INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN

NAVAL RESEARCH LABORATORY
WASHINGTON, DC

PREPARED BY:

NAVAL RESEARCH LABORATORY
RESEARCH AND DEVELOPMENT SERVICES DIVISION
TECHNICAL SERVICES BRANCH
ENVIRONMENTAL SECTION

EFFECTIVE 2018 UNTIL REVISED

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN
NAVAL RESEARCH LABORATORY, WASHINGTON, DC

APPROVAL

This Integrated Natural Resources Management Plan has been prepared in accordance with the Sikes Act, as amended (16 United States Code [U.S.C.] § 670 *et seq.*), and Department of Defense (DoD) and United States Navy instructions and policies, in cooperation with the U.S. Fish and Wildlife Service and the District of Columbia Department of Energy and Environment, fulfilling Federal, DoD, and Navy requirements for the management and stewardship of natural resources at the Naval Research Laboratory, Washington, D.C.

S.D. MORAN, Commanding Officer
Naval Research Laboratory

13 MAR 2019
Date

Jennifer Cheswick, Technical Services Branch Head
Naval Research Laboratory

28 FEB 2019
Date

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN
NAVAL RESEARCH LABORATORY, WASHINGTON, DC

APPROVAL

This Integrated Natural Resources Management Plan fulfills the requirements of the Sikes Act, as amended through 2012 (16 U.S. Code [U.S.C.] § 670 *et seq.*), Department of Defense Instruction 4715.03, the Chief of Naval Operations Environmental Readiness Program Instruction 5090.1D, and the Environmental Readiness Program Manual 5090.1. This plan was prepared and reviewed in coordination with the U.S. Fish and Wildlife Service and Maryland Department of Natural Resources, in accordance with the 2006 Memorandum of Understanding for a Cooperative Integrated Natural Resource Management Program on Military Installations.

Genevieve LaRouche, Field Supervisor
U.S. Fish and Wildlife Service

12/14/18
Date

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Bryan D. King — DEC. 12, 2018

Bryan King, Associate Director, Fish and Wildlife Division
District of Columbia Department of Energy and Environment

Date

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN
NAVAL RESEARCH LABORATORY, WASHINGTON, DC

ANNUAL REVIEW AND COORDINATION

By their signature, the certifying official affirms that annual review of the Integrated Natural Resources Management Plan (INRMP) for the Naval Research Laboratory, Washington, DC, in accord with Department of Defense Instruction 4715.03, INRMP Implementation Manual (DOD M-4715.03), and Chief of Naval Operations Environmental Readiness Program Instruction 5090.1D and the Environmental Readiness Program Manual 5090.1.

Annual NRL INRMP Metrics Meeting, Review, and Approval			
Fiscal Year	**Date of Meeting and Metrics Review**	**Certifying Official**	
2018	10-25-2018		
		Name: S.D. MORAN	Signature
		Title: Commanding Officer	
2019			
		Name	Signature
		Title	
2020			
		Name	Signature
		Title	
2021			
		Name	Signature
		Title	

EXECUTIVE SUMMARY

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN
NAVAL RESEARCH LABORATORY, WASHINGTON, DC

Overview

This Integrated Natural Resources Management Plan (INRMP) for the Naval Research Laboratory installation in Washington, DC (NRL-DC) has been developed and implemented pursuant to the statutory requirements and policies set forth by:

- the Sikes Act Improvement Act of 1997 (SAIA) (16 U.S.C.§ 670a, *et seq*.), as amended;
- Department of Defense Instruction (DoDI) 4715.03, *Natural Resources Conservation Program*, March 18, 2011 and the INRMP Implementation Manual (DOD M-4715.03), November 25, 2013; and,
- Chief of Naval Operations (CNO) *Environmental Readiness Program Instruction* (OPNAVINST) 5090.1D and the *Environmental Readiness Program Manual* (OPNAV M-5090.1), 10 Jan 2014.

The SAIA requires the preparation and implementation of INRMPs for military installations with significant natural resources, in coordination with the U.S. Fish and Wildlife Service (FWS) and appropriate state agency. The Act requires that, consistent with the use of military installations to ensure the preparedness of the Armed Forces, INRMPs provide for the conservation and rehabilitation of natural resources on military installations; the sustainable multipurpose use of the resources; and, subject to safety requirements and installation security, public access to the installation. DoDI 4715.03, OPNAVINST 5090.1D and OPNAV M-5090.1, provide DoD and Navy requirements for INRMP development and implementation.

NRL implemented this INRMP for NRL-DC in 2003. The SAIA, and DoD and Navy policy, require that INRMPs be reviewed as to operation and effect not less often than every five years, and revised as needed. NRL conducted a review of the INRMP in calendar year 2018 and has updated the INRMP to ensure the INRMP remains consistent with the NRL mission and natural resources needs, Federal and District rules and regulations, and current DoD and Navy policy for the management of natural resources.

This INRMP was updated and formatted in accordance with the Department of Defense Legacy Resource Management Program, *Considerations and Recommendations When Developing Department of Defense Integrated Natural Resource Management Plans*, February 2009; DoD Integrated Natural Resources Management Plan Template With Comments, 12 March 2010; CNO Guidance, *How to Prepare, Implement, and Revise Natural Resource Management Plan*s (April 2006); and Conserving Biodiversity on Military Lands, *A Guide for Natural Resources Managers*, 2008 edition. Adherence to this guidance is presented throughout this document, and required DoD/Navy crosswalk table Appendix K.

This version of the NRL-DC INRMP updates potential mission constraints relative to installation natural resources; identifies opportunities for the stewardship of installation natural resources; provides overarching goals, and resource specific objectives and strategies aimed at sustaining the integrity of the natural environment on which mission activities rely; and facilitates compliance of NRL-DC mission activities with those authorities governing the conservation, protection, and stewardship of installation natural resources. This update also incorporates DoD and Navy policy issued since implementation of the INRMP in 2003.

Purpose

This INRMP is a practical guide for the management and stewardship of natural resources at NRL-DC. This INRMP serves as a long-term planning document that guides the NRL Natural Resources Management Program in achieving two primary goals:

1. Ensuring the integrity of the installation's natural environment is maintained;
2. Ensuring no net loss of the capability of installation lands to support the Navy mission.

The Natural Resources Management Program also uses the INRMP to provide installation planners with baseline information on the natural environment and serves as a principal source of information for preparing environmental planning documents, such as environmental assessments or environmental impact statements, for proposed installation actions.

Scope

It is Navy policy that INRMPs address all natural resources for lands that are:

- owned by the U.S. and administered by the Navy;
- used by the Navy via license, permit, or lease for which the Navy has been assigned management responsibility;
- withdrawn from the public domain for use by the Navy for which the Navy has been assigned management responsibility; and
- leased lands on the installation and areas occupied by non-DoD entities.

This INRMP addresses a total of 131.2 acres of land owned and administered by NRL, and the near-shore area contiguous to 4,041 feet of shoreline along the Potomac River. There is no Federally regulated restricted area or security zone that has been designated for the near-shore area; however, NRL has a pier that extends 800 feet from the shoreline into the Potomac River, and public access to the pier and shoreline is not permitted for security and safety purposes.

Management Actions

This INRMP prescribes management actions, outlined in Section 4, which provide a set of specific goals, objectives, and strategies for the conservation of various natural resources present at NRL-DC. The management actions prescribed, and their corresponding goals, objectives, and strategies collectively aim to support the purpose of this INRMP: to protect the integrity of natural resources under the administration of NRL, while ensuring no net loss of the capability of installation lands to support the Navy mission**.**

Management actions include a combination of ongoing natural resources management activities from previous years, as well new management actions developed during the five-year INRMP review and update process. In this updated INRMP, management actions are prescribed for NRL-DC lands; aquatic resources; invasive and exotic species; fish and wildlife; resources of special interest, which include threatened and engendered species; outdoor recreation and public access; and integrated pest management. These management actions, outlined in Section 4, are shaped by DoD and Navy guidelines and directives, applicable Federal and District laws and regulations, and natural resources conservation needs.

Project Prescriptions

This INRMP prescribes projects that provide for the protection and conservation of installation natural resources. Because it is Navy policy to not only comply with Federal and District laws and regulations that

provide for the protection and conservation of installation natural resources, but to provide leadership in the stewardship of these resources, some of the projects prescribed are to ensure NRL remains compliant with Federal and District laws and regulations, while other projects are not based on any legal requirement, but aimed at enhancing the installation's natural environment; these are proactive conservation actions that demonstrate environmental leadership. To help distinguish between compliance based and stewardship projects, the Navy developed an Environmental Readiness Level (ERL) classification system, which prioritizes projects by funding level (Tab. 5.1). The highest priority (ERL 4) is assigned to those "must fund" projects or activities necessary for compliance with legal requirements. ERL 3 through ERL 1 are those projects that meet various NRL responsibilities for continued and effective management of installation natural resources, and demonstrate investments in Navy environmental leadership and stewardship.

Implementation of the INRMP involves the anticipated execution of all ERL 4 "must fund" projects or actions. Project prescriptions and ERL classification levels are summarized in Table ES-1, and a full table of project prescriptions provided in Appendix B of this INRMP. It must be noted that all management actions and projects prescribed in this INRMP, "must fund" or otherwise, are subject to the availability of funds properly authorized and appropriated under Federal law. Nothing in the INRMP is intended to be, nor must be construed, to be a violation of the Anti-Deficiency Act (31 U.S.C. 1341 *et seq*.).

Table ES-1. Summary of INMRP Project Prescriptions.

Project Area	Description	Implementation	ERL	Cost Estimate ($)
Land Management				
LM-P-1	Pollinator Habitat Improvement	16-21	3	TBD
LM-P-2	Street Tree Inventory	19	3	TBD
Invasive and Exotic Species Management				
ES-P-1	Invasive/Exotic Species Control	16-21	4	TBD
Fish and Wildlife Management				
FW-P-1	Breeding Bird Surveys	16-21	3	200/yr.
FW-P-2	American Kestrel Box Maintenance	16-21	3	200
Resources of Special Interest				
RSI-P-1	Northern Long-Eared Bat Survey	16 -21	4	10,000
RSI–P-2	Special Status Species Surveys	20-22	4	40,000

National Environmental Policy Act Compliance

Although not required by the Sikes Act, the President's Council on Environmental Quality (CEQ) determined that Sikes Act Improvement Act requirements for INRMP implementation necessitate the preparation of an environmental review pursuant to the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. § 4321 *et seq*.), and the Assistant Secretary of the Navy for Energy, Installations and Environment requires the preparation of NEPA documentation prior to INRMP implementation (ASN (I&E) memo 12 Aug 98). To comply with this requirement, NRL prepared an Environmental Assessment (EA) for the original INRMP which resulted in a finding of no significant impact (located in the Natural Resources Program electronic files at: NATURAL RESOURCES\3 Permits). Additionally, the 2013 DoD INRMP Implementation Manual states that if only minor changes to an existing INRMP are required, and these changes are not expected to require natural resources management practices materially different from those described in the existing INRMP, the installation is not required to perform additional NEPA analysis or provide an additional opportunity for public comment. For this subsequent INRMP, there are no natural resource management practices that are materially different from the original INRMP; therefore, no further analysis is required.

Effectiveness of the INRMP in Achieving No Net Loss

The Sikes Act Improvement Act mandates that an INRMP provide for no net loss in the capability of installation lands and near-shore areas to support the military mission. To accomplish this, the integrated relationships among land use, environmental compliance requirements, mission activities, and other aspects of the mission served by the natural environment at NRL-DC need to be understood. This INRMP identifies and describes these relationships, and provides a fundamental framework from which NRL can manage for the long term sustainability of the NRL-DC natural environment and mission. Fundamentally, anticipating and protecting against constraints and encroachment on the Navy mission, and providing for the protection of environmental resources that are key to sustaining the mission, are what this INRMP attempts to achieve.

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Section 1.0

Overview

1.1 Authority and Background

The legal authority for natural resources management programs on military installations is the Sikes Act of 1960 (16 U.S.C. § 670, *et seq*). In November 1997, the Sikes Act was amended by the Sikes Act Improvement Act (SAIA), which requires the preparation and implementation of an Integrated Natural Resources Management Plan (INRMP) for each military installation in the U.S. that has significant natural resources. This INRMP for the U.S. Naval Research Laboratory (NRL) installation in Washington, DC (NRL-DC) has been prepared in accordance with the SAIA, and Department of Defense (DoD) and Navy instructions and policies including:

- Sikes Act Improvement Act of 1997 (16 U.S.C.§ 670a, *et seq*.), as amended;
- Department of Defense Instruction (DoDI) 4715.03, *Natural Resources Conservation Program*, March 18, 2011 and the INRMP Implementation Manual (DOD M-4715.03), November 25, 2013; and
- Chief of Naval Operations (CNO) *Environmental Readiness Program* Instruction (OPNAVINST) 5090.1D, and the *Environmental Readiness Program Manual* (OPNAV M-5090.1), 10 January 2014.

The SAIA requires DoD installations to prepare the INRMP in cooperation with the U.S. Fish and Wildlife Service (FWS) and appropriate state agencies. SAIA specifies that, consistent with the use of military installations to ensure the preparedness of the Armed Forces, INRMPS provide for the conservation and rehabilitation of natural resources on military installations; the sustainable multipurpose use of the resources, which include hunting, fishing, trapping and non-consumptive uses; and, subject to safety requirements and installation security, public access to the installation. The SAIA mandates that INRMPs shall, to the extent appropriate and applicable, 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;
- integration of, and consistency among, the various activities conducted under the plan;
- establishment of specific natural resource management goals, objectives, and timeframes;
- sustainable use by the public of natural resources to the extent that the use is not inconsistent with the needs of fish and wildlife resources;
- public access to the installation for the purposes of use of natural resources as appropriate, subject to requirements necessary to ensure safety and military security;
- enforcement of applicable natural resource laws (including regulations);
- no net loss in the capability of installation lands to support the military mission of the installation; and

- such other activities as the Secretary of the military department determines appropriate.

This document represents an update of the INRMP, which was first implemented in 2003. The SAIA, and DoD and Navy policy, require that INRMPs be reviewed as to operation and effect, and revised as needed, not less often than every five years. NRL conducted a five-year review during calendar year 2018 and revised the INRMP to ensure the INRMP remains consistent with the NRL mission and natural resources needs, Federal and District rules and regulations, and current DoD and Navy policy for the management of natural resources.

This INRMP has been revised and formatted in accordance with the following additional policies and guidance:

- CNO Guidance, *How to Prepare, Implement, and Revise Natural Resource Management Plans* (April 2006);
- Conserving Biodiversity on Military Lands, A Guide for Natural Resources Managers, 2008 edition;
- Department of Defense Legacy Resource Management Program, *Considerations and Recommendations When Developing Department of Defense Integrated Natural Resource Management Plans*, February 2009; and
- DoD Integrated Natural Resources Management Plan Template with Comments, 12 March 2010.

Adherence to this guidance is presented in the DoD/Navy crosswalk table, in Appendix K.

This INRMP updates potential mission constraints relative to installation natural resources; identifies opportunities for the stewardship of installation natural resources; provides overarching goals, and resource specific objectives and strategies aimed at sustaining the integrity of the natural environment on which mission activities rely; and facilitates compliance of NRL mission activities with those authorities governing the conservation, protection, and stewardship of installation natural resources. This update also incorporates new DoD and Navy policy issued since implementation of the INRMP in 2003.

1.2 Purpose and Scope

This INRMP is a practical guide for the management and stewardship of natural resources at NRL-DC. This INRMP serves as a long-term planning document that guides the NRL Natural Resources Management Program in achieving two primary goals:

1. Ensuring the integrity of the installation's natural environment is maintained.
2. Ensuring no net loss of the capability of installation lands to support the Navy mission.

The Natural Resources Management Program also uses the INRMP to provide installation planners with baseline information on the natural environment and serves as a principal source of information for preparing environmental planning documents, such as environmental assessments or environmental impact statements, for proposed installation actions.

It is Navy policy that INRMPs address all natural resources for lands and near-shore areas that are:

- owned by the U.S. and administered by the Navy;
- used by the Navy via license, permit, or lease for which the Navy has been assigned management responsibility;

- withdrawn from the public domain for use by the Navy for which the Navy has been assigned management responsibility; and
- leased lands on the installation and areas occupied by non-DoD entities.

The NRL-DC field site is located in an urban area Washington, DC (Fig. 1.1). This INRMP addresses a total of 131.2 acres.

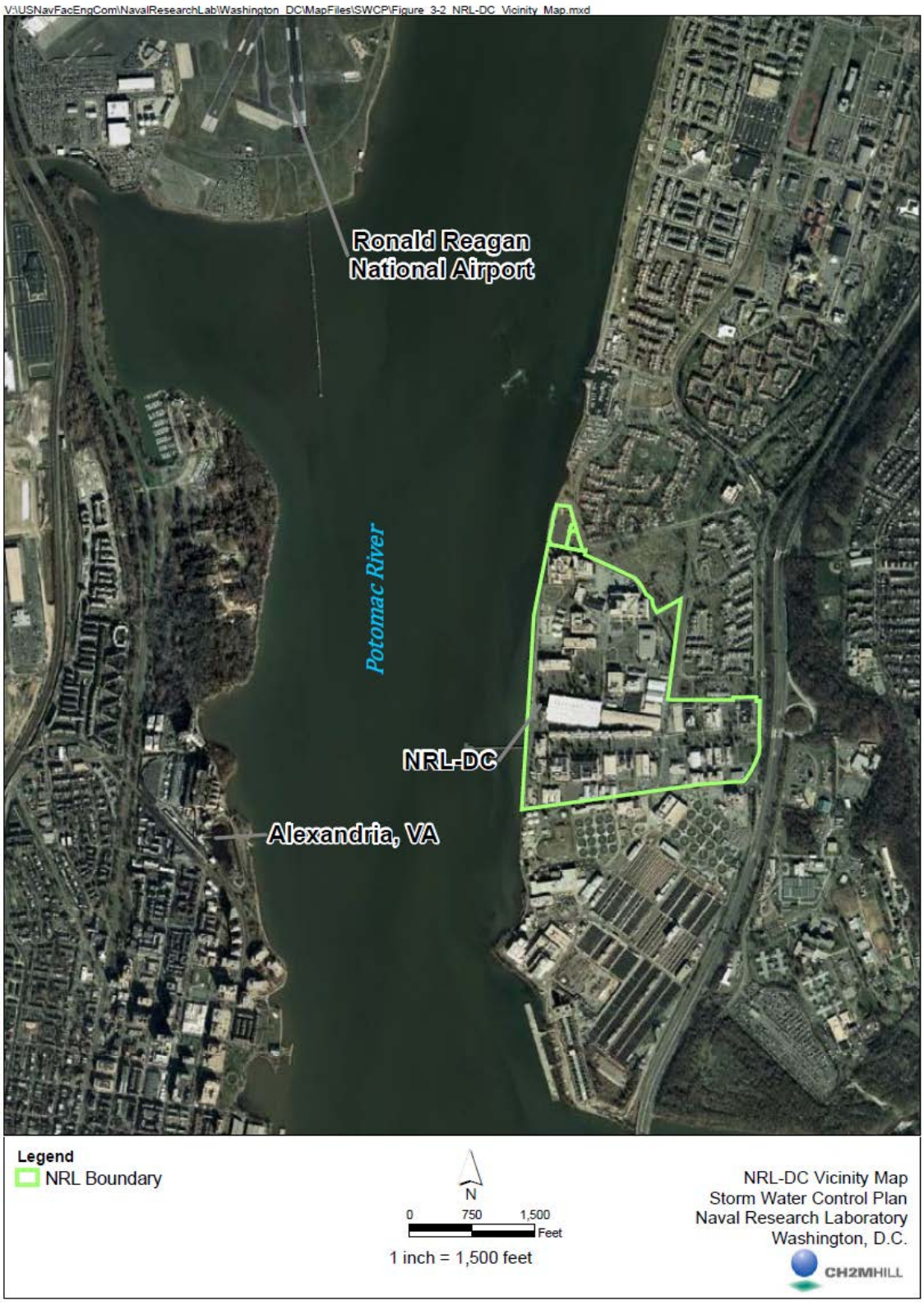

Figure 1.1. Location of NRL-DC. NRL-DC is located in the southwest quadrant of Washington, D.C., sited along the eastern shore of the Potomac River. The installation is comprised of 131.2 acres of land, 4,041 feet of shoreline, and the near-shore areas contiguous to the shoreline.

1.3 INRMP Development and Responsibilities

This section discusses the internal and external stakeholders for this INRMP and describes their responsibilities and participation in the development of this document. The roles and responsibilities of statutory, internal, and external stakeholders related to INRMP update and implementation are described in the following subsections.

1.3.1 Statutory Stakeholders

Department of the Navy

The Naval Research Laboratory is to ensure that all Sikes Act Improvement Act statutory requirements for the administration of installation natural resources are fulfilled.

U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service (FWS) is the primary federal agency with which NRL collaborates on natural resources management. FWS provides technical assistance pursuant to the Endangered Species Act, Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, and the Fish and Wildlife Coordination Act. FWS actively participates in review and updates to this INRMP, and the DoN consults formally and informally with FWS, as appropriate, to address the potential effects of Navy activities on wildlife and critical habitats. The FWS office with responsibilities in implementing this INRMP is the Chesapeake Bay Field Office, 177 Admiral Cochrane Drive, Annapolis, Maryland 21401.

District of Columbia Department of Environment and Energy

The District of Columbia Department of Energy and Environment (DOEE) is a Sikes Act partner in developing, reviewing, and implementing this INRMP, and provides leadership in partnering with/and or supporting District fishing and hunting programs, Wildlife Action Plans, and District conservation and restoration programs. The objectives of the Wildlife Branch identify, monitor and ultimately prevent species of greatest conservation need and their habitat from becoming rare by implementing various wildlife surveys and other research that affects wildlife populations and benefits recreational users. The main objective of the Fisheries Management Branch is to provide suitable fish habitat to increase the number and diversity of fish in the waters of the Potomac and Anacostia rivers in the District. The DOEE office with responsibilities in implementing this INRMP is located at 1200 First St NE, Washington, DC 20002.

1.3.2 Internal Navy Stakeholders

Chief of Naval Operations

The Chief of Naval Operations (CNO) serves as the principal leader and overall Navy Program Manager and advisor for Navy matters related to natural resource management. Responsibilities include, but are not limited to, providing policy needed to establish and maintain a program for the management, conservation, and enhancement of natural resources on Navy lands.

Naval Research Laboratory Commanding Officer

The Commanding Officer (CO) ensures the preparation and implementation of an INRMP. The CO ensures that NRL has the funding, staff, and other resources necessary to manage, subject to the availability of funds, the installation's natural resources effectively in order to fulfill the environmental stewardship

component to ensure no net loss of the Navy mission. Additionally, the CO designates a Natural Resources Manager responsible for the management efforts related to the preparation, update, implementation, and funding of the INRMP.

Natural Resources Manager and NRL Environmental Section

The Natural Resources Manager is typically delegated the responsibility for INRMP development and implementation through the CO, formally, through an appointment letter (Appendix J). The Natural Resources Manager provides technical support and oversight of all aspects of INRMP implementation. The Natural Resources Manager ensures the CO is informed regarding the conditions of natural resources at NRL installations, aware of potential or actual conflicts between the NRL mission and natural resources conservation mandates, and the objectives of the INRMP. The Environmental Section is responsible for ensuring compliance of Navy actions with the objectives of the INRMP.

NRL Office of Counsel

NRL Office of Counsel provides review of, and consults on, the INRMP during development and revisions to ensure the INRMP is legally sufficient. Counsel also provides legal services on a variety of environmental matters, particularly legal interpretations involving compliance with natural resources laws as they pertain to installation operations.

NRL Facilities Management

NRL facilities management activities overlap with the INRMP, as they relate to INRMP goals and objectives (e.g., road repair and maintenance, regular grounds maintenance, and similar activities). Facilities management ensures Navy personnel and contractors implement INRMP goals and objectives for all maintenance and grounds activities.

NRL Public Affairs Office

The NRL Public Affairs Office promotes public understanding of the natural resources management program and serves as coordinator of the public notification process.

1.3.3 External Stakeholders

External stakeholders include local government, conservation groups, and neighboring land owners. FWS and DOEE were provided the opportunity to review and comment on drafts of the INRMP update during the review process, which permitted these agencies sufficient time to evaluate potential issues, proposed management strategies and projects, and provide recommendations.

1.4 INRMP Goals, Objectives, and Strategies

This INRMP prescribes management actions for the conservation of installation natural resources, which are outlined in Section 4. Management actions are a set of specific goals, objectives, and strategies, for a given natural resource. The goals, objectives, and strategies of each management action are shaped by DoD and Navy guidelines and directives, applicable Federal and District laws and regulations, and installation natural resources conservation needs. In this updated INRMP, management actions are prescribed for NRL-DC lands; aquatic resources; invasive and exotic species; fish and wildlife; resources of special interest (including threatened and endangered species); outdoor recreation and public access; and integrated pest management.

The management actions prescribed, and their corresponding goals, objectives, and strategies, collectively aim to support the purpose of this INRMP: to protect the integrity of natural resources under the administration of NRL, while ensuring no net loss of the capability of installation lands to support the Navy mission.

1.5 Management Strategy

1.5.1 Ecosystem Management

An effective Natural Resources Management Program must be resilient and responsive to changing conditions, both environmental, and mission derived. This is accomplished through implementation of an adaptive ecosystem management approach; a requirement of both the Sikes Act Improvement Act and the Navy. Ecosystem management employs an adaptive, holistic framework that manages for the integrated relationships among natural, social, and economic systems, and human activities, to include military mission activities. This type of comprehensive "big-picture" strategy takes account of large scale ecosystem functions, uncertainties, considers multiple influences on ecosystem dynamics, strives to achieve the sustainable use of natural resources, and balance diverse societal objectives. The concepts and strategies of ecosystem management serve to better sustain environmental integrity, and ensure the continued availability of natural resources for mission readiness requirements and other human uses.

DoDI 4715.03 describes the implementation of ecosystem management as a goal-driven approach whereby Natural Resources Managers:

- manage at a scale compatible with, and according to, natural environmental processes that occur on and in the area of the installation;
- manage with nature's timeframes in mind;
- recognize and preserve the value of the ecosystem goods and services that provide for economic, social, and mission needs;
- ensure management is adaptable to complex and changing requirements;
- understand and prevent the potential reciprocal impacts shared among natural, social, and economic systems, and human activities; and
- promote effective, beneficial partnerships with private, local, state, and Federal interests.

Inherent to ecosystem management is the principle of adaptive management, which is the process of monitoring the outcome of management actions, and adjusting management actions as needed to remain consistent with the long-term vision of the INRMP. As such, the strategies and projects implemented should be monitored over a sufficient period of time, so that requisite changes to management practices can be made if it is found that prescribed strategies and projects are not achieving their goals. Similarly, mission, environmental, social, or economic conditions may change and require adaptation of management plans and actions to address such changes. As new installation plans, DoD or Navy guidance, and relevant regulations are developed, INRMP management goals, objectives, strategies, and projects should be adapted in a timely manner to ensure the INRMP remains consistent with the purpose of the INRMP, and that there is no net loss to the Navy mission. These types of adaptive management practices are accomplished in part through the annual and five-year INRMP review processes.

