implementation procedures described by *Floodplain Management Guidelines* for implementing EO 11988 (Federal Emergency Management Administration 2012) provides an eight-step decision-making process for carrying out the EO's directives. This eight-step process entails (1) determining whether a proposed action is in the base floodplain; (2) providing for public review; (3) identifying and evaluating practicable alternatives to locating in the base floodplain; (4) identifying the impacts of the proposed action; (5) minimizing threats to life, property, and natural and beneficial floodplain values and restoring and preserving the natural and beneficial values of floodplains; (6) reevaluating alternatives; (7) issuing findings and a public explanation; and (8) implementing the action. This process is implemented with the NEPA process. If floodplain disturbance is unavoidable, NEPA documentation details the impacts before any ground-disturbing activities are undertaken. Floodplain data are included in the installation's GIS for all projects. It is JBAB policy is to avoid disturbance in these areas or mitigating potential impacts when disturbance is necessary (see Figure 2-8).

7.6 Wetland Protection

Applicability Statement

This section applies to USAF installations that have existing wetlands on USAF property. This section **IS NOT** applicable to this installation.

Program Overview/Current Management Practices

In 2016, a delineation of wetlands and U.S. waters was conducted by the USACE Baltimore District for JBAB (see Tab 2—Wetland Delineation Report and Jurisdictional Determination). Three wetlands were delineated and identified as non-jurisdictional—rather, they are part of the stormwater system. As such, there are no wetland management objectives or actions identified within this INRMP.

7.7 Grounds Maintenance

Applicability Statement

This section applies to USAF installations that perform ground maintenance activities that could impact natural resources. This section **IS** applicable to this installation.

Program Overview/Current Management Practices

JBAB has a variety of landscaped areas, street trees, lawns, and small, vegetated buffer areas along fence lines and beside roadways. To date, however, there has not been a complete vegetation survey conducted for JBAB, although trees were surveyed for developing the Urban Forestry Inventory and Management Plan. Formal vegetation surveys should be conducted at JBAB to inventory and characterize the semi-natural and natural areas of the base. The survey results will provide the information needed to accurately define vegetation management goals and strategies for JBAB. For the purposes of this INRMP, vegetation management would be any actions occurring outside of the areas maintained under Public/Private Venture (PPV) housing contracts.

The goal of vegetation management on JBAB is the use of regionally native plants and landscaping practices and technologies that conserve water and prevent pollution IAW with the Presidential Memorandum on Beneficial Landscaping, USAF policy, and the 2015 IAP. Areas landscaped with native trees and shrubs would improve quality of life for JBAB employees, residents, and their visitors by improving curb appeal and providing a more natural, pleasant environment in which to live and work. See Tab 3—Landscape Planning for JBAB.

7.7.1 Vegetation Management Strategies

Grounds maintenance is routinely conducted on improved areas of JBAB. Trees and shrubs planted in appropriate locations reduce energy consumption by shading buildings, providing windbreaks, and cooling the air through transpiration. Benefits from landscape vegetation can be maximized by planting deciduous trees on the south, east, and west sides of buildings to provide shade during the summer but allow insolation in the winter, and by installing evergreen buffers on the windward sides of buildings to reduce heat-loss effects of wind. Vegetation management at JBAB emphasizes landscaping with low-maintenance, native species. Where there is poor regeneration of native plant species or where the threats of invasive species or erosion are high, the use of an aggressive, highly competitive grass is recommended (see Section 7.11.1 Invasive Species—Surveys and Management Strategies, Objectives, and Actions for details about invasive species management). Tab 3—Landscape Planning provides a list of appropriate grasses for landscaping in the DC region.

Key guidance for landscape maintenance practices on federal properties is the 1994 Presidential Executive Memorandum, *Environmentally and Economically Beneficial Landscape Practices on Federal Landscaped Grounds* (60 FR 40837). This memorandum requires federal agencies to incorporate beneficial landscape practices on or in all federal grounds, federal projects, and federally funded projects, to the extent practicable. The concept of beneficial landscaping emphasizes the following pactices.

- Use regionally native plants.
- Design, use, and promote construction practices that minimize adverse effects on the natural habitat.
- Prevent pollution by reducing fertilizers and pesticides, using integrated pest management (IPM) techniques, recycling green waste, and minimizing runoff.
- Implement water- and energy-efficient landscaping practices.

- Create outdoor demonstrations that incorporate native plants, as well as pollution-prevention and water-conservation techniques, to promote awareness of the environmental and economic benefits of implementing this directive.

The term beneficial landscaping describes practices that integrate native vegetation into the landscape and minimize the adverse effects that landscaping has on the natural environment. The use of regionally native plant species, which are generally better suited for local site conditions than non-native species, reduces the need for intensive maintenance and the use of fertilizers and pesticides. Using a variety of native trees and shrubs that offer structural diversity and flower at staggered times will also enhance wildlife value for birds and native pollinators in the developed areas of the base. Specific beneficial landscaping guidance, including a list of various tree, shrub, and herbaceous species appropriate for use in the Mid-Atlantic region, is provided in Tab 3—Landscape Planning.

7.7.2 Vegetation Management Objectives and Actions

Vegetation management objectives at JBAB are to promote biodiversity; minimize the use of energy, water, fertilizer, and herbicides for grounds maintenance activities; and increase habitat suitable for native wildlife, which in turn would support the goals of the DC's WAP, without jeopardizing the installation's mission and training requirements. In addition, areas landscaped with native trees and shrubs improve quality of life for JBAB employees, residents, and their visitors by providing a more natural, pleasant environment in which to live and work. To meet these vegetation management objectives, recommended actions are summarized below.

- Replace street trees and landscaped materials as they die and/or are removed.
- Review landscaping plans and modify as necessary to meet native plant requirements.
- In disturbed areas with adequate space, establish early successional native vegetation, while ensuring that invasive plant species do not become established.

7.7.3 Lawns

The lawns at JBAB are mowed to present a neat and attractive appearance. Grassy areas generally are planted with fescue or Bermuda grasses. Beneficial landscaping practices that could be implemented include reducing the amount of mowed lawn by increasing the use of native trees, shrubs, and ground covers. In disturbed urban environments such as JBAB, however, desirable vegetation should be well established before mowing ceases or it could lead to infestation by aggressive invasive species, and the cost of controlling them would exceed the cost of avoiding invasions in the first place. Other recommended practices for lawn care include maintaining the grass at a height of approximately three inches and restricting mowing during dry periods; however, in locations were Canada geese are a flight-safety concern, grass should be maintained at a height that discourages its use, as discussed in Section 7.12 Bird/Wildlife Aircraft Strike Hazard.

7.8 Forest Management

Applicability Statement

This section applies to USAF installations that maintain forested land on USAF property. This section **IS** applicable to this installation.

Program Overview/Current Management Practices

There are no large, contiguous tracts of forestland on JBAB that would require typical forestry practices such as thinning and harvesting, and commercial forestry is not an objective of forest management. Forests

on JBAB are mainly composed of individual or small copses of trees planted for aesthetic landscaping purposes and do not have potential for commercial forest management. Forest management on JBAB primarily concerns urban forest and woodland community management.

The goal of urban forestry (Tab 4—Urban Forestry Management Plan) is to optimize the social benefits of forested areas based on aesthetic, environmental, planning, and wildlife considerations, while reconciling these objectives to the needs of people, buildings, and other structures that typically coexist with urban forested land. Regularly scheduled management is needed to minimize safety hazards and sustain the urban forest on JBAB.

Although the woodland resources on JBAB are not managed for timber production, they do provide some social, environmental, and economic benefits. Some of the benefits provided by these urban forests include watershed protection, wildlife habitat, visual buffers, and reducing the heating and cooling costs for buildings. Urban trees, however, can present some problems: inadequate planning for removal and replacement may result in the presence of hazardous trees; poor pruning and other maintenance practices could lead to poor aesthetics and may defeat the trees' intended purposes; and inadequate pest or animal damage control may reduce the trees' landscape values. Urban forestry practices often focus on establishing standard tree and shrub maintenance. Implicit in these standards is the goal of preventing unnecessary damage to trees and shrubs from construction or grounds maintenance activities. Implementing standard grounds maintenance practices that protect existing trees and shrubs can help to achieve this goal.

Urban forestry planning involves selecting plants and trees suited to the particular site conditions or regional climate, planting trees or shrubs appropriate distances from buildings, and using proper pruning techniques. A prime concern in such landscape planning is the potential for trees to conflict with utility infrastructure—both existing and proposed. For the purposes of this INRMP, forest management implementation would occur outside of the residential areas (see Figure 2-14), which are maintained under PPV contracts.

7.8.1 Forest Surveys

In December 2015, an Urban Forest Inventory and Management Plan was completed for JBAB. The plan provides an inventory of 1,997 individual trees comprising 55 species outside the PPV area. Of the 55 species identified, 37 are native and 18 are considered introduced. Native tree species accounted for approximately 54 percent (1,080) of the inventoried trees. General dendrological metrics (age, height, and crown classes) were collected and, based on these data, trees were assigned a prioritization for removal or pruning. No timber inventories or commercial assessments have been conducted because commercial forest management would not be consistent with JBAB's mission or regional land-use planning for JBAB.

7.8.2 Forest Management Strategies, Objectives, and Actions

Urban forestry practices often focus on establishing standard tree and shrub maintenance. Implicit in these standards is the goal of preventing unnecessary damage to trees and shrubs from construction or grounds maintenance activities.

The trees on JBAB are recognized as essential for moderating temperatures, reducing energy consumption, and mitigating stormwater runoff. The JBAB IDP will provide a vision of incorporating trees, other vegetation, low-impact landscaping, and other sustainable practices throughout the base. As no commercial forestry operations will be conducted at JBAB, recommended forest management actions are limited to urban forest health and hazardous tree management. Urban forestry planning involves selecting plants and trees that are suited to the particular site conditions or regional climate, planting trees or shrubs appropriate

distances from buildings, and using proper pruning techniques. A prime concern in such landscape planning is the potential for tree and utility conflicts, involving both existing and proposed facilities.

The forest management objectives at JBAB are to implement the Urban Forest Management Plan to maximize the benefits and minimize the problems associated with urban trees, and to avoid creating conflicts with utilities. Current implementation of the plan is performed by in-house resources and contracted support. Since the 2015 INRMP, twelve trees were replaced in FY 2017 and fourteen trees were replaced in FY 2020. To achieve the forest management objective, recommended actions for JBAB are summarized below. Action descriptions are located in Section 10.0 Annual Work Plans.

- Practice standard grounds maintenance practices.
- Perform periodic monitoring by the 11 Civil Engineer Squadron (CES) Natural Resources Program Manager and/or Grounds & Entomology staff.
- Conduct annual tree health surveys for forest and tree pests.

7.9 Wildland Fire Management

Applicability Statement

This section applies to USAF 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

The urban environment of JBAB precludes the need to develop a wildfire management plan. The JBAB Fire Department is responsible for all structural and wildfire control at the base.

7.10 Agricultural Outleasing

Applicability Statement

This section applies to USAF installations that lease eligible USAF land for agricultural purposes. This section **IS NOT** applicable to this installation.

Program Overview/Current Management Practices

There is no agricultural outleasing at JBAB.

7.11 Integrated Pest Management Program

Applicability Statement

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

Program Overview/Current Management Practices

An invasive species is defined by EO 13751, *Safeguarding the Nation from the Impacts of Invasive Species* (8 December 2016), as ". . . a non-native organism whose introduction causes or is likely to cause economic or environmental harm, or harm to human, animal, or plant health." Invasive plants can cause ecological impacts, such as loss of biodiversity, habitat degradation, and other environmental problems; many invasive species displace or otherwise harm native species and can alter ecosystem processes and both aquatic and

terrestrial habitats. In fact, invasive species are recognized as a leading threat to natural ecosystems and biodiversity, as well as a leading cause of species becoming threatened and endangered. It is estimated that 42 percent of the species protected by the ESA are at risk primarily because of nonnative, invasive species (Pimental et al. 2005). Moreover, invasive plants are the top threats to wildlife habitat in the DC and achieving the goals outlined in the WAP (DOEE 2006). Invasive species also can impact the military mission.

EO 13751 directs federal agencies to prevent the introduction and spread of invasive species and support efforts to eradicate and control invasive, non-native species on federal lands. In addition to the requirements of EO 13751, the Federal Noxious Weed Act of 1974 (7 USC 2814) provides for the control of noxious plants on lands under the control or jurisdiction of the federal government. Section 15 of the Plant Protection Act (7 USC 7701 *et seq.*), enacted in June 2000, requires federal land management agencies to develop and establish a management program for control of undesirable plants that are classified under federal or state law as undesirable, noxious, harmful, injurious, or poisonous, on federal lands. Prevention and control of invasive species reduces their impacts on military missions while also supporting native ecosystems.

On DoD lands, DODI 4715.03 states that installations shall ". . . identify, prioritize, monitor, and control invasive species. . . " and restore habitats with native species as practical. AFMAN 32-7003, Sections 3.62–3.63 direct USAF installations to preclude authorizing, funding or carrying out any management actions likely to introduce nonnative invasive species, and to conduct surveys and manage natural resources in a manner that will control invasive species. It further directs that USAF installations shall, "Formulate and implement INRMP goals and objectives to detect, respond to, and control populations of invasive species in a cost-effective and environmentally sound manner whenever and wherever practical." NRMs are to prioritize control of invasive species where they impact USAF operations and where their control will have the greatest chance of restoring a native ecosystem to self-sustainability. Invasives management goals should be consistent with the Federal Invasive Species Management Plan and other guidelines promulgated by the National Invasive Species Council.

The primary goals of invasive species management at JBAB are to control, reduce, or eliminate invasive plant populations to the greatest extent practicable to promote biodiversity and ecosystem integrity on base (see Tab 5—Integrated Pest Management Plan (IPMP)). Identifying and preventing new infestations, as well as continuing to control the principal infestations, are the objectives of invasive species management. Pest management is overseen by the Entomology Shop within the Operations Flight of the Civil Engineering Squadron and is not considered a natural resources issue.

7.11.1 Invasive Species—Surveys and Management Strategies, Objectives, and Actions

JBAB is a highly developed, urban base with large ratios of edge-to-area, rendering these areas highly vulnerable to invasion by exotic species. The majority of vegetation on JBAB consists of a mix of native and non-native species planted for landscaping and aesthetics. The health and viability of the native vegetation, however, are under stress from the invasive species that occur. Regularly monitoring for new populations of invasive species allows for early control of infestations, since management efforts are more effective when population sizes are small. Early control minimizes maintenance costs and adverse effects on native species. Management of invasive species will be conducted in accordance with the JBAB IPMP, which is currently under revision and its completion is expected in early 2022.

When the 2015 JBAB INRMP was being developed, 18 invasive plant species were observed on base during general site visits. In 2016 and 2017, a formal survey of invasive plant species was conducted, during which an additional 21 species were documented (Table 7-3, Figure 7-1). Using the results of the survey, an invasive species management plan was developed.

Table 7-3. Invasive plant species observed at Joint Base Anacostia-Bolling.

Common Name	Scientific Name	Common Name	Scientific Name
Trees		**Vines**	
Tree-of-heaven	*Ailanthus altisima*	English ivy	*Hedera helix*
White mulberry	*Morus alba*	Japanese Honeysuckle	*Lonicera japonica*
Callery pear	*Pyrus calleryana*	Mile-a-minute	*Polygonum perfoliatum*
Chinese elm	*Ulmus parvifolia*	Porcelainberry	*Ampelopsis brevipedunculata*
Norway maple	*Acer platanoides*	Bittersweet vine	*Celastrus orbiculatus*
Paper mulberry	*Broussonetia papyrifera*	Sweet autumn clematis	*Clematis terniflora*
Princess tree	*Paulownia tomentosa*	**Graminoids/Grasses**	
Shrubs		Broadleaf cattail	*Typha latifolia*
Bush honeysuckle	*Lonicera maackii*	Japanese stiltgrass	*Microstegium vimineum*
Multiflora Rose	*Rosa multiflora*	Johnsongrass	*Sorghum halepense*
Wineberry	*Rubus phoenicolasius*	Narrowleaf cattail	*Typha angustifolia*
Herbs/Forbs		Common reed	*Phragmites australis*
Crown vetch	*Securigera varia*	Chinese foxtail	*Setaria faberi*
Japanese hops	*Humulus japonicus*	Giant Chinese silvergrass	*Miscanthus sinensis*
Japanese knotweed	*Polygonum cuspidatum*	Nutsedge	*Cyperus spp.*
Sericea lespedeza	*Lespedeza cuneata*		
Asiatic dayflower	*Commelina communis*		
Beefsteak	*Perilla frutescens*		
Purple loosestrife	*Lythrum salicaria*		
Bull thistle	*Cirsium vulgare*		
Canada thistle	*Cirsium arvense*		
Hairy nightshade	*Solanum physalifolium*		
Jimson weed	*Datura stramonium*		
Long-bristled smartweed	*Polygonum longiseta*		
Mugwort	*Artemisia vulgaris*		
Sweet clover	*Melilotus officianlis*		

