Integrated Natural Resources Management Plan
Naval Station Mayport
Mayport, Florida

2019
Update

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Mayport, Florida




2019 Update

Final

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN
NAVAL STATION MAYPORT
MAYPORT, FLORIDA

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2019 Update

NAVAL STATION MAYPORT
MAYPORT, FLORIDA
INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN (INRMP) - 2019 OPERATIONS AND EFFECT CONCURRENCE

The Sikes Act and Department of Defense instruction require that annual and 5-year operation and effect reviews of INRMPs occur with federal and state partners. Representatives of the Navy, U.S. Fish & Wildlife Service, Florida Fish and Wildlife Conservation Commission, and National Marine Fisheries Service are invited annually to participate in the yearly Naval Station Mayport INRMP and Natural Resources Metric review. The last operation and effect review of this INRMP was completed in April 2014. We have revised the installation INRMP with input from the signatory partners as part of the required 5-year review process. By signing below, the partners concur that the management actions prescribed in the INRMP and implemented will contribute to the conservation and rehabilitation of installation natural resources.

D. [illegible] CAPT, USN — 16 OCT 19

Commanding Officer, Naval Station Mayport — Date

8/14/2019

Natural Resources Manager, Naval Station Mayport — Date

2/22/2019

U.S. Navy Region Southeast Environmental Program Manager — Date

2/20/2019

Natural Resources Manager, Commander Navy Region SE — Date

3/5/2019

U.S. Fish and Wildlife Service — Date

Thomas H. Eason — 4/11/19

Florida Fish and Wildlife Conservation Commission — Date

[illegible] Benhart — 4/25/19

National Marine Fisheries Service — Date

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EXECUTIVE SUMMARY

ES.1 Type of Document

This is an Integrated Natural Resources Management Plan.

ES.2 Purpose of Document

The purpose of this document is to meet statutory requirements under the Sikes Act Improvement Amendment (SAIA), Public Law 105-85, Div. B. Title XXIX, Nov. 18, 1997, 111 Stat 2017-2019, 2020-2022. In November 1997, the Sikes Act, 16 U.S.C. § 670a et seq., was amended to require the Secretary of Defense to carry out a program to provide for the conservation and rehabilitation of natural resources on military installations. To facilitate this program, the amendments require the Secretaries of the military departments to prepare and implement integrated natural resources management plans (INRMP) for each military installation in the United States (U.S.) unless the absence of significant natural resources on a particular installation makes preparation of a plan for the installation inappropriate. The SAIA mandates that all military installations prepare and implement an INRMP by November 17, 2001. The U.S. Navy has prepared this INRMP for the Naval Station Mayport (NAVSTA Mayport), and for the Navy Fuel Depot (NFD) located at Heckscher Drive in Jacksonville, Florida, owned by NAVSTA Mayport.

ES.3 Goals and Objectives of the INRMP

The goal of the INRMP is to implement an ecosystem-based conservation program that provides for conservation and rehabilitation of natural resources in a manner consistent with the military mission; integrates and coordinates all natural resources; provides for sustainable multipurpose uses of natural resources; and provides public access for use of natural resources subject to safety and military security considerations. The INRMP covers a period of 10 years. Five installation-wide ecosystem management goals and 15 objectives have been identified for NAVSTA Mayport and NFD. The objectives developed to implement each goal are related to a natural resources issue facing the installation. The following are the goals, issues, and objectives for NAVSTA Mayport and NFD.

Goal 1: Protect and maintain natural resources at NAVSTA Mayport and NFD.

Issue: Present-day support and future development of aviation and afloat training and maintenance tenant command operations require a substantial commitment at NAVSTA Mayport. These military operations potentially could impact natural resources. To minimize the impact, NAVSTA Mayport must enforce appropriate measures to ensure the protection of habitats, such as the beach dune community, numerous hydric hammocks, and vast areas of salt marsh.

Objective 1.1: To continue existing and establish new programs and procedures to monitor, maintain, and enhance wetlands and water quality.

Objective 1.2: To identify, reduce, and control invasive and exotic plant species and pests.

Objective 1.3: To maintain attenuation capacity of the remaining undisturbed acreage within 100 year floodplain.

Objective 1.4: To ensure that land management and land use decisions comply with all applicable laws, executive orders, regulations, directives, and instructions, and that adverse impacts to the natural environment are minimized.

Objective 1.5: To protect and enhance existing shorelines through existing and new programs.

Objective 1.6: To implement environmentally beneficial landscaping, grounds maintenance, and urban forestry practices.