1.6 Stewardship and Compliance

To accomplish the DoD mission of national security, the public endowed the Navy with an investment in public lands, waters, and air; and the invaluable ecosystems of which these natural resources are a part. It is incumbent upon the Navy to administer these natural resources in a way that ensures the sustainability of the goods and services of ecosystems under Navy administration. It is Navy policy to not only comply with applicable Federal and District laws and regulations that provide for conservation and protection of these resources, but to provide leadership in the stewardship of these resources. An INRMP is the primary means by which natural resources compliance and stewardship based priorities are set and funding requirements are determined.

Compliance Based Projects or Activities

Compliance based projects are those responsive to Federal and District laws and regulations, DoD and DoN directives, Executive Orders, and Memoranda of Agreements or Understanding, applicable to NRL-DC. These are "must fund" projects or activities because they are necessary to meet recurring natural resources conservation legal or policy requirements.

Stewardship Based Projects or Activities

INRMPs can also prescribe projects and programs that move beyond compliance-only management actions. These are projects and programs aimed at enhancing an installation's natural environment; that are proactive conservation actions, and/or that demonstrate environmental leadership. These include projects and activities that support or improve the natural environment, but are not legally required. However, stewardship projects generally complement state and local natural resources programs, as well as those that explore opportunities to simply enhance the environment of NRL-DC.

To help distinguish between compliance based and stewardship management efforts, the Navy developed an Environmental Readiness Level (ERL) classification system, which prioritizes projects by funding level (Tab. 5.1). The highest priority (ERL 4) is assigned to those "must fund" projects or activities necessary for compliance with legal requirements. ERL 3 through ERL 1 are those projects that meet various NRL responsibilities for continued and effective management of installation natural resources, and investments that demonstrate Navy environmental leadership and proactive environmental stewardship. Projects or activities prescribed in this INRMP are prioritized according to Navy ERLs to ensure the NRL's highest priorities are promoted through future budget cycles (Appendix B).

1.7 INRMP Approval, Distribution, Review, and Revision

1.7.1 Approval of the INRMP

Approval of this INRMP is reflected by mutual agreement among the Navy, U.S. Fish and Wildlife Service (FWS), and the District Department of Energy and Environment (DOEE). This mutual agreement among parties is only required in regard to those elements of the plan that are subject to the applicable legal authority of FWS and DOEE. INRMP approval is indicated by signature of the designated Navy, FWS, and DOEE authority on the appropriate signature pages, included in the front matter of this INRMP. A Memorandum of Understanding among NRL, FWS, and DOEE addresses the responsibilities, expectations, and commitments of the parties can also satisfy the Sikes Act Improvement Act mutual agreement requirement. In addition, letters of endorsement from FWS and DOEE can be included in the INRMP appendix to indicate concurrence and approval. While this INRMP reflects cooperative agreement among

the Navy, FWS, and DOEE, this agreement does not replace or affect any Federal laws or regulations or state responsibility and authority for protecting fish and wildlife resources.

1.7.2 National Environmental Policy Act Requirements

Although not required by the Sikes Act, the President's Council on Environmental Quality (CEQ) determined that Sikes Act Improvement Act requirements for INRMP implementation necessitate the preparation of an environmental review pursuant to the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. § 4321 et seq.), and the Assistant Secretary of the Navy for Energy, Installations and Environment requires the preparation of NEPA documentation prior to INRMP implementation (ASN (I&E) memo 12 Aug 1998). To comply with this requirement, NRL prepared an Environmental Assessment (EA) for the original INRMP which resulted in a finding of no significant impact (located in the Natural Resources Program electronic files at: NATURAL RESOURCES\3 Permits). Additionally, the 2013 DoD INRMP Implementation Manual states that if only minor changes to an existing INRMP are required, and these changes are not expected to require natural resources management practices materially different from those described in the existing INRMP, the installation is not required to perform additional NEPA analysis or provide an additional opportunity for public comment. For this subsequent INRMP, there are no natural resource management practices that are materially different from the original INRMP; therefore, no further analysis is required.

1.7.3 Distribution of Final INRMP

Electronic copies of all INRMPs shall be uploaded into the Navy Conservation Web site and the OPNAV (N45) Environmental Planning Library. The Natural Resources Manager is encouraged to study other INRMPs and exchange information among INRMP stakeholders to learn more about current management techniques.

1.7.4 Review and Revision Process

1.7.4.1 Five-Year Review

The Sikes Act Improvement Act mandates that INRMPs be reviewed as to operation and effect by the parties thereto on a regular basis, but not less often than every five years.

1.7.4.2 Annual Review

Although the Sikes Act Improvement Act specifies that only a formal review must be completed no less often than every five years, DoD policy requires installations to review INRMPs annually in cooperation with FWS and state agencies party to the INRMP. As part of the annual review, NRL invites participation and feedback from FWS and DOEE on the effectiveness of the INRMP and will inform the agencies about those INRMP projects and activities that are required to meet current natural resources compliance needs.

With agreement from FWS and DOEE, written documentation of the annual informal reviews may be used to substitute for the five-year formal review, thereby reducing the demands on Commanding Officers; provided these "regular" reviews are reasonably comprehensive and the written documentation evidences the parties' mutual agreement. In addition, minor changes can be made to the INRMP following annual reviews that will prevent the need for a more costly and time-consuming update following the five -year review.

It is the Navy's intent that each installation fully document annual reviews and work with FWS and state partners to utilize the annual review process to meet the five-year formal review requirements whenever possible. Therefore, NRL will document the outcome of reviews in a memorandum or letter summarizing the rationale and conclusions of the parties reviewing the INRMP. This written documentation should be jointly executed or in some other way reflect the parties' mutual agreement. These documented annual reviews are also useful in providing the DoD information for the Annual Environmental Quality Report to Congress, and meet Section 101(f) of the Sikes Act Improvement Act.

1.7.4.3 INRMP Review Metrics

INRMP reviews are to utilize Navy and Marine Corps Metrics provided in Appendix I, and to verify whether or to what degree the INRMP is being implemented, and contributing to the conservation and/or rehabilitation of natural resources on NRL-DC. As a guide for performing annual INRMP review, the Navy Natural Resources Metrics are used to verify that:

- all ERL 4 projects and activities have been budgeted for and implementation is on schedule;
- all required trained natural resources positions are filled or in the process of being filled;
- projects and activities for the upcoming year have been identified and included in the INRMP (an updated project list does not necessitate revising the INRMP);
- all required coordination has occurred; and,
- all significant changes to the installation's mission requirements or its natural resources have been identified.

1.7.4.4 INRMP Revision

The requirement for the annual and five-year INRMP review does not mean that the INRMP necessarily needs to be revised; however, there are certain developments that may necessitate INRMP revision. These developments include, but are not limited to the following:

- a change in mission requirements or intensity of land use;
- significant change in natural resource baseline condition (e.g., a substantial change in population for a listed species or a new invasive species);
- the INRMP has proven inadequate, was unable to be implemented, or monitoring has shown projects to be ineffective in meeting natural resource management goals;
- natural resource management goals have changed or planning horizon of previous INRMP has expired; or
- base re-alignment and closure actions.

If any such developments are predicted to take place in the near future, they should be brought to the attention of FWS and DOEE during the review process. Revisions will be reviewed for consistency with the military mission, applicable Federal and District laws, and goals and objectives of the INRMP.

If the five-year INRMP review for operation and effect results in major revisions to the plan, it is Navy policy to solicit public review and comments. If an existing INRMP requires only limited revisions that

are not expected to result in significant environmental effects other than those anticipated for the existing INRMP, then neither a NEPA analysis, nor public review, are necessary.

INRMP modifications and updates that are identified during an annual review can usually be accomplished under the initial Environmental Assessment (EA). Upon updating the INRMP, the NEPA practitioner may consider the plan as a within-scope modification. Thus, the responsible command would be comparing a proposed INRMP update against the extant plan per existing NEPA documentation. Under many circumstances, the conclusion may be that the update is within the scope of the initial NEPA document.

If more substantial revisions to an INRMP are thought to be required, and these revisions are expected to result in environmental consequences different from those anticipated in the existing INRMP, and analyzed in the existing NEPA document, then a new or supplemental NEPA analysis must be prepared and the public provided a reasonable opportunity to comment on the revised INRMP and EA.

1.8 Integration of Other Plans and Surveys

This INRMP integrates the natural resources components of existing NRL plans and surveys, and the requirements of all applicable DoD, Navy, and installation regulations and guidelines. The plans and surveys summarized in Table 1.1 are related to protection and conservation of natural resources at NRL-DC installation, and information and recommendations contained within these plans were used in the development of this INRMP.

Table 1.1 NRL-DC Plans and Surveys	
Integrated Pest Management Plan, Naval Research Laboratory, Washington, D.C.	2003
Spill Prevention Control and Countermeasures (SPCC) Plan, Naval Research Laboratory, Washington, D.C.	2009
Storm Water Control Plan, Naval Research Laboratory, Washington, D.C.	2010
Accidental Spill Prevention and Slug Control Plan, Naval Research Laboratory, Washington, D.C.	2010
NRL Emergency Response Action Plan, Naval Research Laboratory, Washington, D.C.	2010
Hazardous Materials and Hazardous Waste Management Plan, Naval Research Laboratory, Washington, D.C.	2012
Rare, Threatened and Endangered Species Survey Naval Research Laboratory , Washington, D.C.	2016
Bat Survey, Naval Research Laboratory , Washington, D.C.	2016
Amphibian and Reptile Survey, Naval Research Laboratory , Washington, D.C.	2017
Wetland Survey, Naval Research Laboratory , Washington, D.C.	2017

1.9 Regional Plans, Initiatives, and Guidance

This INRMP also incorporates components of plans, guidance, and initiatives relevant to the region to ensure integration of regional and local natural resources concerns and goals. Other plans, guidance, and initiatives relevant to NRL-DC that do, or could, affect the decisions made in the development and implementation of this INRMP include the following:

District of Columbia Wildlife Action Plan

The District of Columbia Wildlife Action Plan (DCWAP) is an action plan for guiding the conservation of the District's wide diversity of fish and wildlife. The plan addresses the full array of the District's wildlife and describes "at risk" species of Greatest Conservation Need, which include District and Federally listed

threatened and endangered species, rare species, species whose populations are in decline, endemic species, and those species for which the District of Columbia constitutes a significant portion of their continental population. The DCWAP also describes key wildlife habitats, such as wetlands, grasslands, and submerged aquatic vegetation; which are all habitat types extant at NRL-DC. Many of the species addressed in the DCWAP may occur on or in the area of NRL-DC, and this INRMP incorporates the DCWAP data and natural resources management goals and policies by reference. The plan is located in the Natural Resources Program electronic files at: NATURAL RESOURCES\7 State Wildlife Action Plans.

Guidance for Federal Land Management in the Chesapeake Bay Watershed, May 12, 2010 (EPA 841-R-10-002)

This guidance provides practices that may be used to reduce nonpoint source pollution in the Chesapeake Bay and other water bodies. The guidance is applicable to land management practices for federal agencies with land, facilities, or installation management responsibilities affecting 10 or more acres within the watershed of the Chesapeake Bay to contribute toward the restoration of the Chesapeake Bay and its watershed. The guidance is located in the Natural Resources Program electronic files at: NATURAL RESOURCES\6 Guidance and Regulations.

Plant Invaders of Mid-Atlantic Natural Areas, 4th ed., 2010. National Park Service and U.S. Fish and Wildlife Service. Washington, DC. 168pp.

The mid-Atlantic region includes the District of Columbia and the states of Delaware, Maryland, New Jersey, Pennsylvania, Virginia and West Virginia. Approximately 280 exotic plant species have been identified by experts as being invasive in natural areas in this region. A complete list is available from the Invasive Plant Atlas of the United States (see References). As of this printing, the Invasive Plant Atlas shows 1,173 plants having been reported to be invasive in natural areas in the U.S. This guide should be used as an introduction to invasive plants and the impacts they are having on natural habitats and ecosystems. Plants not included here should not be assumed to be non-harmful. The guidance is located in the Natural Resources Program electronic files at: NATURAL RESOURCES\6 Guidance and Regulations.

Conserving Biodiversity on Military Lands: A Guide for Natural Resources Managers (2008 edition)

This DoD biodiversity conservation guide presents an updated overview of the subject of biological diversity on DoD lands and includes discussions of scientific thought that reflects the many new issues confronting the DoD natural resources manager. Via a supporting website (www.DoDbiodiversity.org), it provides a forum for military natural resources managers to discuss biodiversity conservation and offer suggestions and ideas for biodiversity enhancement programs. The guidance is located in the Natural Resources Program electronic files at: NATURAL RESOURCES\6 Guidance and Regulations.

Section 2.0

Current Installation Conditions and Uses

2.1 Abbreviated History of the Area

The area in which NRL-DC is located remained largely rural well into the 19th century, being sparsely settled and with few roads. The land that today comprises NRL-DC was historically part of a tract of approximately 1,200 acres that was conveyed to Thomas Grafton Addison in 1795. Addison called the tract "Bellevue" and constructed a mansion on high ground northeast of the current day NRL-DC property. Zachariah Berry acquired the land from the Addison estate in 1827. By the 1860s, a shad and herring fishery operated on Bellevue and the Berry-owned property to the south, what is now an area called Blue Plains. Heirs to the Berry property sold 87 acres of the Bellevue Estate to the Federal government in 1873. A portion of that land became the Bellevue Annex to the Washington Navy Yard.

The history of the Bellevue Annex is intricately tied to the development and expansion of the Washington Navy Yard (WNY) as a result of its function as an annex to the Naval Gun Factory. Located in the southeast quadrant of the city, the WNY is strategically located along the Anacostia River and would become the center of naval ship building, and ordnance production and development. The Bellevue Annex, located just south of the WNY along the Potomac River, allowed for easy transportation between the main yard and the magazine. The first buildings constructed at the Bellevue Annex after its establishment were two storage buildings, a high explosives building and magazine (demolished), and the Commandant's quarters. As part of the WNY complex, the Bellevue Magazine initially served as a magazine and storage facility for the WNY.

The history of NRL-DC itself begins with a proposal introduced by Thomas Edison in 1915. During an interview with the New York Times, Edison suggested that, "The Government should maintain a great research laboratory…In this could be developed the continually increasing possibilities of great guns, the minutiae of new explosives, all the techniques of military and naval progression, without any vast expense. When the time came, if it ever did, we could take advantage of the knowledge gained through this research work and quickly manufacture in large quantities the very latest and most efficient instruments of warfare."

With this interview and with the progression of World War I, the idea of a central research facility for the Navy began to take shape. Secretary of the Navy Josephus Daniels took up the cause initiated by Edison and convinced the scientist to head the Naval Consulting Board. A committee, headed by Edison, was organized to draw up plans for the formation of the Laboratory. The plans called for "a series of twenty-three splendid buildings." The original NRL-DC campus was located between the Bellevue Annex to the north and Blue Plains to the south. Construction contracts for NRL were awarded in November 1920, and the laboratory was officially dedicated on July 1, 1923. The former land of the Bellevue Annex of the Naval Gun Factory, was acquired by NRL in 1963.

Initially, the location of NRL-DC along the east bank of the Potomac River was isolated, with a single road providing pedestrian access. At the time of its establishment, there was no trolley or passenger train service to the campus, although a rail spur from the Baltimore and Ohio Railroad had been constructed for heavy transport. From 1873 to 1946, the Potomac River shoreline along what is now NRL-DC property changed substantially. During that period, approximately 16.2 acres of land was reclaimed from the tidal flats with

dredging spoil from the Potomac River. The sea wall was later constructed to stabilize this artificial shoreline. Prior to development and infilling along the banks of the Potomac River, freshwater marshes would have been common along the shorelines, home to a wide variety of plants and animals including fish, shellfish, mammals, and many species of migratory waterfowl.

Today, the property is heavily developed, with only a few small areas not covered by buildings, concrete, asphalt, or other impervious surfaces. The river bottom and shoreline have been modified by dredging and construction of the sea wall. The present-day, highly urbanized character of the area has meant a considerable decline in habitat for flora and fauna. Vegetation on site is primarily comprised of landscaping trees, shrubs, flowers, and grasses.

2.2 NRL Mission, Operations, and Infrastructure

The Navy's mission, mandated by Federal law (10 U.S.C. § 5062, *et seq.*), is to organize, train, equip, and maintain combat-ready naval forces and to successfully fulfill its current and future global mission of winning wars, deterring aggression, and maintaining freedom of the seas. This, in part, requires the development of aircraft, weapons, tactics, techniques, and equipment to support the needs of naval combat and service elements. As the Navy's single, integrated corporate laboratory, NRL is charged with initiating and conducting broad-based scientific research, and providing new and improved mission related warfare and force-protection materials, techniques, equipment, and combat systems, to ensure current and future needs of the Navy are realized.

NRL is located in Southwest Washington, D.C., and is bounded by Joint Base Anacostia-Bolling to the north/northeast; Interstate-295 and Overlook Avenue to the east; the Washington, D.C., Water and Sewer Authority Blue Plains Wastewater Treatment Plant to the south; and the Potomac River to the west (Figure 2.1).

NRL currently hosts 93 buildings and 30 structures in support of mission operations. Land use at NRL-DC is comprised of high-density development with intervening open spaces scattered throughout the installation. The primary use of developed land is for research facilities, while the secondary purpose is for support buildings and areas consisting of maintenance, supply, training, and industrial operations. There is no residential land use on the NRL property. Land use at NRL can be separated into two major categories, open areas and impervious surfaces:

- Open areas: The main open areas on NRL-DC include a strip of land along the Potomac River, the central mall area, and the area around the historic Commandant's Quarters in the Bellevue Annex.
- Impervious surfaces: Impervious surfaces comprise approximately 94 acres, and 70% of the installation's land. Buildings cover 36 acres, and paved surfaces, including parking areas, roads, and sidewalks, cover 58 acres.

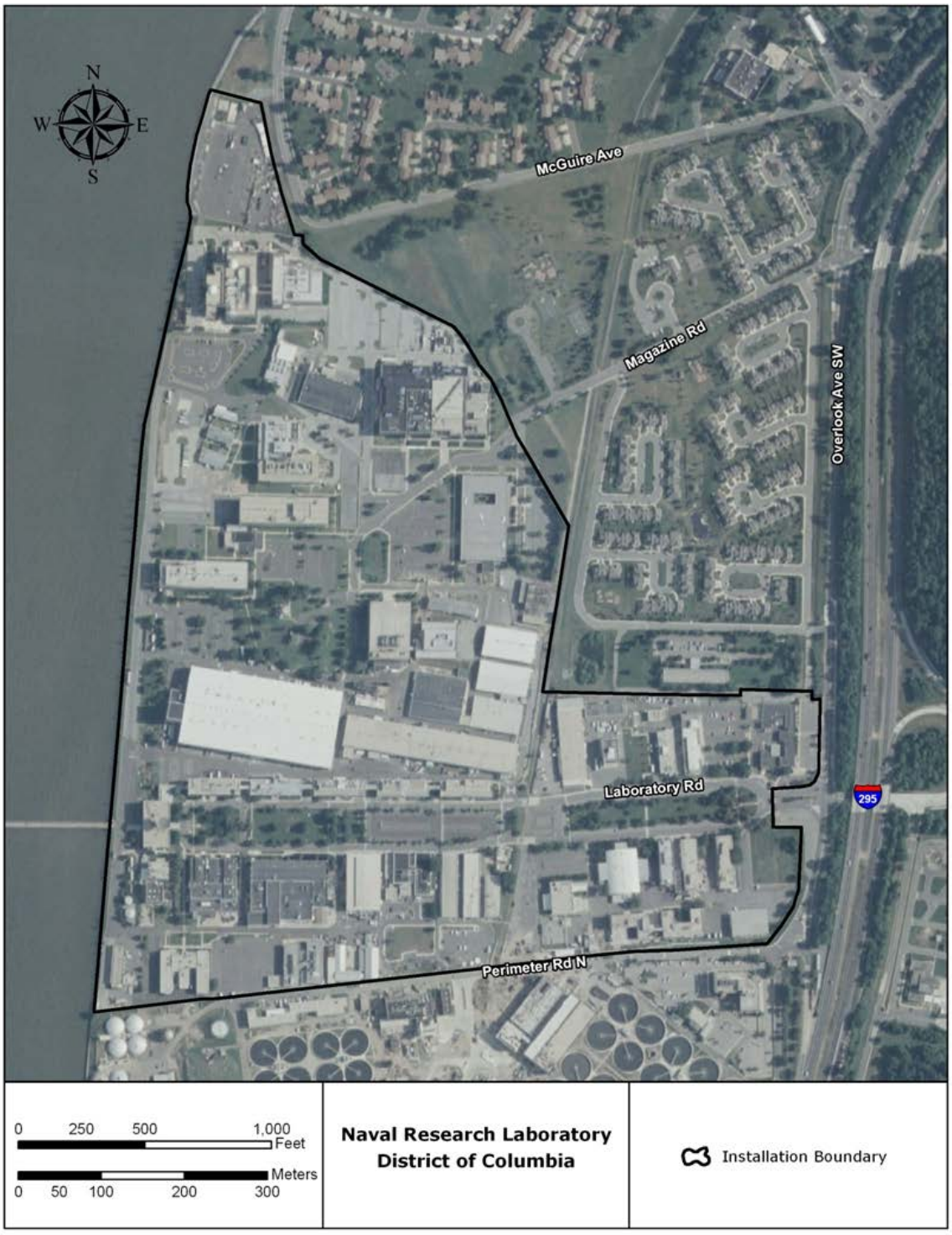

Figure 2.1. NRL-DC Installation Infrastructure. NRL-DC site location, boundaries, and infrastructure: Impervious surfaces comprise approximately 94 acres. Buildings cover 36 acres, and paved surfaces, including parking areas, roads, and sidewalks, cover 58 acres. Open areas on NRL-DC include a strip of land along the Potomac River, the central mall area along Laboratory Road, and the area around the historic Commandant's Quarters in the centrally located Bellevue Annex.

2.3 Encroachment, Constraints, and Opportunities

Encroachment is any non-Navy or Navy action planned or executed in the vicinity of a naval activity or operational area which inhibits, curtails, or possesses the potential to impede the performance of the mission of the naval activity, and environmental concerns are a major focus area for encroachment management (Navy 2007). Encroachment can take many forms, including: urban development, wetlands, threatened and endangered species, Critical Habitat designations for endangered species, groundwater or other potable water supplies, cultural resources, air quality regulations, noise, radio frequency spectrum, and Federal Aviation Administration regulations.

Generally, there are two types of encroachment: internal, or within the boundaries of the installation (e.g., wetlands, endangered species), and external, or outside the boundaries of the installation (e.g., development). Managing encroachment requires an integrated approach that considers both internal and external factors. Achieving "no net loss" of lands to support the mission is the underlying goal when managing encroachment.

Understanding and recognizing these types of encroachments on mission activities allows Natural Resource Managers to anticipate and proactively address potential impacts on the mission; to preserve the ability of installations to meet existing and future mission requirements. For the most part, NRL-DC currently faces only minimal operational and Research, Development, Testing, and Evaluation (RDT&E) constraints due to encroachment.

2.3.1 Internal Encroachment (within installation boundaries)

There are four types of internal encroachment that either reduces the overall amount of space or land available, or restricts the types of mission activities that are allowed:

1. Potential Infrastructure Constraints (constraints generally related to development, infrastructure, or effects of past military activities):

- **Built environment:** While NRL-DC is heavily developed, current infrastructure, the built environment, does not significantly conflict with the natural environment, and there is little potential for the development of conflicts between the built environment and natural resources for the foreseeable future
- **Hazardous materials and wastes:** The installation stores, uses, and disposes of small quantities of hazardous materials and wastes (HM&W), which are administered under NRL's Hazardous Waste Management Plan. The installation also stores petroleum products in above ground storage tanks. The tanks and petroleum products are administered under the NRL Tank Management Plan. The storage and use of HM&W and petroleum products has not presented any significant past constraints, and no significant future constraints are anticipated.

2. Natural constraints (e.g., surface water, topography)

- There is a 500-year flood plain along the Potomac River, which comprises 38 acres. Structural units sited in the flood plain require consideration of the risk of flood loss and impact on NRL infrastructure. New development and renovations within the floodplain will need to comply with existing local codes and ordinances for safety and security of the facility and occupants.

3. Cultural Resources Constraints (e.g., cemeteries, cultural resources, regulatory constraints that are not "natural resources")

- **Historic Sites:** In 2010, an architectural survey was conducted in compliance with Section 110 of the National Historic Preservation Act (NHPA). Thirty seven buildings and structures are recommended as contributing elements of the proposed Bellevue Annex/Naval Research Laboratory Historic District. In addition, four sites (non-archaeological) are recommended as contributing to the district. Three archeological sites, the Bellevue Annex, and building that comprise the Annex, are eligible for listing in the Nation Register of Historic Places. These buildings and areas are restricted to actions that will not adversely affect these resources. Cultural resources are managed under the NRL-DC Integrated Cultural Resources Management Plan.

4. Natural Resources Constraints (e.g., endangered species, wetlands)

- NRL-DC has few natural resources under its administration that could pose constraints on mission activities. The Potomac River, stormwater quality, and air quality, require protection, although management of these does not present any significant constraints on the RDT&E activities conducted at NRL. Natural vegetation on the installation should be maintained where possible to preserve the landscape, enhance the installation, and maintain habitats for urban wildlife.

2.3.2 External Encroachment (outside the installation)

Commercial/Industrial/Residential Development

NRL-DC is bounded by Joint Base Anacostia-Bolling (JBAB) on the north and DC Blue Plains water treatment facility to the south. Highway 295 defines the eastern border.

NRL-DC faces external encroachment issues from the surrounding built environment, and future planned development. Described below are encroachment impacts imposed by public planning initiatives, development projects, and areas adjacent to or in the vicinity of the NRL.

- Airborne chemicals released from the treatment of wastewater at Blue Plains Wastewater Treatment Plant can interfere with mission essential equipment.
- The Anacostia Waterfront Initiative and Riverwalk could increase pedestrian traffic along the installation boundary, which could create security issues.
- The St. Elizabeth's West Campus Master Plan, East Redevelopment Framework Plan, and Bellevue Revitalization Plan, could impact the area surrounding NRL-DC by increasing traffic congestion.

Where these activities could present encroachments on mission activities, these types of external encroachments would not affect installation natural resources.

2.3.3 Potential Impacts of Encroachment

Potential impacts that could result from internal or external encroachments include:

Avoidance areas created: These are areas on installations or ranges that are permanently or temporarily unavailable for testing or training activities. The National Register of Historical Place eligible historic resources and floodplain are avoidance areas, and activities are prohibited in these areas. NRL does not disturb cultural resource areas without consulting with the District of Columbia State Historic Preservation Office.

Prohibited testing/training events or reduced usage days: If operations, testing, and training activities could adversely impact the natural environment at NRL, these activities may be prohibited, or usage days

reduced. Currently, there few natural resources related prohibitions on mission activities that are expected to occur at NRL. Occasionally, certain activities have been restricted, or mitigation measures imposed so as to protect natural water and/or air quality; however, these prohibitions or mitigation measures did not significantly affect the NRL mission, nor are they expected to do so in the future.

Reduced operational proficiency: Encroachment from community development, endangered species, sensitive habitat, environmental regulations, and other factors may reduce opportunities for certain mission activities, or increase burden on operations, maintenance, and testing activities, thereby potentially reducing proficiency. None of these issues are currently expected to have an impact on operational proficiency at NRL-DC.