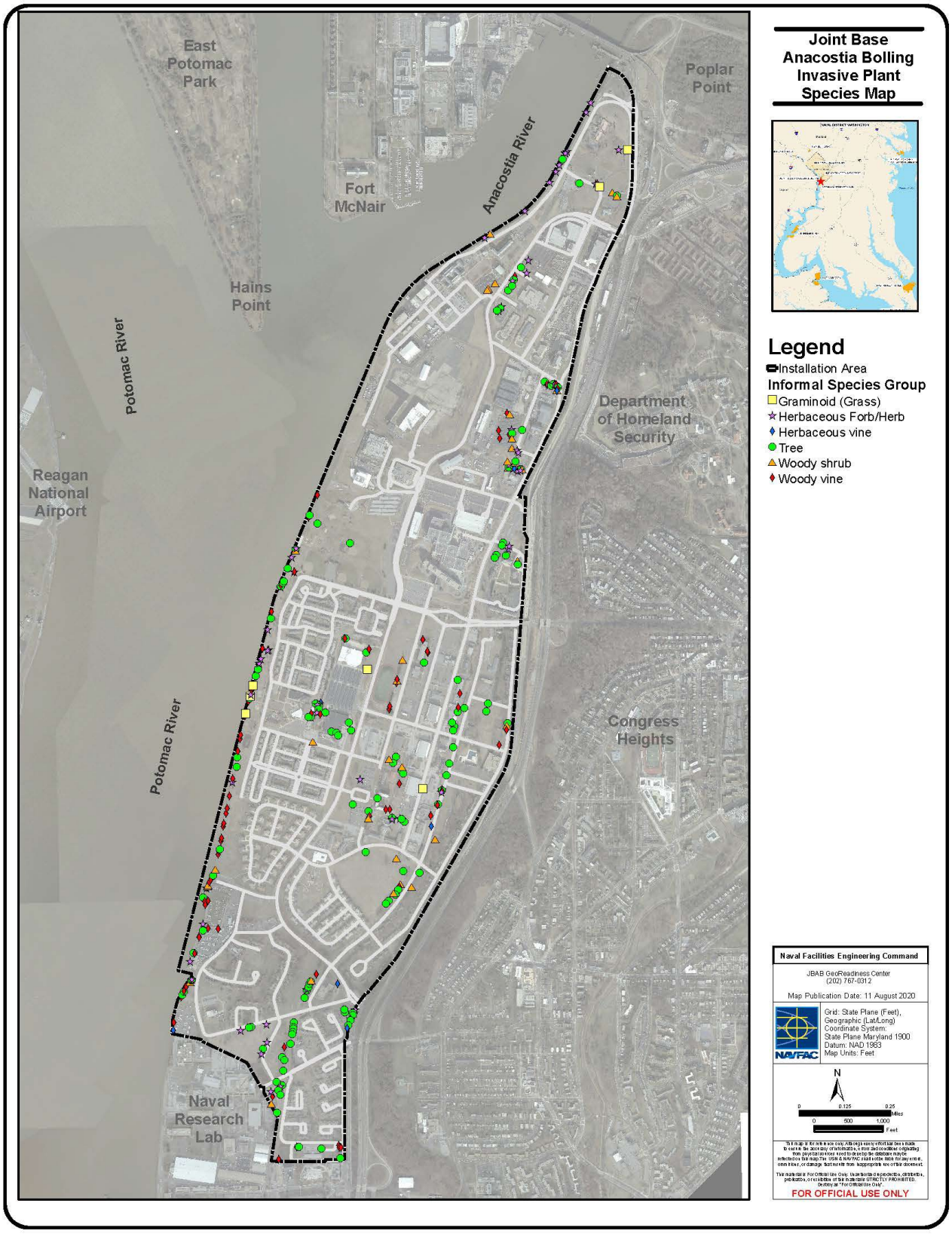

Figure 7-1. Invasive plants at Joint Base Anacostia-Bolling.

To meet invasive plant management goals, the objectives are to implement the Invasive Species Management Plan (Tab 6—Invasive Species Management Plan) and increase the awareness of installation employees and residents of issues related to invasive species. To achieve the objectives of invasive plant management, recommended actions are summarized below. Action descriptions are located in Section 10.0 Annual Work Plans.

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- Conduct annual treatments of invasive plant species.
- Conduct habitat restoration for each treatment site, as necessary.
- Conduct periodic surveys of invasive plant species.
- Incorporate invasive species control measures in landscaped areas into grounds maintenance contracts (see Tab 6—Invasive Species Management Plan).
- Organize educational outreach programs and volunteer participation in invasive plant removal during events such as Earth Day, National Public Lands Day, and other events.

7.11.2 Nuisance Wildlife Management

Nuisance wildlife species are those that, because of their feeding or nesting habits, interfere with the military mission or well-being of domestic animals, other wildlife, or humans. The primary nuisance wildlife species at JBAB is the Canada goose.

IAW DoDI 4150.07, DoD Pest Management Program, all federal, state, and local permits will be obtained for pest management, including nuisance wildlife. In the DC, wildlife control operators must be licensed to provide wildlife control services. According to the DC Wildlife Protection Act of 2010, wildlife is defined as any free roaming wild animal, with the exception of commensal rodents, invertebrates, fish, and domestic animals kept as pets (including feral dogs and cats). Contractors that supply pest management services must also be certified by the DOEE to operate as a pest management business.

7.11.2.1 Canada Goose

Historically, migratory Canada goose populations arrived in the continental U.S. in spring and left in the fall. In recent decades, however, resident Canada goose populations have been increasing throughout the US, including in urban environments where the abundance of open water ponds and grassy lawns provides ideal year-round habitat. The primary concern with the presence of Canada geese on JBAB is the hazard they pose to flight safety. In addition, they can cause lawn damage, soil sidewalks and pond water, and exhibit aggressive behavior during the nesting season. Large amounts of fecal droppings around the base can be carried into facilities on shoes, increase the transmission of fecal coliform bacteria, and pose a potential public health issue. It also contributes to excess nutrients in the surrounding waterways, which can lead to water-quality degradation. Resident, or non-migratory, Canada geese are those that nest within the lower 48 states and the DC during the months of March through June, or that reside there during the months of April through August (USDA Animal and Plant Health Information Service [APHIS] Wildlife Services [WS] 2009). Migratory Canada geese are those that nest in Alaska and northern Canada and fly south to winter in the lower 48 states.

As a migratory bird species, the Canada goose is protected under the MBTA. This federal law prohibits capturing or killing Canada geese outside of legal hunting seasons; however, in 2006, the USFWS revised regulations that pertain to resident Canada geese by issuing the Resident Canada Goose Nest and Egg Depredation Order (50 CFR 21.50). This regulation allows landowners to remove Canada geese at airports, in agricultural area, and in other areas where they are causing conflicts with human populations. Moreover, it allows natural resources manager to destroy resident Canada goose nests and eggs when necessary to

resolve or prevent injury to people, property, agricultural crops, or other interests. Under this order, no permit is required, but the landowner must register with the USFWS in order to conduct this activity. The landowner or land manager (including employees that may conduct the work) must register each year prior to taking nests and eggs. Nests and eggs may be taken only between March 1 and June 30. Each registered landowner must then return to the website by October 31 to report the number of nests with eggs destroyed, and the date and location (USDA APHIS WS 2009). In 2014, JBAB contracted APHIS WS to take the depredation action of oiling eggs in resident Canada goose nests. In 2021, JBAB contracted with the USDA APHIS WS to conduct the depredation action of oiling goose eggs and a round up and euthanasia of 99 geese.

7.11.2.2 Rock Pigeon

The rock pigeon (*Columba livia*), formerly known as the rock dove, is native to most of Europe, western Asia, and northern Africa, and is now found throughout North America (Invasive Species Specialist Group [ISSG] 2008). Rock pigeons are commonly found in disturbed areas, such as urban and agricultural environments. They are very dependent on humans for food and roosting and nesting sites (Internet Center for Wildlife Damage Management 2005). They also are known to carry several diseases, including those that can be transmitted to humans, such as toxoplasmosis, salmonella, and encephalitis. Rock pigeon droppings can accelerate the deterioration of buildings, kill vegetation, and deface public and private property. Rock pigeons can be controlled through habitat modification and exclusion (ISSG 2008). Habitat modification includes the removal of food, water, and roosting and nesting locations, as well as discouraging people from feeding pigeons in public areas. Pigeons can be excluded from buildings by modifying ledges, rafters, and other roosting sites by adding material, such as nets, wires, sheet metal, wood, and Styrofoam to block or discourage landing and roosting.

7.11.2.3 Stray and Feral Pets

Stray pets are those that were once owned and then either became lost or they were abandoned or left behind by owners and became nuisance wildlife on military bases. Feral pets, however, are those that are born and live outside. Feral pets may carry diseases such as rabies, distemper, and feline leukemia (in cats) and pose a serious health threat to humans and other family pets. It is therefore important to ensure that pets are properly vaccinated, tagged, and registered when brought onto JBAB. In addition, feral animals and loose pets, particularly cats, are known to be very damaging to bird populations and other native wildlife. It is estimated that there are over 10 million feral cats in the US, and free-ranging domestic cats kill an estimated 1.4 to 3.7 billion birds and 6.9 to 20.7 billion mammals in the U.S. each year (Loss et al. 2013).

IAW AFMAN 32-7003, “Installations will not, to the extent practicable and permitted by law, authorize, fund, or carry out activities that are likely to cause the introduction or spread of feral dogs, cats, horses, cattle, pigs, goats or other non-native domesticated animals on Air Force-controlled lands.” Privately owned animals are not permitted to run at large on the base. The AFI 2-6001-SFGM2 (Change to AFI 32-6001), *Air Force Guidance Memorandum—Pets in Military, Government-Managed, and Privatized Family Housing* (see https://download.militaryonesource.mil/12038/Plan%20My%20Move/Memo%20-%20AF%20Policy%20on%20Pets.pdf) stipulates that pets must be leashed or under positive [voice] control except when they are in fenced yards or patios, they must have current immunizations, and pet areas must be cleaned to control odor and vermin, including the cleanup of feces outside of personal yards.

7.11.2.4 Rat

The Norway rat (*Rattus norvegicus*), the roof rat (*R. rattus*), and a subspecies of roof rat, the black rat (*R. rattus rattus*) were introduced North America early in U.S. history when they escaped from ships that had originated from Europe (Internet Center for Wildlife Damage Management 1994). Both species live in close

association with humans, although roof rats are more aerial than Norway rats, preferring to live in trees and other elevated areas. The Norway rat has spread throughout the US, whereas the roof rat seems to be limited to the southern half of the East Coast (Maryland and south), the Gulf states, and along the Pacific coast. Rats consume and contaminate human food and animal feed, damage crops, and damage food and feed containers and packaging materials. Rats also damage buildings by gnawing on pipes, electrical wires, and gnawing on or burrowing through walls, floors, windowsills, ceilings, and doors. Rats carry and transmit diseases to humans, such as murine typhus, leptospirosis, trichinosis, salmonellosis, and rat-bite fever. (Rat-bite fever is an infectious disease that, in North America, can be caused by the bacteria *Streptobacillus moniliformis*. People usually acquire the disease from infected rodents or consumption of contaminated food or water. When the latter occurs, the disease—also known as Haverhill fever—can be serious or even fatal if not treated [see the Centers for Disease Control web site at http://www.cdc.gov/rat-bite-fever/]). Although all rodents are potential vectors for plague (*Yersinia pestis*), the roof rat is a more common vector than the Norway rat. The control of rats (as pests and disease vectors) is part of the DoD Pest Management Program (DoDI 4150.07) and is carried out as part of the base's approved IPM program (see above).

7.11.2.5 Groundhog (Woodchuck)

Groundhogs (*Marmota monax*) are commonly found in open areas or wooded or brushy areas adjacent to open areas (Bollengier 1994). They typically excavate their burrows in fields and pastures, along walls, roadsides, building foundations, or at the bases of trees. The primary concern about groundhogs in an urban area would be damage from burrowing activity near building foundations and on earthen dikes and levees. Groundhogs also may eat or gnaw on landscaping trees and vegetation, and they have been known to gnaw on underground cables and vehicle hoses. Groundhog control should be included in the base's approved IPM program.

7.12 Bird/Wildlife Aircraft Strike Hazard

Applicability Statement

This section applies to USAF 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

JBAB has two airfield (helicopter) operations: the larger of the two is the HMX-1 operation in the northwestern portion of the installation, and the smaller is a centrally located helipad/helicopter operation. As mentioned earlier, JBAB also lies within the Atlantic Flyway, a major bird migration corridor. Moreover, although the installation is located within a highly developed urban area, the base has and is surrounded by some habitat types that tend to attract a number of bird species (e.g., vultures, raptors, waterfowl) capable of posing significant hazards to flight operations and aircraft. Open fields and mowed turf grasses commonly found on military bases, especially those near water bodies like the Potomac and Anacostia Rivers, are especially attractive to species such as geese that pose significant risks to air operations.

Every DoD installation with flight activities must develop a BASH plan that lists personnel responsibilities, requirements, and procedures for preventing mishaps between wildlife and aircraft or causing disruptions in flight operations. JBAB's BASH plan (see Tab 7—Bird/Wildlife Aircraft Strike Hazard (BASH) Plan) was developed under Navy leadership, and is anticipated to be updated to a USAF plan in the near future. BASH plans are meant to safeguard not only USAF flight operations, but also to ensure compliance with federal laws and protected species. Managing wildlife hazards requires a full understanding of which species are likely to occur in the area and their timing of occurrence (i.e., season, time of day or tides).

Natural resource personnel also must understand which resources tend to draw wildlife to the airfield and surrounding areas and how habitat management and other aspects of wildlife management can either encourage or discourage their presence. As such, DoD airfields must be managed very carefully to discourage wildlife use of airfields and nearby areas, and the goal of BASH-related natural resources management is to reduce the potential for BASH incidents to the lowest level possible through sound bird and wildlife management and conservation actions.

For USAF installations with flight activities, AFMAN 32-7003 (Sections 3.64—*Bird/Wildlife Aircraft Strike Hazard Program* and 3.65—*Natural Resources Management in the Airfield Environment*) outlines the personnel responsibilities, requirements, and procedures associated with preparing and implementing the installation's BASH plan as an integral part of the INRMP. As discussed in AFMAN 32-7003, all USAF natural resources management programs must adhere to requirements of AFI 91-202—*The U.S. Air Force Mishap Prevention Program*, which implements AFPD 91-2—*Safety Programs*; AFI 91-204—*Safety Investigations and Reports* (and its subsequent 2020 supplement), which provides policy guidance for investigating and reporting USAF mishaps; and AFI 91-21—*Bird/wildlife Aircraft Strike Hazard (BASH) Management Program*, which provides policy, guidance, and program management information for implementing an effective BASH-management program, including program requirements, and program responsibilities. More information and access to supporting documentation and forms for the USAF BASH program are available from the BASH page on the Air Force Safety Center website (https://www.safety.af.mil/Divisions/Aviation-Safety-Division/BASH/).

7.12.1 Focal Bird/Wildlife Aircraft Strike Hazard Management Species

The Canada goose is a focal species for BASH management at JBAB because its population is relatively large and the year-round resident population in the mid-Atlantic region is growing. Between 1 January 2010 and 1 August 2020, the Federal Aviation Administration (FAA) confirmed 12 airstrikes with Canada geese at DC airports, 7 of which occurred at Reagan National Airport (FAA 2020). Between 2010 and 2020, there also were seven incidents of helicopter strikes with Canada geese in the US. Actions for managing resident Canada goose population are discussed in Section 7.11.2 Nuisance Wildlife Management.

7.13 Coastal Zone and Marine Resources Management

Applicability Statement

This section applies to USAF 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

The CZMA encourages states to preserve, protect, develop, and, where possible, restore or enhance valuable natural coastal resources such as wetlands, floodplains, estuaries, beaches, dunes, barrier islands, and coral reefs, as well as the fish and wildlife supported by those habitats. Although there are no Coastal Zone Management Program requirements in the DC (USACE 2012), the DOEE Watershed Protection Division, works with several regional agencies and organizations, such as the USEPA, Chesapeake Bay Program, Interstate Commission on the Potomac River Basin, and the Metropolitan Washington Council of Governments to address shared environmental concerns. The use of nationwide permits to authorize any activity within the DC, including the coastal zone, is contingent upon obtaining an individual Water Quality Certificate (WQC) or a project-specific WQC waiver. For work in the DC, a WQC can be obtained by submitting a joint permit application form.

7.14 Cultural Resources Protection

Applicability Statement

This section applies to USAF 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

The earliest records of the site currently occupied by JBAB were of Nacochtank Native American settlements along the Potomac and Anacostia Rivers. During the Civil War, this area was the site of the Giesboro Calvary depot (Bolling AFB 2001).

Natural resources have the potential to be impacted when conducting archaeological surveys as part of the cultural resources program. The Anacostia Historic District is largely located within the floodplain on JBAB. Sea level rise and increased severe storm frequency have the potential to negatively impact historic resources in such areas. See Tab 8—Integrated Cultural Resources Management Plan.

7.15 Public Outreach

Applicability Statement

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

Program Overview/Current Management Practices

Public outreach is limited to dissemination of press releases through the Joint Base Public Affairs Office. Public service announcements are limited due to the security requirements and type of activities conducted at these bases. The environmental awareness program on JBAB takes advantage of the base newspaper, *Joint Base Journal*, as well as email and social media, to advertise articles or notices of activities.

Maintaining and enhancing the waterfront greenway provides an excellent opportunity for environmental outreach on JBAB. The trail runs along the Potomac River shoreline and has several areas consisting of maintained turf grass and isolated trees. A goal for the greenway is to help improve water quality by capturing runoff before it reaches the river. The installation of grassed swales and limiting plantings to native species would help to improve the area's ecosystem function. Adding interpretive signs that present environmental topics, such as the benefits of native plants over non-native plants, the importance of floodplain protection, and information on native birds and wildlife, also would provide environmental outreach.

Events such as Earth Day present opportunities for base employees, residents, and service members and their guests to learn about environmental issues of importance to JBAB and to get involved with the surrounding community. Earth Day is widely celebrated by the DoD, with numerous activities being sponsored around the region at many bases. Earth Day is celebrated on April 22, but Earth Day in the DC is observed throughout the month of April with many activities occurring each day. Volunteers may be involved with a wide range of projects, such as those listed below.