Goal 2: Protect, maintain, and restore native vegetative communities, and plant and wildlife populations.

Issue: Although much of the natural communities on NAVSTA Mayport and NFD have been disturbed by development activities, the Florida Natural Areas Inventory (FNAI) survey concluded that five occurrences of three natural communities (*e.g.*, beach dune, hydric hammock, wetlands and tidal marsh) were located on the installation.

Objective 2.1: To maintain the ecological integrity of wetlands, forest stands and upland natural communities, to protect the communities and their native plant and animal species consistent with the military mission.

Objective 2.2: To preserve and protect threatened and endangered species and species of concern to ensure no reduction in population sizes.

Objective 2.3: To control nuisance wildlife and wildlife diseases that may adversely affect human health or welfare, the health of the ecosystem and/or the military mission.

Goal 3: Encourage recreational and educational uses of natural resources.

Issue: The SAIA requires that military installation evaluate the potential for providing outdoor recreational resources to the general public. This presents a unique opportunity to evaluate the area for potential public access (*e.g.*, interpretive opportunities) if consistent with the military mission.

Objective 3.1: To establish an outdoor recreation planning team to study recreational needs of NAVSTA Mayport personnel and the general public.

Objective 3.2: To maintain existing and develop additional outdoor recreational facilities at NAVSTA Mayport.

Goal 4: Conserve and enhance the ecological value and diversity of natural resources through ecosystem management.

Issue: Existing programs and plans for maintaining and managing natural resources within NAVSTA Mayport and NFD must consider relationships among resources. Rather, existing programs and plans have typically focused on the management of individual resources in accordance with Federal or state laws.

Objective 4.1: Provide adequate staffing, equipment, technology, and training to the Natural Resources Program to ensure proper implementation of this INRMP.

Objective 4.2: Incorporate the concept of ecosystem management into all planning and management processes.

Objective 4.3: Implement training, education, and stewardship initiatives for ecosystem management. Ecosystem management cannot be accomplished solely through the implementation of programs and plans focused on individual resources.

Goal 5: Manage natural resources in a manner that ensures consistency with the use of the Installation to support military preparedness while providing for the conservation and rehabilitation of natural resources, the sustainable multipurpose use of natural resources, and public access consistent with security and mission requirements.

Issues: All the natural and recreational resources should be balanced with the military mission of NAVSTA Mayport and NFD. A BASH management plan is an example of integrating military mission and natural resource planning. Installation and management activities that are detrimental to wetland functions, such as storage and filtration of water, on NAVSTA Mayport and NFD can potentially affect the military mission, and is another example of integration of the military mission with natural resources planning.

Objective 5.1: Ensure that natural resource and recreational management does not compromise the military mission.

ES.4 Functional Areas and Management Focuses

To achieve these goals and objectives, NAVSTA Mayport and NFD have been divided into functional areas. Functional areas reflect the use of the area for its military purpose and the potential for natural resources management. Within each functional area, natural resources management focuses are identified. The management focus for an area may include: land management, forestry, fish and wildlife, and outdoor recreation. A management focus includes the primary practices necessary to achieve the long-term goals and objectives of the INRMP.

Based on the location of military uses on NAVSTA Mayport and NFD and the availability and sustainability of natural resources, NAVSTA Mayport and NFD are divided into three basic functional areas:

- *Protected areas (P)* include land protected due to the unique natural, cultural or aesthetic value.
- *Operational Protected areas (OP)* include areas vital to the continuance of the military mission.
- *Mixed Use areas (MU)* include areas where non-timber values such as wildlife habitat, water quality (wetland, stormwater and floodplains protection), recreational potential or urban management are the basis for management decisions.

ES.5 Species Management

The natural resource actions described in this INRMP are for the benefit of the plants, animals and ecosystems occurring on the installation. Special attention is given to rare, threatened, and endangered (RTE) species, and their habitats, through management actions referenced in Table 1. These actions are long-term conservation measures that provide benefits for terrestrial and aquatic habitats on the installation. Management actions such as soil conservation and storm water management, for example, control sediment and pollutant runoff to protect nearshore water quality for species such as Florida manatees, shorebirds, and fish.