Increased costs or risks: Encroachment can increase the cost of executing the mission in a variety of ways. Examples include transportation and other costs, which would accrue if the Navy were required to test or train away from their home station when encroachment limits these activities; fuel costs for RDT&E activities involving aircraft that must travel to ranges farther away because of the presence of sensitive natural resources in testing areas; the costs of natural resource conservation projects; and costs associated with environmental restoration projects. Currently, there are no natural resources related matters that are expected to present any increased costs or risks relative to mission activities conduced at NRL-DC.

2.3.4 Encroachment Summary

The majority of RDT&E activities conducted at NRL-DC occur indoors, and, due to the limited natural resources at NRL, mission constraints as related to natural resources are relatively few (Figures 2.2-2.3). Potential environmental constraints are primarily those related to the renovation or expansion of NRL facilities and supporting infrastructure, which could face constraints due to:

- lack of undeveloped land and predominance of impervious surfaces;
- a 38-acre 500-year flood along the Potomac River;
- air quality;
- Potomac River water quality and aquatic biota; and
- National Register of Historical Place eligible archeological sites;

Natural resources management actions would limit access to, or restrict, construction/renovation activities in certain areas due to the above factors, which require compliance with applicable Federal and District laws and regulations; primarily the Clean Water Act (33 U.S.C. §1251 *et seq.*) and National Historic Preservation Act (Public Law 89-665 and amendments thereto; 16 U.S.C. 470 *et seq.*). Management actions could also temporarily preclude the use of certain areas to prevent damage to soils or existing wildlife habitat, or during periods required for vegetation growth recovery.

In principle, maintaining compliance with the numerous laws, policies, and regulations that provide protection of natural resources could also potentially affect certain mission activities. However, for NRL, this is primarily limited to cultural resources, and the effect of cultural resources protection on the mission could occur if construction/renovation projects potentially affecting cultural resources, such as National Registered Historic Property-eligible sites, are restricted to actions that will not adversely affect those resources.

2.3.5 Opportunities

There are several areas of opportunity for enhancing the installation's natural environment. Effective management of natural resources at NRL-DC could have numerous beneficial effects, including maintaining or improving the natural landscape, an improvement in the quality of life of personnel, and a streamlining of the compliance process and a reduction in potential conflicts. Opportunities for NRL-DC are primarily in the areas of landscaping, tree/shrub planting, and promoting environmental awareness through public participation in NRL natural resource program activities, at NRL-DC and NRL field sites.

2.3.6 Encroachment Management

Achieving "No Net Loss" of the capability of installation lands to support the NRL mission is the underlying goal of managing encroachment. Natural Resource Managers need to remain current on potential encroachment issues to address and mitigate potential issues as early as possible. Encroachment management is about preventing encroachment, rather than trying to mitigate encroachment conflicts once they have occurred.

Currently, due to expanding residential suburban and commercial development around the installation, there is some potential for external encroachment in the coming years. In the event encroachment from surrounding development may become a concern, Chief of Naval Operations Instruction (OPNAVINST) 11010.40 provides details for development of Encroachment Action Plans, which identify, quantify, and provide mitigation strategies for the potential encroachment threats to an installation (Navy 2007). This instruction delineates short-, mid-, and long-term strategies to address encroachment threats at an installation. Encroachment partnering with allowable entities will help accomplish the DoD's goal of preservation and sustainment of conditions that are compatible with the mission and that achieve operational assurance.

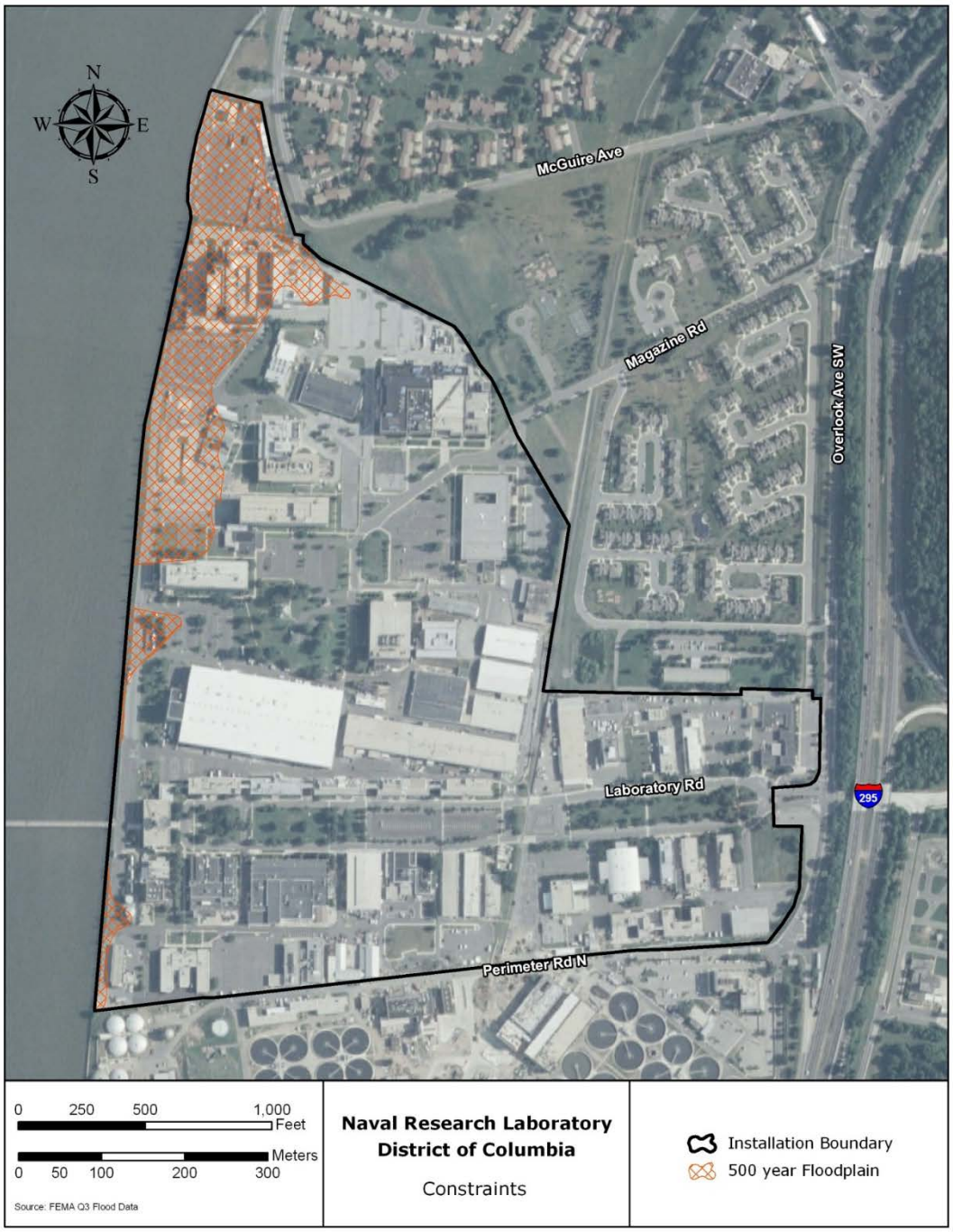

Figure 2.2. Constraints Map for NRL-DC. Potential constraints for NRL are a lack of undeveloped land and predominance of impervious surfaces; air quality; Potomac River water quality and aquatic biota; and a 38-acre 500-year flood along the Potomac River.

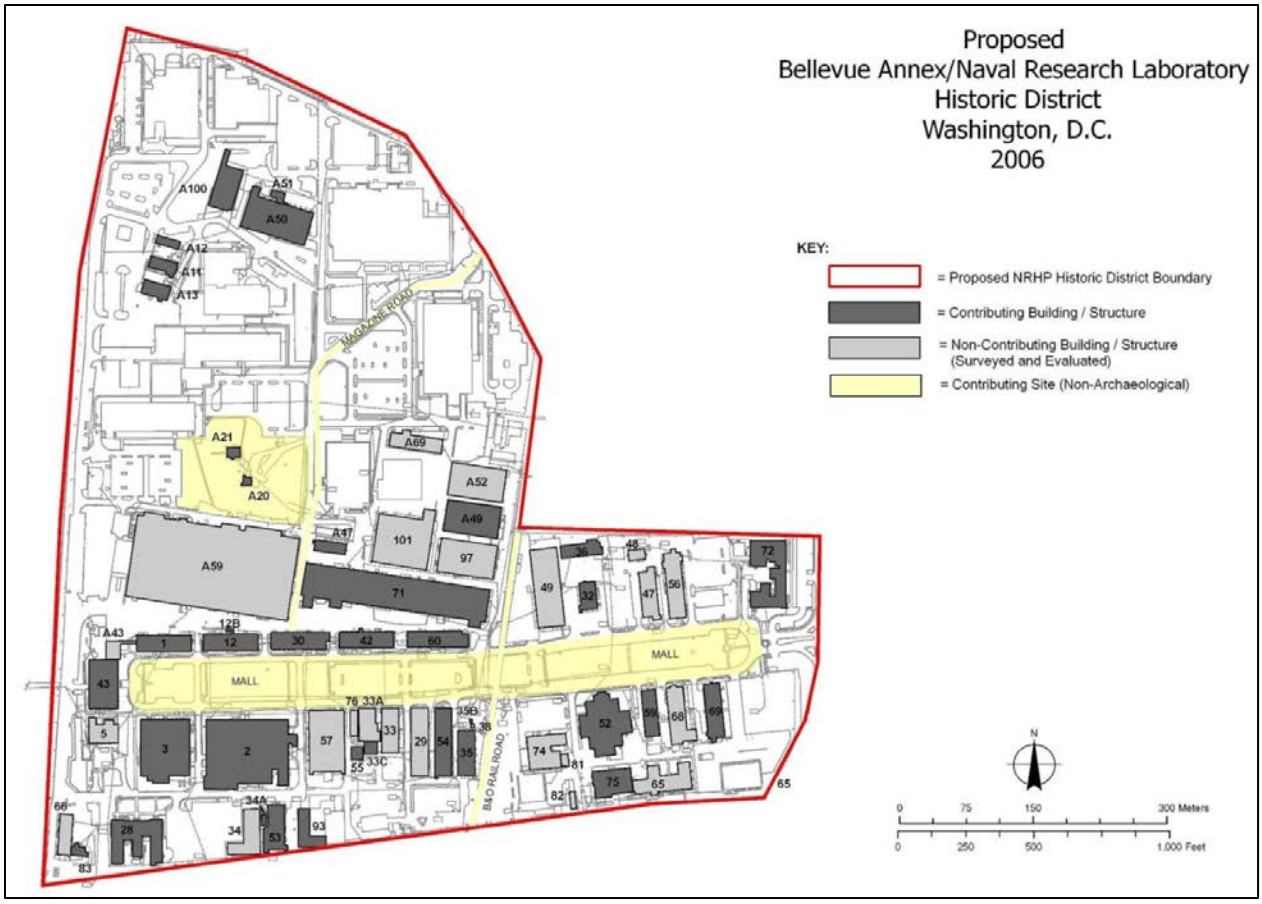

Figure 2.3 Constraints Map for NRL-DC: Historical/Cultural Resources. Thirty seven buildings and structures are recommended as contributing elements of the proposed Bellevue Annex/Naval Research Laboratory Historic District. In addition, four sites (non-archaeological) are recommended as contributing to the district. Three archeological sites, the Bellevue Annex, and building that comprise the Annex, are eligible for listing in the National Register of Historic Places. These buildings and areas are restricted to actions that will not adversely affect these resources. Cultural resources are managed under the NRL-DC Integrated Cultural Resources Management Plan.

2.4 Natural Environment

2.4.1 Climate

Temperature

NRL-DC lies on the northern border of the humid subtropical climate zone; characterized by hot, humid summers and mild to cold winters. Winter temperatures average around 38°F (3.3°C) from mid-December to mid-February. Summers are hot and humid with a July daily average of 79.8°F (26.6°C) and average daily relative humidity around 66%. During a typical year, the area averages about 37 days at or above 90°F (32.2°C) and 64 nights at or below freezing.

Precipitation

Precipitation is evenly distributed year-round, with an average an annual rainfall of approximately 43 inches. While rainfall is ample, irregular droughts can occur periodically. Most summer rainfall occurs

during thunderstorms and an occasional tropical storm or hurricane. Annual snowfall in the area averages 15.5 inches (39 cm), and blizzards affect the area on average once every four to six years.

Hurricanes and tropical storms

Hurricanes and tropical storms form in the warm equatorial waters of the Atlantic Ocean and Caribbean Sea and typically move northward along the east coast of the U.S. following the path of the Gulf Stream. High winds, heavy rains, and flash floods accompany these events. Fortunately for Washington, D.C., the hurricane threat — particularly the risk of intense hurricanes — decreases north of Cape Hatteras, North Carolina and west of the Chesapeake Bay. While direct hits are rare, it is not uncommon for the area to receive the remnants of hurricanes and tropical storms as they move up the east coast on their typical trajectory.

2.4.2 Ecological Region

Ecological regions, environments of general similarity in the type, quality, and quantity of natural resources, are conceptual frameworks that can inform Natural Resource Managers as to what is normal or appropriate for a given area.

NRL-DC is located within the Coastal Plain physiographic province, nearly adjacent to the fall line, which separates the Piedmont physiographic province (ecoregion 45) to the west from the Coastal Plain physiographic province to the east (ecoregions 65 and 63). A fall line (or fall zone) is the geomorphologic break between an upland region of relatively hard crystalline basement rock and a coastal plain of softer sedimentary rock. The fall line bisects Washington, D.C., and NRL-DC is sited just of the line in ecoregion 65, the Southeastern Plain (or Southeastern Coastal Plain), sub-region 65n (Figure 2.4), the Chesapeake Rolling Coastal Plain, as defined by the U.S. Environmental Protection Agency (EPA), and Southern Plains as defined by the U.S. Geological Survey (USGS). This area has a low-lying topographic relief, reaching an elevation of no more than 440 feet (134 m) above sea level. The region is characterized by bays and tidal rivers, nutrient-rich soils, extensive native forest, nontidal and tidal wetlands, and low-gradient "swamp streams" (those streams that normally have no visible flow during a part of the year). This region is also characterized by hilly upland areas, with narrow stream divides, and deeply incised streams (a stream with terraces at the top of the banks). The Coastal Plain uplands, woodlands, and wetlands are among the most diverse communities in temperate North America, having both high levels of species richness and large numbers of endemic flora and fauna. The richness of flora is notable at multiple scales: as many as 50 plant species can occur in a single square meter, and over a 1000 species can be found within an area of a few thousand hectares. In fact, nearly one-quarter of all vascular plant species found in the U.S. occur in the Coastal Plain landscapes.

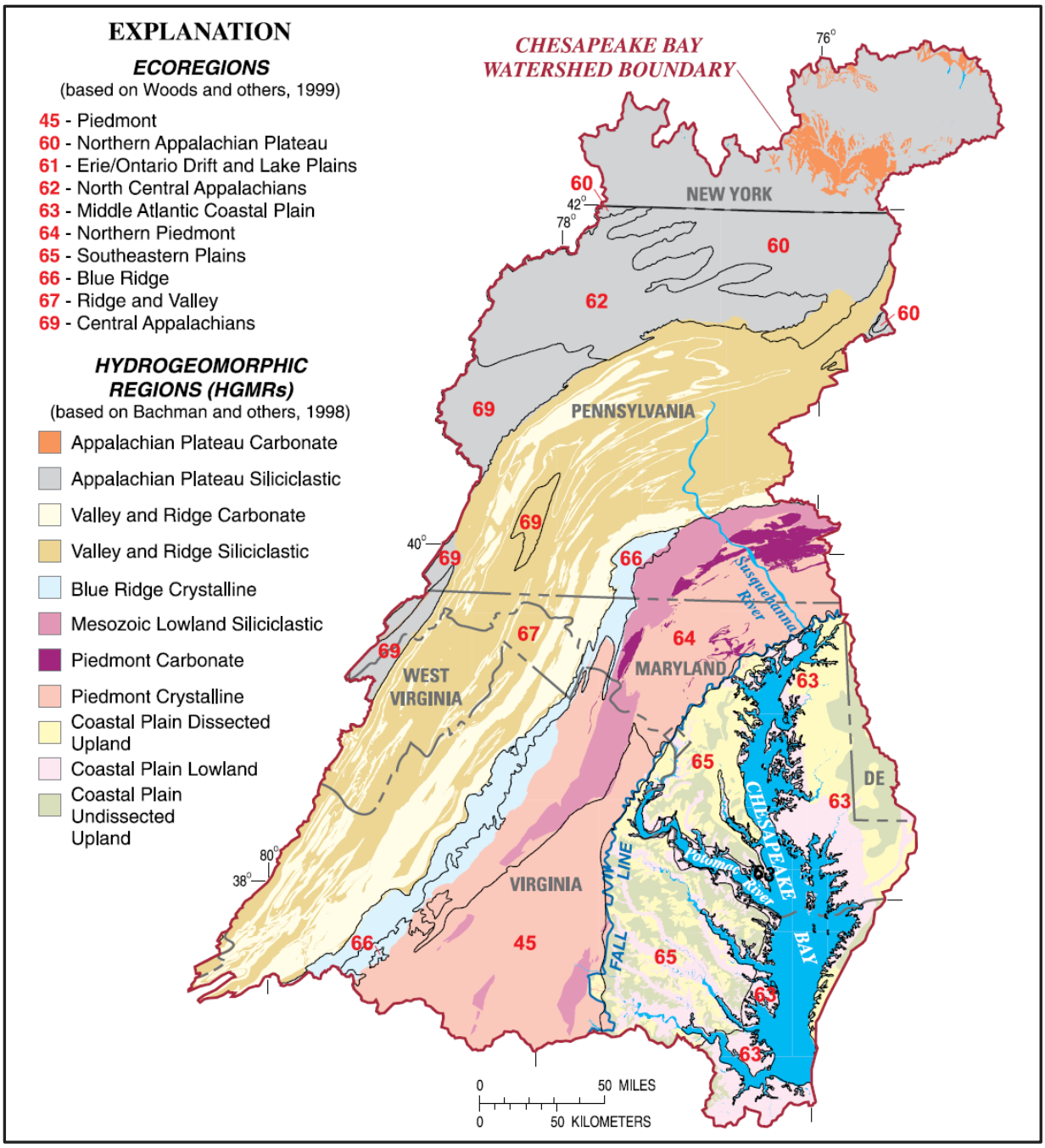

Figure 2.4. Ecological Region: Southeastern Coastal Plain. NRL-DC lies in Ecoregion 65, the Southeastern Plain (or Southeastern Coastal Plain), sub-region 65n, the Chesapeake Rolling Coastal Plain.

2.4.3 Topography, Geology, and Soils

The topography of the installation is flat with surface elevations ranging from approximately 10 feet above mean sea level (msl) at the seawall adjacent to the Potomac River to 45 ft msl on the east side of the installation. The overall slope of the land from shoreline landward is about 1%. The normal overland flow path of stormwater is from northeast to southwest. Approximately 12 acres of the installation along the Potomac River shoreline is located below the 100-year floodplain elevation of 11 ft msl.

The western portion of NRL-DC is underlain by bedrock of the upper Pleistocene Maryland Point Formation. The formation consists of fine-to-coarse-grained sands and poorly sorted silty clay, with fossil oyster beds present near the top of the formation. The eastern portion of the NRL is underlain by the lower Pleistocene Chicamuxen Formation which parallels the Potomac River along the I-295 corridor. Soils across most of the property consist of Udorthents, Urban land, or the Urban land-Galestown complex, with isolated sections of the Woodstown-Urban land (Woodstown sandy loam) and Galestown-Urban land complexes (Galestown loamy sand) (Figure 2.5; Table 2.1). Udorthents are described as heterogeneous, earthy fills overlying poorly drained Coastal Plain sediments. Urban land is a complex mix of artificial fill and natural sediments, with over 80% of the ground surface covered by buildings or impervious surfaces such as asphalt or concrete. Thus, much of the NRL-DC property consists of either disturbed or filled ground.

Among the soil types, the Urban Land category includes impervious surfaces covered with asphalt, concrete, or buildings. Urban land comprises approximately 70% of installation lands. Galestown (GeB) soils are somewhat excessively drained and nearly level to gently sloping. These soils formed in old marine and alluvial deposits of sandy material, and some of them have been reworked by water. These soils are chiefly in areas bordering major rivers. Galestown comprises approximately 8% of installation lands. Udorthents (U1, U6, UmB) soils 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. Udorthents comprises approximately 19% of installation lands. Woodstown (WpB) soils are deep and moderately well drained located in upland areas. These soils formed in old sandy sediments containing moderate amounts of silt and clay. Woodstown comprises approximately 3.2% of installation lands.

Figure 2.5. NRL-DC Soil Map.

Table 2.1 NRL-DC Soil Characteristics			
Soil Unit Symbol	**Soil Type**	**Approximate Acres in Area of Interest**	**Approximate Proportion of Area of Interest**
GeB	Galestown-Urban land complex, 0 to 8 percent slopes	10.7	7.9%
U1	Udorthents	26.2	19.4%
U6	Udorthents, smoothed	0.1	0.1%
Ub	Urban land	45.6	33.8%
UmB	Urban land-Galestown complex, 0 to 8 percent slopes	48.0	35.5%
WpB	Woodstown-Urban land complex, 0 to 8 percent slopes	4.4	3.2%
Totals for Area of Interest		**135.0**	**100.0%**

2.4.4 Aquatic Resources

Aquatic resources means all those associated with water in the area of NRL-DC, and the variety of functions water serves. Aquatic resources encompasses the quantity and quality of water, hydrologic cycling, and various human, animal, and plant needs and uses. Management of aquatic resources encompasses the link between freshwater systems and downstream estuarine and coastal areas into which terrestrial sources drain, and the biologically-rich and commercially-important ecosystems sustained by this linkage. Aquatic resources at NRL-DC are limited to the Potomac River; there are no surface waters on NRL-DC.

2.4.4.1 Near-Shore Area

The Potomac River watershed, home to over 5 million people, stretches across parts of four states (Maryland, Pennsylvania, Virginia and West Virginia) as well as the District of Columbia. The Potomac River runs 405 miles (652 km) from its origin in Fairfax Stone, West Virginia to Point Lookout, Maryland, and drains 14,679 square miles (38,020 km^2). Once the Potomac drops from the Piedmont to the Coastal Plain, ocean tides begin to influence the river as it reaches Washington, D.C. Salinity in the Potomac River increases as the river approaches the Chesapeake Bay.

During the 20th century, the river was heavily impaired by nutrient and chemical inputs as a result of agricultural, residential, and commercial development in the watershed. Modest improvements in water quality began to be achieved in the early 2000's as a result of federal, state, and non-governmental initiatives; however, the river and its tributaries remain vulnerable to eutrophication, heavy metals, pesticides and other toxic chemicals, over-fishing, invasive and exotic species, and pathogens associated with fecal coliform bacteria and shellfish diseases. In 2005 the US Geological Survey (USGS) and FWS began to identify fish in the Potomac and tributaries that exhibited "intersex" characteristics, as a result of endocrine disrupting compounds (pollution). Currently, fish consumption is not advised for most species in the Washington, D.C. area due to polychlorinated biphenyl contamination (PCBs), nor is recreational swimming due to pollution. Stormwater inputs are a critical issue for Potomac River water quality.

2.4.5 Flora and Vegetative Communities

2.4.5.1 Terrestrial

A summary of the region's flora is provided here in Section 2.4.5. Detailed listings of regional flora are provided in Appendices F and G, and in the in the District of Columbia Wildlife Action Plan (DOEE 2005), located in the Natural Resources Program electronic files (NATURAL RESOURCES\7 State Wildlife Action Plans).

The original vegetation at NRL-DC was removed through former agricultural activity (pre-NRL development). As a result of the high density development of the installation and extensive areas of impervious surface, flora and vegetation communities are limited in terms of area and diversity. While biodiversity of flora is low, the installation does host a number of trees, shrubs, and flowers, in those areas suitable for their growing. A 2011 inventory of NRL-DC trees documented 929 trees on the installation; 31 of these were identified as in need of removal for safety reasons, or due to age, exposed roots, stress, and other factors. Trees and shrubs on the installation are comprised of a mix of conifer and deciduous species (Table 2.2). Some of the more common varieties are cedar, cherry, crabapple, crape myrtle, holly, maple, magnolia, oak, pine, and zelkova. The majority of vegetation, to include open lawn, is found in the central mall area, and around the historic Bellevue Annex and Commandant's Quarters property. Shrubs used for decorative purposes are found around several buildings throughout the installation.

The Natural Resources Program maintains an active program for tree and shrub planting to replace dead or diseased trees removed from the installation. The program provides opportunities for public outreach by enjoining the local community and children of NRL employees to participate in tree and shrub planting activities. Plantings over the years have included eastern red bud, willow oak, pin oak, northern red oak, holly, maple, and decorative fountain grass and day Lilly. Flora on NRL is largely administered through contracted landscaping, and tree inspection and removal services.

Table 2.2. NRL-DC Tree Inventory

APPLE SPECIES	EASTERN REDBUD	MAPLE, AMUR	PINE, AUSTRIAN
ARBORVITAE	EASTERN RED CEDAR	MAPLE, JAPANESE	PINE, EASTERN WHITE
ASH, GREEN	ELM, AMERICAN	MAPLE, NORWAY	PINE, JAPANESE BLACK
BIRCH, RIVER	ELM, CHINESE	MAPLE, RED	PINE, SCOTCH
BLACKGUM	ELM, SIBERIAN	MAPLE, SILVER	PINE, SHORTLEAF
CEDAR SPECIES	GOLDENRAIN TREE	MAPLE, SUGAR	PINE, VIRGINIA
CEDAR, ATLAS	HAWTHORN, OTHER	MULBERRY, RED	PLUM, PURPLELEAF
CEDAR, DEODAR	HEMLOCK, EASTERN	OAK, BUR	SPRUCE, COLORAD BLUE
CHERRY SPECIES	HICKORY, PIGNUT	OAK, CHINKAPIN	SPRUCE, NORWAY
CHERRY, BLACK	HOLLY, AMERICAN	OAK, NORTHERN RED	SYCAMORE, AMERICAN
CHERRY, KWANZAN	HOLLY, BURFORD	OAK, PIN	TULIP TREE
CHERRY, OKAME	HOLLY, NELLIE STEVENS	OAK, SAWTOOTH	YEW, COMMON
CHERRY, YOSHINO	HONEYLOCUST	OAK, SHUMARD	ZELKOVA
CRABAPPLE	JAPANESE ZELKOVA	OAK, SWAMP CHESTNUT	
CRAPEMYRTLE, COMMON	LINDEN, LITTLE LEAF	OAK, WHITE	
CYPRESS, LEYLAND	MAGNOLIA, SAUCER	OAK, WILLOW	
DOGWOOD, FLOWERING	MAGNOLIA, SOUTHERN	PEAR, CALLERY	
DOGWOOD, KOUSA	MAGNOLIA, SWEETBAY	PHOTINIA	

2.4.5.2 Aquatic Vegetation

Although freshwater marshes would have naturally been common along the shoreline, they no longer exist due to shoreline development. The entire shoreline is bulkheaded and precludes the establishment of natural shoreline communities of shrubs, reeds, and tall grasses. Submerged aquatic vegetation (SAV) however remains viable in near-shore areas, and is an important habitat type for both resident and migratory fish. It is utilized by both aquatic and terrestrial species. Species of SAV commonly found in the area of the Potomac River at which NRL-DC is sited include *Hydrilla verticillata*, *Ceratophyllum demersum*, *Myriophyllum spicatum*, *Vallisneria americana*, *Heteranthera dubia*, *Najas minor*, *Najas guadalupensis*, and *Myriophyllum spicatum*.