- Trash clean-up
- Tree and native vegetation planting
- Invasive plant removal or weeding
- Wildlife habitat improvement or restoration activities

- Wetland, streamside, or shoreline restoration
- Interpretive trail building and/or maintenance

Parklets are portable landscape gardens approximately the size of a parking space. They provide a small habitat of natural vegetation and wildlife in JBAB's otherwise urban environment (Figure 7-1). During FY 2013, four parklets were designed and installed at JBAB, each representing a different theme: Aroma Therapy, Meadows, Pollinators, and Rain Gardens. In 2020, the Child Development Center Parklet was refurbished and replanted with native species.

Other environmental activities in which JBAB participates include tree planting activities for Arbor Day and activities associated with Japanese American Day.

7.16 Climate Change Vulnerabilities

Applicability Statement

This section applies to USAF installations that have identified climate change risks, vulnerabilities, and adaptation strategies by using authoritative region-specific climate science, climate projections, and existing tools. This section **IS** applicable to this installation.

Program Overview/Current Management Practices

The approximately 25 million acres of land managed by DoD are integral to the military's mission of keeping our nation secure (Stein et al. 2019). As such, there is an operational need to ensure that current and future climatic changes do not compromise the ability of DoD installations to serve their essential operational, training, and testing functions (Stein et al. 2019). Understanding climate risks and vulnerabilities will greatly improve the chances for sustaining the capacity of ranges and bases to meet their missions, now and into the future (Stein et al. 2019).

To address these risks, DoDM 4715.03 calls for installations to address climate considerations when updating or revising their INRMPs. When doing so, natural resources managers are required to incorporate climate adaptation into their management goals and actions. Adaptation actions are intended to reduce climate-related vulnerabilities or enhance resilience (Stein et al. 2019). Adaptation planning should be tailored to the particular mission, resources and needs of an installation (Stein et al. 2019).

To ensure that general principles and processes of climate adaptation are captured in all INRMPs, DoD developed the guide, *Climate Adaptation for DoD NRMs* (Stein et al. 2019). The guide provides overarching adaptation concepts and principles for NRMs to incorporate into INRMPs.

Over the coming decades, JBAB could experience increased risks from climate-driven changes in the environment, which could impact the base's mission. Reducing risk can be achieved by integrating the INRMP with climate change adaptations and taking steps to reduce the installation's vulnerability and increase its resiliency. Because JBAB is bound by the Anacostia and Potomac Rivers to the west, rising sea level and more frequent and/or severe flash flooding during rain events likely will be chief concerns.

The next major update of this INRMP is scheduled to occur in FY 2024. Based on the DoD guide, JBAB will develop a climate change management plan that will be included as an Appendix to the INRMP. Climate change and adaptation principles and processes will be incorporated into future updates of not only the INRMP, but also other existing JBAB management plans, as applicable. Identifying potential projects to decrease risk and increase resilience over the next several years will propel the installation towards climate readiness.

7.16.1 Greenhouse Gas Emission Reduction

Federal agencies were instructed to develop 2020 reduction targets for greenhouse-gas emissions and to measure, manage, and reduce greenhouse-gas emissions to meet those targets. These reductions are to be met through the implementation of several energy, water, and waste reduction measures. The goals of greenhouse gas emission reduction is the improvement of facility energy efficiency, reduced fossil fuel use, and increased use of renewable energy sources. The *Air Emissions Guide for Air Force Mobile Sources* and the *Air Emissions Guide for Air Force Stationary Sources* provide guidance and methods for estimating the quantities of air pollutant emissions released into the atmosphere from mobile and stationary sources, respectively (see https://aqhelp.com/Documents/2020%20Mobile%20Guide%20-%20Final.pdf and https://www.solutioenv.com/Documents/2018%20StationarySourceGuide.pdf, respectively).

7.17 Geographic Information Systems

Applicability Statement

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

Program Overview/Current Management Practices

AFI 32-10112—*Installation Geospatial Information and Services* provides the policy and guidance for GIS management on all USAF installations. GIS is a management tool that consists of computer hardware, software, geographic and non-geographic data, and personnel whose responsibilities are to accurately and efficiently capture, store, maintain, analyze, and display geographically referenced information. The AFCEC/CZO manages the overall GIS hardware infrastructure, whereas the 11 CES manages the functional environmental GIS work, including table design and creation, data storage methodologies, data maintenance, analysis, and the development of custom end products.

The USAF GeoBase vision is to enable decision-makers with an enterprise capability for installation mapping and visualization of fused, analyzed, and multi-functional data.

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. The objectives indicate a management initiative or strategy for specific long- or medium-range outcomes and are supported by projects. Projects are specific actions that can be accomplished within a single year. Also, in cases where off-installation land uses may jeopardize USAF 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. Goals, objectives, and projects are listed both below and in Section 10.0 Annual Work Plans.

Installation Supplement—Management Goals and Objectives

GOAL 1 INTEGRATE NATURAL RESOURCES MANAGEMENT RESPONSIBILITIES WITH MILITARY ACTIVITIES, INSTALLATION PLANNING AND PROGRAMMING, AND OTHER ACTIVITIES TO ENSURE NO NET LOSS TO THE MISSION.

Objective 1.1 Identify and facilitate coordination between the responsible parties and stakeholders concerned with natural resources management at JBAB.

Project 1.1.1 Implement Canada goose and other nuisance wildlife management through population control.

Project 1.1.2 Execute 5-year INRMP update.

Project 1.1.3 Execute INRMP Annual Review and prepare INRMP Annual Review Summary in accordance with AFMAN 32-7003

GOAL 2 ENSURE SUSTAINABLE MULTIPURPOSE USE OF THE RESOURCES AND PUBLIC ACCESS WHEN CONSISTENT WITH THE MISSION, SAFETY, AND SECURITY REQUIREMENTS.

Objective 2.1 Describe the current and future base mission and its requirements and constraints on natural resources.

Project 2.1.1 Enforce the policy objective to replace any trees removed at a 1:1 ratio to ensure no net loss of tree canopy on the installation.

Project 2.1.2 Collaborate with the Entomology Shop to implement nuisance wildlife control measures.

Project 2.1.3 Conduct shoreline cleanups.

Objective 2.2 State the policies, management philosophy, and objectives of natural resources management JBAB

Project 2.2.1 Develop and implement an updated strategic plan for addressing invasive species at JBAB.

Project 2.2.2 Conduct the five-year INRMP update in FY 2025 to comply with the Sikes Act

GOAL 3 ENSURE NATURAL RESOURCES MANAGEMENT REQUIREMENTS ARE IMPLEMENTED BY OR COORDINATED WITH PROFESSIONALLY TRAINED NATURAL RESOURCES MANAGERS.

Objective 3.1 Provide information regarding the existing biological and physical conditions and the desired future conditions of the installation and the surrounding area.

Project 3.1.1 Determine whether any RTE wildlife species occur on JBAB.

Project 3.1.2 Determine whether any RTE plant species occur on JBAB.

GOAL 4 APPLY ECOSYSTEM-BASED PRINCIPLES TO NATURAL RESOURCES MANAGEMENT BY SHIFTING FROM SINGLE-SPECIES TO MULTIPLE-SPECIES CONSERVATION; FORMING PARTNERSHIPS NECESSARY TO CONSIDER AND MANAGE ECOSYSTEMS THAT CROSS INSTALLATION BOUNDARIES; AND USING THE BEST AVAILABLE SCIENTIFIC INFORMATION AND SCIENTIFICALLY SOUND STRATEGIES FOR ADAPTIVE MANAGEMENT.

Objective 4.1 Identify key natural resources management issues and concerns at the installation and in the surrounding area.

Project 4.1.1 Update existing urban forestry management plan.

Project 4.1.2 Decrease the quantity of non-native/diseased trees and promote growth of healthy native species.

Project 4.1.3 Decrease the infestation of invasive species on the installation.

Project 4.1.4 Keep four parklets maintained and planted with plants that are native to the Chesapeake Bay watershed and drought resistant.

Project 4.1.5 Remove dead/dying plants and replace with drought resistant plants native to the Chesapeake Bay watershed.

Project 4.1.6 Reduce the quantity of nuisance wildlife on the installation to reduce BASH risk and reduce potential for infrastructure damages (groundhogs).

Project 4.1.7 Maintain nesting boxes to promote and encourage nesting of native avian species.

Objective 4.2 Identify scheduling priorities and funding opportunities for the implementation of natural resources projects and management actions.

Project 4.2.1 Forge partnerships with non-governmental organizations and special interest groups with a connection to natural resources in and around JBAB. For example, JBAB is collaborating with the Anacostia

Watershed Society to become integrated into the DOEE-funded mussel project.

Project 4.2.2 Review update the INRMP and the Annual Work Plan yearly to reflect scheduling priorities and funding opportunities/limitations.

9.0 INRMP IMPLEMENTATION, UPDATE, AND REVISION PROCESS

9.1 Natural Resources Management Staffing and Implementation

9.1.1 Staffing

The Sikes Act requires the DoD to ensure that sufficient numbers of professionally trained personnel are available and assigned responsibility for natural resources management and law enforcement to conduct tasks necessary for carrying out natural resources management programs. Natural resources management at JBAB is integrated with other 11 CES environmental programs. In addition, other flights and elements support natural resource management activities, such as the entomology department, operations, GIS staff and others.

9.1.1.1 Cooperative Agreements and Partnerships

Per DoD Instruction 4715.03, DoD bases may enter into cooperative agreements with states, land-grant universities, local governments, nongovernmental organizations, and individuals to provide for the maintenance and improvement of natural resources or conservation research on or off DoD bases.

9.1.1.2 The Cooperative Ecosystem Studies Unit National Network

The Cooperative Ecosystem Studies Unit (CESU) National Network provides coordinated research, technical, and educational assistance to federal agencies and their partners for natural and cultural resources through a network of 17 regional partnerships. As of October 2016, DoD was a member of 17 CESUs. Each CESU is competitively developed under a single cooperative agreement based on the need of INRMP approved projects. DoD and host university/partner universities collaborate on specific projects with the host/partner universities providing space, faculty expertise, students and educational services while DoD provides scientists and funding.

9.1.2 Implementation

The AFCEC Environmental Directorate implements AFMAN 32-7003, allocates funding, and oversees implementation of USAF conservation programs. All conservation, compliance, and stewardship projects must be entered into the TRIRIGA/Automated Civil Engineer System and receive approval up the chain of command to receive funding. Proposed projects necessary to implement this INRMP, an implementation schedule, funding level, and proposed funding source are described in Section 10.0 Annual Work Plans. Environmental funding priorities are determined by several levels of funding classification, as defined in Enclosure 4 of DoDI 4715.03 and described below in Sections.9.1.2.1 Recurring Natural Resources Conservation Management Requirements and 9.1.2.2 Non-Recurring Natural Resources Management Requirements.

9.1.2.1 Recurring Natural Resources Conservation Management Requirements

Recurring requirements include activities needed to cover the recurring administrative, personnel, and other costs associated with managing the DoD Natural Resources Conservation Program that are necessary to meet applicable compliance requirements in federal and state laws, regulations, EOs, and DoD policies, or in direct support of the military mission. Recurring costs include labor, training, supplies, hazardous waste disposal, recycling activities, permits, fees, testing and monitoring and/or sampling and analysis, reporting and record keeping, maintenance of environmental conservation equipment, and compliance self-assessments.

9.1.2.2 Non-Recurring Natural Resources Management Requirements

9.1.2.2.1 Current Compliance

Non-recurring requirements under current compliance includes projects and activities needed because a base is currently out of compliance; has a signed compliance agreement; has received a consent order; has not met requirements based on applicable federal or state laws, regulations, standards, presidential EOs, or DoD policies; and/or are immediate and essential to maintain operational integrity or sustain readiness of the military mission. Projects and activities that will be out of compliance if not implemented in the current year are to include those listed below.

- EAs for natural resources conservation projects.
- Monitoring studies required to assess and mitigate potential impacts of the mission on conservation resources.
- Planning documents such as INRMPs.
- Natural resources planning level surveys.
- Fulfilling requirements of biological opinions and biological assessments.
- Mitigation to meet existing regulatory permit conditions and the DoD Chesapeake Bay Strategic Action Plan.
- Nonpoint source pollution or watershed management studies or actions needed to meet compliance.
- Compliance with missed deadlines established in DoD executed agreements.

9.1.2.2.2 Maintenance Requirements

Non-recurring maintenance requirements are those associated with projects and activities not currently out of compliance, but which will be out of compliance if projects or activities are not implemented in time to meet an established deadline beyond the current program year. Non-recurring maintenance requirements are listed below.

- Conservation, GIS mapping, and data management to comply with federal, state, and local regulations, EOs, and DoD policy.
- Efforts undertaken in accordance with non-deadline-specific compliance requirements of leadership initiatives.
- Conservation recommendations in biological opinions issued pursuant to the ESA.

9.1.2.3 Enhancement Actions Beyond Compliance

Non-recurring requirements under enhancement actions includes those projects and activities that enhance conservation resources or the integrity of the base 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. Such actions include those listed below.

- Community outreach activities.
- Education and public awareness projects.
- Restoration or enhancement of natural resources with no specific compliance requirement.

9.1.2.4 Monitoring INRMP Implementation

Natural Resources Conservation data calls through the biannual EESOH-MIS data call are used to assess the overall health and trends of the JBAB Natural Resources Program and to identify and correct potential

funding and other resource shortfalls. Data call questions have been developed to assess INRMP implementation, measure conservation efforts, ensure no net loss of military testing and training lands, understand the conservation program's installation mission support, and indicate the success of partnerships with the USFWS and the DOEE. This evaluation is facilitated by the web-based EESOH-MIS. The data call provides the means to evaluate performance in seven focus areas.

1. Natural Resources Management
2. Listed species and critical habitat
3. Recreational Use and Access
4. Sikes Act Cooperation
5. Team adequacy
6. INRMP implementation
7. Natural Resource Program Support of the Installation Mission

Additionally, the DoD produces an annual end-of-year Environmental Management Review to meet Congressional and in house requirements from data derived from the annual metrics/data call review.

9.2 Annual INRMP Review and Update Requirements

The INRMP requires annual review, IAW DoDI 4715.03 and AFMAN 32-7003, to ensure the achievement of mission goals, verify the implementation of projects, and establish any necessary new management requirements. This process involves installation natural resources personnel and external agencies working in coordination to review the INRMP. 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 the USFWS and the appropriate state natural resources or wildlife agency (i.e., the DOEE). The NRM/POC documents the findings of the annual review in an Annual INRMP Review Summary and obtains signatures from the coordinating agencies on review findings. By signing the Annual INRMP Review Summary, the collaborating agency representatives assert concurrence with the findings. If an agency declines to participate in an on-site annual review, the installation's Natural Resources Manager submits to the agency (1) the INRMP for review along with (2) the Annual INRMP Review Summary document via official correspondence and requests return correspondence with comments/concurrence.

The USFWS, the DOEE, and the NRM/Section conduct an Annual INRMP Review Meeting. This meeting takes place in person with respective representatives for each agency. Individuals may telephone or video call if they cannot attend in person. During this meeting, the NRM/Section updates the external stakeholders/parties with the end of the year execution report and coordinates future work plans and any necessary changes to management methods. All parties review the INRMP and begin preliminary collaborative work on updating the INRMP (new policies, procedures, impacts, mitigations, etc.) as applicable.

Appendix B provides the letters associated with the most recent annual review submitted to the USFWS, DOES, and NOAA Fisheries.

9.2.1 Internal Stakeholders

The responsibility for the development, review, revision, and implementation of INRMPs is shared by several command elements and other internal USAF stakeholders. The roles and responsibilities for USAF

natural resources management are fully described in chapter 1 of AFMAN 32-7003. A brief summary of responsibilities for natural resources management at JBAB follows.

The JBAB Installation or Wing Commander maintains installation relationships with governments, tribes, and other stakeholder entities; designates base natural resource management staff; and ensures the preparation, completion, approvals, and implementation of the INRMP, and systematic application of conservation practices set forth in the plan. It is his/her responsibility to act as steward of base natural resources and integrate natural resources requirements into the day-to-day decision-making process; involve appropriate operational and training commands in the INRMP review process to ensure no net loss of military mission; and endorse this INRMP via Commanding Officer signature.

The JBAB NRM is primarily responsible for implementing this INRMP. This includes assessing current programs and evaluating the status and trends of JBAB's natural resources to identify natural resource issues and concerns, and it entails ensuring compliance with all natural resources laws and regulations. The NRM also coordinates with other installation components and personnel to assess potential impacts of proposed activities on sensitive natural resources and make recommendations to avoid, reduce, or mitigate adverse effects to comply with applicable laws and regulations.

The Marine HMX-1 Operations Officer as well as the Installation Force Protection Air Operations Manager for the two installation helipads must review and approve conservation practices set forth in the plan to ensure practices do not interrupt operational and training requirements. In addition, the Operations Officer and Air Operations Manager must ensure the plan and proposed projects complement the unit's BASH program and do not increase BASH potential.

Other important base stakeholders include Community Support, 11th FSS, 11th Logistics Readiness Squadron, and the 11th CES. The 11th Wing's review and approval of the INRMP ensures that goals, objectives and actions are in line with mission requirements, and identify potential project conflicts and/or opportunities for cooperative program implementation.

9.2.2 External Stakeholders

External stakeholders are non-DoD entities that have a vested interest in how the natural resources at JBAB are managed. As such, external stakeholders have been included in the natural resources planning process and have had the opportunity to provide technical and/or regulatory input during the development of this INRMP and in its annual reviews.

Under the Sikes Act, new INRMPs and significant changes to existing INRMPs are required and conducted in cooperation with the USFWS and the appropriate state fish and wildlife agencies. New or significant changes to INRMPs must also be made available to the public for review. The USFWS is the principal federal agency for conserving, protecting, and enhancing fish, wildlife, plants, and their habitats and has responsibility for the enforcement of federal wildlife protection laws such as the ESA and the MBTA.