This INRMP includes goals, objectives, strategies, and projects for the benefit and long-term conservation of RTE species found, or potentially found, on the installation. Species explicitly accounted under the Threatened and Endangered Species subheading of the *Biotic Communities Management* section of this INRMP (section 4.5.3.3) are:

- Atlantic Sturgeon (fish)
- Bald Eagle
  Dwarf Seahorse (fish)
- Florida Manatee
- Giant Manta Ray (fish)
- Gopher Frog
- Gopher Tortoise
- Least Tern (bird)
- Monarch Butterfly
- North Atlantic Right Whale
- Piping Plover (bird)
- Red Knot (bird)
- Shortnose Sturgeon (fish)
- Sea Turtles
  Green Sea Turtle
  Hawksbill Sea Turtle
  Kemp's Ridley Sea Turtle
  Leatherback Sea Turtle
  Loggerhead Sea Turtle
- Smalltooth Sawfish
- Southern Hog-nosed Snake
- Spotted Turtle
- Wood Stork (bird)
- Worthington's Marsh Wren (bird)

Table ES-1. Habitat Management Actions at NAVSTA Mayport

Habitat Management Actions	Sections
Wetlands Management	4.4.1.1
Soil Conservation and Erosion Control	4.4.1.2
Stormwater and Water Quality Control	4.4.1.3
Landscaping and Grounds Maintenance	4.4.1.4
Floodplain Management	4.4.1.5
Invasive and Exotic Species	4.4.1.6
Urban Forestry and Tree Mitigation	4.4.1.7
Forest Management	4.4.2
Fisheries Management	4.4.3.1
Biotic Communities Management	4.4.3.2
Wildlife Damage and Wildlife Disease	4.4.3.4

ES.6 Projects of the INRMP

Projects are discrete actions for fulfilling a particular strategy. Projects may be required in order for NAVSTA Mayport and NFD to fulfill regulatory requirements regarding natural resources management, or to enhance existing measures for ensuring compliance. Projects of the INRMP are shown in Table 32 in Section 6.

Funding for implementation of the INRMP will come from the installation, Commander, Naval Installations Command (CNIC) or Naval Facilities Engineering Command (NAVFAC) natural resources fund sources. The natural resources programs and projects described in this INRMP

are divided into mandatory and stewardship categories to reflect implementation priorities. Every effort will be made to acquire funding to implement Department of Defense (DoD) mandatory projects in the timeliest manner possible. Stewardship-type projects will be funded through forestry revenues, agriculture outlease, fish and wildlife, Legacy Funds or other fund sources.

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LIST OF ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
°F	degrees Fahrenheit
AICUZ	Aircraft Installation Compatible Use Zone
AOO	Air Operations Officer
ATG	Afloat Training Group
BASH	Bird/Aircraft Air Strike Hazard
BHWG	Bird Hazard Working Group
BMP	Best Management Practices
CAA	Clean Air Act
CERCLA	Comprehensive, Environmental Response, Compensation and Liability Act
CNO	Chief of Naval Operations
CO	Commanding Officer
COMNAVREG	Commander, Naval Region
COMREGSUPPGRU	Commander, Regional Support Groups
CWA	Clean Water Act (of 1977)
CWAP	Clean Water Action Plan
CZMA	Coastal Zone Management Act (of 1972)
DLA	Defense Logistic Agency
DoD	United States Department of Defense
DoD PARC	Department of Defense Partners in Amphibian and Reptile Conservation
DOI	United States Department of Interior
DoN	United States Department of the Navy
EA	Environmental Assessment
EFD	Engineering Field Division
EFH	Essential Fish Habitat
EO	Executive Order
EPA	United States Environmental Protection Agency
EPR	Environmental Program Requirements
ESA	Endangered Species Act
F.S.	Florida Statutes
FCMP	Florida Coastal Management Program
FDACS	Florida Department of Agriculture and Consumer Services
FDEP	Florida Department of Environmental Protection
FDOF	Florida Division of Forestry
FEMA	Federal Emergency Management Agency
FFWCC	Florida Fish and Wildlife Conservation Commission
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FLC	Fleet Logistics Center
FLUCFCS	Florida Land Use, Cover and Forms Classification System
FMIS	Forest Management Information System
FNAI	Florida Natural Areas Inventory
FONSI	Finding of No Significant Impact
FWPCA	Federal Water Pollution Control Act
FY	fiscal year
GFC	Game and Fish Commission