The SAV beds in the District are constantly changing, both in size and location, in response to several environmental variables all related to water quality. This prime aquatic habitat is constantly threatened by poor water quality related to high suspended solid loads because these solids block light from penetrating to the plants. Enhanced SAV populations could not only help stabilize river, stream and pond bottom, but also enhance essential habitat for our aquatic and terrestrial species with the greatest conservation need. It is incumbent upon NRL that the Natural Resources Program conserve and promote the SAV communities in the near-shore areas of the Potomac River.

2.4.6 Fauna

2.4.6.1 Terrestrial Fauna

A summary of the region's fauna is provided here in Section 2.4.6. Detailed listings of regional fauna are provided in Appendices F and G, and in the in the District of Columbia Wildlife Action Plan (DOEE 2005), located in the Natural Resources Program electronic files (NATURAL RESOURCES\7 State Wildlife Action Plans).

The District of Columbia Wildlife Action Plan (DOEE 2005) describes 378 species of birds, mammals, reptiles, and amphibians that are known to reside or occur as transients in the area. An untold number (> 300) of insect and other invertebrate species (crustaceans, spiders, mollusks, etc.) also reside here. However, because of the urban environment in which NRL is located, and the heavily developed nature of the installation, few of these species are common to NRL-DC, and the potential for attracting wildlife is relatively low. Suitable habitat on NRL is limited to avifauna, and generalist species, such squirrel, groundhog, and chipmunk, and small herpetofauna (e.g., toads, salamanders, snakes). Opossum have also been occasionally seen. The District of Columbia Wildlife Action Plan addresses 148 species as "species of greatest conservation need (SGCN)" for the District, a list of which is provided in Appendix G.

2.4.6.2 Avifauna

The avifauna of the upper and lower coastal plain, which are common to the area, are a mix of species mostly centered in southeastern North America, with some additional species spilling over from more inland regions. No formal surveys for species of birds present on NRL-DC has yet been conducted; however, the Maryland / District of Columbia Records Committee of the Maryland Ornithological Society describes 328 species of birds common to the region (current listing can be found in the Natural Resources Program electronic files: NATURAL RESOURCES\4 Programs-Projects\DC\Birds). A wide variety of birds in this region are coastal plain breeders, those species that are associated with water and wetland habitats. Other species are those of upland forests, shrublands, and grasslands. Waterfowl, marsh birds, shorebirds, and colonial nesting species, aggregately known as waterbirds, are an important component of

the region's avifauna; these however would be less common in the area of NRL-DC due to the lack of substantial shoreline/marsh habitat, or surface waters on NRL-DC. Some of the more common species found in the area of NRL-DC are listed in Table 2.3. Conspicuous avifauna at NRL are a local population of Canada geese that are commonly found throughout the installation.

Most of the bird species in this area are migratory, hence, most species occurring on the installation will be migratory. Because of their protected status under the Migratory Bird Treaty Act (MBTA; 16 U.S.C. §§ 703–712), migratory species are discussed in more detail in Section 2.5.8, Resources of Special Interest.

Table 2.3 Birds Common to the Area of Washington, DC: Year-Round Residents (non-migratory)

❑ American Crow	❑ Chipping Sparrow	❑ Mourning Dove
❑ American Goldfinch	❑ Common Grackle	❑ Northern Bobwhite
❑ American Kestrel	❑ Common Yellowthroat	❑ Northern Cardinal
❑ American Woodcock	❑ Cooper's Hawk	❑ Northern Flicker
❑ American Robin	❑ Downy Woodpecker	❑ Northern Mockingbird
❑ Bald Eagle	❑ Eastern Bluebird	❑ Peregrine Falcon*
❑ Barn Owl	❑ Eastern Meadowlark	❑ Pileated Woodpecker
❑ Barred Owl	❑ Eastern Phoebe	❑ Pine Warbler
❑ Black Vulture	❑ Eastern Screech-Owl	❑ Red-bellied Woodpecker
❑ Black-billed Cuckoo	❑ Eastern Towhee	❑ Red-headed Woodpecker
❑ Blue Jay	❑ Field Sparrow	❑ Red-tailed Hawk
❑ Boat-tailed Grackle*	❑ Fish Crow	❑ Red-winged Blackbird
❑ Brown Creeper	❑ Gray Catbird	❑ Rock Pigeon
❑ Brown Thrasher	❑ Great Horned Owl	❑ Song Sparrow
❑ Brown-headed Cowbird	❑ Hairy Woodpecker	❑ Tufted Titmouse
❑ Brown-headed Nuthatch*	❑ Herring Gull	❑ Turkey Vulture
❑ Canada Goose	❑ Horned Lark	❑ Virginia Rail
❑ Carolina Chickadee	❑ House Finch	❑ White-breasted Nuthatch
❑ Carolina Wren	❑ House Sparrow	❑ Wild Turkey
❑ Cedar Waxwing	❑ Killdeer	

● Wood Margins, Hedgerows, Scrub; ● Fresh Marshes, Reservoirs, Rivers, Ponds; ● Agricultural, Fields and Pastures;
● Forests, Floodplains and Swamps; ● Estuaries, Bay, Jetties, Salt Marshes, Tidal and Mud Flats; * Rare

2.4.6.3 Key Wildlife Habitat at NRL-DC

One of the primary goals in the stewardship of wildlife at NRL installations is the conservation of wildlife habitat. Key habitat on NRL-DC includes the following:

Urban Landscapes

Urban landscapes are home to at a variety of species of greatest conservation need. Urban landscapes include both built and natural areas that are managed for human use. Usually, these areas are mowed, trimmed, experience a great deal of foot traffic, and are exposed to wind because they are cleared. These areas consist of golf courses, school campuses, backyards, cemeteries, land surrounding memorials and monuments, and non-vegetated areas such as roads, residential and commercial buildings, and parking lots. While some urban landscapes are built space, they still provide habitat for wildlife and are important areas for conservation planning. Within the extremely urbanized setting, the natural areas could provide important wildlife habitat and migratory corridors. There are several options for transforming urban landscapes into habitat, including using native plants in landscaping, strategic mowing, limiting pesticides, turning off lights in buildings and educating people as to the value of wildlife. Because NRL-DC has a large area of urban landscape, it has a responsibility for conserving species that specialize in urban habitats.

Rivers

The Potomac River provides habitat for 62 species of greatest conservation need, making it the highest priority habitat in the area. All wildlife taxa utilize the river in some way, whether it is to feed, breed, migrate, or inhabit. Rivers perform many ecological functions: They form natural corridors that connect otherwise isolated habitats; connect the neighboring states to the District's habitats; are important for recreational activities such as fishing, swimming, wildlife observation, and boating; and are aesthetic amenities for residential development and public open space. Water quality is a critical issue for the Potomac River, which is largely accomplished by controlling the quality of stormwater runoff.

Submerged Aquatic Vegetation

Submerged aquatic vegetation (SAV), found in the near-shore areas of NRL-DC is a very important habitat type for both resident and catadromous fish. SAV is utilized by both aquatic and terrestrial species, provides food and habitat for many aquatic species, as well as helps to control erosion and sedimentation. Many species depend upon SAV for foraging and juvenile life stages. SAV is decreasing throughout the District's waterways, which has a negative impact on both aquatic habitats and species of greatest conservation need. Conservation of SAV is major objective for the District of Columbia.

2.4.7 Invasive and Exotic Species

Terrestrial invasive and exotic species have not been a significant problem for NRL-DC, largely due to the fact that there are limited natural areas on the installation. The northern snakehead (*Channa argus*) is a predatory species of freshwater fish native to China. First documented in U.S. waters in 2002, the snakehead is considered highly invasive and poses significant threats to native fish populations. Unfortunately, the snakehead has become established in several DC, Maryland, and Virginia waterways, including the near-shore area of the Potomac River. The DOEE recommends that if a northern snakehead is caught, it should be immediately killed.

A full list of potential invasive flora and control mechanisms for each species is described in "Plant Invaders of Mid-Atlantic Natural Areas" (Swearingen *et al.* 2010), located in the Natural Resources Program electronic files (NATURAL RESOURCES\6 Guidance and Regulations\Invasive and Exotic Species.

2.4.8 Resources of Special Interest

Resources of special interest include threatened and endangered species listed under the Endangered Species Act (ESA; 16 U.S.C. § 1531 et seq.) and DOEE Wildlife Action Plan listed species of concern; and rare or sensitive ecological communities.

At this time, there are no known Federal- or District-listed species occurring at NRL-DC; however, the installation is a potential stopover point for many migratory birds along the Atlantic flyway or transitory Atlantic or Shortnose Sturgeon.

Within the District, there are three species listed as Endangered and one listed as Threatened under the ESA (Table 2.4).

Table 2.4. Resources of Special Interest: Federally – Listed Species

Common name	Scientific Name	Federal Status	District Status	Occurrence
MAMMALS				
Northern Long-eared Bat	*Myotis septentrionalis*	T	SGCN	n/o
Crustacean				
Hay's Spring amphipod	*Stygobromus hayi*	E	SGCN	n/o
Fish				
Atlantic sturgeon	*Acipenser oxyrinchus*	E	SGCN	i
Shortnose sturgeon	*Acipenser brevirostrum*	E	SGCN	i

NOTES:
E - Endangered; i – indeterminate; n/o – not occurring; SGCN – Species of Greatest Conservation Need.

Northern Long-eared Bat

Northern long-eared bat *(*NLEB, *Myotis septentrionalis)* is listed as Threatened under the Endangered Species Act (ESA; 16 U.S.C. § 1531 *et seq*.). The FWS rule for NLEB provides guidence for measures necessary and advisable for its conservation in areas that could be NLEB habitat. White-nose syndrome (WNS, *Geomyces destructans*) is the primary threat to NLEB (FWS 2016).

NLEB ranges across much of the eastern and northcentral United States, and all Canadian provinces west to the southern Yukon Territory and eastern British Columbia. NLEB predominantly overwinter in hibernacula that include caves, abandoned mines, and, to a lesser extent, abandoned railroad tunnels. NLEB are typically found roosting in small crevices or cracks in cave or mine walls or ceilings. During the summer, NLEB typically roost singly or in colonies underneath bark or in cavities or crevices of both live trees and snags (predominantly hardwoods). NLEB have also been observed roosting in colonies in human-made structures, such as in buildings, in barns, on utility poles, behind window shutters, and in bat houses. NLEB most likely are not dependent on certain species of trees for roosts throughout their range; rather, many tree species that form suitable cavities or retain bark will be used by the bats opportunistically. Canopy coverage at NLEB roosts has ranged from 56% to greater than 84%.

To date, in addition to the Northern Rock Creek Park, District of Columbia, NLEB has been documented on several regional Navy installations to include Naval Support Activity Northwest Annex, VA, Naval Air Station Oceana (Main Site), VA and Naval Auxiliary Landing Field, VA; Joint Expeditionary Base Little Creek, VA; and Naval Weapons Station Yorktown, VA. Surveys conducted in 2016 did not reveal the presence of this bat species at NRL-DC.

Hay's Spring amphipod

Hay's Spring amphipod listed as Endangered under the ESA. This rare species of crustacean is endemic to the District of Columbia, where it occurs only in Rock Creek, a tributary of the Potomac River. Given its native habitat, Hay's Spring amphipod would not occur on or near NRL-DC.

Atlantic and Shortnose Sturgeon

The Atlantic and shortnose sturgeon are listed as Endangered under the ESA and are found in the Chesapeake Bay and its tributaries, including the Potomac River. Atlantic sturgeon spawn in freshwater in the spring and early summer and migrate into estuarine and marine waters where they spend most of their lives. Adults live in coastal waters and estuaries when not spawning, generally in shallow (10-50 m; 32-164 ft) nearshore areas dominated by gravel and sand substrates. Atlantic sturgeon will ascend tributaries to spawn in tidal freshwater in May or June when temperatures reach approximately 18°C (64°F). Conversely, shortnose sturgeon inhabit rivers and estuaries. Spawning suitability windows follow day length of 13.9–14.9 h, water temperature of 7–15°C, and river discharge that provides 30–120 cm/sec (mean 70 cm/sec) bottom velocity. All spawning windows must be open simultaneously for spawning to occur. The shortnose sturgeon will occur as a transient in the near-shore waters as it migrates to upper portions of the Potomac River to spawn.

Migratory Birds

NRL-DC is located such that it is a potential stopover point for migratory birds along the Atlantic flyway. Most birds in this area are migratory, and as such, most of the species present on NRL-DC will be migratory. The Migratory Bird Treaty Act (MBTA; 16 U.S.C. §§ 703–712) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests except as authorized under permit. Any action that may potentially violate the MBTA requires coordination with FWS. National guidelines for nest site protection have been adopted by the Federal government and apply to District of Columbia nest sites.

The Bald Eagle was removed from the Federal endangered species list in August 2007. Although this species is not Federally listed, they continue to receive protection under the MBTA and Bald and Golden Eagle Protection Act (BGEPA; 16 U.S.C. § 668-668d). 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, unless allowed by permit. To "take" includes to kill, harm, harass, or possess, and there is also a prohibition on disturbing eagles, including agitating an eagle to the degree that causes, or is likely to cause, injury to an eagle, decreased productivity through interference with normal breeding, feeding, or sheltering behavior, and/or nest abandonment. Any action that may potentially violate the BGEPA requires a take permit from FWS. Additional protection for migratory birds on Federal properties is provided by EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds (2001). The Order directs incorporation of bird conservation principles in agency management plans and requires federal agencies enter into a memorandum of understanding on migratory birds with the FWS.

The Maryland/District of Columbia Records Committee of the Maryland Ornithological Society describes 328 species of birds common to the region. Some of the more common species of migratory birds known to occur in the area of NRL-DC are listed in Tables 2.5 – 2.7. There are 35 species birds on the DOEE's list of species of greatest conservation need, representing the largest percentage of species on the list after invertebrates.

Table 2.5. Migratory Birds Common to the District of Columbia: Transients

❑ American Golden-Plover	• •	❑ Connecticut Warbler*	• •	❑ Philadelphia Vireo*	• •
❑ Bicknell's Thrush	• •	❑ Golden-winged Warbler*	•	❑ Rose-breasted Grosbeak	• •
❑ Black-bellied Plover	• •	❑ Gray-cheeked Thrush	• •	❑ Swainson's Thrush	• •
❑ Blackpoll Warbler	• •	❑ Greater Yellowlegs	• • •	❑ Tennessee Warbler	• •
❑ Black-throated Green Warbler	• • •	❑ Least Flycatcher	• •	❑ Upland Sandpiper	•
❑ Blue-headed Vireo	• •	❑ Lincoln's Sparrow	• •	❑ Veery	•
❑ Blue-winged Warbler	• •	❑ Magnolia Warbler	• •	❑ Warbling Vireo	• •
❑ Bobolink	• •	❑ Mourning Warbler*	• •	❑ Willow Flycatcher*	•
❑ Canada Warbler	•	❑ Nashville Warbler	• •	❑ Wilson's Warbler	• •
❑ Cape May Warbler	• •	❑ Nelson's Sharp-tailed Sparrow*	• • •	❑ Yellow-bellied Flycatcher	• •
❑ Chestnut-sided Warbler	• •	❑ Northern Waterthrush	• •	❑ Yellow-billed Cuckoo	• •
❑ Cliff Swallow	• • •	❑ Palm Warbler	• •		

• Wood Margins, Hedgerows, Scrub; • Fresh Marshes, Reservoirs, Rivers, Ponds; • Agricultural, Fields and Pastures; • Forests, Floodplains and Swamps; • Estuaries, Bay, Jetties, Salt Marshes, Tidal and Mud Flats; * Rare

Table 2.6 Migratory Birds Common to the District of Columbia: Summer Residents

❑ Acadian Flycatcher	• •	❑ Great Egret	• •	❑ Royal Tern	•
❑ American Redstart	• •	❑ Green Heron	• • •	❑ Ruby-throated Hummingbird	• •
❑ Baltimore Oriole	• • •	❑ Hooded Warbler	•	❑ Sandwich Tern*	•
❑ Bank Swallow	• • •	❑ House Wren	• •	❑ Scarlet Tanager	•
❑ Black-and-white Warbler	•	❑ Indigo Bunting	•	❑ Snowy Egret	• •
❑ Black-crowned Night-Heron	• •	❑ Kentucky Warbler	•	❑ Summer Tanager	•
❑ Blue Grosbeak	•	❑ King Rail	•	❑ Tree Swallow	• • •
❑ Blue-gray Gnatcatcher	• •	❑ Laughing Gull	• •	❑ Whip-poor-will*	• •
❑ Broad-winged Hawk	•	❑ Least Bittern*	• •	❑ White-eyed Vireo	• •
❑ Cattle Egret	• •	❑ Least Tern*	•	❑ Willet	•
❑ Chimney Swift	• •	❑ Louisiana Waterthrush	•	❑ Wood Duck	• •
❑ Chuck-will's-widow*	• •	❑ No. Rough-winged Swallow	• • •	❑ Wood Thrush	•
❑ Clapper Rail	•	❑ Northern Parula	• •	❑ Worm-eating Warbler	•
❑ Common Nighthawk	•	❑ Orchard Oriole	•	❑ Yellow Warbler	•
❑ Dickcissel*	•	❑ Osprey	• •	❑ Yellow-breasted Chat	•
❑ Eastern Kingbird	• •	❑ Ovenbird	•	❑ Yellow-crowned Heron*	• • •
❑ Eastern Wood-Pewee	• •	❑ Prairie Warbler	•	❑ Yellow-throated Vireo	•
❑ European Starling	•	❑ Prothonotary Warbler	•	❑ Yellow-throated Warbler	•
❑ Forster's Tern	• •	❑ Purple Martin	S • • •		
❑ Grasshopper Sparrow	•	❑ Red-eyed Vireo	S • •		
❑ Great Crested Flycatcher	• •	❑ Red-shouldered Hawk	• •		

• Wood Margins, Hedgerows, Scrub; • Fresh Marshes, Reservoirs, Rivers, Ponds; • Agricultural, Fields and Pastures; • Forests, Floodplains and Swamps; • Estuaries, Bay, Jetties, Salt Marshes, Tidal and Mud Flats; * Rare

Table 2.7 Migratory Birds Common to the District of Columbia: Winter Residents

❑ American Pipit	❑ Orange-crowned Warbler*	❑ Short-eared Owl
❑ American Tree Sparrow	❑ Pine Siskin	❑ Snow Bunting*
❑ Dark-eyed Junco	❑ Purple Finch	❑ Swamp Sparrow
❑ Fox Sparrow	❑ Red-breasted Nuthatch	❑ White-crowned Sparrow
❑ Golden-crowned Kinglet	❑ Rough-legged Hawk*	❑ White-throated Sparrow
❑ Hermit Thrush	❑ Ruby-crowned Kinglet	❑ Winter Wren
❑ Lapland Longspur*	❑ Rusty Blackbird	❑ Yellow-bellied Sapsucker
❑ Merlin	❑ Savannah Sparrow	❑ Yellow-rumped Warbler
❑ Northern Harrier	❑ Sedge Wren	
❑ Northern Saw-whet Owl*	❑ Sharp-shinned Hawk	

● Wood Margins, Hedgerows, Scrub; ● Fresh Marshes, Reservoirs, Rivers, Ponds; ● Agricultural, Fields and Pastures; ● Forests, Floodplains and Swamps; ● Estuaries, Bay, Jetties, Salt Marshes, Tidal and Mud Flats; * Rare

Section 3.0

Natural Resources Management and Mission Sustainability

3.1 Integrating Natural Resources Management and the Military Mission

To successfully execute the DoD mission, Commands must have the energy, land, air, and water resources necessary to train, operate, and conduct Research, Development, Testing, and Evaluation (RDT&E), both today and in the future, in a world where there is increasing competition for resources. The common denominator between the DoD mission for national security and stewardship of public lands is the concept of sustainability.

For NRL, sustainability means the ability to effectively conduct mission requirements in perpetuity, while being a responsible steward of the resources - natural, cultural, and man-made - under its care and responsibility, and it is the sole purpose of this INRMP to support these sustainability goals.

Sustainability is in part achieved through understanding and working with constraints, identified in Section 2.3, ensuring compliance of management with Federal and District rules and regulations, and working cooperatively with regional and local planners and interest groups, as well recognizing and pursuing opportunities for the stewardship of installation natural resources.

3.1.1 Operations Planning and Review

Natural Resource Managers further support natural resources and mission sustainability through an internal NRL environmental/NEPA review process. Key aspects of the review process are as follows:

1. Mission activities conducted at NRL-DC require coordination with the Environmental Section of the NRL Technical Services Branch for review of potential impacts on the natural environment.
2. The Natural Resources Manager, in coordination with the NRL Environmental Section, will review all RDT&E, construction, and facility maintenance activities for potential impacts on installation natural and cultural resources. The necessary NEPA analysis will be conducted and documented for each applicable activity, to include NAVFAC capital improvement projects at NRL-DC.
3. When potentially adverse environmental impacts are recognized in any proposed project, coordination between the action proponent(s), requisite Federal and District authorities, and the Environmental Section is required to implement necessary mitigation measures and/or acquire appropriate permits.
4. Similarly, natural resource management actions with potential impact on mission activities are to be coordinated with relative NRL Directorates and Divisions to ensure avoidance or minimization of constraints on mission plans and activities.

3.1.2 Sustainability Challenges

Operational sustainability rests on the long-term carrying capacity of the natural environment to support mission activities. The installation's natural environment supports the NRL mission by providing:

- sufficient lands on which to conduct mission operations securely;
- lands capable of supporting required infrastructure, instrumentation, and equipment, necessary for operations and research;
- natural resources that are utilized to build and maintain infrastructure and materials supporting mission essential research, operations, and training; and
- environments capable of supporting the required tempo and intensity of operations, training, and research to sustain mission readiness.

For the purpose of this INRMP, an impact to mission achievement has occurred when any of the above are constrained or when one of the following conditions occurs:

- the quality of mission objectives is impacted by natural resources restrictions;
- mission objectives are not accomplished without significant delay or conflict due to environmental issues; or
- conflict resolution impacts the intensity or tempo of mission activities, and critical mission objectives.

At NRL-DC, potential challenges to sustainability derive primarily from (1) mission activities, (2) the natural environment, and/or (3) installation operations and maintenance activities.

1. Mission Activities

Currently, there are no significant conflicts, or potential conflicts, between mission activities and the natural environment that could significantly constrain mission operations or RDT&E activities at NRL-DC. NRL-DC is unlike many DoD installations in that it is a relatively small research facility that supports Navy RDT&E. Unlike most DoD installations, there is no operational area or ground training, there is no airfield or air operations, nor is there any weapons or artillery testing. Because of this, there are few challenges to sustainability relative to mission activities conducted at NRL-DC.

2. Natural Resources

Potential challenges to sustaining natural resources are largely limited to maintaining installation vegetation and optimal stormwater quality. While these aspects of the natural environment require active management, they have historically presented little challenge to management or sustainability goals, and significant future constraints are not anticipated, as long as these resources are adequately managed and protected.

3. Facilities Maintenance Activities

Maintenance activities require small quantities of hazardous materials and wastes to be stored, used, and disposed of, as well as occasional application of pesticides or herbicides when needed. These activities are done in accordance with applicable Federal, District, and DoN requirements, with little significant challenge to sustainability goals.

NRL-DC also operates above ground storage tanks containing various petroleum products that are regulated as to potential impacts on navigable waters of the U.S. These tanks and petroleum products are properly maintained and administered through the NRL Tank Management Program, and, if properly managed and

maintained, do not present a significant challenge to sustainability goals. NRL has a Spill Prevention, Control, and Countermeasures Plan for NRL-DC which targets pollution reductions in navigable waters.

Renovation and construction activities present some potential for adverse impacts on the natural environment if not effectively managed and executed, largely due to ground disturbance and erosion, potential alteration of installation hydrologic flows, habitat loss, or disturbance of areas with archeological resources (whether known or unknown). If construction/renovation activities are to be undertaken, DoD and Navy policy require the demonstration of environmentally sound practices through sustainable land use planning, the NEPA processes, interdepartmental coordination, and timely review and revision of installation site development and project plans to ensure accordance with Federal, District, and DoD/Navy sustainability requirements.

Project proponent must coordinate and consult with the appropriate Federal and District agencies when potential natural resources issues are present, and it is the responsibility of the Natural Resources Manager to ensure that all required consultations occur. Development/construction activities that do occur must preserve, and enhance where possible, the natural environment of NRL-DC. DoD's Sustainable Buildings policy requires agencies to site, design, build, operate, maintain, re-use, and demolish facilities in a sustainable manner to minimize the resources they consume, maximize the benefits they provide, and minimize the wastes they generate. The DoD Unified Facilities Criteria (UFC) defines the minimum requirements and guidance for High Performance and Sustainable Buildings in the planning, design and construction, renovation, repair, maintenance and operation, and equipment installation in new and existing facilities. The Navy's sustainable buildings policy requires the pursuit of greater energy and water efficiency when it reduces total ownership cost of the facility, or preserves or increases mission effectiveness with projected resource scarcity. In general, renovation and construction activities, implemented according to Federal and Navy requirements, are not anticipated to present a significant challenge to sustainability goals.

3.2 Natural Resources Consultation Requirements

A number of Federal laws require consultation with a designated federal regulatory agency if a Federal action has the potential to adversely impact a regulated resource. Laws that could potentially apply to NRL-DC resources and require consultation are those summarized below. A comprehensive list of laws and regulations is provided in Appendix C.

Clean Water Act (33 U.S.C. § 1251 *et seq*.)

The purpose of the Clean Water Act (CWA) is to restore and maintain the chemical, physical, and biological integrity of the nation's waters. To accomplish its objective, the CWA prohibits the discharge of pollutants into navigable waters by any person except in compliance with certain sections of the CWA, including Section 402 of the CWA, 33 U.S.C. § 1342. Section 402 of the CWA established a National Pollutant Discharge Elimination System (NPDES) permit program and provided EPA with the authority to issue permits for the discharge of any pollutant, or combination of pollutants, to navigable waters. In 1990, EPA issued regulations requiring NPDES permit coverage for stormwater discharges transported through municipal separate storm sewer systems (MS4s), from medium and large cities or certain counties with populations of 100,000 or more (40 CFR 122.26). In 1999, EPA issued Phase II of the regulations requiring regulated small MS4s in urbanized areas, as well as small MS4s outside the urbanized areas that are designated by the permitting authority, to obtain NPDES permit coverage for their stormwater discharges.

NRL has an independent stormwater system from the District of Columbia, which would typically qualify NRL as a Phase II Municipal Separate Storm Sewer System (MS4). Phase II MS4's typically comply with the EPA regulations by applying for a general permit under an EPA approved regulatory scheme. However, EPA did not adopt a general permitting program for the District of Columbia. Therefore, to comply with EPA's Phase II regulations, NRL applied for an individual Phase II MS4 permit in November 2010 and prepared a Stormwater Control Plan to accompany the permit application. EPA replied in September 2014, denying the permit application and requiring NRL to comply with the District of Columbia's Phase I MS4 permit. In the alternative, they offered NRL the ability to reapply for an MS4 permit under more stringent requirements similar to a Phase 1 permit. As long as NRL does not have an approved permit from EPA, it is subject to the requirements of the Phase I DC MS4 permit. NRL has chosen not to reapply for the separate MS4 permit.

Clean Air Act (42 U.S.C. §7401 *et seq*.)