The equivalent state fish and wildlife agency for JBAB is the DOEE FWD, which is responsible for conserving the DC's wildlife and the natural communities. As such, they manage the health and recreational use of the DC's wildlife, including the conservation of wildlife, fisheries management, and invasive plant management. The DOEE Natural Resources Administration has regulatory authority over the discharges of pollutants to the waters of the United States under Section 402 of the federal CWA, the National Pollutant Discharge Elimination System Program, and Section 401 of the CWA, which requires an applicant for any federal permit covering an activity that may result in a discharge into the state's waters to first obtain a state

certification, to ensure that the project will comply with state water quality standard. The DOEE also oversees compliance with the federal CAA in the DC.

In accordance with the Sikes Act, the USFWS Chesapeake Bay Field Office and the DOEE FWD are obligated to cooperate in the development of INRMPs and provide comments and mutual agreement concerning the conservation, protection, and management of fish and wildlife resources detailed in the INRMP. The resulting INRMP for JBAB is to reflect the mutual agreement of these parties concerning the conservation, protection, and management of fish and wildlife resources.

Within the DC, the NCPC, along with various DC government departments, actively plan, review, develop, and approve DC land-use and development projects. The NCPC is the federal planning agency for the National Capital Region (see Section 1.4.1.13 Comprehensive Plan for the National Capital Area). JBAB is located in an area that is subject to several federal plans and policies such as the Comprehensive Plan for the National Capital, Extending the Legacy: Planning America's Capital for the 21st Century, and the Memorials and Museums Master Plan. There are also two other plans which target areas in close proximity to the Joint Base, namely the Anacostia Waterfront Initiative and the Anacostia Waterfront Framework Plan.

9.2.3 Review and Revision Process

INRMPs are long-term planning documents that require periodic reviews. Reviews offer a chance to evaluate management goals, objectives, and actions as well as the opportunity to incorporate new science and information. INRMPs must be reviewed and if necessary, revised, at least every five years; however, it is USAF policy to review INRMPs annually. INRMP revisions are only required when major fundamental changes have occurred, as described in section 9.3.3.1. INRMPs are updated routinely during the INRMP Annual Review. Updates for this INRMP are documented in Appendix F.

9.2.3.1 INRMP Revision

An INRMP revision is required if there are changes to the installation's mission or land use that would alter the biogeophysical environment in a way that significant edits would be needed to ensure that the INRMP reflects the current natural resource management requirements. Examples of changes that necessitate an INRMP revision would be changes to its goals and objectives or a change in land use that would result in environmental impacts not anticipated since the last time the INRMP was reviewed. The necessity of an INRMP revision is determined during the INRMP annual review. For an INRMP revision, the public should be provided an opportunity to review and comment on the draft IRNMP revision. For new and revised INRMPs, mutual agreement by cooperating agencies is documented by the signature of an authorized representative from each agency on the signature page of the IRNMP, or by written correspondence. A key steps for revising the JBAB INRMP, is outlined in AFMAN 32-7003.

9.2.3.2 Annual INRMP Updates

USAF installations must conduct an annual assessment of the installation's natural resources program by reviewing the INRMP goals and objectives, actions taken to achieve goals and objectives, and by completing an Annual INRMP Review. AF policy requires that INRMPs be reviewed annually by the installation with the cooperation of the appropriate field-level offices of the USFWS, state fish and wildlife agency, and other internal and external stakeholders. Annual reviews will enable project tracking and assessment, will help to facilitate adaptive management, and will be used to inform changes to future INRMP updates and revisions. Reviews may be accomplished via correspondence or in a meeting between appropriate parties. The annual review is designed to assess and verify that

- the INRMP is effective in preventing net loss capability of military base lands to support the military mission;
- current information on all INRMP implantation efforts is available;
- all projects and activities have been budgeted for and implementation is on schedule;
- all required, trained natural resources positions are filled or are in the process of being filled;
- projects and activities for the upcoming year have been identified and included in the INRMP Annual Work Plan (an updated project list does not necessitate revising the INRMP);
- all required coordination has occurred; and,
- all significant changes to the base's mission requirements or its natural resources have been identified.

The INRMP Annual Review Report (developed during the annual reviews are further used to assess the overall health and trends of each base's natural resources program. Moreover, they are used to identify and correct potential funding and other resource shortfalls and to report progress toward meeting natural resources conservation program measures of merit to Congress in the Defense Environmental Programs Annual Report to Congress.

10.0 ANNUAL WORK PLANS

The INRMP Annual Work Plans are included in this section. These projects are listed by fiscal year, including the current year and four succeeding years. For each project and activity, a specific timeframe for implementation is provided (as applicable), as well as the appropriate funding source and priority for implementation. The work plans provide all the necessary information for building a budget within the USAF 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 USAF is non-compliant with the Sikes Act; or that it is specifically tied to an INRMP goal and objective and is part of a "Benefit of the Species" determination necessary for Endangered Species Act (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.

10.1 Site Approval Request Process

To facilitate early planning and ensure compliance with NEPA and other substantive regulations, site approval is required for all projects sited on USAF-controlled land holdings, including projects listed in this INRMP. Site approval that may require special consideration include the situations described below.

- Any project site that will have explosives safety criteria implications associated with ammunitions and explosives
- Any project that affects or is affected by airfield safety criteria
- Any project that creates or is proposed to be in an area of electromagnetic illumination or involves electromagnetic transmission
- Any project that proposes changing the use of a facility
- Any project that changes or has the potential to change the land use or physical layout of an area

The level of NEPA documentation for a proposed action should be identified during the Site Approval Request (SAR) process. The natural resources constraints discussed in this INRMP will support and inform the SAR process.

***Natural Resources Standard Titles by PB28 Code (excluding Environmental Directorate Technical [CZT]/ Environmental Directorate Compliance [CZC] titles)**

INRP	MMA	Threatened and Endangered Species	MNRA	WTLD
Program & Financing (P&F), CN	Mgt, Species	Mgt, Habitat	Compliance Public Notification	Mgt, Wetlands/ Floodplains
Interagency/Intra-agency, Government, Sikes Act	Interagency/ Intraagency, Government, Sikes Act	Mgt, Species	Plan Update, Other	Monitor Wetlands
Interagency/Intra-agency, 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/Intra-agency, Government, Sikes Act		
Supplies, CN, CLEO	Vehicle Leasing, CN	Interagency/Intra-agency, 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, 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				

Table 10-1. Annual Joint Base Anacostia-Bolling work plans for fiscal years 2021–2025.

Resource Category	Goal	Objective	FY	OPR	Funding Source	Priority Level	Standard Title*	Project Title	Project Number	Description
Urban Forestry Management Plan	Urban Forestry Management	Update existing urban forestry management plan	2023		EQ	H	MGT, HABITAT, URBAN, FOREST	Urban Forestry Management Plan		Develop an Urban Forestry Management Plan to update the plan that was developed in 2015. This plan would inventory the trees on the installation, assess tree health including identifying non-native/invasive trees, investigate the occurrence of common pests such as gypsy moth (*Lymantria dispar dispar*), emerald ash borer (*Agrilus planipennis*), spotted lanternfly (*Lycorma delicatula)* and anthracnose (a fungal infection). Any trees that are identified to be affected by these or other pests will be documented and necessary actions to address these issues. The plan will also identify areas on the installation for mitigation planting to meet the base's tree replacement policy objective of 1:1 replacement for removed trees, and mitigation for new development projects. Annual maintenance of the GIS layer would be completed by the USAF.
Urban Forest Management Plan Implementation	Urban Forestry Management	Decrease the quantity of non-native/diseased trees and promote growth of healthy native species.	2021–2024		F2F	H	MGT, HABITAT, URBAN, FOREST	Urban Forestry Management Plan Implementation	BXUR216119	Remove 3 non-native/diseased/dead trees, replace with native species.
Annual Tree Health Survey	Urban Forestry Management	Assess the health of urban tree health throughout the basis on a rolling basis	2021–2025			H	MGT, HABITAT, URBAN, FOREST	Annual Tree Health Survey		Not currently funded or programmed.

Resource Category	Goal	Objective	FY	OPR	Funding Source	Priority Level	Standard Title*	Project Title	Project Number	Description
Invasive Plant Species Control and Replanting	Invasive Species Management	Decrease the infestation of invasive species on the installation	2021–2024		F2F	H	MGT, INVASIVE SPECIES	Invasive Plant Species Control and Replanting	BXUR216121	Removal of invasive species treatment, areas targeted for treatment identified in May 2018 Invasive Species Management Plan.
Invasive Plant Surveys and Mapping	Update 2018 Invasive Species Management Plan	Develop & implement an updated strategic plan for addressing invasive species at JBAB	2023		EQ	H	MGT, INVASIVE SPECIES	Invasive Species Plant Surveys and Mapping		Base wide invasive species survey—identify invasives on the installation, map location, develop an updated management plan (update to May 2018 Invasive Species Management Plan).
Baseline Wildlife Surveys	Identify any Rare, Threatened, or Endangered (RTE) species on JBAB	Determine whether any RTE species occur on JBAB	2024		EQ	M	MGT, SPECIES T&E	Baseline RTE Wildlife Survey		Perform base wide wildlife survey to provide baseline wildlife data, including if RTE occur on the base.
Habitat Enhancement for Cavity Nesters	Increase habitat for cavity nesters	Maintain nesting boxes to promote and encourage nesting of native avian species	2021–2025		In-house	M	MGT, HABITAT	Habitat Enhancement for Cavity Nesters		Existing nesting boxes will be maintained in-house. Tasks include cleaning out nesting boxes seasonally and maintaining or repairing boxes as needed.
Habitat Enhancement for Pollinators/ Parklet Maintenance	Maintain pollinator habitat to promote species health.	Keep four parklets maintained and planted with CB watershed native plants that are drought resistant.	2021–2025		EQ or in-house	M	MGT HABITAT, T&E			Seasonal upkeep of plants, watering, pruning etc.

Resource Category	Goal	Objective	FY	OPR	Funding Source	Priority Level	Standard Title*	Project Title	Project Number	Description
Parklet Maintenance Overhaul	Revamp parklets and replant to promote pollinator habitat	Remove dead/dying plants, replant with drought resistant plants native to CB watershed	2023			M	MGT HABITAT, T&E			Four parklets were installed at JBAB representing a variety of themes (aromatherapy, meadow, pollinators, and rain gardens). The parklets have had varying degrees of success and have received complaints regarding their appearance. The purpose of this project is to redesign and replant all four parklets using drought-resistant, native plants with wildlife/pollinator benefits. The design should be aesthetically pleasing and easy to maintain. Annual maintenance at each parklet is required to include: watering, weeding, pruning, and replacement of failing materials for each parklet. JBAB is agreeable to a single plant palette across all four parklets to include plants such as native coneflowers, tickseed, black-eyed Susans, and lavender (while not native, it is drought-tolerant, beneficial to pollinators, perennial, and easy to maintain).
Nuisance Species Survey and Management Plan	Develop Management Plan for nuisance wildlife		2024			M	MGT, NUISANCE WILDLIFE	Nuisance Species Survey and Management Plan		Nuisance species are vectors for diseases and safety issue for installation employees. Some species damage buildings by burrowing, gnawing on pipes, electrical wires, and through walls, floors, window sills, ceilings, and doors (rats) or by droppings defacing and deteriorating of exterior surfaces (rock doves). Ground hogs can also cause damage to building foundations and earthen berms and levees from burrowing, as well as foraging on native vegetation. The purpose of this project would be to conduct baseline surveys for nuisance species (rock doves, feral cats, muskrats, ground hogs, etc.) to determine population, areas used, and impacts to the natural resources at JBAB. Methods of survey will vary depending upon target species. Following the surveys, a management plan would be developed addressing the potential damage to natural resources

Resource Category	Goal	Objective	FY	OPR	Funding Source	Priority Level	Standard Title*	Project Title	Project Number	Description
										as well as recommended methods to minimize or eliminate the impacts.
Canada Goose Nuisance Wildlife Management Implementation and other Nuisance Wildlife	Manage nuisance wildlife on the installation.	Control infrastructure degradation resulting from nuisance wildlife activity. Reduce safety and health risks resulting from overpopulation of nuisance wildlife species.	2021–2025		EQ/MIPR	M	MGT, NUISANCE WILDLIFE	Canada Goose Nuisance Wildlife Management Implementation and other Nuisance wildlife	BXURA53226122	JBAB has a number of nuisance wildlife management issues. Non-migratory Canadian geese roosting on the helicopter pads are problematic. There is an overpopulation of groundhogs on the installation which are encroaching into building foundations and BMP structures. Other potential nuisance wildlife species include feral cats, rats, and rock dove (pigeon). This project will implement nuisance wildlife management, namely for Canadian geese and groundhogs in partnership with USDA Wildlife Services.
Education Materialson Native Plants and Wildlife, Canada Geese, Stray and Feral Pets	Nuisance Wildlife Management	Educational Materials on native plant and wildlife species, the need and methods for Canada geese control, and the impacts of stray and feral pets and applicable policies for their control.	2024		EQ	H	MGT, NUISANCE WILDLIFE	Education Materialson Native Plants and Wildlife, Canada Geese, Stray and Feral Pets		This project would develop and produce educational materials for base-wide consumption on plant, wildlife, and pet issues. The educational material developed would cover the following subject areas. • Plant and wildlife species that are native to the Mid-Atlantic Coastal Plain and their benefits. Provision of simple methods to promote the establishment and conservation of native species in an area, such as through the use of plantings, bird nesting boxes, and bat roosts. • The problems associated with resident populations of Canada geese and the methods used to control their numbers. • The problems associated with stray and feral pets and the policies governing the control of stray and feral pets military installations.

Resource Category	Goal	Objective	FY	OPR	Funding Source	Priority Level	Standard Title*	Project Title	Project Number	Description
RTE Plant Survey	Determine whether any RTE plants occur on JBAB. Increase compliance with Sikes Act goals and objectives.	Survey and identify and rare, threatened, endangered plant species that occur on the installation.	2023		EQ	M	MGT, HABITAT T&E	RTE Plant Survey		The purpose of this project would be to conduct seasonal RTE plant surveys for a period of one year for species identified as having the potential to occur at JBAB. The results of the survey should be used to develop a GIS layer for RTE flora. This information is necessary to maintain a current status of the INRMP and will enable natural resources staff to develop management plans and conduct habitat enhancement projects, if necessary.
INRMP Update	5-year update to INRMP	Sikes Act compliance, 5-year update	2025		F2F?	H	PLAN REVISION, INRMP	INRMP Update		Execute 5-year INRMP update; review all content for consistency and accuracy with current goals, update out year goals, obtain outside agency concurrence, installation commander approval.

Note: All actions contemplated in this INRMP are subject to the availability of funds properly authorized and appropriated under Federal law. Nothing in this INRMP is intended to be nor must be construed to be a violation of the Anti-Deficiency Act (31 USC1341 *et seq.*).

11.0 REFERENCES

11.1 Standard References (Applicable to all USAF installations)

- AFMAN 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)*

11.2 Installation References

Bolling Air Force Base (AFB). 2001. Bolling AFB Integrated Natural Resources Management Plan (Draft).

Bolling Air Force Base (AFB). 2010. Bolling AFB Integrated Cultural Resources Management Plan.

Chesapeake Progress. 2021. 2025 Watershed Implementation Plans (WIPs). Chesapeake Progress. Online at https://www.chesapeakeprogress.com/clean-water/watershed-implementation-plans, accessed December 2021.

Cornell Laboratory of Ornithology. 2019. All About Birds: Golden-winged Warbler. Retrieved from https://www.allaboutbirds.org/guide/Golden-winged_Warbler/lifehistory.

Council of the District of Columbia. 2006. The Comprehensive Plan for the National Capital. Retrieved from http://planning.dc.gov/page/comprehensive-plan.

Department of the Air Force. (2021) 11th Wing homepage. Online at https://www.jbab.jb.mil/JBAB-Units-Agencies/11th-Wing/.

Department of Defense and United States Fish and Wildlife Service (DoD and USFWS). 2006. Memorandum of Understanding between the United States Department of Defense and the United States Fish and Wildlife Service to Promote the Conservation of Migratory Birds. Retrieved from https://www.fws.gov/migratorybirds/pdf/management/moudod.pdf.

Department of Energy and the Environment (DOEE). n.d. District of Columbia Fish Field Guide. Retrieved from http://ddoe.dc.gov/page/dc-fish-field-guide.

Department of Energy and the Environment (DOEE). 2006. District of Columbia Wildlife Action Plan. Government of the District of Columbia, DOEE, Fisheries and Wildlife Division. Washington DC.

Department of Energy and the Environment (DOEE). 2010. Chesapeake Bay Watershed Agreement Implementation Plan, Phase I. Online at https://doee.dc.gov/sites/default/files/dc/sites/ddoe/publication/attachments/Final_District_of_Coluimbia_WIP_Bay_TMDL.pdf.

Department of Energy and the Environment (DOEE). 2012. Chesapeake Bay Watershed Agreement Implementation Plan, Phase II. District of Columbia, Department of Energy and the Environment. Online at https://doee.dc.gov/sites/default/files/dc/sites/ddoe/publication/attachments/FINAL%20DC%20WIP%20March%2030%202012.pdf.

Department of Energy and the Environment (DOEE). 2013. The Comprehensive Plan for the National Capital: District Elements. Chapter 18 Far Southeast and Southwest. District of Columbia

Department of Energy and the Environment (DOEE). 2013. Watershed Protection. District of Columbia. Retrieved from http://green.dc.gov/watershed.

Department of Energy and the Environment (DOEE). 2015. District of Columbia Wildlife Action Plan. District of Columbia, DOEE, Fisheries and Wildlife Division. Washington DC. Retrieved from https://doee.dc.gov/service/2015-district-columbia-wildlife-action-plan.