GIS	Geographic Information System
GPS	Geographic Positioning System
HSWA	Hazardous and Solid Waste Amendments
HWMP	Hazardous Waste Management Plan
ICW	Intracoastal waterway
INRMP	Integrated Natural Resources Management Plan
IPM	Integrated Pest Management
IR	Installation restoration
JP	Jet Propellant
LED	light-emitting diode
LMD	Land Management Department
LSJRB	Lower St. Johns River Basin
MBTA	Migratory Bird Treaty Act
METOC	meteorology and oceanography
MRSG	Marine Resources Support Group
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act (of 1996)
msl	mean sea level
MU	Mixed-Use (Functional Area)
MWR	Morale, Welfare, and Recreation
NAAQS	National Ambient Air Quality Standards
NAS	Naval Air Station
NAVFAC	Naval Facilities Engineering Command
NAVSTA Mayport	Naval Station Mayport
NAVSURGRU	Naval Surface Group
Navy	United States Department of the Navy
NCSU	North Carolina State University
NELP	Navy Environmental Leadership Program
NFD	Naval Fuel Depot
NGIS	Nay Gateway Inns and Suites
NLMOD	Naval Atlantic Meteorology and Oceanography Department
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRM	Natural Resources Manager
NRP	Natural Resources Plan
ONI	Office of Naval Intelligence
OP	Operational Protected (Functional Area)
OPA 90	Oil Pollution Act (of 1990)
OPNAVINST	Office of the Chief of Naval Operations Instruction
P	Protected (Functional Area)
PAH	polynuclear aromatic hydrocarbons
PIF	Partners in Flight
PMP	Pest Management Plan
PWC JAX	Public Works Center Jacksonville
PWO	Public Works Officer
RCRA	Resource Conservation and Recovery Act
RFI	Resource Conservation and Recovery Act Field Investigation

SAIA	Sikes Act Improvement Act
SERMC	Southeast Regional Maintenance Center
SJRWMD	St. Johns River Water Management District
SOO	Ship Operations Officer
NAVFAC SE	Southeast Division, Naval Facilities Engineering Command
SUBASE	Naval Submarine Base
SWIM	Surface Water Improvement and Management
SWMU	Solid Waste Management Unit
SWPPP	Stormwater Pollution Prevention Plan
SWPPT	Stormwater Pollution Prevention Team
T/A	Timber/Agricultural (Functional Area)
TIMU	Timucuan Ecological and Historic Preserve
TNC	The Nature Conservancy
U.S.C.	United States Code
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFS	United States Department of Agriculture Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UWA	Unified Watershed Assessment
WRAP	Wetlands Rapid Assessment Program

1.0 INTRODUCTION

1.1 PURPOSE AND ORGANIZATION

The purpose of this document is to meet statutory requirements under the Sikes Act Improvement Amendment (SAIA), Public Law 105-85, Div. B. Title XXIX, Nov. 18, 1997, 111 Stat 2017-2019, 2020-2022. In November 1997, the Sikes Act, 16 U.S.C. § 670a et seq., was amended to require the Secretary of Defense to carry out a program to provide for the conservation and rehabilitation of natural resources on military installations. To facilitate this program, the amendments require the Secretaries of the military departments to prepare and implement Integrated Natural Resources Management Plans (INRMP) for each military installation in the United States (U.S.) unless the absence of significant natural resources on a particular installation makes preparation of a plan for the installation inappropriate. The Act mandates that all military installations prepare and implement an INRMP by November 17, 2001. These plans are reviewed every year by military installations and modified as necessary. INRMP reviews are coordinated every 5 years with the U.S. Fish and Wildlife Service (USFWS) and the states.

The U.S. Department of the Navy (DoN) is preparing this INRMP for the Naval Station (NAVSTA) Mayport and Fleet and Industrial Supply Center Jacksonville Navy Fuel Depot (NFD) (Figure 1-1) to comply with the SAIA and with Department of Defense (DoD) Instruction (DoDINST 4715.3). This INRMP also complies with the Office of the Chief of Naval Operations Instruction (OPNAVINST) 5090.1C, Chapter 24, ASN (I&E) Memorandum of 12 August 1998, OUSD Memorandum of 21 September 1998, CNR ltr Ser N45D/8U589016 of 25 September 1998, and Chief of Naval Operations (CNO) ltr Ser N456F/8U589129 of 30 November 1998.

Other than the mandated requirement, the primary purpose of the INRMP is to provide the NAVSTA Mayport and NFD with a foundation from which to manage their natural resources. The INRMP will outline the management of the natural resources for NAVSTA Mayport and NFD over the next 10 years. The INRMP will account for the goals of the natural resources program within those 10 years, while not interfering with the military mission. The INRMP will also consider the surrounding natural resources through implementation of an integrated approach to management.