The Clean Air Act (CAA) established guidelines for atmospheric pollution, and the EPA and DOEE regulate air emissions from stationary and mobile sources on NRL-DC installations. All air emissions units at NRL-DC require review, and permitting through the DOEE when necessary. Permits include pollution-control requirements from Federal or District regulations that apply to a source. NRL-DC operates under a CAA Title V Permit, which specifies the operational, maintenance, and reporting requirements for air emissions units present at NRL-DC.

Endangered Species Act (16 U.S.C. § 1531 *et seq*.)

The Endangered Species Act (ESA) protects endangered and threatened species and their habitats by prohibiting the import, export, take, possession, sale, or offer of sale, delivery, carry, transport, or shipment of listed plants and animals, including their parts, nests, and products, except under Federal permit (16 U.S.C. §1538). Take is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct" (16 U.S.C. §1532). Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering.

Under Section 7 of the ESA, federal agencies are required to consult with federal wildlife and fisheries agencies to ensure that any action "authorized, funded or carried out by such agency…is not likely to jeopardize the continued existence of any threatened or endangered species" or destruction or modification of critical habitat (16 U.S.C. § 1536(a)(2)). These interagency consultations, or Section 7 consultations, are designed to assist Federal agencies in fulfilling their duty to ensure Federal actions do not jeopardize the continued existence of a species or destroy or adversely modify critical habitat.

The Migratory Bird Treaty Act of 1918 (16 U.S.C. §§ 703–712)

The Migratory Bird Treaty Act (MBTA) prohibits the taking, possessing, importing, exporting, transporting, selling, purchasing, bartering, or offering for sale, purchase or barter, any migratory bird, their eggs, parts, and nests except as authorized by permit (16 U.S.C. § 703). FWS is the agency charged with enforcing the MBTA and their regulations define "take" to mean to "pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect" (50 C.F.R. § 10.12). Take is defined as "to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or any attempt to carry out these activities." A take does not include habitat destruction or alteration, as long as there is not a direct taking of birds, nests, eggs, or parts thereof. A complete list of protected species is found at 50 CFR 10.13.

In February 2007, FWS finalized an exemption to the MBTA that allows incidental take of migratory birds by the DoD during military readiness activities (50 CFR 21.15). If NRL determines that a proposed or an ongoing military readiness activity may result in a significant adverse effect on a population of a migratory bird species, they must confer and cooperate with FWS to develop appropriate and reasonable conservation measures to minimize or mitigate identified significant adverse effects.

Bald and Golden Eagle Protection Act (16 U.S.C. §§ 668-668d)

The Bald and Golden Eagle Protection Act protects both the Bald Eagle and the Golden Eagle by prohibiting 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, unless allowed by permit (16 U.S.C. 668(a)). Included in the definition of "take" is a prohibition on disturbing eagles (16 U.S.C. 668c), which FWS defines to include agitating an eagle to the degree that causes, or is likely to cause, injury to an eagle, decreased productivity through interference with normal breeding, feeding, or sheltering behavior, and/or nest abandonment (50 CFR 22.3). The law allows permitted take of both species of eagle, including disturbance, limited take resulting in mortality, take of nests for purposes of human health and safety, and under other limited circumstances (see 50 CFR 22).

The National Historic Preservation Act (16 U.S.C. 470 et seq.)

Section 106 of the National Historic Preservation Act of 1966 requires Federal agencies to take into account the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment (16 U.S.C. 470f). Historic properties are properties that are included in the National Register of Historic Places (NRHP) or that meet the criteria for the National Register. NRL-DC has sites that qualify as historic and, pursuant to the National Historic Preservation Act of 1966, must consult with the District of Columbia State Historic Preservation Office on actions that may affect NRHP eligible properties.

3.3 National Environmental Policy Act Compliance

The National Environmental Policy Act of 1969 (NEPA) establishes a national environmental policy with goals for the protection, maintenance, and enhancement of the environment, and provide a process for implementing these goals within federal agencies (42 U.S.C. § 4321 *et seq*). The main objective of NEPA is to ensure that federal agencies consider potential environmental impacts of proposed actions, and alternatives to those actions, within their decision-making process. As a procedural law, NEPA requires compliance with various other laws. NEPA does not dictate the decision to be made by the federal agency.

The DoN issued guidelines to assist with NEPA implementation in OPNAVINST 5090.1D, Chapter 10. Navy requirements are to:

- Conduct environmental planning and decision-making using a systematic, interdisciplinary approach that integrates the natural and social sciences where there may be an impact on the human environment;
- Consider and evaluate a reasonable range of alternatives to proposed actions that rigorously explores and sharply defines the issues, provides full disclosure of the potential environmental consequences, and provides a clear basis for choice among options by the decision-maker and the public;
- Strive to achieve a balance between resource use and Navy's mission and avoid environmental degradation, risk to health and safety, or other consequences that are undesirably and unintended; and

- Provide the opportunity for public involvement in the environmental planning process, where applicable.

Additionally, the Navy implemented NEPA regulations at 40 CFR 775, which require the Navy to initiate the NEPA processes at the earliest possible time, so as to be an effective decision-making tool in the course of identifying a proposed action and to develop and carefully consider a reasonable range of alternatives for achieving the purpose of the proposed action. The Environmental Section of the Technical Services Branch is responsible for ensuring the NRL's compliance with NEPA, as described in Section 3.1.1.

3.4 Beneficial Partnerships and Collaborative Planning

Collaborative partnerships can promote the sharing of expertise, information, and other resources among agencies, facilitate project implementation and progress, and at times reduce overall costs of INRMP implementation, and are important for effective ecosystem management. The following are potential groups and agencies that may serve in useful collaborative efforts or partnerships with NRL.

U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers (USACE) provides contract management, construction management, and technical support. DoD has the option to employ USACE contracts as vehicles for natural resources management and to access USACE organizations, such as the U.S. Army Engineer Research and Development Center, for technical assistance on natural resources projects. In addition, USACE has regulatory authority over waters of the U.S., which include activities within perennial and intermittent streams and wetlands.

Armed Forces Pest Management Board

The Armed Forces Pest Management Board (AFPMB) recommends policy, provides guidance, and coordinates the exchange of information on all matters related to pest management throughout the DoD. AFPMB's mission is to ensure that environmentally sound and effective programs are present to prevent pests and disease vectors from adversely affecting DoD operations. The AFPMB Natural Resources Committee provides guidance on integrating pest management and natural resources management programs including the following:

- addressing wildlife damage management and pest management requirements;
- identifying conflicts between threatened and endangered species and pest management actions;
- integrating pest management considerations with natural resources program responsibilities regarding vegetation management, forest insect and disease damage, and pest damage to ornamentals;
- coordinating approval and use of pesticides for vegetation management and other natural resources programs; and
- initiating or reviewing research regarding natural resources pest management requirements/considerations.

U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service (FWS) Conservation Planning Assistance Program strives to provide fish and wildlife information early in project planning before commitments of resources are made. This is accomplished through:

- evaluating the impacts of water resource development projects on fish and wildlife;
- making recommendations to mitigate (avoid, reduce and compensate for) these impacts and enhance fish and wildlife and their habitats; and
- providing technical assistance to private individuals, organizations and businesses regarding project impacts.

Projects evaluated by the Conservation Planning Assistance Program include flood control, navigation, water supply, hydroelectric power, irrigation, private development, recreation, streambank and shoreline protection, and beach nourishment.

Natural Resources Conservation Service

The Natural Resources Conservation Service (NRCS) is the U.S. Department of Agriculture's principal agency for providing conservation technical assistance to private landowners, conservation districts, tribes, and federal organizations. NRCS has several natural resources conservation programs that could assist NRL in managing resources including conserving soils, improving water quality, increasing wildlife habitat, and reducing damage resulting from floods or other natural disasters.

U.S. Department of Agriculture

The mission of U.S. Department of Agriculture (USDA) - Wildlife Services is to provide leadership in managing problems that occur when human activity and wildlife are in conflict with one another. USDA-Wildlife Services can be utilized by NRL to monitor nuisance wildlife, and provide nuisance and non-native fauna control.

The mission of the USDA Animal and Plant Health Inspection Service (APHIS) is to protect the health and value of agriculture and natural resources. APHIS is a multi-faceted agency with a broad mission area that includes protecting and promoting U.S. agricultural health, regulating genetically-engineered organisms, administering the Animal Welfare Act, and carrying out wildlife damage management activities.

U.S. Geological Survey

The U.S. Geological Survey (USGS) is a multi-disciplinary organization that provides scientific information on biology, geography, geology, geospatial information, and water, to minimize damage from natural disasters; and manage the nation’s water, biological, energy, and mineral resources. USGS could assist NRL by helping design biological, water quality, and hydrologic surveys, and facilitating the integration of NRL data into national or regional databases.

DOEE Fisheries and Wildlife Division

The main objective of the Wildlife Branch is to identify, monitor and ultimately prevent species of greatest conservation need and their habitat from becoming rare by implementing various wildlife surveys and other research that affects wildlife populations and benefits recreational users. These projects involve habitat manipulation, management of wildlife populations, and the creation of opportunities for people to enjoy wildlife. The DOEE Wildlife Management Branch actively sponsors a variety of educational programs to increase the knowledge of District residents that have an interest in wildlife resources. The Fisheries Management Branch conducts annual surveys and studies of migratory and resident fish in the District waterways. This data is used to estimate populations and determine age and growth trends of the District's fish species. The information gathered helps managers make informed resource decisions to assess water quality conditions and the state of aquatic habitats.

Nature Conservancy

The Nature Conservancy (TNC) and DoD signed a cooperative agreement in 2010. This agreement allows installation commanding officers to obtain technical assistance from TNC and to participate in programs and projects of mutual interest. It also permits TNC to study significant ecosystems under DoD's control. Natural resources staff at NRL could benefit from this agreement through the utilization of TNC resources and staff to assist in management of natural resources. Additionally, installations can partner with TNC to purchase land encroachment buffers that benefit natural resources and preserve the mission.

Contractors

Contractors may be hired to perform specialized management projects or provide technical knowledge about natural resources management. Contractors must adhere to the requirements and management strategies detailed in the INRMP. Examples of potential contractor support in the implementation of natural resources management goals include: endangered species surveys, invasive species surveys, soil surveys, and wetland delineations.

Volunteers

It is Navy policy that commands interact with the surrounding community to develop positive and productive community involvement, participation, and educational opportunities; and use volunteers under the supervision of professionally trained natural resources personnel, when feasible. Through support from volunteers, NRL is able to educate the public on the natural resources programs conducted at NRL sites, demonstrate environmental stewardship of natural resources, and develop and maintain partnerships with the local community.

3.5 Public Access and Outdoor Recreation

3.5.1 Public Access and Outdoor Recreation

Although provision for public access is addressed in the Sikes Act Improvement Act, NRL-DC is a secured installation, and security and safety concerns restrict public use of the installation.

3.5.2 Public Outreach

Public outreach opportunities exist in the form of engaging local schools and community organizations in project implementation at NRL-DC. NRL-DC also has the opportunity to publish news releases, so the public can stay informed about environmental stewardship practices through the NRL Natural Resources Management program and activities conducted at NRL-DC.

3.6 District of Columbia Wildlife Action Plan

The District of Columbia Wildlife Action Plan (DCWAP 2005), referenced throughout this INRMP, was developed and implemented by DOEE. The plan focuses on species and habitats of greatest conservation need in DC; however, it is also an action plan for the conservation of all of the district's wildlife. The plan is maintained in the NRL Natural Resource Program electronic files for reference (NATURAL RESOURCES\7 State Wildlife Action Plans). The DCWAP is also available online at: http://doee.dc.gov/publication/2015-wildlife-action-plan. In 2015, the DCWAP was being revised and once finalized, will serve as the updated Plan for NRL to use as a reference.

The 2005 DCWAP identifies significant habitat threats and outlines district-wide management actions deemed vital to DC's conservation needs. This INRMP incorporates by reference the goals of DC's plan, DC's natural resources concerns, and information on species and habitats of greatest conservation need.

Section 4.0

Management Actions

The management actions to be implemented at NRL-DC are prescribed in this section of the INRMP. The INRMP Project Prescriptions and Implementation Table is provided in Appendix B. Natural resources management actions generally follow guidance provided though DoDI 4715.03, *Natural Resources Conservation Program,* March 18, 2011, the DoD INRMP Implementation Manual (DOD M-4715.03), November 25, 2013; and CNO Guidance, *How to Prepare, Implement, and Revise Natural Resource Management Plans* (April 2006). Although addressed in this guidance, it should be noted that Bird Aircraft Strike Hazard (BASH) Management, Agricultural Outleases, Natural Resources Conservation Law Enforcement, and Cantonment Area Natural Resources Management, are not addressed in this INRMP, as they are not relevant to NRL-DC.

4.1 Land Management

The principal purpose of DoD lands and waters is to support mission activities. Land management is the most important component of an INRMP, providing the foundation for all other natural resources programs. Land management at NRL-DC largely involves controlling soil erosion, landscaping and grounds management practices, and monitoring and advising on facilities development activities. Land management has significant integration among soil and water conservation; non-point source pollution; erosion control; floodplain protection; weed and invasive species management; and fish and wildlife management.

4.1.1 Soil Erosion and Sedimentation Control Guidelines

The Soil and Water Conservation Act of 1977 (16 U.S.C. §§ 2001-2009); Executive Order 13508, *Chesapeake Bay Protection and Restoration*, May 12, 2009; and OPNAVINST 5090.1D require protection of soil and water resources on NRL-DC lands.

Controlling vegetation disturbance is fundamental to prevention of erosion and protection of soils and water quality. Erosion, transport, and deposition of sediments into water bodies can contribute to a variety of adverse effects, including:

- destroying beneficial channel structures such as pools and riffles;
- damaging gills of fish and aquatic insects;
- filling in pore spaces on the stream bed and suffocating benthic biota;
- interfering with fish spawning habitat, and egg and larval survival; and
- reducing light penetration and interfering with algae and aquatic plant photosynthesis.

Management of potential erosion problems, vegetation, and damage to soils at NRL-DC entails review of construction/renovation and RDT&E activities through the internal environmental/NEPA review process as described in Section 3.3, and monitoring of natural processes on installation lands (e.g., droughts, large storms can that uproot vegetation).

Construction, Renovation, and Maintenance Activities

The erosion potential of a site and adjacent water resources will be identified during the planning of construction, RDT&E activities, and similar actions that may disturb sites, and proper controls integrated

into any activity with the potential to disturb plants or soils. Any project-specific concerns, such as tree and shrub removal or ground disturbance through construction or maintenance activities, should be addressed by implementation of DoD Unified Facilities Criteria Low Impact Development Criteria (UFC 3-210-10N, 6 April 2010). DoD Low Impact Development criteria and EPA guidance documents are located in the NRL Natural Resources Program electronic files (NATURAL RESOURCES\6 Guidance and Regulations).

The Environmental Protection Agency (EPA) also provides substantive guidance for land management in this region in Guidance for Federal Land Management in the Chesapeake Bay Watershed (EPA 2010). This guidance provides information and data on appropriate, proven, and cost-effective tools and practices for management of lands at federal facilities.

Natural Vegetation Disturbance

Due to topography and soil types, certain areas are susceptible to natural erosion problems, particularly when vegetation is disturbed. Tree and shrub removal through natural processes, such as loss of foliage to pests or disease, or during severe storms, can cause or accelerate soil erosion. While NRL-DC does have soils and areas on the installation (primarily on slopes) that are susceptible to natural erosion, soil erosion has not presented significant problems on the installation in the past. However, it is incumbent upon NRL to sustain all native vegetation on NRL-DC to help protect soils and stormwater quality. The planting of trees, shrubs, and grasses in areas that require such (e.g., disturbed sites such as uprooted trees, erosion prone slopes) should be consistently done on a timely basis. These actions will promote soil development, preclude soil erosion, can stabilize soils on slopes, and strengthen the integrity of stream banks.

Interior Watercourses and Hydrologic Flows

Maintenance of installation hydrologic flows is important to the integrity of the local environment, particularly in form of water quality. Areas sensitive to erosion occur in the areas of stormwater pipe inflows and outfalls associated with the stormwater system. Erosion control in these areas is important to protecting the water quality of both installation surface waters, and those offsite water-bodies installation surface waters feed, because erosion can:

- reduce the integrity of watercourses and hardened structures conveying water;
- reduce vegetation;
- speed run-off; and
- increase sediment loads in surface water runoff.

Collectively, controlling human activities (e.g., construction, renovation, grounds maintenance activities), and correcting or mitigating erosion processes, helps eliminate sediment loading into the stormwater system and Potomac River. Use of natural vegetation is the ideal method to secure erodible soils; however, there may be instances where hardened structures, or similar mechanical means, provide more stable long term solutions.

DoD and EPA guidance documents referenced in this section provide substantive methods and alternatives for management of soils, erosion, and stormwater runoff, and should be fully utilized, as needed. These guidance documents are located in the NRL Natural Resources Program electronic files (NATURAL RESOURCES\6 Guidance and Regulations), and available online.

4.1.2 Landscaping Guidelines

It is Navy policy that installations support the goals of EO 13508, *Chesapeake Bay Protection and Restoration* (May 12, 2009) on all new or extended landscaped areas. Environmentally and economically beneficial landscaping practices reduce maintenance costs while providing wildlife habitat, and lessen or avoid adverse effects from grounds-maintenance activities to the overall ecosystem and sensitive resources. Landscape management practices on NRL-DC follow OPNAVINST 5090.1D, and EO 13508 guidelines, which direct installations to:

- use regionally native plants for landscaping;
- design, use, and promote construction practices that minimize adverse effects on natural habitat;
- prevent pollution by reducing fertilizer and pesticide use, integrated pest management practices, recycling green waste (composting), and minimizing runoff;
- implement water-efficient practices, such as the use of mulches, effective irrigation systems, audits to determine exact landscaping water-use needs, use of recycled or reclaimed water, and the selecting and siting of plants in a manner that conserves water and controls soil erosion;
- use landscaping practices, such as planting regionally native shade trees around buildings to reduce air conditioning demands and energy consumption reduction goals; and
- create demonstration projects to promote awareness of environmental and economic benefits of these practices.

It is incumbent upon NRL to sustain all native vegetation on NRL-DC to help protect soils and water quality, and maintain installation wildlife habitat. The planting of trees, shrubs, and grasses in areas that require such (e.g., disturbed sites such as uprooted trees) should be consistently done on a timely basis. These actions will promote soil development, preclude soil erosion, and can stabilize soils on slopes.

Landscaping and grounds maintenance at NRL-DC are administered by the Research and Development Services Division through contracts to licensed landscape managers. The Natural Resources Program Manager coordinates with contracted landscape professionals to ensure that INRMP landscaping goals, objectives, and strategies, and Navy policy, are properly implemented through these contracts.

4.1.3 Tree Management Guidelines

Tree management is essential to the overall health of the local ecosystem. The many benefits trees provide to local ecosystems and mission justify the allocation of resources necessary for the implementation of urban forestry programs on DoD installations. These benefits include, but are not limited to:

- wildlife habitat;
- microclimate modification (i.e., wind breaks, shade, dissipation of "city heat island" effects);
- water quality enhancement;
- soil conservation;
- biodiversity;
- carbon sequestration;
- flood control,
- mission operations security and privacy;

- encroachment buffering; and
- aesthetic value.

NRL-DC site is comprised of over 900 trees. Navy policy is to improve the ecological value, health, and diversity of forest resources and related ecosystems, and to do so via restoration, enhancement, and improvement of forest resources. NRL-DC has no forested areas, although the trees on the installation are an invaluable resource.

4.1.4 Assessment of Land Resource Management

On a day-to-day basis, land management at NRL-DC is largely comprised of landscaping. On an intermittent basis, construction or renovation activities have and may occur.

The Natural Resources Program has been responsive to NRL-DC land management needs, has provided guidance on the management of NRL-DC lands, and provided for the protection of installation soils and vegetation.

4.1.5 Land Management Strategy

Objective: *To sustain the long-term integrity of the goods and services lands provide in support of the Navy mission, and wildlife habitat that installation lands provide.*

Implementation Strategies

Land management strategies are abbreviated LM-S, projects implementing strategies are abbreviated LM-P in the INRMP Projects Prescription Table in Appendix B.

- **LM-S-1:** To help meet the objectives of Presidential Memorandum - Creating a Federal Strategy to Promote the Health of Honey Bees and Other Pollinators (20 Jun 2014), when opportunities are available, NRL will convert turf grass to meadows by planting native flowers and grasses or by ceasing to mow.
- **LM-S-2:** Periodically review landscaping practices for efficacy in the reduction of erosion, control of invasive and exotic species, use of only native plants, and ensure that landscaping practices implement rules, regulations, Executive Orders, and Navy policies regarding landscaping. Provide professional advice to assist the grounds landscaping and maintenance program in the use of native species as identified in the INRMP recommended plant list. Maintain and annually update the list of recommended plants that can be used in landscaping.
- **LM-S-3:** Periodically survey for areas where soil erosion and compaction may occur. Correct erosion problems using the best available biological controls or mechanical technologies. Establish erosion resistant native vegetation in eroded/disturbed areas.
- **LM-S-4:** Reduce high-maintenance turf areas by enhancing turf stand density. Use soil and turf enhancement practices to increase turf density as appropriate for use and location. Mow at heights of three inches and higher, which shades out weeds, slows overland flows, protects grass vigor, and reduces erosion.
- **LM-S-5:** Review RDT&E, construction, and maintenance activities to ensure no impact to existing landscapes by requiring, during the planning phase, that activities avoid, or mitigate, impacts to the

natural and developed landscape, and enhance the natural environment when feasible, to the maximum extent possible.

- **LM-S-7:** Implement DoD Unified Facilities Criteria Low Impact Development Criteria practices in projects where feasible, integrated with landscaping practices, to improve water quality and enhance wildlife habitat.
- **LM-S-6:** Ensure utilization of silt or filter fences, straw bales, brush barriers, or gravel or stone filter berms for sediment control during short-term actions that may disturb sites. Establish vegetated buffer zones around long-term construction or other activities that may disturb sites.

4.2 Aquatic Resources Management

Aquatic resources management at NR-DC involves managing installation hydrologic flows; controlling land uses and non-point source pollution; and stormwater discharges. These efforts collectively support the maintenance of Potomac River water quality and the wildlife that depend on this aquatic resource. The NRL-DC Spill Prevention, Control, and Countermeasures plan (SPCC), and Stormwater Control Plan (SWCP), in addition to the INRMP, play an integral part in the management of aquatic resources.

Drainage to Navigable Waters

The surface runoff from the facility flows directly to the Potomac River. The storm water conveyance system drains the installation and consists of a network of storm sewer lines and natural flow paths.

Stormwater Quality

In additions to the laws and regulations that protect water resources that were previously discussed under Soil Erosion and Sedimentation Control, stormwater quality is also protected through the NRL-DC Spill Prevention, Control, and Countermeasures Plan (SPCC 2011) and the Stormwater Control Plan (SWCP 2010). The SPCC establishes procedures, methods, equipment, and other criteria to prevent the discharge of oil products from non-transportation related facilities into storm waters. Environmental personnel review RDT&E, construction, and facilities maintenance activities to evaluate potential impacts on stormwater quality. NRL personnel perform these reviews through an internal environmental/NEPA review process, and consult with the requisite Federal and District agencies (e.g., DOEE) on any necessary conservation or permitting requirements. The appropriate environmental program manager provides assistance in identifying potential alternatives to ensure compliance with regulations, and ensures that impacts to aquatic resources are avoided or minimized to the maximum extent possible.

The NRL-DC SWCP assesses the facility, identifies areas with a potential to contaminate stormwater, and provides best management practices (BMPs) to limit or eliminate the potential for contamination. The SWCP also appoints a Stormwater Control Team, responsible for carrying out the responsibilities of the SWCP. BMPs on NRL include monthly stormwater inspections, increased awareness through signage, spill response and prevention, and Low Impact Development.

Although NRL-DC has a separate stormwater conveyance system that flows directly into the Potomac River, stormwater discharges are regulated under the DC MS4 Permit.

4.2.1 Near-shore and Submerged Lands Guidelines

NRL-DC has no surface waters. Management goals for near-shore areas and submerged lands at NRL-DC are (1) to protect and conserve special interest species in these areas through habitat conservation and enhancement, (2) ensure the health and sustainability of near-shore ecosystems, and (3) ensure near-shore areas provide sustained support for RDT&E, and other mission activities. Achieving these goals largely involves managing stormwater quality, and preventing the entry of chemicals and hazardous materials into stormwater.

Natural resources personnel will review RDT&E, construction, and facilities maintenance activities conducted at NRL to evaluate potential impacts on aquatic resources. NRL manages RDT&E, and construction and maintenance activities through an internal environmental/NEPA review process, and, in association with the Natural Resource Manager, will consult with the requisite Federal and District agencies (e.g., National Marine Fisheries Service, U.S. Coast Guard, EPA, DOEE) on any necessary safety and permitting requirements.

4.2.2 Hydrologic Flow Guidelines

Maintaining predevelopment hydrology is required for federal facilities by the Energy Independence and Security Act (EISA) of 2007 (P.L. 110-140, H.R. 6). The predevelopment hydrologic condition of the site is the combination of runoff, infiltration, evapotranspiration rates, volumes, and watercourses that typically existed on the facility site before development (meaning any construction of infrastructure on undeveloped land). EISA mandates that the sponsor of any development or redevelopment project involving a federal facility with a footprint that exceeds 5,000 square feet to use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow.

Guidance for hydrologic flow management is provided in:

EPA's "Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act (EPA 2009)"

"Guidance for Federal Land Management in the Chesapeake Bay Watershed (EPA 2010)."

Both documents are located in Natural Resources Program electronic files (NATURAL RESOURCES\6 Guidance and Regulations)

NRL-DC's Spill Prevention, Control, and Countermeasures (SPCC) Plan targets pollution reductions in navigable waters. Where pollutant reduction actions are vital components of programs to manage installation water quality (e.g., SPCC), these actions alone may not be substantive enough to ensure installation discharges meet Federal and District requirements, or provide for adequate stewardship of water quality and hydrologic flows. This section addresses management of hydrologic flows on NRL-DC. NRL will implement DoD and Navy Policy for Sustainable Design and Development (SDD), Leadership in Energy and Environmental Design (LEED) certification and Low Impact Development (LID) under the Energy Independence and Security Act of 2007 (EISA) as a means to manage stormwater for all construction and maintenance projects.

In April 2010, the DoD issued revised Unified Facilities Criteria (UFC) on low impact development (LID) (UFC 3-210-10N) that prescribes planning, design, construction, sustainment, restoration, and modernization criteria, and provides protections for aquatic resources. Using LID techniques on NRL-DC

facility projects can assist in fulfilling environmental regulatory requirements under the Clean Water Act and EISA. Implementation of LID measures can help restore the ecological and hydrological functions and processes of a site. DoD UFC LID criteria are available online and in the Natural Resources Program electronic files (NATURAL RESOURCES\6 Guidance and Regulations).

All proposed projects or development activities at NRL-DC will be reviewed by the Natural Resources Manager during the planning process to ensure that potential impacts to installation hydrologic flows are adequately addressed. The Natural Resources Manager provides assistance in identifying potential alternatives to ensure compliance with regulations, ensures that impacts to hydrologic flows are avoided or minimized to the maximum extent possible, and that DOEE stormwater requirements are met for all construction and similar projects conducted at NRL-DC.