Department of Energy and the Environment (DOEE). 2019. Chesapeake Bay Watershed Agreement Implementation Plan, Phase III. District of Columbia, Department of Energy and the Environment. Online at https://doee.dc.gov/sites/default/files/dc/sites/ddoe/service_content/attachments/FINAL%20DC%20PHASE%20III%20WIP%20-%20HQ2%20web.pdf.

Department of the Navy (DoN). 2006. Integrated Natural Resources Management Plan Guidance: How to Prepare, Implement, and Revise Integrated Natural Resources Management Plans (INRMPs). 23 April 2006. Washington Division, Naval Facilities Engineering Command, Washington DC.

Department of the Navy (DoN). 2010a. Environmental Assessment for the Joint Base Anacostia-Bolling Master Plan, District of Columbia.

Department of the Navy (DoN). 2010b. Integrated Cultural Resource Management Plan 2 (2010-2014), Naval District of Washington, DC, Maryland, and Virginia.

Department of the Navy (DoN). 2010c. Naval Support Activity Washington, Encroachment Action Plan.

Department of the Navy (DoN). 2014a. Joint Base Anacostia-Bolling Installation Master Plan, Washington, DC.

Department of the Navy (DoN). 2014b. Joint Base Anacostia-Bolling Transportation Management Program.

Department of the Navy (DoN). 2015a. Joint Base Anacostia-Bolling Integrated Natural Resource Management Plan.

Department of the Navy (DoN). 2015b. Joint Base Anacostia-Bolling Installation Appearance Plan.

Department of the Navy (DoN). 2020. Integrated Cultural Resources Management Plan, Joint Base Anacostia-Bolling, Washington, DC.

Federal Aviation Administration (FAA). 2020. FAA Wildlife Strike Database. Retrieved from http://wildlife.faa.gov/database.aspx.

Federal Emergency Management Administration. 2010. Flood Insurance Rate Map (FIRM), District of Columbia, Washington, DC. Map Number 1100010057C. Retrieved from https://msc.fema.gov/portal/search?AddressQuery=joint%20base%20anacostia-bolling#searchresultsanchor.

Federal Emergency Management Administration. 2012. Executive Order 11988: Floodplain Management. Retrieved from http://www.fema.gov/environmental-planning-and-historic-preservation-program/executive-order-11988-floodplain-management#1.

Federal Interagency Floodplain Management Task Force. 2012. Guidance on "Unwise Use of Floodplains." Retrieved from https://www.fema.gov/media-library-data/20130726-1841-25045-7320/fifm_tf_signedunwiseuseguidance_3_26_12.pdf.

Helmenstine, Marie. n.d. How Much Oxygen Does One Tree Produce? Retrieved from http://chemistry.about.com/od/environmentalchemistry/f/oxygen-produced-by-trees.htm

Hurley, L.M. n.d. Submerged Aquatic Vegetation. Pages 2-19 *in* Funderbunk S.L., S.J. Jordan, J.A. Mihursky and D. Riley (eds). Habitat requirements for Chesapeake Bay living resources, 2nd ed. Chesapeake Research Consortium, Inc., Solomons, MD.

Internet Center for Wildlife Damage Management. 1994. Prevention and Control of Wildlife Damage. Hygnstrom, S.E., R.M. Timm, and G.E. Larson (eds.). University of Nebraska-Lincoln. 2 vols. Retrieved from http://icwdm.org/handbook/index.aspx.

Internet Center for Wildlife Damage Management 2005. Pigeons (Rock Doves). Retrieved from http://icwdm.org/handbook/birds/Pigeons.asp.

Invasive Species Specialist Group (ISSG). 2008. Global Invasive Species Database—*Columba livia*. Retrieved from http://www.issg.org/database/species/ecology.asp?si=1052&fr=1&sts=sss&lang=EN.

Joint Base Anacostia-Bolling and Naval Facilities Engineering Command. 2017. Integrated Pest management Plan. Joint Base Anacostia-Bolling, Washington, DC.

Joint Base Anacostia-Bolling and Air Force Civil Engineering Center (JBAB/AFCEC). Stormwater Pollution Prevention Plan (SWPPP). Joint Base Anacostia-Bolling and Air Force Civil Engineering Center, Washington, DC, April 2021.

Kottek, M., J. Grieser, C. Beck, B. Rudolf, and F. Rubel. 2006. World Map of the Köppen-Geiger Climate Classification Updated. Meteorologische Zeitschrift 15:259–263. Retrieved from http://www.gloh2o.org/koppen/.

Loss, S.R., T. Will, and P.P. Marra. 2013. The Impact of Free-Ranging Domestic Cats on Wildlife of the United States. Nature Communications 4:1396–1402.

Marste-Day et al. 2017. Report for Bat Surveys at Multiple Installations at NSF Dahlgren, Virginia; NSA Annapolis; NSF Carderock, and NAS Patuxent River, Maryland; and U.S. Naval Observatory and Joint Base Anacostia-Bolling, Washington, DC. Marstel-Day, LLC,January 2017.

Marstel-Day, LLC, and VT Conservation Management Institute. 2020. Butterfly and Pollinator Species Survey at Joint Base Anacostia-Bolling, Washington, DC. Marstel-Day, LLC, May 2020.

Maryland Department of Natural Resources. 2015. 2015 Maryland State Wildlife Action Plan. Maryland Department of Natural Resources, Annapolis, MD. Available at https://dnr.maryland.gov/wildlife/Pages/plants_wildlife/SWAP_Submission.aspx;

Maryland / District of Columbia Records Committee of the Maryland Ornithological Society. 2021. Official List of the Birds of District of Columbia from 1842 as of 30 July 2021. Available online at https://mdbirds.org/wp-content/uploads/dc-bird-list.pdf.

Maryland Department of Natural Resources. 2013. Climate Change Impact Areas. Retrieved from https://dnr.maryland.gov/climateresilience/Documents/ClimateChangeImpactAreas2.pdf.

Maryland Geological Survey. 2012. A Brief Description of the Geology of Maryland. Retrieved from http://www.mgs.md.gov/esic/brochures/mdgeology.html.

National Audubon Society, Inc. 2013. Atlantic Flyway. Online at https://pineisland.audubon.org/landingbirds/critical-sanctuary-along-atlantic-flyway.

National Oceanic and Atmospheric Administration (NOAA). 1998. Essential Fish Habitat Description: Windowpane flounder (*Scophthalmus aquosus*). Retrieved from http://www.nero.noaa.gov/hcd/windowpane.pdf.

National Oceanic and Atmospheric Administration (NOAA). 2010. Tides and Currents—Washington Navy Yard. Retrieved from https://tidesandcurrents.noaa.gov/map/index.html.

National Oceanic and Atmospheric Administration (NOAA). 2013a. Essential Fish Habitat Description: Bluefish (*Pomatomus saltatrix*). Retrieved from http://www.nero.noaa.gov/hcd/bluefish.htm

National Oceanic and Atmospheric Administration (NOAA). 2013d. Essential Fish Habitat Description: Summer Flounder (*Paralichthys dentatus*). Retrieved from http://www.nero.noaa.gov/hcd/summerflounder.htm.

National Oceanic and Atmospheric Administration (NOAA). 2013e. Essential Fish Habitat Designations for New England Skate Complex. Retrieved from http://www.nero.noaa.gov/hcd/skateefhmaps.htm.

National Oceanic and Atmospheric Administration (NOAA). 2014a. Endangered and Threatened Marine Species. Retrieved from http://www.nmfs.noaa.gov/pr/pdfs/species/esa_table.pdf.

National Oceanic and Atmospheric Administration (NOAA). 2014b. Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*). Retrieved from http://www.nmfs.noaa.gov/pr/species/fish/atlanticsturgeon.htm.

National Oceanic and Atmospheric Administration (NOAA). 2015. Estimated Range of Atlantic Sturgeon Distinct Population Segments. Retrieved from http://www.greateratlantic.fisheries.noaa.gov/protected/section7/guidance/maps/.

National Oceanic and Atmospheric Administration (NOAA). 2020. NOAA Online Weather Data. Retrieved from https://w2.weather.gov/climate/xmacis.php?wfo=lwx.

National Park Service (NPS). 2013a. Anacostia Park-Nature and Science. Online at https://www.nps.gov/anac/learn/nature/index.htm, accessed 29 March 2013.

Natural Resources Conservation Service (NRCS). n.d.[a]. National soil survey handbook, title 430-VI. Retrieved from http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/ref/?cid=nrcs142p2_054242.

Natural Resources Conservation Service (NRCS). n.d.[b]. Official Soil Series Descriptions. United States Department of Agriculture, Natural Resources Conservation Service, Soil Survey Staff. Retrieved from http://soils.usda.gov/technical/classification /osd/index.html.

Natural Resources Conservation Service (NRCS). 2006. Web Soil Survey. United States Department of Agriculture, Natural Resources Conservation Service. Retrieved from http://websoilsurvey.nrcs.usda.gov/app/.

Natural Resources Conservation Service (NRCS). 2013. Web Soil Survey—Related Attributes. United States Department of Agriculture, Natural Resources Conservation Service. Retrieved from http://websoilsurvey.sc.egov.usda.gov/WssProduct/ oynwatzuvlbgnlfgpaf2x4pu /oynwatzuvlbgnlfgpaf2x4pu/20140313_09402309280_95_ RUSLE2_Related_Attributes--District_of_Columbia.pdf.

NatureServe. 2013. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, VA. Retrieved from http://www.natureserve.org/explorer.

Pennsylvania Fish and Boat Commission. 2015. Species Action Plan: Chesapeake Logperch. Retrieved from https://www.fishandboat.com/Resource/Documents/species-plan-chesapeake-logperch.pdf.

Pimentel, D., R. Zuniga, and D. Morrison. 2005. Update on Environmental and Economic Costs Associated with Alien-Invasive Species in the United States. Ecological Economics 52:273–288.

Stein, B. A., D. M. Lawson, P. Glick, C. M. Wolf, and C. Enquist. 2019. Climate Adaptation for DoD Natural Resource Managers: A Guide to Incorporating Climate Considerations into Integrated Natural Resource Management Plans. National Wildlife Federation, Washington, DC. Available at https://www.nwf.org/-/media/Documents/PDFs/NWF-Reports/2019/DoD-Adaptation-Guide.ashx.

Strategic Environmental Research and Development Program (SERDP). n.d. Climate Change Science and Tools. Retrieved from http://www.serdp.org/Tools-and-Training/Resource-Conservation-and-Climate-Change/Climate-Change-Science-and-Tools2.

United States Army Corps of Engineers (USACE). 2012. Public Notice (#12-32): Final Regional Conditions and Suspension for the 2012 Nationwide Permits. Retrieved from http://www.nap.usace.army.mil/Portals/39/docs/regulatory/nwp/spn12-04.pdf.

United States Department of Agriculture/Animal and Plant Health Inspection Service/Wildlife Services (USDA APHIS WS). 2009. Factsheet—Management of Canada Goose Nesting. Online at https://www.aphis.usda.gov/wildlife_damage/downloads/canada_goose.pdf.

United States Department of the Interior and United States Geological Survey (USGS). 2007. Synthesis of United States Geological Survey Science for the Chesapeake Bay Ecosystem and Implications for Environmental Management. Online at http://pubs.usgs.gov/circ/circ1316/circular1316.pdf.

United States Environmental Protection Agency (USEPA). 2013. Waters GeoViewer. Retrieved from https://www.epa.gov/waterdata/waters-geoviewer.

United States Fish and Wildlife Service (USFWS). 2002. Golden-winged Warbler Habitat Model. Retrieved from https://www.fws.gov/r5gomp/gom/habitatstudy/metadata2/golden-winged_warbler_model.htm.

United States Fish and Wildlife Service (USFWS). 2009. Shortnose Sturgeon in the Potomac River. United States Fish and Wildlife Service Update, Maryland Fisheries Resources Office. Retrieved from http://www.fws.gov/northeast/marylandfisheries/reports/shortnose_fact_sheet_7_21_09.pdf.

United States Fish and Wildlife Service (USFWS). 2011a. Migratory Birds. Retrieved from http://www.fws.gov/ChesapeakeBay/migbird.html.

United States Fish and Wildlife Service (USFWS). 2011b. Conserving Fish and Wildlife Now and for the Future, Strategic Habitat Conservation Plan FY2011-2016. Chesapeake Bay Field Office Annapolis, Maryland. Retrieved from http://www.fws.gov/chesapeakebay/pdf/2011_Strategic_Habitat_Plan_CBFO.pdf.

United States Fish and Wildlife Service (USFWS). 2014. Species Profile—Northern long-eared bat (*Myotis septentrionalis*). Retrieved from http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=A0JE.

United States Fish and Wildlife Service (USFWS). 2016. Fact Sheet—Rusty Patched Bumble Bee (*Bombus affinis*). September 21, 2016.

United States Fish and Wildlife Service (USFWS). 2017a. Migratory Bird Program—Permits. Retrieved from https://www.fws.gov//birds/policies-and-regulations/permits.php.

United States Fish and Wildlife Service (USFWS). 2017b. The Rusty Patched Bumble Bee (*Bombus affinis*), Interagency Cooperation under Section 7(a)(2) of the Endangered Species Act Voluntary Implementation Guidance, Version 1.1. March 21, 2017.

United States Fish and Wildlife Service (USFWS). 2019. Yellow Lance. Retrieved from https://www.fws.gov/southeast/wildlife/mussels/yellow-lance/.

United States Fish and Wildlife Service (USFWS). 2020a. Hay's Spring Amphipod. Environmental Conservation Online System (ECOS). Retrieved from https://ecos.fws.gov/ecp/species/8410#crithab, October 2021.

United States Fish and Wildlife Service (USFWS). 2020b. Listed Species Believed or Known to Occur in Each State. Environmental Conservation Online System (ECOS). Retrieved from https://ecos.fws.gov/ecp/report/species-listings-by-state-totals?statusCategory=Listed.

United States Fish and Wildlife Service (USFWS). 2021. Birds of Conservation Concern 2021. United States Department of the Interior, U.S. Fish and Wildlife Service, Migratory Birds Program, Falls Church, VA. Available at https://www.fws.gov/migratorybirds/pdf/management/birds-of-conservation-concern-2021.pdf, accessed October 2021.

United States Geological Survey (USGS). 2013. Physiographic Province Map of Maryland, Delaware, and the District of Columbia. Retrieved from http://md.water.usgs.gov/groundwater/physiomaps/.

Virginia Department of Wildlife Resources. 2020. Wood Turtle. Retrieved from https://dwr.virginia.gov/wildlife/information/wood-turtle/.

Virginia Herpetological Society. 2020a. Wood Turtle. Retrieved from http://www.virginiaherpetologicalsociety.com/reptiles/turtles/wood-turtle/wood_turtle.php.

Virginia Herpetological Society. 2020b. Northern Red-bellied Cooter. Retrieved from https://virginiaherpetologicalsociety.com/reptiles/turtles/northern-red-bellied-cooter/northern_red-bellied_cooter.php.

Virginia Institute of Marine Science. 2020. SAV in Chesapeake Bay and Coastal Bays. Retrieved from https://www.vims.edu/research/units/programs/sav/access/tables/segment_area/index.php.

Woods, A.J., J.M. Omerick, and D.D. Brown. 1999. Level III and IV Ecoregions of Delaware, Maryland, Pennsylvania, Virginia, and West Virginia. United States Environmental Protection Agency, National Health and Environmental Effects Research Laboratory. Retrieved from https://www.epa.gov/eco-research/ecoregions.

Woods, A.J., J.M. Omerick, and D.D. Brown. 2012. Level III and IV Ecoregions of EPA Region 3. United States Environmental Protection Agency, National Health and Environmental Effects Research Laboratory. Retrieved from https://www.epa.gov/eco-research/ecoregions.