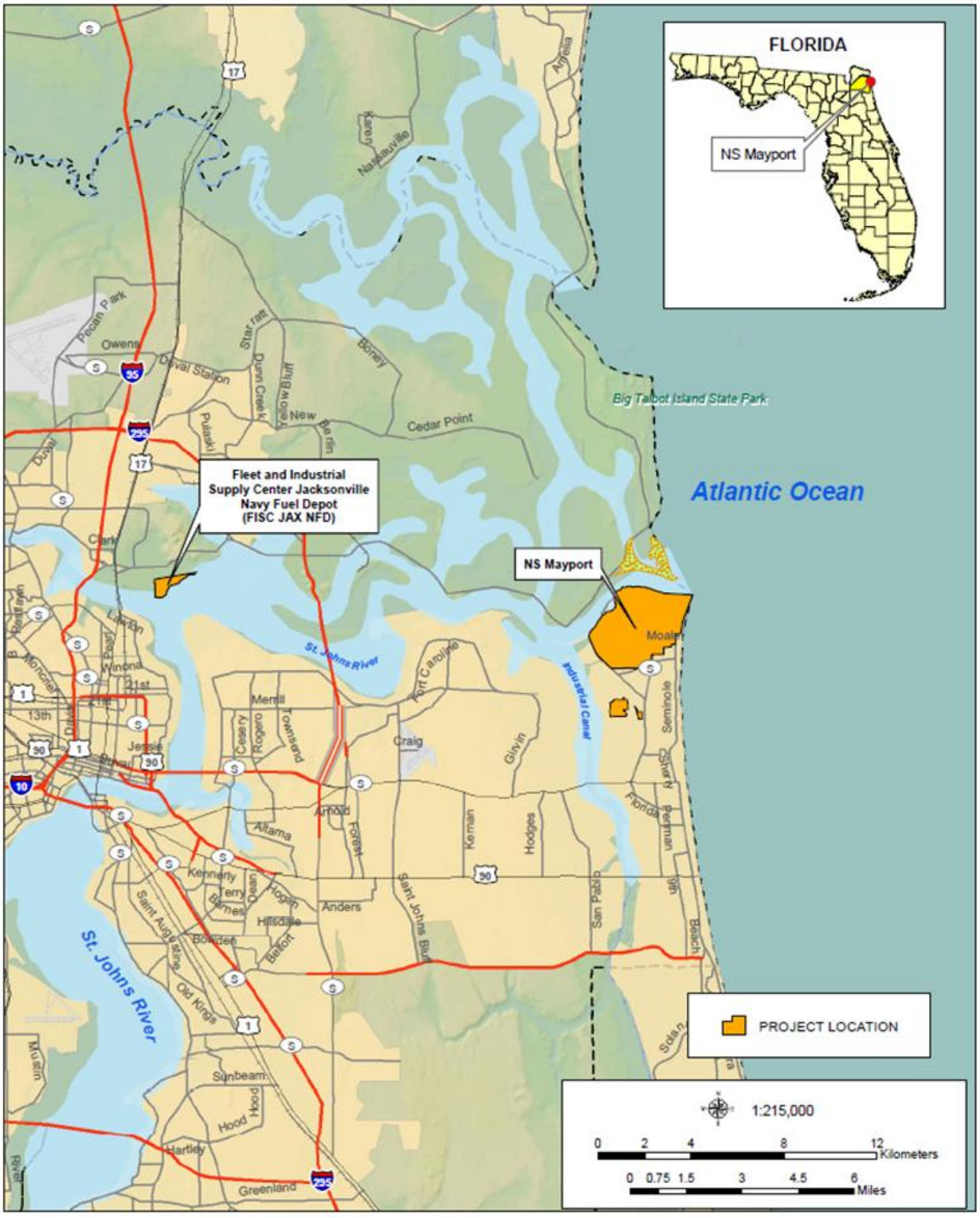

Figure 1-1. Vicinity Map of Naval Station Mayport and Industrial Supply Center Jacksonville Navy Fuel Depot.

The first three sections of this INRMP establish the existing conditions at the NAVSTA Mayport and NFD. Section 1 provides a general overview of the purpose and intent of the INRMP and processes for review, implementation, and revision of the plan. Section 2 establishes the importance of the military mission within the DoN, discusses the organization of the installation; provides a brief overview of the natural resources program; and identifies installation partnerships and stakeholders with a particular interest in the protection of installation and regional natural resources. Section 3 discusses the existing physical and biological characteristics of the local and regional environment. Physical characteristics include climate, topography, geology, soils, hydrology, groundwater, and land use. Biological characteristics include wetlands, threatened and endangered species, coastal zone issues, and natural vegetative communities.