4.2.3 Assessment of Aquatic Resource Management

On a day-to-day basis, aquatic resources management at NRL-DC is largely comprised of managing installation hydrologic flows; controlling land uses and non-point source pollution; and stormwater discharges. On an intermittent basis, construction or renovation activities have and may occur. The Natural Resources Program has been responsive to NRL-DC aquatic resource management needs, has provided guidance on the management of NRL-DC aquatic resources.

4.2.4 Aquatic Resources Management Strategy

Objectives: *To avoid impacts of mission activities on aquatic resources and mitigate unavoidable impacts to the greatest extent practicable; enhance aquatic habitats where feasible to maximize ecosystem functions; and ensure compliance with Federal and District laws and regulations, and Navy directives, governing aquatic resources.*

Implementation Strategies

Aquatic resources management strategies are abbreviated AQR-S, projects implementing strategies are abbreviated AQR-P in the INRMP Projects Prescription Table in Appendix B.

- **AQR-S-1:** Minimize the impact of RDT&E, construction, and maintenance activities on aquatic habitat and SAV in near-shore areas by ensuring during project planning and review that activities avoid, or attempt to mitigate, adverse impacts to the maximum extent possible.
- **AQR-S-2:** Ensure sound landscape management practices are implemented to control the quality of stormwater runoff through vegetating and/or fortifying areas on the installation with erosion potential, and by maintaining turf grass at three inches or higher.
- **AQR-S-3:** Inventory and classify existing and potential areas of erosion.
- **AQR-S-4:** Ensure sound landscape management practices are implemented to control the quality of stormwater runoff through vegetating and/or fortifying areas on the installation with erosion potential, and by maintaining turf grass at three inches or higher.
- **AQR-S-5:** Minimize point and non-point source pollution of surface and groundwater by ensuring implementation of the SWCP and SPCC.
- **AQR-S-6:** Conduct, where feasible, periodic stormwater surveys that assess water quality at stream discharge points (e.g., volume, temperature, rate, duration, chemical composition, sedimentation).

- **AQR-S-7:** Coordinate with the FWS, National Marine Fisheries Service (NMFS), EPA, and DOEE, as appropriate, with regard to restrictions on, or required permits for, any Navy actions that may affect aquatic resources.

4.3 Invasive and Exotic Species Management

Invasive and exotic species can cause damage that far outweighs their numbers. They can be mammals, birds, insects, reptiles, fish, plants, viruses, and fungi – any type of living organism. They can have major effects on natural habitats and native species. In the U.S., 45% of species listed as rare, threatened, or endangered are listed as such in part due to invasive species.

It often takes years before an introduced species begins to reproduce and spread to become invasive, an interval referred to as lag time. Once recognized, an invasive species can be present in such numbers that it is highly expensive, or even impossible, to eradicate. Management of invasive and exotic species requires minimizing the invader's negative impacts by reducing its numbers or containing its geographical range as early as possible.

4.3.1 Invasive and Exotic Species Guidelines

It is DoD policy that installations identify, prioritize, monitor, and control invasive and noxious species and feral animals on its installations whenever feasible. Accordingly, native species should be used, where feasible, to restore any habitats from which native species are removed or controlled. All invasive species management practices are to be consistent with DoD Instruction 4150.07, "DoD Pest Management Program," May 29, 2008; Executive Order 13112, "Invasive Species," February 3, 1999; National Invasive Species Act of 1996 (16 U.S.C. § 4701 *et seq.*); and sections 4701-4751 of the "Aquatic Nuisance Prevention and Control Act of 1990 (16 U.S.C).

It is Navy policy to prevent the introduction of invasive species and provide for their control. Subject to the availability of appropriations and to the extent practicable and permitted by law, NRL will:

- prevent the introduction of invasive species;
- detect and control such species in a cost-effective manner;
- monitor invasive species populations;
- provide for restoration of native habitats that have been invaded;
- conduct research on invasive species to prevent introduction and for sound control; and
- promote public education on invasive species where feasible to do so.

NRL is to ensure that invasive species prevention recommendations are incorporated into new construction programs and operations. Land or ecosystem restoration projects are to require the use of native species only. Natural resources managers are to monitor invasive species populations and identify areas where research and new technology may be needed to better control invasive species in the military environment. Currently, NRL-DC does not have significant problems with these species, although periodic monitoring for and control of these species is required.

4.3.1.1 Control Mechanisms

There are a variety of control mechanisms available (e.g., chemical, mechanical, biological) that NRL can use to manage invasive and exotic species. The Federal Interagency Committee for the Management of Noxious and Exotic Weeds, The Nature Conservancy, and the Virginia Department of Conservation and Recreation can also provide assistance, if or when needed, on invasive species management issues and projects.

Control methods for a broad variety of invasive and exotic species can also be found in "Plant Invaders of Mid-Atlantic Natural Areas (Swearingen et al. 2010), located in the Natural Resources Program electronic files (NATURAL RESOURCES\6 Guidance and Regulations\Invasive and Exotic Species.

Early eradication of small infestations save significant time and money and more successful than attempts to eradicate larger infestations. Expansive infestation should be contained by preventing the edges from advancing by using long-term control efforts, such as biological control, focused on the core of the infestation. Several control mechanisms are available to address problems with invasive and exotic species. These include the following:

Avoidance: Prohibiting the use of invasive plants for landscaping or other purposes

Several avoidance measures are in place at NRL installations and include prohibiting the use of invasive plants for landscaping or other purposes, implementing management practices to minimize land disturbances that promote invasion, and re-vegetating disturbed areas with native species. Avoidance will remain the preferred measure of control.

Mechanical Controls

This method involves physical removal of invasive plants through means such as hand pulling of individual stems, digging, cutting, and mowing. This method can be very effective for certain species on a localized basis and is often the preferred method in order to avoid impacts to non-target species and the use of herbicides. However, physical removal can be labor intensive on a larger scale, and repeated removal is typically required to ensure success. When implemented on a large scale, measures must be taken to avoid impacts to non-target species and to minimize the potential for erosion. If used inappropriately, large-scale mechanical methods that disturb the ground can actually encourage invasive plant growth. Mechanical methods are often used in combination with selective use of a glyphosate-based herbicide.

Biological Controls

Biological controls typically involve the introduction of a species (biological control agent) that feeds on or impedes the growth of the target invasive plant. The science of biological controls has made significant advances in recent years, but effective and approved methods are currently limited. Where applicable, this method can be very cost effective and avoids potential impacts associated with chemical and mechanical controls. However, many biological control agents are nonnative species, which raises additional concerns. Biological control measures may be used at NRL installations when they are determined to be the most appropriate measure available. Use of biological controls will be limited to those agents that are U.S. Department of Agriculture-approved and for which NEPA documentation already exists.

Chemical Controls

Pesticide/Herbicide application can be a very effective means of controlling invasive plants. However, these chemicals have the potential to impact non-target plants as well as fish and wildlife resources. However, when appropriately used, non-persistent herbicides can be the most appropriate control measure for many circumstances. Selective glyphosate-based herbicide application, in combination with mechanical

methods and/or controlled burning, is an effective method for many common invasive plants. In accordance with DoD Pest Management Guidelines, herbicide used to control invasive plants will be limited to the extent possible. Only licensed herbicides will be utilized in accordance with their approved uses and a DoD-certified applicator (or equivalent) will perform all applications.

4.3.2 Assessment of Resource Management

NRL has dedicated funding to control non-native plant species at NRL-DC.

4.3.3 Invasive and Exotic Species Management Strategy

Objective: *To protect ecosystem integrity by improving and maintaining the quality of native plant and animal communities.*

Implementation Strategies

Invasive and exotic species management strategies are abbreviated IandES-S, and corresponding projects implementing strategies are abbreviated IandES-P in the INRMP Projects Prescription Table in Appendix B.

- **IandES-S-1:** Protect and restore native wildlife habitats that have been invaded by employing the most effective and environmentally friendly control mechanism(s) (e.g., avoidance, mechanical controls, biological controls, chemical controls). Prioritize dominant and high density species. Eliminate introduced non-native invasive species as early as possible.
- **IandES-S-2:** Ensure landscape management practices deter and do not foster the introduction of new, or spread of existing invasive and exotic species.
- **IandES-S-3:** Conduct periodic surveys for invasive and exotic species to monitor the spread of known species and understand the location and abundance of any newly introduced species.

4.4 Fish and Wildlife Management

Fish and wildlife conservation efforts at NRL-DC primarily focus on preventing the loss of, or enhancing, installation biodiversity by taking into consideration ecological principles such as carrying capacity, habitat disturbance, and environmental conditions such as physical geography and hydrology.

4.4.1 Fish and Wildlife Guidelines

Outside of monitoring for Federal- and District-listed species, management of fish and wildlife at NRL is primarily accomplished by managing fish and wildlife habitats. Management practices focus primarily on custodial management; using preventive or protective measures to minimize external influences on native populations and habitats. Stewardship of installation habitats is assumed to take care of the life cycle needs of most fish and wildlife populations, and the preferred management strategy.

Surveying, monitoring, and managing for key individual species may prove beneficial in some instances, where these species are threatened or endangered; however, managing individual wildlife populations can be a daunting task, costly, and prone to decisions that may be ignorant of effects at the ecosystem level of

organization. For this reason, the preservation and maintenance of existing installation habitat is the preferred approach to management of fish and wildlife resources. Habitat protection is achieved through the collective implementation of management strategies and projects prescribed here for fish and wildlife, and those management actions prescribed for:

- invasive and exotic species control;
- wetlands protection;
- aquatic resources; and
- forest and vegetation management.

Biodiversity conservation guidelines for DoD lands and waters are provided in "Conserving Biodiversity on Military Lands: A Guide for Natural Resources Managers" (2008), and should be followed whenever practicable to:

- maintain or restore remaining native ecosystem types across their natural range of variation;
- maintain or reestablish viable populations of native species, when practical;
- maintain ecological processes, such as disturbance regimes, hydrologic processes, and nutrient cycles, to the extent practicable; and
- manage and monitor resources over sufficiently long time periods to allow for adaptive management and assessment of changing ecosystem dynamics (i.e. incorporate a monitoring component to management plans).

The Natural Resources Program Manager coordinates with the DOEE, NMFS, and FWS, as appropriate to identify, prioritize, and implement habitat and wildlife diversity projects targeted for particular species, or groups of species, that FWS, DOEE, and/or NMFS determine to require particular attention and habitat conservation in the area of NRL-DC.

Potential Issues

Nuisance animals at NRL-DC can sometimes include woodchucks (groundhogs), turkey vultures, and black vultures. In accordance with the Memorandum of Understanding between the DoD and USDA Animal and Plant Health Inspection Service-Wildlife Services – Wildlife Services, assistance may be obtained for animal damage assessment, and control of these species, if they present a nuisance to NRL operations.

4.4.2 Assessment of Resource Management

Fish and wildlife resources on NRL-DC have required minimal active management to date, since implementation of the INRMP in 2003. For NRL, the majority of the installation is high density development, comprised largely of impervious surfaces and mowed lawn, which provides limited habitat for wildlife. As such, the potential for supporting a wide diversity of wildlife is relatively low and most species known or expected to occur on the installation are those that are adapted to urban environments (e.g., Canada geese, groundhogs). However, while limited, installation habitats are valuable, and NRL natural resources personnel coordinate with DOEE, NMFS, and FWS to identify, prioritize, and implement habitat and wildlife diversity projects targeted for particular species or groups of species that FWS, NMFS, and/or DOEE determine to be important. Habitat protection and development is achieved through the collective implementation of management actions prescribed for aquatic resources, and land management.

4.4.3 Fish and Wildlife Management Strategy

Objective: *To conserve existing habitat, and enhance installation habitat areas where feasible to do so, for the purposes of maintaining the diversity of native communities. Ensure compliance with applicable Federal and District laws and regulations governing the protection of fish and wildlife.*

Implementation Strategies

Fish and wildlife management strategies are abbreviated FW-S, projects implementing strategies are abbreviated FW-P in the INRMP Projects Prescription Table in Appendix B.

- **FW-S-1:** Periodically coordinate with DOEE, NMFS, and FWS to ensure NRL remains current on District and Federal fish and wildlife management issues and initiatives relative to NRL-DC.
- **FW-S-2:** Where feasible, conduct periodic surveys of wildlife and associated habitat to determine occurrence, relative abundance, and distribution of native and invasive flora and fauna.
- **FW-S-3:** Minimize the impact of construction and installation maintenance activities on existing habitat by ensuring during project planning and review that activities avoid, or attempt to mitigate, adverse impacts to the maximum extent possible.
- **FW-S-4:** Use biological controls for pests and insects as much as possible to minimize the use of chemical treatments.
- **FW-S-5:** Create/enhance habitat in optimal areas of the installation to attract and maintain populations of beneficial wildlife such bats, birds, and key pollinator species, as well as species deemed in need of improved habitats by DOEE and FWS.
- **FW-S-6:** Ensure compliance of NRL activities with all Federal and District laws and policies, and local policies that provide for the protection of wildlife species and their habitats. Ensure all necessary consultations occur with DOEE, NMFS, and FWS, actions that may impact wildlife, and that all required permits are obtained for any action that may impact wildlife or wildlife habitat.

4.5 Resources of Special Interest Management

The primary laws governing special interest species at NRL-DC include, but may not be limited to:

- Endangered Species Act (16 USC §§ 1531-1544) as amended;
- Bald and Golden Eagle Protection Act (16 USC §§ 688-688 d) as amended;
- Migratory Bird Treaty Act (16 U.S.C. §§ 703–712) as amended;

4.5.1 Resources of Special Interest Guidelines

In accordance with Navy policy, monitoring and surveys for protected species will be conducted on a periodic basis in consultation with the DOEE, NMFS, and FWS.

At this time, there are no known Federal- or District-listed species occurring at NRL-DC; however, Atlantic and Shortnose sturgeon can occur as transients in the near shore areas of NRL-DC as the species migrate to spawning grounds, and the installation is a potential stopover point for migratory birds along the Atlantic flyway. Migratory birds or nests have not been identified on the installation; however, the potential exists that migratory birds could establish seasonal nesting sites on NRL-DC.

Management strategies will be developed, or revised, based on the recommendations of these surveys.

- It is Navy policy to comply fully with the Federal and District requirements for the protection of listed species. Pursuant to DoDI 4715.3, NRL will identify opportunities to conserve all rare, threatened, and endangered species and the ecosystems on which those species depend.
- Species not listed as threatened or endangered but protected under Federal and District laws and regulations, and Species at Risk (SAR), on or in proximity to NRL-DC need to be understood, to the extent practicable. SAR are plants or animals whose populations have declined to the point where they are at-risk of needing the special protections granted by the Endangered Species Act. Management actions focus on efforts that have the greatest potential to prevent the listing of SAR (e.g., habitat conservation, planning level surveys, monitoring), if present or in proximity to NRL-DC, so as to preclude the listing of a SAR adversely impacting mission operations.

4.5.1.1 Northern Long-Eared Bat

A Bat Survey performed in 2016 did not detect any northern long-eared bats on the installation. However, activities occurring at NRL-DC require complying with the rule under the authority of section 4(d) of the Endangered Species Act that provides measures necessary and advisable to provide for the conservation of the northern long eared bat, which includes remaining current as to the status of the species presence in proximity to NRL-DC. This is accomplished through consultations with DOEE and FWS, review of NRL-DC project plans, and the NEPA review process.

4.5.2 Other Protected Species

Migratory Birds

NRL-DC provides substantial habitat for migratory birds that migrate annually within and beyond North America, and bald eagles have been observed perching on installation structures. The types of migratory birds that would occur on NRL-DC would be largely limited to land-birds. Habitat for waterfowl, shorebirds, and other waterbirds, is limited to Potomac River.

Primary considerations with regard to migratory bird management are compliance with the Migratory Bird Treaty Act (MBTA); implementation of migratory bird management actions in accordance with Executive Order 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*; and support, contribution, and compatibility with the goals and efforts of numerous regional migratory and game bird conservation programs.

MBTA prohibits the taking, possessing, importing, exporting, transporting, selling, purchasing, bartering, or offering for sale, purchase or barter, any migratory bird, their eggs, parts, and nests except as authorized by permit. Take is defined as "to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or any attempt to carry out these activities." A take does not include habitat destruction or alteration, as long as there is not a direct taking of birds, nests, eggs, or parts thereof. A complete list of protected species, including their body parts (feathers, plumes etc.), nests, and eggs is found at 50 CFR 10.13. Special purpose permits may be requested and issued by FWS that allow for the relocation or transport of migratory birds for management purposes.

Executive Order 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, requires all federal agencies taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations to develop and implement, within two years, a Memorandum of Understanding with FWS.

The Strategic Plan for Bird Conservation and Management on Department of Defense Lands (2014) states that installations shall minimize impacts on migratory birds and address effects of activities on migratory birds in INRMPs and appropriate NEPA documents. This plan policy requires installations to:

- develop and implement appropriate conservation measures if a proposed action may have a significant adverse effect on migratory bird populations;
- assess the effects of non-military-readiness activities on migratory birds pursuant to NEPA; and
- for military-readiness activities, confer and cooperate with FWS if a proposed action may have a significant adverse effect on a migratory bird populations.

In accordance with the MBTA and Executive Order 13186, NRL will consult with the FWS and DOEE on any activities that may affect migratory birds, and employ operational and conservation measures that avoid, minimize, or mitigate take of migratory birds. Protection of migratory birds at NRL-DC is further accomplished through environmental/NEPA review of construction and facilities maintenance activities, to assess potential impacts on migratory birds, and to ensure compliance with the MBTA, and FWS, and DOEE requirements.

4.5.3 Assessment of Special Interest Resource Management

A rare, threatened, and endangered species survey is underway in 2015-2016 and its findings will be incorporated into future INRMP updates.

4.5.4 Resources of Special Interest Management Strategy

Objectives: *To protect special interest species and their habitats to the extent possible, and to ensure compliance with Federal and District laws and regulations governing the conservation of resources of special interest.*

Implementation Strategies

Resources of special interest management strategies are abbreviated RSI-S, projects implementing strategies are abbreviated RSI-P in the INRMP Projects Prescription Table in Appendix B.

- **RSI-S-1:** Coordinate with the FWS, NRMS, and DOEE, as needed, to remain current on the status of special interest species and habitats associated with the installation and surrounding communities.
- **RSI-S-2:** Periodically conduct special interest species surveys. Incorporate new information and survey data into the INRMP and adapt special interest species' management practices as needed to survey results.
- **RSI-S-3:** Protect, to the maximum extent practical, and where feasible provide improvements to, special interest species habitats that are identified on NRL-DC.
- **RSI-S-4:** Ensure compliance with all Federal and District laws and policies that provide for the protection of listed species, and species otherwise protected, which have been identified in this INRMP. Ensure all necessary consultations, occur with FWS, NMFS, and DOEE, and that all required permits are obtained for any action that may impact resources of special interest.

4.6 Outdoor Recreation and Public Access Management

4.6.1 Regulations and Recreation

The Sikes Act requires that an INRMP provide for the sustainable multipurpose use of the resources on military installation, to include hunting, fishing, trapping, and non-consumptive uses, subject to safety requirements and military security, and public access to military installations to facilitate these uses.

It is Navy policy to make lands accessible to the public for educational or recreational use of natural and cultural resources when such access is compatible with military mission activities; ecosystem sustainability; and other considerations such as security, safety, and fiscal soundness. Opportunities for such access are to be equitably and impartially allocated. The Navy defines outdoor recreation as any program, activity, or opportunity dependent on the natural environment (e.g., hunting, fishing, camping, hiking, bird-watching, etc.).

4.6.2 Access and Restrictions

Because NRL-DC is a secure installation, public access to NRL-DC is limited to public participation in environmental programs and projects conducted through the Natural Resources Management Program at NRL-DC. Hunting, trapping, and similar uses of resources by the public are not permitted on NRL-DC lands.

Where feasible, NRL can include public participation in environmental projects implemented at NRL-DC. Opportunities for public access, education, and participation in NRL-DC installation natural resources activities include:

- Earth Day
- Arbor Day
- International Migratory Bird Day
- Pollinator Week
- National Public Lands Day
- Wildlife Habitat development and monitoring programs and projects.

4.6.3 Outdoor Recreation Management Strategy

Objective: *To allocate lands for educational or recreational use of natural resources by the public, when such access is compatible with military mission activities, and provide for environmental education, public awareness, and outreach through engagement of the local community (e.g., local schools) in NRL-DC programs and projects.*

Implementation Strategies

Outdoor recreation and public access management strategies are abbreviated RPA-S, and corresponding projects implementing strategies are abbreviated RPA-P in the INRMP Projects Prescription Table in Appendix B.

- **RPA-S-1:** Provide opportunities for quality public participation experiences in Natural Resources Management Program activities, while ensuring that the activities are not in conflict with mission

priorities, personal safety, or natural resources management objectives, and that such activities comply with Federal and District laws and Navy instructions.

4.7 Integrated Pest Management

Without control, pests could interfere with the NRL mission, damage real property, increase maintenance costs, and potentially expose installation personnel to diseases. Pest management at NRL-DC is implemented under the NRL Integrated Pest Management Plan (IPMP; 2003), pursuant to the Federal Insecticide, Fungicide, and Rodenticide Act, as amended (7 U.S.C 136r-l). DoD Instruction 4150.07, DoD Pest Management Program (May 29, 2008) defines policy, assigns responsibilities, and prescribes procedures for the DoD Integrated Pest Management Program. Only licensed herbicides will be utilized in accordance with their approved uses and a DoD-certified applicator (or equivalent) will perform all applications.

Target pests include weeds and other unwanted vegetation, crawling insects (e.g., termites, spiders, ants, crickets, cockroaches, etc.), flying insects (mosquitoes, gypsy moths, etc.), mice, gophers, and other vertebrate pests. Without control, these pests could interfere with the NRL mission, damage real property, increase maintenance costs, and potentially expose installation personnel to diseases. However, pesticide and herbicide will be minimized in proximity to surface waters and wetlands.

Pesticide Permitting

Permits are required for discharges to waters of the District of Columbia from the application of (1) biological pesticides or (2) chemical pesticides that leave a residue, when the pesticide application is for one of the following pesticide use patterns:

- mosquito and other flying insect pest control;
- aquatic weed and algae control;
- aquatic nuisance animal control; and
- forest canopy pest control.

This general permit is for operators that apply pesticides in or near water. The permit regulates discharges from pesticides applied directly to surface waters to control pests, or applied to control pests that are present in or over, including near, surface waters. Any pest management activity conducted at NRL-DC must comply with DOEE pesticide/herbicide application and permitting requirements.

4.8 Geographic Information System Management and Data Integration

GIS software enables installation staff to capture, store, update, manipulate, synthesize, analyze, and display all forms of natural resources inventory and monitoring data. NRL recognizes the value of this platform in natural resource planning and protection, and is integrating this technology into its natural resource management program by developing a natural resources GIS database.

Section 5.0

Implementation

INRMP implementation involves the anticipated execution of all "must fund" projects and activities as identified in Appendix B. "Must fund" conservation requirements are those actions that are required to meet recurring natural and cultural resources conservation management requirements (ERL 4). These specific classes of actions are given the highest priority, and would be implemented, like all actions, subject to the availability of funds properly authorized and appropriated under Federal law.

Pursuant to the Sikes Act, an INRMP is considered implemented if the installation:

- actively requests, receives, and uses funds for all ERL 4 projects and activities;
- ensures that sufficient numbers of professionally trained natural resources management staff are available to perform the tasks required by the INRMP;
- coordinates annually with all cooperating offices; and
- documents specific INRMP action accomplishments undertaken each year.

A Sikes Act Improvement Act Cooperative Agreement developed with state agencies, universities, non-governmental organizations, or individuals, while not required, can also provide a vehicle to help implement the projects prescribed in the INRMP. Other options for project implementation include contracts, and use of volunteers from conservation programs, non-governmental organizations, or community organizations.

5.1 Project Prescription

The Office of Management and Budget and the Environmental Protection Agency require federal agencies to classify natural resources projects based in part on compliance requirements. The list of projects prescribed in this INRMP, implementation schedule, and funding level classification are described in Appendix B. Project priority in this INRMP is determined by classification systems developed the DoD and DoN, which are summarized in Table 5.1.

Table 5.1. Funding Classes for Recurring and Non-Recurring Conservation Requirements and Navy Environmental Readiness Levels	
DOD RECURRING AND NON-RECURRING CONSERVATION REQUIREMENTS	**NAVY ENVIRONMENTAL READINESS LEVELS**
Class 0: Recurring Natural Resources Conservation Management Requirements	**Environmental Readiness Level 4**
Includes activities needed for: a. Administrative, personnel, and other costs associated with managing the DOD Natural Resources Conservation Program that are necessary to meet applicable compliance requirements in Federal, state, and territorial laws; regulations; Executive Orders; and DOD policies, or in direct support of the military mission. b. DOD components shall give priority to recurring natural resources conservation management requirements associated with the operation of facilities, installations, and deployed weapons systems. These activities include day-to-day costs of sustaining an effective natural resources management program, and annual requirements, including manpower, training, supplies, permits, fees, testing and monitoring, sampling and analysis, reporting and recordkeeping, maintenance of natural resources conservation equipment, and compliance self-assessments.	Minimum level of environmental readiness capability required to maintain compliance with applicable legal requirements: a. Supports all actions specifically required by law, regulation, or Executive Order (DOD Class I and Class II requirements) just in time. b. Supports all DOD Class 0 requirements as they relate to a specific statute such as hazardous waste disposal, permits, fees, monitoring, sampling and analysis, reporting, and record-keeping. c. Supports recurring administrative, personnel, and other costs associated with managing environmental programs that are necessary to meet applicable compliance requirements (DOD Class 0). d. Supports minimum feasible Navy executive agent responsibilities, participation in Office of the Secretary of Defense- (OSD) sponsored inter-department and interagency efforts, and OSD-mandated regional coordination efforts.
Class I: Non-Recurring Natural Resources Management Requirements - Current Compliance	**Environmental Readiness Level 3**
Includes installation projects andactivities to support: a. Installations currently out of compliance. b. Signed compliance agreement or consent order. c. Meeting requirements with applicable Federal, state, or territorial laws, regulations, standards, Executive Orders, or DOD policies. d. Immediate and essential maintenance of operational integrity or military mission sustainment. e. Projects or activities that will be out of compliance if not implementedin the current program year.	a. Supports all capabilities provided by ERL 4. b. Supports existing level of Navy executive agent responsibilities, participation in OSD-sponsored interdepartmental and interagency efforts, and OSD mandatedregional coordination efforts. c. Supports proactive involvement in the legislative and regulatory process to identify and mitigaterequirements that will impose excessive costs or restrictions on operations and training. d. Supports proactive initiatives critical to theprotection of Navy operational readiness.