12.0 ACRONYMS AND ABBREVIATIONS

12.1 Standard Acronyms (Applicable to all USAF installations)

- eDASH Acronym Library
- Natural Resources Playbook—Acronym Section
- United States EPA Terms & Acronyms

12.2 Installation Acronyms

11 CES	11th Civil Engineer Squadron
11 CES/CEI/CEIE	11th Civil Engineer Squadron, Installation Management Flight, Environmental Element
AFB	Air Force Base
AFCEC	Air Force Civil Engineer Center
AFPD	Air Force Policy Directive
AFI	Air Force Instruction
AFMAN	Air Force Manual
APHIS WS	Animal and Plant Health Information Service, Wildlife Services (United States Department of Agriculture)
APZ	Accident Potential Zone
AT/FP	Anti-terrorism/Force Protection
BASH	Bird/Animal Aircraft Strike Hazard
BGEPA	Bald and Golden Eagle Protection Act
BMP	Best Management Practices
BRAC	Base Realignment and Closure
CAA	Clean Air Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESU	Cooperative Ecosystem Studies Unit
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CLEO	Conservation Law Enforcement Officer
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DC	District of Columbia
DCHPO	District of Columbia Historic Preservation Office
DCMR	District of Columbia Municipal Regulations
DDOT	District of Columbia Department of Transportation
DIA	Defense Intelligence Agency
DoD	Department of Defense
DoDI	Department of Defense Instruction
DoDM	Department of Defense Implementation Manual

DOEE	Department of Energy & Environment (District of Columbia)
DoN	Department of the Navy
EA	Environmental Assessment
EAP	Encroachment Action Plan
EESOH-MIS	Enterprise Environmental, Safety & Occupational Health Management Information System
EFH	Essential Fish Habitat
EIAP	Environmental Impact Analysis Process
EMP	Environmental Management Plan
EMS	Environmental Management System
EO	Executive Order
ERP	Environmental Restoration Program
ESA	Endangered Species Act
ESQD	Explosive Safety-Quantity Distance
EESOH-MIS	Enterprise Environmental, Safety & Occupational Health
EZ	Exclusion Zones
FAA	Federal Aviation Administration
FR	Federal Register
FSS	Force Support Squadron
FWD	Fisheries and Wildlife Division of the District of Columbia's Department of Energy & Environment
FY	Fiscal Year
GIS	Geographic Information System
HMX-1	Marine Helicopter Squadron 1
IAP	Installation Appearance Plan
IAW	In Accordance With
ICRMP	Installation Cultural Resources Management Plan
IDP	Installation Development Plan
IMP	Installation Master Plan
INRMP	Integrated Natural Resources Management Plan
IPM	Integrated Pest Management
IPMP	Integrated Pest Management Plan
ISSG	Invasive Species Specialist Group
JBAB	Joint Base Anacostia-Bolling
JADOC	Joint Air Defense Operations Center
LID	Low Impact Development
MBTA	Migratory Bird Treaty Act
MEC	Munitions and Explosives of Concern
MMPA	Marine Mammal Protection Act

MMRP	Military Munitions Response Program
MOU	Memorandum of Understanding
MRA	Munitions Response Area
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
MWR	Morale, Welfare, and Recreation
NAS	Naval Air Station
NAVD	North American Vertical Datum
NAVFAC	Naval Facilities Engineering Command
NCPC	National Capital Planning Commission
NDW	Naval District Washington
NEPA	National Environmental Policy Act
NETHCS	Northeast Lexicon and Northeastern Terrestrial Wildlife Habitat Classification System
NHPA	National Historic Preservation Act
NOAA	National Oceanic and Atmospheric Administration
NOAA Fisheries	National Oceanic and Atmospheric Administration National Marine Fisheries Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRL	Naval Research Laboratory
NRM	Natural Resource Manager
NRPM	Natural Resources Program Manager
NPS	National Park Service (United States Department of the Interior)
NSA	Naval Support Activity
NSF	Naval Support Facility
OPR	Office of Primary Responsibility
OPNAVINST	Chief of Naval Operations Operating Instruction
P&F	Program & Financing
POC	Point of Contact
PPV	Public/Private Venture
QRP	Qualified Recycling Program
RCRA	Resource Conservation and Recovery Act
RTE	Rare, Threatened, and Endangered (species)
SAR	Site Approval Request
SAV	submerged aquatic vegetation
SGCN	species of greatest conservation need
SWMP	Stormwater Management Plan
TMDL	Total Maximum Daily Load
U.S.	United States

USACE	United States Army Corps of Engineers
USAF	United States Air Force
USDA	United States Department of Agriculture
USC	United States Code
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UXO	Unexploded Ordnance
WAP	Wildlife Action Plan (of the District of Columbia)
WHCA	White House Communication Agency
WIP	Watershed Implementation Plan
WQC	Water Quality Certificate

13.0 DEFINITIONS

13.1 Standard Definitions (Applicable to all USAF installations)

- Natural Resources Playbook—Definitions Section

13.2 Installation Definitions

- Add unique state, local, and installation-specific definitions.

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.

Appendix A. Annotated summary of key legislation related to design and implementation of the INRMP.

Federal Public Laws	
Defense Appropriations Act of 1991—Legacy Resource Management Program (Public Law [P.L.] 101–511)	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.
National Defense Authorization Act of 1989—Volunteer Partnership Cost-Share Program (P.L. 101-189)	Amends two Acts and establishes volunteer and partnership programs for natural and cultural resources management on DoD lands.
Executive Orders	
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 11644—Use of Off-Road Vehicles on the Public Lands, as amended by EO 11989, Off-Road vehicles on Public Lands	Installations permitting off-road vehicles to designate and mark specific areas/trails to minimize damage and conflicts, publish information including maps, and monitor the effects of their use. Installations may close areas if adverse effects on natural, cultural, or historic resources are observed.
EO 11987—Exotic Organisms	Agencies shall restrict the introduction of exotic species into the natural ecosystems on lands and waters which they administer.

Appendix A. Annotated summary of key legislation related to design and implementation of the INRMP.

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—Use of Off Road Vehicles on Public Lands	Installations permitting off-road vehicles to designate and mark specific areas/trails to minimize damage and conflicts, publish information including maps, and monitor the effects of their use. Installations may close areas if adverse effects on natural, cultural, or historic resources are observed.
EO 11990—Protection of Wetlands	Requires federal agencies to avoid undertaking/providing assistance for new construction in wetlands unless there is no practicable alternative, all practicable measures to minimize harm to wetlands have been implemented, the natural/beneficial values of wetlands are to be preserved/enhanced when carrying out the agency's responsibilities for acquiring/managing/disposing of federal lands/facilities; providing federally undertaken/financed/ assisted construction/improvements; and conducting federal activities/programs affecting land use, water, and related land resources planning/regulating/licensing activities.
EO 12088—Federal Compliance with Pollution Control Standards	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 authority to conduct reviews and inspections to monitor federal facility compliance with pollution control standards.
EO 12777—Implementation of §311 of the Federal Water Pollution Control Act of 1972 (OPA), as amended, and the Oil Pollution Act of 1990	Implements the act by outlining emergency response procedures for handling spills of oil/hazardous materials into U.S. waters. Delegates the appropriate federal agencies, including DoD, to provide representatives to both national and regional response teams for contingency planning; assigns roles/responsibilities relevant to regulation/mitigation/inspection/enforcement/ emergency response, financial liabilities/penalties, and litigation.
EO 12898—Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, partially amended by EO 14008, 21 January 2021	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/ addressing disproportionately high/adverse health or environmental effects on minority/low-income populations. EO 14008, Sec. 220, amended EO 12898, to create a White House Environmental Justice Interagency Council Chaired by the Chair of the Council on Environmental Quality, with council members to include the Secretary of Defense, to develop strategies and accountabilities for implementing environmental justice; includes requirement of agency leads to develop an analysis of security implications associated with climate change (Climate Risk Analysis) that can be incorporated into models/simulations, war-games, and other analyses, with annual updates of progress.

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EO 12962—Recreational Fisheries, as amended by EO 13474 in 2008	Mandates federal agencies, to the extent permitted by law and where practicable, to improve the quality/function/sustainable productivity/distribution of aquatic resources in the U.S. to enhance and increase opportunities for recreational fishing; also established the National Recreational Fisheries Coordination Council. Detailed at https://www.epa.gov/cwa-404/enhancing-aquatic-systems-increase-recreational-fisheries-executive-order-12962. EO 12962 was strengthened by EO 13474 by ensuring that sustainably managed recreational fishing is available/enhanced at National Wildlife Refuges, National Park Service units, National Marine Sanctuaries and other protected marine areas, and any other appropriate conservation or management areas/activities under federal jurisdiction.
EO 13112—Invasive Species	To prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause.
EO 13186—Responsibilities of Federal Agencies to Protect Migratory Birds	The 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 13432—Cooperation among Agencies in Protecting the Environment with Respect to Greenhouse Gas Emissions from Motor Vehicles, Nonroad Vehicles, and Nonroad Engines	Establishes a policy for coordinated and effective exercise of the authorities of the President and the heads of the Department of Transportation, the Department of Energy, and the Environmental Protection Agency to protect the environment with respect to greenhouse gas emissions from motor vehicles, nonroad vehicles, and nonroad engines, in a manner consistent with sound science, analysis of benefits and costs, public safety, and economic growth.
EO 13514—Federal Leadership in Environmental, Energy, and Economic Performance	Establishes an integrated strategy towards sustainability in the Federal Government and to make reduction of greenhouse gas emissions (GHG) a priority for federal agencies. The EO also lays out targets for reducing GHG emissions, reducing intensity of potable water use, and a number of additional targets and general practices for reducing environmental impacts.

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EO 13547—Oceans, Coasts, and the Great Lakes; Protection, Maintenance, and Restoration Efforts	Adopts the Interagency Ocean Policy Task Force recommendations (except where otherwise provided by the EO) and directs executive agencies to implement those recommendations under the guidance of a National Ocean Council. Establishes a national policy to ensure protection/ maintenance/restoration of ocean/coastal/Great Lakes ecosystems/ resources health and resiliency, enhances sustainability of ocean/coastal economies, preserves maritime heritage, supports sustainable uses/access, provides for adaptive management for understanding/ responding to climate change and ocean acidification, and coordinates with national/and foreign policy interests. Provides for development of regional coastal/ marine spatial plans to improve existing federal/state/ tribal/local/regional decision-making/planning processes, enables integrated/ecosystem-based/flexible/proactive approach to planning/managing sustainable multiple uses across sectors and improve ocean/coastal/Great Lakes conservation.
EO 13751—Safeguarding the Nation from the Impacts of Invasive Species	Amends Executive Order 13112—Invasive Species and directs continuation of coordinated federal invasive species prevention/control efforts; maintains the National Invasive Species Council (Council) and the Invasive Species Advisory Committee; expands Council membership and clarifies its operations; incorporates human/environmental health, climate change, technological innovation, and other emerging priorities into federal efforts to address invasive species; and strengthens coordinated, cost-efficient federal actions.
EO 13834—Efficient Federal Operations	Establishes policy for energy/environmental performance of executive departments and agencies (agencies) that meets statutory requirements to increase efficiency, optimizes performance, eliminates unnecessary resources use, and protects the environment. Prioritize actions that reduce waste, cut costs, enhance the resilience of federal infrastructure/operations, and enable more effective mission accomplishment.
EO 14008—Tackling the Climate Crisis at Home and Abroad, 21 January 2021	Puts the climate crisis at the forefront of national foreign policy and national security, and requires the U.S. to cooperate and work with other countries and partners to quickly alter the course of climate change and to build resilience to impacts of climate change, both at home and abroad.
United States Code	
American Indian Religious Freedom Act of 1978 (42 USC 1996)	Establishes policy to protect the rights of Native Americans to exercise their traditional religions by ensuring access to sites, use and possession of sacred objects, and the freedom to worship through ceremonials and traditional rites. Effects of activities on sites eligible for listing on the National Register may trigger a Section 106 review under the National Historic Preservation Act. The National Park Service's Heritage Preservation Services has a major role in fulfilling this policy
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.

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Antiquities Act of 1906 (16 USC 431 *et seq*.)	This was the first U.S. law to protect cultural or natural resources and established national historic preservation policy. Provides Presidential authority to set aside/protect historic landmarks, historic/prehistoric structures, and other objects of historic or scientific interest on U.S. public lands; the protected areas were then designated as National Monuments and federal agencies assigned to oversee them were required to afford proper resource care/management. Required that examination of ruins, excavation of archaeological sites, and gathering objects of antiquity on Departments of Interior, Agriculture, and War lands be carried out only after a permit to do so had been issued by the applicable department Secretary.
Archeological and Historical Preservation Act of 1974 (16 USC 469 *et seq*.)	Amended and expanded the Reservoir Salvage Act of 1960. Required federal agencies to preserve historical/archeological data (including relics/specimens) to preclude their loss or destruction from federal construction projects/activities/programs that alter terrain. Primary federal agencies this affected were those that construct reservoirs and related structures: Army Corps of Engineers and Bureau of Reclamation.
Archeological Resources Protection Act of 1979, as amended (16 USC 470 *et seq*.)	The Act's goal is to protect archaeological resources/sites by governing excavation of archaeological sites on U.S. federal and Native American lands and the removal/disposition of archaeological collections from those sites.
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.
Base Realignment and Closure Act of 1977 (Part A of title XXIX of P.L. 101-510; 10 USC 2687)	Established a process for the Department of Defense (DoD) to reorganize base structure to increase efficiency, effective support of U.S. forces, and operational readiness, and to facilitate new ways of conducting business by coordinating base realignment and closure (BRAC) of DoD installations after the Cold War. Five rounds of BRAC between 1988 and 2005 resulted in closure of 350 installations for an annual savings of $12 billion.
Clean Air Act of 1955, as amended (42 USC § 7401–7671q)	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.

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Coastal Zone Management Act of 1972 (16 USC 1451–1456)	Provides for the management of U.S. coastal resources and Great Lakes. Overall goal is to preserve/protect/develop and, where possible, to restore/enhance coastal resources. Administered by National Oceanic and Atmospheric Administration, the act outlines three national programs: the National Coastal Zone Management Program (CZMP), the National Estuarine Research Reserve System (ERRS), and the Coastal and Estuarine Land Conservation Program (CELCP) The CZMP aims to balance competing land and water issues through state and territorial coastal management programs. The ERRS reserves serve as field laboratories to help improve understanding of estuaries and anthropogenic impacts on them. THE CELCP provides matching funds to state/local governments for purchasing threatened coastal/estuarine lands or obtain conservation easements.
Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (Superfund), as amended (26 USC § 4611–4682, P.L. 96-510, 94 Stat. 2797)	Authorizes and administers a program to assess damage, respond to releases of hazardous substances, fund cleanup, establish clean-up standards, assign liability, and other efforts to address environmental contaminants. Installation Restoration Program guides cleanups at DoD installations.
Defense Environmental Restoration Program (10 USC 2701)	Under this program, the DoD conducts environmental cleanup at active installations, Formerly Used Defense Sites (FUDS), and BRAC locations. The Army, Navy, Air Force, and Defense Logistics Agency manage the cleanup programs at their active installations and BRAC locations, and the Army oversees execution of the U.S. Army Corps of Engineers' FUDS cleanup program. The Office of the Secretary of Defense, through the Deputy Under Secretary of Defense for Installations and Environment, Environment, Safety, and Occupational Health Directorate, manages/oversees and provides guidance for this program.
Endangered Species Act (ESA) of 1973, as amended (16 USC § 1531 *et seq*.; P.L. 93-205)	Protects threatened, endangered, and candidate species of fish, wildlife, and plants and their designated critical habitats. Under this law, no federal action is allowed to jeopardize the continued existence of an endangered or threatened species. The ESA requires consultation with the USFWS and the NOAA Fisheries (National Marine Fisheries Service) and the preparation of a biological evaluation or a biological assessment may be required when such species are present in an area affected by government activities.
32 CFR National Defense, Part 989—Environmental Impact Analysis Process (EIAP), as amended, and AFI 32-7061—EIAP	Provides guidance and responsibilities in the EIAP for implementing INRMPs. Implementation of an INRMP constitutes a major federal action and therefore is subject to evaluation through an Environmental Assessment or an Environmental Impact Statement.

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Federal Aid in Wildlife Restoration Act of 1937 (Pittman-Robertson Act) (16 USC § 669–669i; 50 Stat. 917)	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 (7 USC, ch. 6 § 136 *et seq*.; P.L. 61-152)	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 Facilities Compliance Act of 1992 (42 USC 6961)	Amends the Solid Waste Disposal Act to waive U.S. sovereign immunity for the purpose of enforcing federal/state/interstate/ local requirements regarding solid/hazardous waste management. Absolves federal employees from personal liability for civil penalties under any federal/state/interstate/ local solid/hazardous waste law if the relevant action/omission was within the scope of official duties. Authorizes the USEPA Administrator to initiate an administrative enforcement action against any federal agency, pursuant to authorities of the Solid Waste Disposal Act.
Federal Insecticide, Fungicide, and Rodenticide Act as amended (7 USC 136 *et seq*.)	Provides for federal regulation of pesticide distribution/sale/use. All pesticides distributed/sold in the U.S. must be registered (licensed) by the USEPA, before which the applicant for a pesticide under this act must show (among other things) that using the pesticide according to specifications generally will not cause "unreasonable adverse effects" on the environment;" unreasonable effects are defined as any unreasonable risk to people or the environment, taking into account the economic/social/environmental costs and benefits of the pesticide's use, or a human dietary risk from pesticide residues inconsistent with the standard under section 408 of the Federal Food, Drug, and Cosmetic Act that may be found in/on any food.
Federal Land Policy and Management Act (43 USC § 1701 *et seq*.)	Requires management of public lands to protect the quality of scientific, scenic, historical, ecological, environmental, and archaeological resources and values; as well as to preserve and protect certain lands in their natural condition for fish and wildlife habitat. This Act also requires consideration of commodity production such as timbering.
Federal Noxious Weed Act of 1974 (7 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 USEPA.
Fish and Wildlife Conservation Act (16 USC § 2901–2911; 94 Stat. 1322, P.L. 96-366)	Installations encouraged to use their authority to conserve and promote conservation of nongame fish and wildlife in their habitats.

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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, as amended (10 USC § 2667)	Authorizes DoD to lease to commercial enterprises Federal land not currently needed for public use. Covers agricultural outleasing program.
Magnuson-Stevens Fishery Conservation and Management Act (MSA) of 1976 as amended/revised (16 USC 1801 *et seq*.)	The MSA is the primary law governing management of marine fisheries in U.S. federal waters; it fosters the long-term biological/economic sustainability of marine fisheries. Objectives are to prevent overfishing, restore overfished stocks, increase long-term economic/social benefits, and ensure a safe and sustainable supply of seafood. Establishes transparency and a public process of science, management, innovation, and collaboration with the fishing industry with regard to fisheries management. Extended U.S. jurisdiction to 200 nautical miles and established 8 regional fisheries management councils that develop fishery management plans that comply with the MSA's conservation/management requirements, including 10 national standards to promote sustainable fisheries management. In 1996, Congress significantly revised the MSA by passing the Sustainable Fisheries Act, and again in 2007 by passing the MSA Reauthorization Act to strengthen requirements, set standards, and other enhancements to protect and restore fisheries.
Management of Undesirable plants on Federal Lands (7 USC 2814)	Mandates that every federal agency will designate an office/person trained in management of undesirable plant species to develop/coordinate a management program for controlling undesirable plants on federal lands under the agency's jurisdiction; establish/adequately fund an undesirable plants management program through the agency's budgetary process; complete/implement cooperative agreements with state agencies for managing undesirable plant species on federal lands under the agency's jurisdiction; and establish integrated management systems to control/contain undesirable plant species targeted under cooperative agreements. If an agency's proposed program should require an Environmental Impact Statement (EIS) under the National Environmental Policy Act, the EIS will be completed within 1 year of that determination. Exception: I there are no similar programs being implemented on state or private lands in the same area, the federal agency is not required to carry out such a program.

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Migratory Bird Treaty Act (MBTA) of 2018 (16 USC § 703–712)	The Act implements treaties with Canada, Mexico, Japan, and Russia for the protection of migratory birds. Under the Act, taking, killing, or possessing migratory birds is unlawful without a valid permit. The act is intended to ensure population sustainability for all protected migratory bird species.
Migratory Birds List (50 CFR 10.13, as amended at 85 FR 21290, 16 April 2020)	Revises the list of migratory bird species protected under the MBTA by both adding and deleting some species (now totaling 1003 species, a net increase of 67 species), as necessary due to taxonomic changes and new evidence of natural occurrences or lack of occurrences in U.S., including its territories.
Migratory Bird Conservation Act of 1929 (16 USC 715)	Created the U.S. States Migratory Bird Conservation Commission to consider/approve any areas of land and/or water recommended by the Secretary of the Interior for purchase or rental by the U.S. Fish and Wildlife Service and to fix the price or prices at which such areas may be purchased or rented.
Multiple Use Sustained Yield Act of 1960 (16 USC 528 *et seq*.)	Establishes the policy that U.S. national forests are established and shall be administered for outdoor recreation, range, timber, watershed, and wildlife and fish purposes. Authorizes the Secretary of Agriculture to cooperate with interested state and local governmental agencies and others in the development and management of national forests, and to develop/ administer renewable surface resources of the national forests for multiple use and sustained yield of the several products/services obtained therefrom; administration of national forests shall consider the relative values of the various resources in particular areas.
National Environmental Policy Act of 1969 (NEPA), as amended (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 (CEQ) 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.
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 Register of Historic Places (36 CFR 60)	Authorized by the National Historic Preservation Act of 1966, the National Park Service's National Register of Historic Places is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect America's historic and archeological resources.

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National Trails Systems Act (16 USC § 1241–1249)	Provides for the establishment of recreation and scenic trails.
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.
Plant Protection Act of 2000 (7 USC § 7701 *et seq*.)	Consolidated related responsibilities previously scattered in the Plant Quarantine Act, the Federal Plant Pest Act, and the Federal Noxious Weed Act of 1974; prevents importation, exportation, and spread of plant pests; provides for plant pest control and plant certification.
Pollution Prevention Act (42 USC 13101 *et seq*.)	Established a U.S. policy of pollution prevention by preventing or reducing pollution at the source wherever feasible, and pollution that cannot be prevented should be recycled in an environmentally safe manner. In the absence of feasible prevention or recycling opportunities, pollution by-products should be treated. Disposal or other releases into the environment should be used only as a last resort and in an environmentally safe manner.
National Environmental Policy Act (NEPA) Implementing Procedures (32 CFR 775)	Updates NEPA implementation procedures pertaining to authorizations issued under the Natural Gas Act (NGA). The goal of the changes is to improve efficiency of Department of Energy (DOE) decision-making process by saving time/expense in the NEPA compliance process and eliminating unnecessary environmental documentation for actions that the DOE has determined normally do not have significant effects.
Resource Conservation and Recovery Act (RCRA) (42 USC 6901 *et seq*.)	Gives the USEPA authority to control hazardous waste from "cradle-to-grave;" includes generation/transportation/treatment/storage/ disposal of hazardous waste through USEPA-developed regulations/guidance/policies that ensure safe management/cleanup of solid and hazardous waste, and programs that encourage source reduction and beneficial reuse. Creates the framework for proper management of hazardous/non-hazardous solid waste; describes the waste-management program mandated by Congress that gave USEPA authority to develop the RCRA program.
Rivers and Harbors Act of 1899 (33 USC § 401 *et seq*.)	Makes it unlawful for the USAF to conduct any work or activity in navigable waters of the United States without a federal permit. Installations should coordinate with the United States Army Corps of Engineers (USACE) to obtain permits for the discharge of refuse affecting navigable waters under National Pollutant Discharge Elimination System 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.

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Safe Drinking Water Act of 1974 (42 USC 201 *et seq*.)	Protects public health by regulating the nation's public drinking water supply. The law was amended in 1986 and 1996 and requires many actions to protect drinking water and its sources—rivers/lakes/reservoirs/springs/ groundwater wells (not private wells that serve fewer than 25 individuals). Also authorizes the USEPA to set national health-based standards for drinking water to protect against both naturally occurring and man-made contaminants. The USEPA, states, and water systems work together to ensure that these standards are met.
Sale of certain interests in land, 10 USC § 2665	Authorizes sale of forest products and reimbursement of the costs of management of forest resources.
Sikes Act (16 USC § 670a–670l, 74 Stat. 1052), as amended	Provides for the cooperation of DoD, the Departments of the Interior (USFWS), and the State Fish and Game Department in planning, developing, and maintaining fish and wildlife resources on a military installation. Requires development of an INRMP and public access to natural resources and allows collection of nominal hunting and fishing fees. NOTE: AFI 32-7064 sec 3.9. Staffing. As defined in DoDI 4715.03, use professionally trained natural resources management personnel with a degree in the natural sciences to develop and implement the installation INRMP. (T-0). 3.9.1. Outsourcing Natural Resources 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, August 4, 1983 (Revised May 29, 2003) does not apply to the development, implementation and enforcement of INRMPs. Activities that require the exercise of discretion in making decisions regarding the management and disposition of government owned natural resources are inherently governmental. When it is not practicable to utilize DoD personnel to perform inherently governmental natural resources management duties, obtain these services from federal agencies having responsibilities for the conservation and management of natural resources.
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.
DoD, USAF, and DoN Directives, Instructions, and Policies	
AFI 32-1015—Integrated Installation Planning	Establishes a comprehensive and integrated planning framework for development/redevelopment of USAF installations.

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AFI 32-7001—Environmental Management (23 August 2019, and changed 21 October 2020; supersedes AFI 32-7001 [16 April 2015] and AFI 32-7047 [22 January 2015])	Implements Air Force Policy Directive (AFPD) 32-70—Environmental Considerations in Air Force Programs and Activities and AFPD 90-8—Environment, Safety, and Occupational Health Management and Risk Management. It formalizes environmental processes consistent with expectations of EEO 13834—Efficient Federal Operations. Also clarifies tasks in this AFI as it applies to overseas installations established in DoDI 4715.05—Environmental Compliance at Installations Outside the U.S. Establishes the framework for an organizational-level Environmental Management System at Headquarters Air Force, Air Force Civil Engineer Center, and USAF installations. Underwent significant changes in October 2020.
AFI 32-10112—Installation Geospatial Information and Services (IGIS)	Implements DoDI 8130.01—Installation Geospatial Information and Services by identifying the requirements to implement and maintain a USAF IGIS program and AFPD 32-10 Installations and Facilities.
AFI 91-212—Bird/ Wildlife Aircraft Strike Hazard (BASH) Management Program	Provides policy/guidance for implementing an effective BASH management program for the USAF. Establishes program requirements, assigns responsibilities for program elements, and contains program management information; provides guidance on programs as specified in AFI 91-202—The USAF Mishap Prevention Program, AFI 91-204—Safety Investigations and Reports, and Air Force Manual 91-223—Aviation Safety Investigations and Reports; also implements the requirements of AFPD 91-2—Safety Programs.
AFMAN 32-1053—Integrated Pest Management Program (6 August 2019; supersedes AFI 32-1053 and AFI 32-1074)	Implements Air Force Policy Directive 32-10—Installations and Facilities. Provides guidance for pest management programs (PMPs) at USAF installations; applies to individuals at all levels who execute the PMP, including Regular Air Force, Air Force Reserve, and Air National Guard, except where noted otherwise.
AFMAN 32-7003—Environmental Conservation	Implements AFPD 32-70—Environmental Quality; DoDI 4715.03—Natural Resources Conservation Program; DoDI 4710.1—Archaeological and Historic Resources Management; and DoDI 7310.5—Accounting for Sale of Forest Products. It explains how to manage natural and cultural resources on USAF property in compliance with Federal, state, territorial, and local standards.
AFPD 32-70—Environmental Quality	Outlines the USAF mission to achieve and maintain environmental quality on all USAF lands by cleaning up environmental damage resulting from past activities, meeting all environmental standards applicable to present operations, planning its future activities to minimize environmental impacts, managing responsibly the irreplaceable natural and cultural resources it holds in public trust and eliminating pollution from its activities wherever possible. AFPD 32-70 also establishes policies to carry out these objectives.

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DoD Directive (DoDD) 3200.15—Sustaining Access to the Live Training and Test Domain, incorporating chg. 1, 2 July 2020	Reissues and renames DoDD 3200.15 (thereby cancelled) pursuant to Title 10, USC; and DoDDs 5124.02 (23 June 2008), 5134.0; and 5141.02; also updates established policy and assigned responsibilities for sustaining full operational use of and access to the DoD's live training and test domain.
DoD Directive 4140.01—DoD Supply Chain Materiel Management Policy	Establishes policy and assigns responsibilities for management of materiel across the DoD supply chain.
DoD Instruction (DoDI) 4001.01—Installation Support, incorporating chg. 1, 15 November 2011	Renames and reissues DoDD 4001.l (thereby cancelled) as a DoDI in accordance with the guidance in DoDI 5025.01 and the authority in DoDD 5134.01. Prescribes installation management policy to enhance DoD use of national infrastructure assets to effectively support the warfighter through efficient delivery of installation support, and establishes the Installations Capabilities Council (ICC).
DoD Instruction 4150.07—DoD Pest Management Program, 29 May 2008	Implements policy, assigns responsibilities, and prescribes procedures for the DoD Integrated Pest Management Program.
DoD Instruction 4165.57—Air Installations Compatible Use Zones, incorporating chg. 3, 31 August 2018	Reissues DoDI 4165.57 (thereby cancelled) in accordance with the authority in DoDD 5134.01 to establish policy, assign responsibilities, and prescribe procedures for the DoD AICUZ program for air installations, in accordance with DoDD 4165.06. Establishes policy and assigns responsibility for educating air installation personnel and engaging local communities on issues related to noise, safety, and compatible land use in and around air installations. Prescribes procedures for plotting noise contours for land-use compatibility analysis.
DoD Instruction (DoDI) 4715.03, Natural Resources Conservation Program	Implements policy, assigns responsibility, and prescribes procedures under DoDI 4715.1 for the integrated management of natural and cultural resources on property under DoD control.
DoD Instruction 4715.1—Environmental Security	Establishes policy for protecting, preserving, and (when required) restoring and enhancing the quality of the environment. This instruction also ensures environmental factors are integrated into DoD decision-making processes that could impact the environment, and are given appropriate consideration along with other relevant factors.
DoD Instruction 4715.9—Environmental Planning and Analysis	Implements policy and assigns responsibilities for integration of environmental considerations into DoD activities and operational planning. Assigns responsibilities and prescribes procedures for implementing DoDD 4715.1

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Office of the Secretary of Defense (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.
OSD Policy Memorandum, 1 November 2004—Implementation of Sikes Act Improvement Act Amendments: Supplemental Guidance Concerning INRMP Reviews	Emphasizes implementing and improving the overall INRMP coordination process. Provides policy on scope of INRMP review, and public comment on INRMP review.
OSD Policy Memorandum, 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.
Policy Memo for Implementation of Sikes Act Improvement Amendments, HQ USAF Environmental Office (USAF/ILEV) on January 29, 1999	Outlines the USAF interpretation and explanation of the Sikes Act and Improvement Act of 1997.

14.2 Installation Appendices (attached)

14.2.1 Appendix B. 2020 Annual Review Letters to Regulatory Agencies

There were no formal regulator agency letters regarding the most recent annual review, but there are notes about emailed and verbal feedback in the 2021 Annual Review Report, which can be accessed on e-Dash at https://usaf.dps.mil/teams/10623/JBAB/Shared%20Documents/Forms/AllItems.aspx?RootFolder=%2Fteams%2F10623%2FJBAB%2FShared%20Documents%2FNatural%20Resources%2FINRMP%2F2021%20INRMP%20Annual%20Review%20%2D%20Report&FolderCTID=0x01200013A11ADA2FA4FF4A9A73BCA64405C0E8&View=%7B15DA41E2%2D38C2%2D458D%2DBF87%2DC647401988EC%7D.

14.2.2 Appendix C. Final EA for Charter School, September 2020, and Environmental Assessment Documents

Appendix C—The Charter School Environmental Assessment (EA) includes the consultation letter with the USFWS that refers to a Biological Opinion regarding the northern long-eared bat, which is embedded in the Charter School EA. There was a Supplemental EA for the Charter School Site 3 (constructed site). Both can be found on e-Dash at https://usaf.dps.mil/teams/10623/JBAB/Shared%20Documents/Forms/AllItems.aspx?RootFolder=%2Fteams%2F10623%2FJBAB%2FShared%20Documents%2FNEPA%2DEIAP&View=%7B15DA41E2%2D38C2%2D458D%2DBF87%2DC647401988EC%7D.

Environmental Assessment documents for JBAB can be accessed on e-Dash at https://usaf.dps.mil/teams/10623/JBAB/Shared%20Documents/Forms/AllItems.aspx?RootFolder=%2Fteams%2F10623%2FJBAB%2FShared%20Documents%2FNEPA%2DEIAP&View=%7B15DA41E2%2D38C2%2D458D%2DBF87%2DC647401988EC%7D.

14.2.3 Appendix D. Confirmation from NOAA that JBAB Is Not Encompassed by Designated Critical Habitat for Atlantic Sturgeon

The determination letter from NOAA Fisheries indicating that JBAB does not encompass any critical habitat for the Chesapeake Bay DPS of the Atlantic sturgeon may be accessed via t e-Dash at https://usaf.dps.mil/teams/10623/JBAB/Shared%20Documents/Natural%20Resources/Biological%20Opinions/Atlantic%20Sturgeon%20NOAA%20Letter.pdf.

The 18 October 2021 email from Lynn Lankshear at NOAA Fisheries to confirm that JBAB does not encompass any critical habitat for the Chesapeake Bay DPS of the Atlantic sturgeon may be found in the attached Appendix D, Confirmation from NOAA Fisheries that JBAB Is Not Encompassed by Atlantic Sturgeon Distinct Population Critical Habitat. The original determination letter from NOAA Fisheries, dated 12 October 2016, is available both at the link above and in the Attached Appendix D.

14.2.4 Appendix E. Wildlife Species with Potential to Occur at JBAB

APPENDIX E

Species That Have The Potential To Occur On Joint Base Anacostia-Bolling (Species Documented On Shepherd Parkway And Anacostia Park)

This table lists only species that have the potential to occur on Joint Base Anacostia-Bolling*. This list is not all inclusive and includes species documented at National Park Service Anacostia Park and Shepherd Parkway and therefore can reasonably be assumed to potentially occur on JBAB.

Common Name	Scientific Name	Origin[1]	State Rank[2]	Global Rank[3]	DC SGCN[4]
Mammals					
American Beaver	*Castor canadensis*	N	S3	G5	
Common muskrat	*Ondatra zibethicus*	N	S4	G5	
Eastern cottontail	*Sylvilagus floridanus*	N	S5	G5	X
Eastern grey fox	*Urocyon cinereoargenteneus*	N	S3	G5	X
Raccoon	*Procyon lotor*	N	S5	G5	
Red fox	*Vulpes vulpes*	N	S4	G5	
Virginia opossum	*Didelphis virginiana*	N	S5	G5	X
White-footed deermouse	*Peromyscus leucopus*	N	S5	G5	
White-tailed deer	*Odocoileus virginianus*	N	S5	G5	
Woodchuck (groundhog)	*Marmota monax*	N	S5	G5	
Reptiles					
Common five-lined skink	*Plestiodon fasciatus*	N	S4	G5	X
Copperhead	*Agkistrodon contortrix*	N	S1	G5	X
Eastern box turtle	*Terrapene carolina*	N	S3	G5	X
Eastern gartersnake	*Thamnophis sirtalis*	N	S4	G5	X
Eastern ratsnake	*Pantherophis alleghaniensis*	N	S3S5	G5	
Eastern wormsnake	*Carphophis amoenus*	N	S4	G5	X
Northern black racer	*Coluber constrictor constrictor*	N	S4	G5	X
Red cornsnake	*Pantherophis guttatus*	N	NA	G5	X
Red-eared slider	*Trachemys scripta elegans*	N	SNA	G5	
Rough greensnake	*Opheodrys aestivus*	N	S4	G5	X
Scarletsnake	*Cemophora coccinea*	N	SH	G5	X
Amphibians					
Red salamander	*Pseudotriton ruber*	N	S3	G5	
Southern leopard frog	*Lithobates sphenocephalus*	N	S2S3	G5	
Spring peeper	*Pseudacris crucifer*	N	S4	G5	X
Three-lined salamander	*Eurycea guttolineata*	N	SNR	G5	

Common Name	Scientific Name	Origin[1]	State Rank[2]	Global Rank[3]	DC SGCN[4]
Birds					
American bald eagle	*Haliaeetus leucocephalus*	N	S2N, SXB	G5	X
American coot	*Fulica americana*	N	S2N	G5	
American crow	*Corvus brachyrhynchos*	N	S5B, S5N	G5	
American goldfinch	*Spinus tristis*	N	S4N, S5B	G5	
American kestrel	*Falco sparverius*	N	S2B, S3N	G5	
American robin	*Turdus migratorius*	N	S5B, S5N	G5	
American woodcock	*Scolopax minor*	N	S3N	G5	X
Baltimore oriole	*Icterus galbula*	N	S1B, S3N	G5	
Barred owl	*Strix varia*	N	S2	G5	
Black duck	*Anas rubripes*	N	S3, S4N	G5	X
Black-crowned night heron	*Nycticorax nycticorax*	N	S3B	G5	X
Brown thrasher	*Toxostoma rufum*	N	S3B, S3N	G5	X
Brown-headed cowbird	*Molothrus ater*	**	S4	G5	
Bufflehead	*Bucephala albeola*	N	S1S2N	G5	
Carolina chickadee	*Poecile carolinensis*	N	S5	G5	
Carolina wren	*Thryothorus ludovicianus*	N	S5	G5	
Caspian tern	*Hydroprogne caspia*	N	S1S2N	G5	
Cattle egret	*Bubulcus ibis*	***	NA	G5	
Chimney swift	*Chaetura pelagica*	N	S4N, S5B	G5	X
Chipping sparrow	*Spizella passerina*	N	S3B, S4N	G5	
Common grackle	*Quiscalus quiscula*	N	S4, S5N, S5B	G5	
Common snipe	*Gallinago delicata*	N	S2, S3N	G5	
Cooper's hawk	*Accipiter cooperii*	N	S3N, SHB	G5	
Dark-eyed junco,	*Junco hyemalis*	N	S5N	G5	
Double-crested cormorant	*Phalacrocorax auritus*	N	S4N	G5	
Eastern meadowlark	*Sturnella magna*	N	S1B, S4N	G5	X
Eastern phoebe	*Sayornis phoebe*	N	S3B	G5	