Class II: Non-Recurring Natural Resources Management Requirements. Maintenance Requirements	**Environmental Readiness Level 2**
Includes those projects and activities needed to meet an established deadline beyond the current program year and maintain compliance. Examples include the following: a. Compliance with future deadlines. b. Conservation, GIS mapping, and data management to comply with Federal, state, territorial, and local regulations; Executive Orders; and DOD policy. c. Efforts undertaken in accordance with non-deadline specific compliance requirements of leadership initiatives. d. Wetlands enhancement to minimize wetlands loss and enhance existing degraded wetlands. e. Conservation recommendations in biological opinions issued pursuant to the Endangered Species Act.	a. Supports all capabilities provided under ERL 3. b. Supports enhanced proactive initiatives critical to the protection of Navy operational readiness. c. Supports all Navy and DOD policy requirements. d. Supports investments in pollution reduction, compliance enhancement, energy conservation, and cost reduction.
Class III: Non-Recurring Natural Resources Management Requirements. Enhancement Actions Beyond Compliance.	**Environmental Readiness Level 1**
Includes those projects and activities that enhance conservation resources or the integrity of the installation mission, or are needed to address overall environmental goals and objectives, but are not specifically required by law, regulation, or Executive Order, and are not of an immediate nature. Examples include: a. Community outreach activities (e.g., International Migratory Bird Day, Earth Day, National Public Lands Day, Pollinator Week, Arbor Day activities). b. Educational and public awareness projects, (e.g., interpretive displays, oral histories, Watchable Wildlife areas, nature trails, wildlife checklists, conservation teaching materials). c. Restoration or enhancement of natural resources when no specificcompliance requirement dictates a course or timing of action. d. Management and execution of volunteer and partnership programs.	a. Supports all capabilities provided under ERL 2. b. Supports proactive actions required to ensurecompliance with pending/strong anticipated lawsand regulations in a timely manner or to prevent adverse impacts on Navy mission. c. Supports investments that demonstrate Navy environmental leadership and proactive environmental stewardship.

5.2 Funding Sources and Mechanisms

Prescribed INRMP projects are funded through the Command, which operates within the Defense Working Capital Fund, unless funds are allocated to projects through cooperative or interagency agreements. Cooperative or interagency agreements are legal relationships (not a contract) between the Navy and states, local governments, institutions of higher education, hospitals, non-profit organizations, and/or individuals. Cooperative or interagency agreements are permitted to accomplish work identified in INRMPs pursuant to section 670c-1 of the Sikes Act (as amended).

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 USC § 1341 *et seq.*).

5.3 Tracking and Evaluating Implementation

Natural resources projects are tracked via the Navy Environmental Program Requirements (EPR-web). The database is used by the Navy to determine programming and budgeting requirements for projects under the Planning, Programming, Budget, and Execution System process. The information in the database is also used to develop the Navy's annual Environmental Quality Report for Congress.

To facilitate tracking the progress of the prescribed projects, a spreadsheet program (e.g., Paradox, Access, Excel) consistent with Navy EPR-web should be developed and maintained. A GIS database established for this Plan could also be maintained to track updates on various management activities, such as results of resource inventories, and locations of restoration projects, resources permitting.

The NRL Natural Resource Manager keeps a narrative and photographic record of projects implemented through the INRMP to document accomplishments, and facilitate monitoring programs and data calls.

5.4 INRMP Review Metrics

The annual and 5-years reviews are a fundamental part of INRMP implementation. To assist in these reviews, DoDI 4715.03 (2011) requires use of the Natural Resources Conservation metrics to assess the overall health and trends of the Natural Resources Management Program and to identify and correct potential funding and other resource shortfalls (DoD 2009, 2011). These metrics, provided in Appendix I, provide a vehicle for facilitating and documenting the annual and 5-year reviews, evaluating the efficacy of INRMP implementation, and determining the overall health of the Navy/Marine Corps' Natural Resources Programs.

5.5 Effectiveness of INRMP in Achieving No Net Loss

The SAIA mandates that an INRMP provide for no net loss in the capability of military installation lands to support the military mission of the installation. To do this, the integrated relationships among land use, environmental compliance requirements, mission activities, and other aspects of the mission served by the natural environment at NRL-DC need to be understood. This INRMP is intended to elucidate and encompass these relationships, and provide a fundamental framework from which NRL can manage for the long term sustainability of the natural environment and mission. Fundamentally, anticipating and protecting against constraints and encroachment on the Navy mission, and providing for the protection of environmental resources that are key to sustaining the Navy mission, is what this INRMP attempts to achieve.

To achieve the mandate of "no net loss," this INRMP identifies needs and opportunities relative to sustaining natural resources, potential military mission constraints in relation to management of natural resources, and establishes actionable management actions that integrate these needs, opportunities, and constraints. As part of an adaptive ecosystem management strategy, INRMP objectives and projects should, as required, be revised over time to reflect changing mission and environmental needs and opportunities. At a minimum, the INRMP must be reviewed, assessed, and modified (as needed) on an annual basis to ensure continued integration with mission activities and environmental needs, and that the management framework is consistent with and provides for no net loss in the capability of installation lands to support the NRL mission.

Section 6.0

References

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U.S. Environmental Protection Agency (EPA). 2010. U.S. Environmental Protection Agency (EPA): Guidance for Federal Land Management in the Chesapeake Bay Watershed (EPA841-R-10-002).

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APPENDIX A

ACRONYMS AND ABBREVIATIONS

APHIS	Animal and Plant Health Inspection Service-Wildlife Services
BGEPA	Bald and Golden Eagle Protection Act
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CNO	Chief of Naval Operations
CWA	Clean Water Act
DOEE	District of Columbia Department of Energy and Environment
DoD	Department of Defense
DoDI	Department of Defense Instruction
DoN	Department of the Navy
EA	Environmental Assessment
EISA	Energy Independence and Security Act
EO	Executive Order
EPA	Environmental Protection Agency
ERL	Environmental Readiness Level
ESA	Endangered Species Act
FWS	United States Fish and Wildlife Service
GIS	Geographic Information Systems
INRMP	Integrated Natural Resources Management Plan
IPMP	Integrated Pest Management Plan
LID	Low Impact Development
MBTA	Migratory Bird Treaty Act
NMFS	National Marine Fisheries Service
NRL	Naval Research Laboratory
NRL-DC	Naval Research Laboratory – District of Columbia
NEPA	National Environmental Policy Act
OPNAVINST	Operating Naval Instruction
RDT&E	Research, Development, Testing, and Evaluation
SAIA	Sikes Act Improvement Act
SPCC	Spill Prevention, Control, and Countermeasures Plan
USACE	United States Army Corps of Engineers
USC	United States Code
USDA	United States Department of Agriculture
USGS	United States Geological Service

APPENDIX B

INMRP PROJECT PRESCRIPTIONS AND IMPLEMENTATION TABLE

NRL-DC INMRP PROJECT PRESCRIPTIONS FISCAL YEARS 2016 - 2020

PROJECT	PROJECT AREA	DESCRIPTION	EPR PROJECT NUMBER	IMPLEMENTATION FREQUENCY	FY	PRIMARY DRIVERS [1]	ERL PRIORITY LEVEL	COST ESTIMATE ($)	FUNDING SOURCE	METRICS FOCUS AREAS
Land Management										
LM-P-1	Pollinator Habitat Improvement	Convert turf grass habitat to native meadow habitat.		Periodic	16-21	B, I, J, K	3	TBD	Internal / budget	1,5
LM-P- 2	Street Tree Inventory	Conduct periodic surveys of installation trees for health, pests, disease, and requisite maintenance actions.		Periodic	19	B,C,G,H,I,J	3	$15K	Internal / budget	1,4,7
Invasive and Exotic Species Management										
ES-P-1	Invasive/Exotic Species Control	Apply appropriate controls for problematic invasive and exotic species.		Periodic	16-21	B, G, H, I, J, K	4	TBD	Internal / budget	1,2,4,7
Fish and Wildlife Management										
FW-P-1	Breeding Bird Surveys	Survey installation's breeding birds		Annual	16-21	B, I,J, K	3	200/yr.	Internal / budget	1
FW-P-2	American Kestrel Box Maintenance	Maintain American Kestrel boxes.		Periodic	16-21	D, I, J	3	200	Internal / budget	1
Resources of Special Interest										
RSI-P-1	Northern Long-eared Bat Survey	Conduct survey for Northern Long-eared Bat that may be present on NRL-DC facilities.		Biennial	16-20	A, B, I,J, K	4	7,000	Internal / budget	1,2,4,5,6,7
RSI–P-2	Special Status Species Surveys	Periodically survey NRL-DC for Rare, Threatened, and Endangered and other protected species.		Quadrennial	20	A, B, D, E, G, H, I, J, K	4	40,000	Internal / budget	1,2,4
Outdoor Recreation and Public Access Management										
		There are no specific projects assigned that entail outdoor recreation or public participation at NRL-DC for FY 2016-2020. Outdoor recreation and public access is administered per the management actions prescribed.								

Notes on Project Prescriptions

1. This is not a comprehensive list of applicable regulations, other regulations, policy, or guidance may apply. Please review Appendix B for a comprehensive list of laws, policies or guidance for management of natural resources.
2. 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 U.S.C. 1341 et seq.).

* TBD = To Be Determined

Legal Drivers

A	Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.), as amended.
B	Sikes Act Improvement Act (see also Conservation Programs on Military Reservations of 1960), as amended (16 U.S.C. 670(a) et seq.)
C	Clean Water Act of 1977 (see Federal Water Pollution Control Act), as amended.
D	Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. 703 et seq.).
E	Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c) of 1940, as amended.
F	EO 11990 Protection of Wetlands (24 May 1977).
G	EO 13112 Invasive Species (3 Feb 1999). Revokes EO 11987
H	32 C.F.R Part 190, Natural Resources Management Program
I	Chief of Naval Operations (CNO) Environmental Readiness Program (OPNAVINST 5090.1D) and Environmental Readiness Program Manual (OPNAV M-5090.1), 10 Jan 2014.
J	Department of Defense Instruction (DoDI) 4715.03, Natural Resources Conservation Program, March 18, 2011.
K	Department of Defense Instruction (DoDI) 4150.7, Pest Management Program, April 22, 1996.
L	EO 13508 Strategy for Protecting and Restoring the Chesapeake Bay Watershed, May 12, 2010.

Natural Resource Metrics

Metrics are based on the seven broad categories developed by the Navy/Marines, but has been slightly modified as the follows:

1	INRMP Implementation
2	Threatened and Endangered Species and Critical Habitat
3	Public Use and Outdoor Recreation
4	Ecosystem Integrity
5	Partnership Effectiveness (External stakeholders)
6	Team Adequacy (Internal Stakeholders)
7	INRMP Impact on the Installation Mission

APPENDIX C

RELEVANT LAWS, REGULATIONS, POLICY, AND GUIDANCE

This list compiles the requirements of acts, regulations, policies, and Executive Orders (EOs), potentially relevant to the conservation of natural resources at NRL-DC.

Federal Laws

Anadromous Fish Conservation Act of 1965 (16 U.S.C. 757).
Anti-Deficiency Act (31 U.S.C. 1341 *et seq*.).
Bald and Golden Eagle Protection Act (BGEPA) of 1940, as amended (16 U.S.C. 668 *et seq.*).
Clean Air Act (CAA) of 1955 (42 U.S.C. 7401).
Clean Water Act (CWA) of 1977 (see Federal Water Pollution Control Act).
Coastal Zone Management Act (CZMA) of 1972 (16 U.S.C. 1451 *et seq.*).
Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) of 1980, as amended (42 U.S.C. 9601 *et seq.*).
Department of Defense Appropriations Act of 1991 (Public Law 102-396).
Defense Environmental Restoration Program of 1991 (10 U.S.C. 2701).
Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986 (42 U.S.C. 11001 *et seq.*).
Emergency Wetlands Resources Act of 1986 (16 U.S.C. 3901–3932).
Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531 *et seq.*).
Erosion Protection Act (33 U.S.C. 426).
Estuary Protection Act of 1968 (16 U.S.C. 1221, PL 90-454), as amended.
Federal Facilities Compliance Act of 1992 (Public Law 102–386).
Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) of 1947, as amended (Public Law 92–516, 7 U.S.C. 136 *et seq.*).
Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701).
Federal Noxious Weed Act of 1974 (7 U.S.C. 2801 *et seq.*).
Federal Plant Protection Act (2000).
Federal Plant Pest Act (7 U.S.C. 150aa *et seq.*).
Federal Water Pollution Control Act (FWPCA) of 1972, as amended (33 U.S.C. 1251*et seq.*).
Clean Water Act (CWA) of 1977, as amended (Public Law 95–217, 33 U.S.C. 1251 *et seq.*).
Fish and Wildlife Conservation Act of 1980 (16 U.S.C. 2901 *et seq.*).
Forest Resources Conservation and Shortage Relief Act of 1990 (16 U.S.C. 620 *et seq*.).
Magnuson-Stevens Fishery Conservation and Management Act as amended (Public Law 94–265; 16 U.S.C. 1801).
Marine Mammal Protection Act (MMPA) of 1972 as amended (16 U.S.C. 1361 *et seq.*).
Marine Mammal Protection Act Amendments of 1994 (Public Law 103–238).
Marine Protection, Research, and Sanctuaries Act (MPRSA) of 1972, as amended (33 U.S.C. 1401 *et seq.* and 16 U.S.C. 1431 *et seq*.).
Migratory Bird Conservation Act (16 U.S.C. 715–715d, 715e, 715f–715r) of 18 Feb 29, (45 Stat. 1222).
Migratory Bird Treaty Act (MBTA) of 1918 as amended, (16 U.S.C. 703 *et seq.*).
Military Construction Authorization Act (Public Law 97–321, 10 U.S.C. 2665 *et seq.*).
Military Reservation and Facilities: Hunting, Fishing and Trapping (10 U.S.C. 2671).
National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321 *et seq.*).
National Historic Preservation Act of 1966 (16 U.S.C. 470 *et seq*.).
National Marine Sanctuaries Act (16 U.S.C. 1431, *et seq.*).
National Marine Sanctuaries Amendments Act of 2000 (Public Law 106-513).
National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-ee).
Non-indigenous Aquatic Nuisance Prevention and Control Act of 1990, as amended (16 U.S.C. 4701 *et seq.*, 1991, 1992 and 1996).
North American Wetlands Conservation Act (16 U.S.C. 4401).
Noxious Plant Control Act of 1968 (43 U.S.C. 1241 *et seq.*).
Outdoor Recreation, Federal/state Program Act (16 U.S.C. 460(L) *et seq*.).
Pollution Prevention Act of 1990 (42 U.S.C. 13101 *et seq*.).
Resource Conservation and Recovery Act (RCRA) of 1976, as amended (42 U.S.C. 6901 *et seq*.).
Rivers and Harbors Act of 1889 (see also Clean Water Act) (33 U.S.C. 401 *et seq.*).
Safe Drinking Water Act (SDWA) of 1974 (42 U.S.C. 300(f) *et seq*.).
Sikes Act, as amended (16 U.S.C. 670(a) *et seq*.).
Conservation and Rehabilitation Program on Military and Public Lands (Public Law 93-452; 16 U.S.C. 670 *et seq.*).
Soil Conservation Act of 1938 (16 U.S.C. 5901 *et seq*.).

Federal Laws

Soil and Water Resources Conservation Act of 1977 (16 U.S.C. 2001).
Solid Waste Disposal Act (SWDA) of 1965, as amended (42 U.S.C. 3251 *et seq*.).
Toxic Substances Control Act (TSCA) of 1976 (15 U.S.C. 2601 *et seq*.).
Water Resources Planning Act (42 U.S.C 1962).
Watershed Protection and Flood Prevention Act (16 U.S.C. 1001; 33 U.S.C. 701).

Executive Orders

EO 11988 Floodplain Management (24 May 77) Revokes EO 11296.
EO 11990 Protection of Wetlands (24 May 77).
EO 11991 Protection and Enhancement of Environmental Quality (24 May 77). Amends EO 11514.
EO 12088 Federal Compliance with Pollution Control Standards (13 Oct 78). EO 13148 revokes sections 1-4.
EO 12777 Implementation of Section 311 of the Federal Water Pollution Control Act of 18 Oct 72, as amended.
EO 12898 Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (11 Feb 94).
EO 12962 Recreational Fisheries (7 Jun 95).
EO 13112 Invasive Species (3 Feb 99). Revokes EO 11987, amended by EO 13286 (2/28/03).
EO 13158 Marine Protected Areas (MPA) (26 May 00).
EO 13186 Responsibilities of Federal Entities to Protect Migratory Birds (10 Jan 01).
EO 13352 Facilitation of Cooperative Conservation (26 Aug 04)

Department of Defense (DoD) and Navy Documents

Conserving Biodiversity on Military Lands, A Guide for Natural Resources Managers, 2008 edition
Department of Defense Legacy Resource Management Program: Considerations and Recommendations When Developing Department of Defense Integrated Natural Resource Management Plans, February 2009
DoD Integrated Natural Resources Management Plan Template With Comments, 12 Mar 2010
DOD Instruction 4715.03 (Natural Resources Conservation Program), 18 Mar 2011
OPNAVINST 6250.4B, Pest Management Program, 27 Aug 1998.
OPNAVINST 5090.1D, Environmental Readiness Program, 10 Jan 2014
OPNAV M-5090.1, Environmental Readiness Program Manual, 10 Jan 2014

APPENDIX D

MIGRATORY BIRD MANAGEMENT

Migratory birds are a large, diverse group of birds that utilize breeding grounds in the United States and Canada, and overwinter in southern North America, Central and South America, the West Indies, and the Caribbean. The Migratory Bird Treaty Act (MBTA) (16 USC §703-711) prohibits the taking, killing, or possessing of migratory birds unless permitted by regulation. An exemption to the rule that allows for the incidental take of migratory birds by the Department of Defense (DoD) during military readiness activities was finalized in February 2007 (72 FR 8931). 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 an ongoing military readiness activity may result in a significant adverse effect on a population of a migratory bird species, they must confer and cooperate with the U.S. Fish and Wildlife Service (FWS) to develop appropriate and reasonable conservation measures to minimize or mitigate identified 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 installation operating support functions, such as: administrative offices; military exchanges; commissaries; water treatment facilities; storage facilities; schools; housing; motor pools; laundries; Morale, Welfare, and Recreation 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 Navy 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 (2001). The Order directs incorporation of bird conservation principles in agency management plans and requires federal agencies enter into a memorandum of understanding on migratory birds with the FWS.

In accordance with the MBTA and E.O 13186, NRL will consult with the FWS and DOEE on actions potentially affecting migratory birds, and employ operational and conservation measures that avoid, minimize, or mitigate take of migratory birds.

DoD Partners in Flight (PIF) Program identifies strategies, goals, and priorities for eight key areas that support and enhance the military mission: stewardship, partnerships/cooperation, communications, habitat and species management, bird/animal aircraft strike hazard, monitoring, research, and information and education. As necessary, NRL will consult a DoD PIF geographic representative on bird conservation priorities, migratory bird legislation, outreach, and partnerships.

APPENDIX E

COMPLETED PROJECTS AND SURVEYS

Completed Plans, Surveys, and Projects

Year	Plan, Survey, Project
2003	Integrated Pest Management Plan, Naval Research Laboratory, Washington, D.C.
2010	Storm Water Control Plan, Naval Research Laboratory, Washington, D.C.
2010	Accidental Spill Prevention and Slug Control Plan, Naval Research Laboratory, Washington, D.C.
2010	NRL Emergency Response Action Plan, Naval Research Laboratory, Washington, D.C.
2012	Hazardous Materials and Hazardous Waste Management Plan, Naval Research Laboratory, Washington, D.C.
2013	Integrated Cultural Resources Management Plan for NRL-DC
2014	Spill Prevention Control and Countermeasures (SPCC) Plan, Naval Research Laboratory, Washington, D.C.
2016	Bat Survey, NRL-DC
2016	Rare, Threatened and Endangered Species Survey Naval Research Laboratory , Washington, D.C.
2017	Amphibian and Reptile Survey, NRL-DC
2017	Wetland Survey, NRL-DC

APPENDIX F

DISTRICT OF COLUMBIA LIST OF SPECIES OF GREATEST CONSERVATION NEED

DISTRICT OF COLUMBIA SPECIES OF GREATEST CONSERVATION	
Common Name	**Scientific Name**
Birds	
Acadian Flycatcher	*Empidonax virescens*
American Bittern	*Botaurus lentiginosus*
American Black Duck	*Anas rubripes*
American Woodcock	*Scolopax minor*
Bald Eagle	*Haliaeetus leucocephalus*
Black-crowned Night-Heron	*Nycticorax nycticorax*
Bobolink	*Dolichonyx oryzivorus*
Broad-winged Hawk	*Buteo platypterus*
Brown Creeper	*Certhia americana*
Brown Thrasher	*Toxostoma rufum*
Cerulean Warbler	*Dendroica cerulean*
Chimney Swift	*Chaetura pelagica*
Eastern Meadowlark	*Sturnella magna*
Eastern Towhee	*Pipilo erythrophthalmus*
Field Sparrow	*Spizella pusilla*
Grasshopper Sparrow	*Ammodramus savannarum*
Great Horned Owl	*Bubo virginianus*
Hooded Warbler	*Wilsonia citrine*
Kentucky Warbler	*Oporornis formosus*
Least Bittern	*Ixobrychus exilis*
Louisiana Waterthrush	*Seiurus motacilla*
Marsh Wren	*Cistothorus palustris*
Northern Bobwhite	*Colinus virginianus*
Ovenbird	*Seiurus aurocapilla*
Prothonotary Warbler	*Protonotaria citrea*
Red-shouldered Hawk	*Buteo lineatus*
Scarlet Tanager	*Piranga olivacea*
Sora	*Porzana carolina*
Virginia Rail	*Rallus limicola*
White-eyed Vireo	*Vireo griseus*
Wilson's Snipe	*Gallinago delicata*
Wood Duck	*Aix sponsa*
Wood Thrush	*Hylocichla mustelina*
Worm-eating Warbler	*Helmitheros vermivorus*
Yellow-throated Vireo	*Vireo flavifrons*

DISTRICT OF COLUMBIA SPECIES OF GREATEST CONSERVATION (CONTINUED)	
Common Name	**Scientific Name**
Mammals	
Allegheny Woodrat	*Neotoma magister*
American Mink	*Mustela vison*
Eastern Chipmunk	*Tamias striatus*
Eastern Cottontail	*Sylvilagus floridanus*
Eastern Red Bat	*Lasiurus borealis*
Eastern Small- footed Myotis	*Myotis lebii*
Gray Fox	*Urocyon cinereoargenteus*
Northern River Otter	*Lutra canadensis*
Southern Bog Lemming	*Synaptomys cooperi*
Southern Flying Squirrel	*Glaucomys volans*
Virginia Opossum	*Didelphis virginiana*
Reptiles	
Bog Turtle	*Clemmys muhlenbergii*
Common Musk Turtle	*Sternotherus odoratus*
Corn Snake	*Elaphe guttata guttata*
Eastern Box Turtle	*Terrapene carolina*
Eastern Fence Lizard	*Sceloporus undulates*
Eastern Garter Snake	*Thamnophis sirtalis*
Eastern Hognose Snake	*Heterodon platirhinos*
Eastern Mud Turtle	*Kinosternon subrubrum*
Eastern Painted Turtle	*Chrysemys picta picta*
Eastern Ribbon Snake	*Thamnophis sauritus*
Eastern Worm Snake	*Carphophis amoenus*
Five- lined Skink	*Eumeces fasciatus*
Northern Black Racer	*Coluber constrictor*
Northern Brown Snake	*Storeria dekayi*
Northern Copperhead	*Agkistsrodon contortrix*
Northern Ringneck Snake	*Diadophis punctatus edwardsii*
Queen Snake	*Regina septemvittata*
Redbelly Turtle	*Pseudemys rubriventris*
Rough Green Snake	*Opheodrys aestivus*
Scarlet Snake	*Cemophora coccinea copei*
Spotted Turtle	*Chrysemys guttata*
Timber Rattlesnake	*Crotalus horridus*
Wood Turtle	*Clemmys inscuplta*

DISTRICT OF COLUMBIA SPECIES OF GREATEST CONSERVATION (CONTINUED)	
Common Name	**Scientific Name**
Amphibians	
American Toad	*Bufo americanus*
Bullfrog	*Rana catesbeiana*
Fowler's Toad	*Bufo fowleri*
Marbled Salamander	*Ambystoma opacum*
Eastern Mud Salamander	*Pseudotriton m. montanus*
Northern Cricket Frog	*Acris crepitans*
Northern Dusky Salamander	*Desmognathus fuscus*
Northern Spring Peeper	*Pseudacris crucifer*
Northern Two- lined Salamander	*Eurycea bislineata*
Pickerel Frog	*Rana palustris*
Northern Red Salamander	*Pseudotriton rubber ruber*
Redback Salamander	*Plethodon cinereus*
Red Spotted Newt	*Notophthalmus viridescens*
Spotted Salamander	*Ambystoma maculatum*
Upland Chorus Frog	*Pseudacris feriarum*
Wood Frog	*Rana sylvatica*
Fish	
Alewife	*Alosa pseudoharengus*
American Eel	*Anguilla rostrata*
American Shad	*Alosa sapidissima*
Atlantic Sturgeon	*Acipenser oxyrhynchus*
Blueback Herring	*Alosa aestivalis*
Bowfin	*Amia calva*
Central Stoneroller	*Campostoma anomalum*
Greenside Darter	*Etheostoma blennioides*
Hickory Shad	*Alosa mediocris*
Shortnosed Sturgeon	*Acipenser brevirostrum*
Silverjaw Minnow	*Ericymba buccata*
Warmouth	*Lepomis gulosus*
Invertebrates	
A Copepod	*Acanthocyclops Columbiensis*
A Copepod	*Acanthocyclops Villosipes*
A Copepod	*Attheyella (Canthocamptus) Illiniosensis*
A Copepod	*Attheyella (Mrazekiella) Illiniosensis*
A Copepod	*Attheyella (Mrazekiella) Obatogamensis*

DISTRICT OF COLUMBIA SPECIES OF GREATEST CONSERVATION (CONTINUED)	
Common Name	**Scientific Name**
Invertebrates	
A Copepod	*Bryocamptus Hutchinsoni*
A Copepod	*Bryocamptus Minutus*
A Copepod	*Bryocamptus Nivalis*
A Copepod	*Bryocamptus Zschokkei*
A Copepod	*Diacyclops Harryi*
A Copepod	*Diacyclops Nearcticus*
A Copepod	*Eucyclops Agilis*
A Copepod	*Macrocyclops Albidus*
A Copepod	*Paracyclops Fimbriatus Chiltoni*
Alewife Floater	*Anodonta implicata*
Appalachian Grizzled Skipper	*Pyrgus wyandot*
Appalachian Spring Snail	*Fontigens bottimeri*
Brook Floater	*Alasmidonta varicosa*
Crossline Skipper Butterfly	*Polites origenes*
Dwarf Wedgemussel	*Alasmidonta heterodon*
Eastern Comma Butterfly	*Polygonia comma*
Eastern Pondmussel	*Ligumia nasuta*
Edward's Hairstreak	*Satyrium edwardsii Fontigens bottimeri*
Emerald Spreadwing	*Lestes dryas*
Fine- lined Emerald	*Somatochlora filosa*
Frosted Elfin	*Callophrys irus*
Great Spangled Fritillary Butterfly	*Speyeria cybele*
Green Floater	*Lasmigona subviridis*
Grey Petaltail	*Tachopteryx thoreyi*
Hay's Spring Amphipod	*Sygobromus hayi*
Kenk's Amphipod	*Stygobromus kenki*
Lilypad Forktail Damselfly	*Ischnura kellicotti williamsoni*
Little Glassywing Butterfly	*Pompeius verna*
Mocha Emerald Dragonfly	*Somatochlora linearis*
Monarch Butterfly	*Danaus P. Plexippus*
Mottled Duskywing	*Erynnis martialis*
Pizzini's Cave Amphipod	*Stygobromus pizzinii*
Potomac Groundwater Amphipod	*Stygobromus tenuis potomacus*
Question Mark Butterfly	*Polygonia interrogationis*
Red Admiral Butterfly	*Vanessa atalanta rubria*
Regal Fritillary Butterfly	*Speyeria idalia*