Common Name	Scientific Name	Origin[1]	State Rank[2]	Global Rank[3]	DC SGCN[4]
European starling	*Sturnus vulgaris*	I	SNA	G5	
Field sparrow	*Spizella pusilla*	N	S2B, S4N	G5	X
Fish crow	*Corvus ossifragus*	N	S1S2N, S3B	G5	
Golden-crowned kinglet	*Regulus satrapa*	N	S3S4N	G5	
Gray catbird	*Dumetella carolinensis*	N	S4N, S5B	G5	
Great black-backed gull	*Larus marinus*	N	S5N	G5	
Great blue heron	*Ardea herodias*	N	S4N	G5	
Greater yellowlegs	*Tringa melanoleuca*	N	S3N	G5	
Green heron	*Butorides virescens*	N	S3S4B, S3S4N	G5	
Horned grebe	*Podiceps auritus*	N	SNA	G5	
House finch	*Haemorhous mexicanus*	I	SNA	G5	
Killdeer	*Charadrius vociferus*	N	S2B, S4N	G5	
Mallard	*Anas platyrhynchos*	N	S4N, S5B	G5	
Northern bobwhite	*Colinus virginianus*	N	S1	G5	X
Northern cardinal	*Cardinalis cardinalis*	N	S5	G5	
Northern flicker	*Colaptes auratus*	N	S2S3N, S5B	G5	
Northern harrier	*Circus cyaneus*	N	S2N	G5	
Northern rough-winged swallow	*Stelgidopteryx serripennis*	N	S2N, S3B	G5	
Orchard oriole	*Icterus spurius*	N	S1B, S3S4N	G5	
Osprey	*Pandion haliaetus*	N	S2S3N	G5	
Peregrine falcon	*Falco peregrinus*	N	S1B, S1N	G4	
Pied-billed grebe	*Podilymbus podiceps*	N	S4S5N	G5	
Red-bellied woodpecker	*Melanerpes carolinus*	N	S5	G5	
Red-shouldered hawk	*Buteo lineatus*	N	S2B, S3N	G5	X
Red-tailed hawk	*Buteo jamaicensis*	N	S3N	G5	
Red-throated loon	*Gavia stellata*	N	NA	G5	
Red-winged blackbird	*Agelaius phoeniceus*	N	S3B, S4S5N	G5	
Ruby-crowned kinglet	*Regulus calendula*	N	S4N	G5	
Ruddy duck	*Oxyura jamaicensis*	N	S3S4N	G5	
Sharp-shinned hawk	*Accipiter striatus*	N	S3N, SHB	G5	
Snowy egret	*Egretta thula*	N	S2N	G5	

Common Name	Scientific Name	Origin[1]	State Rank[2]	Global Rank[3]	DC SGCN[4]
Solitary sandpiper	*Tringa solitaria*	N	S3N	G5	
Song sparrow	*Melospiza melodia*	N	S5B, S5N	G5	
Turkey vulture	*Cathartes aura*	N	S3N	G5	
Warbling vireo	*Vireo gilvus*	N	S1B, S1S2N	G5	
White-throated sparrow	*Zonotrichia albicollis*	N	S5N	G5	
Wild turkey	*Meleagris gallopavo*	N	NA	G5	
Willow flycatcher	*Empidonax traillii*	N	NA	G5	
Wood duck	*Aix sponsa*	N	S3N, S4B	G5	X
Wood thrush	*Hylocichla mustelina*	N	S3B, S4N	G5	X
Yellow warbler	*Setophaga petechia*	N	S2N	G5	
Yellow-throated warbler	*Setophaga dominica*	N	S1N	G5	
Invertebrates					
Spring azure butterfly	*Celastrina ladon*	N	SNR	G4 G5	
Variegated fritillarybutterfly	*Euptoieta claudia*	N	NA	G5	X
Monarch butterfly	*Danaus plexippus*	N	S4B	G5	X
Common least skipper	*Ancyloxypha numitor*	N	SNR	G5	
Sachem	*Atalopedes campestris*	N	SNR	G5	
Tiger swallowtail butterfly	*Papilio glaucus*	N	SNR	G5	
Cabbage white butterfly	*Pieris rapae*	N	SNA	G5	
Eastern amberwing dragonfly	*Perithemis tenera*	N	S4	G5	
Common green darner dragonfly	*Anax junius*	N	S5	G5	
Black saddlebags dragonfly	*Tramea lacerata*	N	S4	G5	
European mantis	*Mantis religiosa*	I	SNA	GNR	

[1] Origin: I = Introduced, N = Native.

[2] State Rank (Nature Serve 2013): S1 = Highly State Rare, S2 = State Rare, S3 = Watch List, S4 = Apparently Secure, S5 = Secure, SNA = Not Applicable, SNR = Unranked, SX = Believed to be extirpated with virtually no chance of rediscovery, S_B = This species is migratory and the rank refers only to thebreeding status of the species, S_N = This species is migratory and the rank refers only to thenon-breeding status of the species (such a migrant may have a different rarity rank for breeding populations), NA = No rank assigned for the District of Columbia.

[3] Global Rank (NatureServe 2013): G1 = Critically ImperiledGlobally, G2 = Imperiled Globally, G3 = Very Rare, G4 = Apparently SecureGlobally, G5 = DemonstrablySecure Globally, GNR = Species Not Yet

[4] Listed as a Species of Greatest Conservation Need (SGCN) in the District of Columbia.

* Avian species documented at nearby Anacostia Park (see https://www.mbr-pwrc.usgs.gov/ Infocenter/Nps/anac.htm) and Shepherd Parkway also may occur at JBAB (see Section 2.3.4.10 Other Sensitive Species), although a real-

Common Name	Scientific Name	Origin[1]	State Rank[2]	Global Rank[3]	DC SGCN[4]

time (i.e., potentially more up-to-date) and comprehensive resource for avian species present in the DC area is available on the eBird web site (https://ebird.org/region/US-DC-001).

** This species historically occurred in the Great Plains west of the Mississippi River and often was associated with bison that stirred up insects and uncovered seeds. Due to the fragmentation of the onceunbroken eastern deciduous forests during the 1700s and 1800s from European settlement, cowbirds expanded its range throughout the eastern United States and Canada (NatureServe 2013).

*** Old World species believed to have spread from populations introduced in South America; however, some have concluded that the species colonized South America and migrated northwards onits own (NatureServe 2013).

14.2.5 Appendix F. Updates to Original INRMP

APPENDIX F
Updates to Original Integrated Natural Resources Management Plan

This INRMP covers a five-year period; the plan is required to be updated annually and reviewed and revised every five years. Updates and revisions are a necessary part of maintaining a proactive management plan. Ecosystem management is a dynamic process; therefore, implementation of management goals and objectives requires prescribed monitoring to measure management success or failure. The knowledge gained from observations and testing provides the framework on which to base revisions to the plan. The section below may be used to document changes to the plan that will improve natural resources management. It is intended to document annual updates, and it is not intended to replace the five-year review and revision process. Annual updates will provide information that will be incorporated into the five- year review. Each entry in this section should reference the plan section and page number that is being updated to facilitate quick cross-referencing.

DATE	SECTION / PAGE	COMMENT	REVIEWER
Apr–Dec 2021	Throughout the INRMP	The March 2021 DoN version of the INRMP was converted to the USAF INRMP template to reflect the recent change of command at JBAB. This involved significant reorganization of the original March 2021 INRMP material, and in some cases existing material fell under new or reworded headings to comply with the template; however, the conversion resulted in few changes to the material itself. Minor copy edits and judicious wordsmithing (mostly for clarification, reducing wordiness/improving grammar & syntax, and entering new transitions where they helped to make the reorganized material read more smoothly) were provided by both CEMML and JBAB, as needed. Items that needed updating/minor wording changes pertained to some dates and URLs, and items now in development (e.g., IDP); also replaced DoN authorities personnel/ranks/titles with the USAF equivalents wherever appropriate/needed. Tables, captions, and section headings with their autonumbering for a multi-level list were formatted consistently according to the USAF template. Figures and tables were moved to their new sections along with the text and their numbering and in-text references were updated as needed. Hotlinks and cross-references were added for easier navigation within the document (to figures, tables, appendices, tabs, and other sections in the document) and to items stored in e-Dash. Where no species scientific name had been provided at first mention in the document, we added them with their full common names.	CEMML, JBAB

DATE	SECTION / PAGE	COMMENT	REVIEWER
		Where applicable/required, USAF INRMP template boiler plate text was been added. Additional details related to the INRMP conversion and needs, including CEMML questions for JBAB and JBAB responses, are detailed in the Memo of Record from CEMML that accompanies the final converted INRMP.	
Apr–Dec 2021	Executive Summary	A paragraph explaining the changes to the INRMP as a result of converting it to the DoN format to the USAF template was added at the end.	
Apr–Dec 2021	Approvals Signature page	The approving official signature page was updated with the names of the current USAF Commanders and regulating agency personnel.	CEMML, JBAB
Apr–Dec 2021	Section 1.0—Overview and Scope	Table 1-1 had important DC Municipal regulations re: emissions, wastewater/discharges, and erosion added to it. In Section 1.1, names and associated POC data were updated in the list of people who were part of the INRMP Working Group. JBAB also requested that CEMML be added to the list.	CEMML, JBAB
Apr–Dec 2021	Section 2.0—Installation Profile	Two new sections (2.2.1.1 and 2.2.1.2) were added as placeholders for JBAB's upcoming climate analysis results, with brief sentences about that. Also new is section 2.4.3—Current major Mission Impacts on Natural Resources and section 2.4.4—Potential Future Mission Impacts on Natural Resources (neither included in DoN INRMP, so text had to be provided by JBAB).	CEMML, JBAB
Apr–Dec 2021	Section 4.0—General Roles and Responsibilities	JBAB filled out this new table required in the USAF INRMP.	CEMML, JBAB
Apr–Dec 2021	Section 9.0—INRMP Implementation, Update, and Revision Process	The most significant text changes were deletions of lengthy text and a table in Section 9.0 that is not called for by AFMAN 32-7003 in the USAF INRMP, and despite the deletions, Section 9.0 is very thorough.	CEMML, JBAB
	Section 11.0—References	References were checked and updated to be sure that all references listed were cited and all of those cited are listed; those no longer cited were deleted, a few new ones were added as needed, and those that needed updating were updated.	
Apr–Dec 2021	Section 12.0—Acronyms and Abbreviations	Acronyms were checked throughout the INRMP to be sure they were defined at first use, and any acronyms defined in the front matter (i.e., UP TO Chapter 12.0) were re-defined in the main body, per customary publishing standards; acronyms used only 1-3 times were deleted to improve readability. The acronyms used were then rectified with the acronyms list to ensure that all used were listed and all listed were used. This list is now Section 12.0 instead of an Appendix.	CEMML, JBAB

DATE	SECTION / PAGE	COMMENT	REVIEWER
Apr–Dec 2021	Section 14.0—Appendices	Several appendices were eliminated because the information was moved to official USAF INRMP template sections (Appendix 1—Acronyms, Appendix 2—Relevant Environmental Laws, Appendix 12—Detailed NR Prescriptions, Appendix 13—Project List) or they were empty/unused (Appendices 7/8—Planning-Level Survey Results Fauna/Flora, respectively [unused]; and Appendix 14—Research Requirements List [unused]. Appendix 10—The special-status species list was deleted because the federally listed species were already listed in Table 2-5 of the INRMP, and the 205 SGCN listed in the DC Wildlife Action Plan is online, so readers are now referred to a URL for that information to ensure access to the most up-to-date list. Appendix 15—Landscape Planning, and Appendix 16—Invasive Species Management Plan are now Tabs in section 15.0 with hotlinks to them in e-Dash. Appendices not needed in the USAF INRMP template (and which can be accessed via e-dash if needed) include Appendix 3—Tri-partite Agreement, Appendix 4—Agency INRMP Review Letters, and Appendix 5—Results of Annual Review [in annual reports]). Appendix 6—Updates to Original Plan is now Appendix F, Appendix 9—Wetlands Delineation Report is no longer needed, as it was determined that JBAB has no jurisdictional wetlands, but Tab 2 is now dedicated to providing e-dash hotlinks to the JD and to the delineation report. Appendix 11—Species with Potential to Occur is now Appendix E. Other changes to Appendices were simply to reorganize their order and give them letters to distinguish them from numbered Tabs according to the USAF INRMP template. A new Appendix D now contains the letter of determination and fall 2021 confirmation email from NOAA Fisheries that JBAB does not fall within the Chesapeake Bay DPS critical habitat for Atlantic sturgeon.	CEMML, JBAB
Apr–Dec 2021	15.0—Associated Plans (aka, Tabs)	A few associated plans that had been part of the original Tab 2 appendices are now their own tabs in Section 15.0 and are hotlinked to their respective plans in e-Dash. See Section 14.0 row above for more information on original Appendices that are now tabs.	CEMML, JBAB

14.2.6 Appendix G. Federal permits Required for Wildlife Management Activities

This appendix section is a placeholder for possible future permit needs, but currently there are no permit needs related to wildlife management activities at JBAB.

15.0 ASSOCIATED PLANS

15.1 Tab 1—Stormwater Pollution Prevention Plan

The Stormwater Pollution Prevention Plan may be accessed via e-Dash at https://usaf.dps.mil/teams/10623/JBAB/Shared%20Documents/Forms/AllItems.aspx?RootFolder=%2Fteams%2F10623%2FJBAB%2FShared%20Documents%2FWater%20Quality%2FStormwater%2FMSGP%2FSWPPP&FolderCTID=0x01200013A11ADA2FA4FF4A9A73BCA64405C0E8&View=%7B15DA41E2%2D38C2%2D458D%2DBF87%2DC647401988EC%7D.

15.2 Tab 2—Wetland Delineation Report and Jurisdictional Determination

The JBAB wetlands delineation report indicates that there are no jurisdictional wetlands at JBAB. The USACE jurisdictional determination may be accessed via e-Dash at https://usaf.dps.mil/teams/10623/JBAB/Shared%20Documents/Natural%20Resources/NR%20Surveys/JBAB_USACE%20Approved%20JD_2016-00218.pdf

and the Wetland Delineation Report may be accessed via e-Dash at https://usaf.dps.mil/teams/10623/JBAB/Shared%20Documents/Forms/AllItems.aspx?RootFolder=%2Fteams%2F10623%2FJBAB%2FShared%20Documents%2FNatural%20Resources%2FNR%20Plans&FolderCTID=0x01200013A11ADA2FA4FF4A9A73BCA64405C0E8&View=%7B15DA41E2%2D38C2%2D458D%2DBF87%2DC647401988EC%7D.

15.3 Tab 3—Landscape Planning

The Landscape Planning document, which includes a list of recommended plant species for JBAB landscaping, may be accessed via e-Dash at https://usaf.dps.mil/teams/10623/JBAB/Shared%20Documents/Natural%20Resources/NR%20Plans/Landscape%20Planning%20Guidance.pdf.

15.4 Tab 4—Urban Forestry Management Plan

The Urban Forestry Management Plan may be accessed via e-Dash at https://usaf.dps.mil/teams/10623/JBAB/Shared%20Documents/Forms/AllItems.aspx?RootFolder=%2Fteams%2F10623%2FJBAB%2FShared%20Documents%2FNatural%20Resources%2FNR%20Plans&FolderCTID=0x01200013A11ADA2FA4FF4A9A73BCA64405C0E8&View=%7B15DA41E2%2D38C2%2D458D%2DBF87%2DC647401988EC%7D.

15.5 Tab 5—Integrated Pest Management Plan (IPMP)

The current IPMP (Joint Base Anastasia-Bolling and Naval Facilities Engineering Command 2017) is undergoing an update resulting from JBAB's change of command from the DoN to the USAF; the revised version is expected to be completed in early 2022 and will be made available at that time via e-Dash.

15.6 Tab 6—Invasive Species Management Plan

The Invasive Species Management Plan, which includes a list of invasive and exotic species at JBAB, may be accessed via t e-Dash at https://usaf.dps.mil/teams/10623/JBAB/Shared%20Documents/Natural%20Resources/NR%20Plans/FINAL%20TO%2029%20Task%203%20JBAB%20Invasive%20Species%20Reportr.pdf.

15.7 Tab 7—Bird/Wildlife Aircraft Strike Hazard (BASH) Plan

The BASH Plan may be accessed via e-Dash at https://usaf.dps.mil/teams/10623/JBAB/Shared%20Documents/Natural%20Resources/BASH/BASH%20INST_JBAB.pdf.

15.8 Tab 8—Integrated Cultural Resources Management Plan

The ICRMP may be accessed via e-Dash at https://usaf.dps.mil/teams/10623/JBAB/Shared%20Documents/Cultural%20Resources/ICRMP/2020%20ICRMP%20Final%20Text.pdf.

An update of this plan is underway (as of December 2021).