DISTRICT OF COLUMBIA SPECIES OF GREATEST CONSERVATION (CONTINUED)	
Common Name	**Scientific Name**
Invertebrates	
Sedge Sprite	*Nehalennia irene*
Sphagnum Sprite	*Nehalennia gracilis*
Spiny- foot Copepod	*Attheyella villosipes*
Tidewater Mucket	*Leptodea ochracea*
Tiger Spiketail Dragonfly	*Cordulegster errones*
Triangle Floater	*Alasmidonta undulata*
Unicorn Clubtail Dragonfly	*Arigomphus villosipes*
Variegated Fritillary Butterfly	*Euptoieta claudia*
Yellow Lampmussel	*Lampsilis cariosa*

APPENDIX G

LANDSCAPING APPROVED PLANTS AND NATIVE TREES LISTS

Native Plants for Landscaping and Site Reclamation

LANDSCAPING APPROVED PLANT LISTS									
Common Name	Scientific Name	Height	Low Moisture	Moderate Moisture	High Moisture	Full Shade	Partial Sun	Full Sun	Suggested Uses
Forbs/Herbs									
Bee Balm	*Monarda spp.*	1'-2'		√				√	
Blackeyed Susan	*Rudbeckia hirta*	2'-3'		√				√	reclamation, wildflower meadow
Boneset	*Eupatorium spp.*	1'-4'	√	√	√		√	√	reclamation, wildflower meadow
Butterfly weed	*Asclepias tuberosa*	1'-3'	√					√	reclamation, wildflower meadow
Cardinal flower	*Lobelia cardinalis*	2'-4'		√	√		√	√	
Common milkweed	*Asclepias syriaca*	1'-2'		√	√		√	√	reclamation, wildflower meadow
Eastern Columbine	*Aquilegia canadensis*	2'-3'		√			√	√	
Goat's rue	*Tephrosia virginiana*	1'-2'	√	√				√	reclamation
Goldenrod	*Solidago spp.*	2'-6'	√	√	√		√	√	reclamation, wildflower meadow
Hoary Mountainmint	*Pycnanthemum incanum*	2'-3'	√	√			√	√	
Late purple aster	*Symphyotrichum patens*	1'-4'	√	√			√	√	reclamation, wildflower meadow
Lanceleaf Coreopsis	*Coreopsis lanceolata*	1'-2'	√	√				√	
New York aster	*Symphyotrichum novi-belgii*	1'-4'		√	√		√	√	reclamation, wildflower meadow
Narrow Mountainmint	*Pycnanthemum tenuifolium*	2'-3'	√	√			√	√	
Oxeye Sunflower	*Heliopsis helianthoides*	3'-6'	√	√				√	

LANDSCAPING APPROVED PLANT LISTS									
Common Name	Scientific Name	Height	Low Moisture	Moderate Moisture	High Moisture	Full Shade	Partial Sun	Full Sun	Suggested Uses
Forbs/Herbs (continued)									
Partridge Pea	*Chamaecrista fasciculata*	1'-3'	√	√				√	
Round-head bushclover	*Lespedeza capitata*	2'-4'	√					√	reclamation
Slender Lespedeza	*Lespedeza virginica*	1'-2'	√	√	√		√	√	
Sunflower	*Helianthus spp.*	1'-2'	√	√			√	√	reclamation, wildflower meadow
Swamp milkweed	*Asclepias incarnata*	1'-2'			√		√	√	reclamation, wildflower meadow
Tall White Beardtongue	*Penstemon digitalis*	3'-5'	√	√				√	
Thimbleweed	*Anemone virginiana*	1'-2'	√	√			√	√	
Threadleaf coreopsis	*Coreopsis verticillata*	2'	√				√	√	reclamation, wildflower meadow
Virginia Bluebells	*Mertensia virginica*	1'-2'		√			√	√	
Wand-like bushclover	*Lespedeza intermedia*	1'-3'	√	√			√	√	reclamation
Wild bergamot	*Monarda fistulosa*	<1'-3'	√					√	reclamation, wildflower meadow
Wingstem	*Verbesina alternifolia*	4'-8'		√			√	√	
Wild bergamot	*Monarda fistulosa*	<1'-3'	√					√	reclamation, wildflower meadow
Zigzag Goldenrod	*Solidago flexicaulis*	1'-3'		√			√	√	

LANDSCAPING APPROVED PLANT LISTS									
Common Name	Scientific Name	Height	Low Moisture	Moderate Moisture	High Moisture	Full Shade	Partial Sun	Full Sun	Suggested Uses
Grasses									
Autunm Bentgrass	*Agrostis perennans*								
Broomsedge	*Andropogon virginicus*	1'-3'	√	√			√	√	native warm-season grassland
Bushy broomsedge	*Andropogon glomeratus*	1.5' -5'		√	√		√	√	native warm-season grassland
Switchgrass	*Panicum virgatum*	3'-5'	√	√	√		√	√	native warm-season grassland
Little bluestem	*Schizachyrium scoparium*	2'-3'	√	√			√	√	native warm-season grassland
Eastern gamma grass	*Tripsacum dactyloides*	4'-8'	√	√			√	√	native warm-season grassland
Side-oats grama	*Bouteloua curtipendula*	1'-3'	√	√			√		native warm-season grassland
Virginia Wild Rye	*Elymus virginicus*	2'-4'		√			√	√	native warm-season grassland
Indian grass	*Sorghastrum nutans*	5'-6'	√	√			√	√	native warm-season grassland
Shrubs									
Blueberry, highbush	*Vaccinium corymbosum*	2'-12'		√	√	√	√		riparian buffer
Blueberry, lowbush	*Vaccinium pallidum*	1'-1.5'	√	√		√	√		reclamation, wildlife
Buttonbush	*Cephalanthus occidentalis*	3'-7'			√	√	√		riparian buffer
Chokeberry, red	*Aronia arbutifolia*	3'-10'	√	√	√		√	√	riparian buffer, reclamation
Dogwood, graystem	*Cornus racemosa*	10'-15'	√	√	√	√	√	√	riparian buffer, reclamation
Dogwood, silky	*Cornus amomum*	6'-10'		√	√		√		riparian buffer
Hazel alder	*Alnus serrulata*	6'-15'		√	√	√	√		riparian buffer
Hazelnut	*Corylus americana*	6'-10'		√	√		√	√	reclamation, wildlife
Inkberry	*Ilex glabrs*	2'-10'		√	√	√	√		riparian buffer, landscape
Mountain laurel	*Kalmia latifolia*	3'-10'	√	√		√	√		landscape

LANDSCAPING APPROVED PLANT LISTS									
Common Name	Scientific Name	Height	Low Moisture	Moderate Moisture	High Moisture	Full Shade	Partial Sun	Full Sun	Suggested Uses
Shrubs (continued)									
Serviceberry	*Amelanchier canadensis*	5'-15'		√					landscape, wildlife
Swamp azalea	*Rhododendron viscosum*	3'-8'		√	√	√	√		riparian buffer
Sweet pepperbush	*Clethra alnifolia*	3'-8'		√	√	√	√	√	riparian buffer, landscape
Viburnum, arrowwood	*Viburnum dentatum*	4'-8'		√	√		√	√	riparian buffer, landscape
Viburnum, blackhaw	*Viburnum prunifolium*	8'-15'	√	√	√	√	√		landscape, reclamation
Virginia sweetspire	*Itea virginica*	3'-5'		√	√	√	√	√	riparian buffer, landscape
Wax myrtle	*Morella (Myrica) cerifera*	2'-6'		√	√		√	√	riparian buffer
Winterberry	*Ilex verticilatta*	4'-12'		√	√		√	√	riparian buffer
Small Trees									
Dogwood	*Cornus florida*	20'-30'		√			√	√	landscape
Hawthorn	*Crataegus* spp.	10'-20'		√			√	√	landscape
Sassafras	*Sassafras albidum*	20'-40'		√			√	√	landscape, reclamation
Serviceberry	*Amelanchier arboria*	15'-25'		√			√	√	landscape, wildlife
Sweetbay magnolia	*Magnolia virginiana*	15'-30'		√	√	√	√		riparian buffer, landscape
Medium to Large Trees									
America holly	*Ilex opaca*	40'-50'		√	√		√	√	landscape, wildlife
Ash, green	*Fraxinus americana*	50'-80'		√	√			√	riparian buffer, landscape
Ash, White	*Fraxinus pennsylvanica*	50'-60'		√	√			√	riparian buffer, landscape
Black locust	*Robinia pseudoacacia*	30'-50'	√	√			√	√	reclamation
Black willow	*Salix nigra*	30'-50'		√	√	√	√		riparian buffer

LANDSCAPING APPROVED PLANT LISTS									
Common Name	Scientific Name	Height	Low Moisture	Moderate Moisture	High Moisture	Full Shade	Partial Sun	Full Sun	Suggested Uses
Medium to Large Trees (continued)									
Blackgum	*Nyssa sylvatica*	50'-70'		√	√		√	√	riparian buffer, landscape, wildlife
Eastern red cedar	*Juniperus virginiana*	45'-65'	√	√	√		√	√	visual screen
Hackberry	*Celtis occidentalis*	40'-60'		√	√		√	√	riparian buffer, landscape
Oak, black	*Quercus velutina*	65'-80'	√	√	√		√	√	landscape, reforestation
Oak, cherrybark	*Quercus pagodaefolia*	70'-80'		√	√		√	√	landscape, reforestation
Oak, chestnut	*Quercus prinus*	65'-80'	√				√	√	reforestation, reclamation
Oak, pin	*Quercus palustris*	60'-70'		√	√		√	√	riparian buffer, landscape
Oak, southern red	*Quercus falcata*	70'-80'	√	√			√	√	landscape, reforestation
Oak, white	*Quercus alba*	70'-80'		√			√	√	landscape, reforestation
Oak, willow	*Quercus phellos*	40'-60'	√	√	√		√	√	landscape, riparian buffer
Persimmon	*Diospyros virginiana*	30'-40'	√	√			√	√	reclamation, wildlife
Pine, loblolly	*Pinus taeda*	80'-100'	√	√	√		√	√	landscape, reforestation
Pine, shortleaf	*Pinus echinata*	80'-100'	√	√			√	√	reforestation
Pine, Virginia	*Pinus virginiana*	30'-50'	√	√			√	√	reclamation
Red maple	*Acer rubrum*	50'-80'	√	√	√		√	√	riparian buffer, landscape
Red mulberry	*Morus rubra*	30'-40'		√			√	√	wildlife
River birch	*Betula nigra*	40'-70'		√	√	√	√		riparian buffer, landscape
Sycamore	*Platanus occidentalis*	75'-120'		√	√		√	√	riparian buffer, landscape
Yellow poplar	*Leriodendron tulipifera*	100'-150'		√			√	√	landscape, reforestation

TIPS FOR USING TREES TO ATTRACT WILDLIFE

- Plant a variety of tree species.
- Try to arrange trees and shrubs in groups together or in hedgerows.
- Avoid planting trees and shrubs in isolation from other vegetation, following your garden center's advice on how far apart your trees should be planted.
- Try to plant some trees that grow tall and some that are not so tall, some that have bushy crowns with relatively bare trunks and some that have thick leaves and branches from the ground up.
- Wildlife species and insects sometimes will use special food and shelter sources found only in certain parts of trees. Planting trees with vertical diversity increases your chances of having a greater variety of species on your property.
- Be sure to plant some evergreens. For wildlife, evergreens provide shelter all year long, especially in winter when other trees have lost their leaves.
- Remember that trees take time to grow. Fast growing species include sumac, red maple, alder and white pine. Consider the time it will take your trees to grow when preparing your tree planting plans.
- If you do not have mature trees nearby, nest boxes for birds and other wildlife can help provide shelter for those species, which use hollows or cavities in trees for nesting.

HOW TO PLANT A TREE

- Remove all wires, ropes, or burlap surrounding the roots of the tree.
- Dig a hole five times the diameter of the root ball, but approximately the same depth of the root ball.
- Set the tree in the center of the planting area so that the upper surface of the root ball is level with the surrounding soil.
- Fill the hole with soil.
- It is preferable not to stake or wrap the tree to stabilize it.
- Use water to pack or settle the soil around the root ball and apply a two to four inch layer of mulch over the entire planting area.

For Additional Information on Trees
For more information
Virginia Department of Conservation and Recreation
Natural Heritage Program
804-786-7951
www.dcr.virginia.gov/natural_heritage/nativeplants.shtml

For a list of nurseries that propagate native species, contact:
Virginia Native Plant Society
400 Blandy Farm Lane, Unit 2
Boyce, VA 22620
540-837-1600 | vnpsofc@shentel.net
www.vnps.org

For a list of nurseries in a particular region of Virginia, contact:
The Virginia Nursery and Landscape Association
383 Coal Hollow Road
Christiansburg, VA 24073
540-382-0943 | vnla@verizon.net

To search for species in VNLA member catalogs, visit:
www.vnla.org/search.asp

APPENDIX H

NAVY AND MARINE CORP NATURAL RESOURCES METRICS

Navy and Marine Corp INRMP Metrics: Considerations and Recommendations

Metrics are based on the seven broad categories developed by the Navy/Marines, but have been slightly modified as follows:

(1) INRMP Implementation
(2) Threatened and Endangered Species and Critical Habitat
(3) Public Use and Outdoor Recreation
(4) Ecosystem Integrity
(5) Partnership Effectiveness (External stakeholders)
(6) Team Adequacy (Internal Stakeholders)
(7) INRMP Impact on the Installation Mission

1. INRMP Implementation

These metrics are concerned with overall implementation of the INRMP. These questions are to be answered by installation natural resources staff and specific internal stakeholders. Planning level surveys or baseline information is included in this section; long-term monitoring is included in #4 Ecosystem Integrity.

Forest Management

1. Proportion Forest Inventory completed? Date last completed?
2. Number of acres of forest managed this Fiscal Year/Calendar Year?
3. Number of acres / proportion of timber harvests primarily conducted for direct benefit of military mission?
4. Number of acres / proportion of timber harvests primarily conducted for wildlife habitat creation/enhancement?
5. Number of acres / proportion of timber harvests primarily conducted for silvicultural purposes?
6. Number of acres of forest harvested due to construction activities?
7. Number of official partnerships/agreements with external entities to implement forest management actions? (This does not apply to contracting actions, but having official agreements with other government agencies, universities, or NGOs)

Vegetation Management

8. Status of Planning Level Survey for flora (proportion complete)? (At a minimum, this is an installation-wide vascular plant survey that provides a list of plant species with verified nomenclature and classification and determine the existence of special status species)
9. Status of Planning Level Survey for vegetative communities (proportion complete)? (At a minimum, the distribution and extent of vegetation communities are described, mapped, field-checked for accuracy, and included in a GIS layer)
10. # official partnerships/agreements with external entities to implement vegetation management actions? (This does not apply to contracting actions, but having official agreements with other government agencies, universities, or NGOs)

Wetlands Management

11. Status of Planning Level Survey for wetlands (% complete)? (At a minimum, wetlands will be identified, classified, mapped, and included in a GIS layer)
12. Number of acres wetlands filled or drained this Fiscal Year/Calendar Year?
13. Number of acres /linear feet of stream lost or impacted this Fiscal Year/Calendar Year?
14. Number of acres wetlands created through mitigation by Cowardin type on-post? Off-post?
15. Number of acres wetland impacts avoided/minimized through project review and design modification.
16. Number of miles/linear feet of stream loss or impact avoided through project review and design modification.

Navy and Marine Corp INRMP Metrics: Considerations and Recommendations

Soil and Water Management

17. Status of Planning Level Survey for soil (proportion complete)? (At a minimum, soils are classified, categorized, described, mapped, and included in a GIS layer)
18. Status of Planning Level Survey for surface water (proportion complete)? (At a minimum, the distribution and extent of surface waters will be described, mapped, and included in a GIS layer)
19. Status of Planning Level Survey for topography (proportion complete)? (At a minimum, a map showing elevations, contours and associated data consistent with USGS standards and topographic map products and included in a GIS layer)
20. Erosion Management: Acres of Land/Stream miles rehabilitated through management actions? (This would be a reactive measure to restore lands after an impact occurred)
21. Erosion Management: Acres of Land/Stream miles protected through management actions? (This would be a proactive measure before impacts occurred (e.g., hardened water crossings)
22. # Official partnerships/agreements with external entities to implement vegetation management actions? (This does not apply to contracting actions, but having official agreements with other government agencies, universities, or NGOs)

Invasive Species Management [could also be included in #4 Ecosystem Integrity]

23. Number of invasive species on the installation / approximate acreage cover of each species?
24. Number of invasive species actively managed?
25. Number of invasive species partially managed?
26. Number of official partnerships/agreements with external entities to implement vegetation management actions? (This does not apply to contracting actions, but having official agreements with other government agencies, universities, or NGOs)

Fish and Wildlife Management

27. Status of Planning Level Survey for mammals (proportion complete)? (At a minimum, this is an installation-wide survey of mammals to provide a list of species with verified nomenclature and determine the existence of special status species)
28. Status of Planning Level Survey for birds (proportion complete)? (At a minimum, this is an installation-wide survey of birds to provide a list of species with verified nomenclature and determine the existence of special status species)
29. Status of Planning Level Survey for reptiles and amphibians (proportion complete)? (At a minimum, this is an installation-wide survey of reptiles and amphibians to provide a list of species with verified nomenclature and determine the existence of special status species)
30. Status of Planning Level Survey for fish (proportion complete)? (At a minimum, this is an installation-wide survey of fish to provide a list of species with verified nomenclature and determine the existence of special status species)
31. Status of Planning Level Survey for aquatic invertebrates (proportion complete)? (At a minimum, this is an installation-wide survey of aquatic invertebrates to provide a list of species with verified nomenclature and determine the existence of special status species)
32. Status of Planning Level Survey for terrestrial invertebrates (proportion complete)? (At a minimum, this is an installation-wide survey of terrestrial invertebrates to provide a list of species with verified nomenclature and determine the existence of special status species)
33. Migratory Bird Conservation. What proportion of habitat or vegetation management projects (or number of acres not impacted) are conducted outside the primary nesting season for migratory birds (Apr 15 - Aug 1)? How many acres are impacted during the nesting season and which bird species are affected? (Are other actions taken to minimize or mitigate the impacts of these actions on migratory birds?)

Navy and Marine Corp INRMP Metrics: Considerations and Recommendations

34. Migratory Bird Conservation. Number of acres of habitat that has been conserved, created, or enhanced for the benefit of migratory birds? Have monitoring projects been implemented to evaluate the success of these habitat actions?
35. Number of official partnerships/agreements with external entities to implement fish and wildlife management actions? (This does not apply to contracting actions, but having official agreements with other government agencies, universities, or NGOs)

Pest Management

36. Is there an Installation Pest Management Plan? (Include date signed)
37. Are the Installation Pest Management Plan and INRMP integrated?
38. Number of nuisance beaver situations handled?

Bird-Aircraft Strike Hazard Management

39. Is there a Bird-Aircraft Strike Hazard Plan? (Include date signed)
40. Are the Bird-Aircraft Strike Hazard Plan and INRMP integrated?
41. Last meeting of Bird-Aircraft Strike Hazard Working Group?

Law Enforcement

42. Number of formal meetings with Law Enforcement and Environmental staff?

Wildland Fire Management

43. Is there an Installation Wildland Fire Management Plan? (Include date signed)
44. Are the Installation Wildland Fire Management Plan and INRMP integrated?

GIS Management

45. Date of the most recent wetlands (National Wetlands Inventory) layer in GIS.
46. Date of the most recent soils (National Resources Conservation Service) layer in GIS.
47. Date of the most recent surface water (National Wetlands Inventory) layer in GIS.
48. Date of the most recent vegetation cover layer in GIS.
49. Date of the most recent Threatened and Endangered Species information layer in GIS.

Leases

50. Number of Agricultural leases (activity)?
51. Number of acres in agricultural lease for cropland/hay, grazing, and other?
52. Financial value of services?
53. Financial cost savings?

2. Threatened and Endangered Species and Critical Habitat

These metrics are concerned with Federally listed threatened and endangered species. These questions are to be answered by installation natural resources staff.

1. Number of and names of threatened and endangered species?
2. Number of acres / % of the installation with designated Critical Habitat?
3. Status of Planning Level Surveys for threatened and endangered species (proportion complete for each species)? (At a minimum, this survey shall produce a map that shows the kinds and known distribution of Federal Threatened And Endangered species)
4. Status of Planning Level Surveys for threatened and endangered species habitat (proportion complete for each species)?
5. Number of individual consultations with the U.S. Fish and Wildlife Service / National Oceanic and Atmospheric Administration this FY/CY?

Navy and Marine Corp INRMP Metrics: Considerations and Recommendations

6. Number (or proportion) of consultations completed through a comprehensive Biological Assessment this Fiscal Year/Calendar Year?
7. What proportion of conservation measures is being met? If less than 100%, identify which areas and proportion completeness.
8. Number of acres of habitat impacts avoided/minimized through project review and design modification?
9. Number of acres of habitat that has been conserved, created, or enhanced on the installation for the benefit of endangered species? Have monitoring projects been implemented to evaluate the success of these habitat actions?
10. How many acres of habitat have been conserved, created, or enhanced off the installation through installation programs (e.g., Army Compatible Use Buffer) for threatened and endangered species?
11. Financial expenditures on threatened and endangered species management (for each species)?

3. Public Use and Outdoor Recreation

These metrics are concerned with public use and outdoor recreation. These questions are to be answered by installation natural resources staff.

1. Does the installation allow the following activities: hunting, fishing, trapping, wildlife viewing, other? If so, how often?
2. How many recreation permits are issued?
3. Proportion of recreation permits issued to the public?
4. Last revision of installation hunting/fishing regulations?
5. Was public outreach conducted? What types of outreach and number of times public outreach conducted?

4. Ecosystem Integrity

These metrics are concerned with how management actions relate to long-term ecosystem health as well as long-term monitoring. These questions are to be answered by installation natural resources staff and specific internal stakeholders.

1. Status of Planning Level Survey for state-listed fauna (proportion complete)? (Including state endangered, threatened and species of special concern, and species of greatest conservation need; at a minimum, the status of these species are assessed and their distribution on the installation mapped)
2. Status of Planning Level Survey for state listed rare plant species (proportion complete)? (Including species as determined by Natural Heritage Program; at a minimum, the statuses of these species are assessed and their distribution on the installation mapped)
3. Status of Planning Level Survey for unique ecological communities (proportion complete)? (Including ecological communities as determined by the Natural Heritage Program; at a minimum, the status of these communities are assessed and their distribution on the installation mapped)
4. Long-term monitoring for state-listed and/or indicator species (list them): Yes/No. If “yes” to monitoring, are they increasing, decreasing, or stable?
5. Long-term monitoring for sensitive vegetation communities (list them): Yes/No. If “yes” to monitoring, are they good/bad; decreasing/increasing/stable?

5. Partnership Effectiveness (External Stakeholders)

These metrics are to be answered by natural resources staff and external stakeholders (i.e. U.S. Fish and Wildlife Service [FWS] and state agencies).

1. How many formal meetings were held between the installation and FWS?
2. How many informal meetings were held between the installation and FWS? (This can include sharing information, discussing issues, etc.)
3. Has the installation sought and received support from FWS, as needed?

Navy and Marine Corp INRMP Metrics: Considerations and Recommendations

4. How well has natural resources management supported geographical/regional FWS objectives (e.g., Migratory Bird Initiative and the Fish Habitat Initiative)? (Not supported, Minimally supported, Satisfactorily supported, Well supported, or Very well supported)
5. Is natural resources program execution meeting FWS expectations? (Dissatisfied, Minimally satisfied, Somewhat satisfied, Highly satisfied, or Completely satisfied).
6. How many formal meetings were held between the installation and state agencies?
7. How many informal meetings were held between the installation and state agencies? (This can include sharing information, discussing issues, etc.)
8. Has the installation sought and received support from state agencies, as needed?
9. How well has natural resources management supported geographical/regional objectives (e.g., District Wildlife Comprehensive Plan)? (Not supported, Minimally supported, Satisfactorily supported, Well supported, or Very well supported)
10. Is natural resources program execution meeting state agencies expectations? (Dissatisfied, Minimally satisfied, Somewhat satisfied, Highly satisfied, or Completely satisfied).
11. What was the date of the last meeting with FWS and state agencies to discuss INRMP "operations and effect"?

6. Team Adequacy (Internal Stakeholders)

These metrics are to be answered by natural resources staff and internal stakeholders.

1. Are staffing levels of natural resources professionals at the installation adequate to meet current requirements? (Members of the team do not have to be within the natural resources department.) If no, how many professionals are required?
2. Do staff have current Individual Development Plans? Are training requirements being fulfilled?
3. Has the installation received support from the Installation Management field offices as needed?
4. What was the date of the last meeting with internal stakeholders to discuss INRMP "operations and effect"?
5. How many formal meetings did Installation Personnel and Environmental Section have during the calendar year? (e.g., monthly coordination meetings, Range Facilities Steering Committee meeting, Natural Resources Conservation Meeting, Forest Management Program Annual Work Plan review, INRMP review meetings).

7. INRMP Impact on the Installation Mission

These metrics are to be answered by the Commanding Officer or his/her Designee considering the mission of the installation.

1. Has Coordination between natural resources and operators been successful/effective? Do Installation Personnel and Environmental Section coordinate and cooperate? (No coordination, Minimal coordination, Satisfactory coordination, Effective coordination, or Highly effective coordination)
2. To what level do Natural Resource compliance requirements support the installation's ability to sustain the operational mission? (Cannot accomplish mission requirements; Meet mission requirements, but with significant work-arounds; Meet mission requirements, but with minimal work-arounds; Meet mission requirements, but with diminished value; or Accomplish all mission requirements with no work-arounds)
3. Has there been a net loss of training lands? The Sikes Act states that each INRMP shall, where appropriate and applicable, provide for no net loss in the capability of military installations lands to support the military mission of the installation. Has the implementation of the installation INRMP resulted in a net loss of lands to support the military mission? (Yes, to such degree that a training activity could not be conducted on the base; Yes, the loss resulted in modification of the training so that it could be conducted on the base; Yes, a loss occurred but it only affects future training activities; No loss occurred; or No loss occurred and the base was able to recover areas for training previously lost due to natural resource requirements)
4. Does the INRMP process effectively consider current mission requirements? (Strongly disagree, Disagree, Not sure (neutral), Agree, or Strongly agree)

Navy and Marine Corp INRMP Metrics: Considerations and Recommendations
5. How well has natural resources management supported other local/regional/national conservation initiatives including public/community initiatives? (Not supported, Minimally supported, Satisfactorily supported, Well supported, or Very well supported)

APPENDIX I

NATURAL RESOURCES MANAGER LETTER OF DESIGNATION

There is currently a gap in the natural resource billet.

APPENDIX J

DEPARTMENT OF DEFENSE/NAVY CROSSWALK TABLE

INRMP CROSSWALK USES THE FOLLOWING GUIDANCE DOCUMENTS:

1. DOD LEGACY RESOURCE MANAGEMENT PROGRAM, CONSIDERATIONS AND RECOMMENDATIONS WHEN DEVELOPING DEPARTMENT OF DEFENSE INTEGRATED NATURAL RESOURCE MANAGEMENT PLANS [LEGACY PROJECT #: 07-356], FEBRUARY 2009

2. DOD INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN (INRMP) TEMPLATE WITH COMMENTS, 12 MARCH 2010

3. CHIEF OF NAVAL OPERATIONS, INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN GUIDANCE FOR NAVY INSTALLATIONS, APRIL, 2006

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