The remaining sections of the INRMP identify issues pertaining to the long-term management of NAVSTA Mayport and NFD's natural resources and land management programs and practices for achieving desired conditions. Section 4 discusses ecosystem management goals, objectives, strategies, initiatives, and/or projects that comprise a logical sequence of actions for achieving the long-range aim of ecosystem management.

Section 5 discusses the environmental planning and mission suitability. Military mission components are addressed and encroachment areas of concern are identified. Section 5 also includes both an evaluation of impacts to the military mission from natural resources management and the impacts of natural resources management on the military mission.

Section 6 describes the projects that will be implemented by NAVSTA Mayport and NFD. Projects were identified by the NAVSTA Mayport Natural Resources Manager in consultation with foresters, fish and wildlife biologists, and soil conservationists with the Land Management Department of NAVFAC Southeast, as well as with Federal, state, and county wildlife biologists, foresters, and land managers. For each project, Section 6 discusses the purpose, location, description, cost, relevance to the goals and objectives listed in Section 4, baselines, and monitoring and legal requirements. It is the intent of NAVSTA Mayport to implement the projects as described in Section 6 to the greatest extent possible. The implementation of projects is largely dependent upon availability of funds. Recognizing the uncertainties in funding and the possibility of changes to NAVSTA Mayport's military mission and its civilian and military staffing, the implementation of projects will proceed as directly and completely as possible.

Section 7 discusses the natural resources management focus areas, including land management, forestry management, fish and wildlife management, and outdoor recreation. Management focus areas were developed for no net loss in capability of lands to support the military mission and to achieve the goals, objectives, and strategies discussed in Section 4. The management focus for an area defines the primary purpose for the land. All other long-term management practices will be implemented in support of the primary purpose.

1.2 ECOSYSTEM MANAGEMENT

In November 1997, the Sikes Act, 16 U.S.C. 670 a et seq., was amended to require the implementation of a program to provide for the conservation and rehabilitation of natural resources on military installations. The Navy's approach for management of natural resources is holistic in that it incorporates an awareness of the broad regional setting in which the installation is located. Appropriate and effective management of natural resources on Navy lands will be achieved in accordance with the principles and practices of ecosystem management.

Ecosystems are important components of environmental systems (Levine 1991). Ecosystem components, living and non-living, are linked together by numerous flows of matter and energy (Levine 1991). Ecosystems involve repetitive or cyclic phenomena and typically contain a great diversity and number of species, individual organisms, and abiotic components. The living members of ecosystems exhibit a wide array of behaviors, and intra- and interspecies interactions are varied and often subtle. Recognizing that crucial interdependencies exist within and between ecosystem components is important in establishing successful environmental management policies.

Ecosystem management is the centerpiece of environmental policy in the late 20th and early 21st centuries and is a unifying approach for the management of military lands. Ecosystem management's broad-based approach to natural resource management involves identifying, protecting, and restoring complete ecosystems — including abiotic structural components and natural processes — while fully incorporating social, economic, and other human concerns into planning (DoD 1996).

1.3 GOALS OF THE INTEGRATED NATURAL RESOURCE MANAGEMENT PLAN (INRMP)

The INRMP is a management-planning document that establishes a guideline for the use and conservation of natural resources on lands and water under DoD control. Currently, DoD is one of the largest landholders in the U.S, with more than 20 million acres. Some of the most environmentally sensitive properties in the U.S., including sensitive species and/or sensitive vegetative communities, occur within these lands.

The development and implementation of the INRMP is a dynamic, multidisciplinary planning process that incorporates as its primary goal the support and maintenance of the military mission while managing, protecting, and enhancing the biological integrity of military lands and waters. The military's use of land and water resources must comply with legal mandates and will, to the extent practicable, be integrated with ecosystem-level goals, plans, and use of lands and waters inside and outside the boundaries of military installations.

1.4 IMPLEMENTATION OF THE INRMP

Implementation of the INRMP for both NAVSTA Mayport and NFD will follow an annual strategy that addresses legal requirements, funding, implementation responsibilities, technical assistance, labor resources, and technological enhancements.

1.4.1 Legal Requirements

Legal requirements are laws, executive orders, regulations, directives, and memoranda regarding the protection and management of natural resources. The INRMP will be updated as legal requirements change. Relevant legal requirements for natural resources management are presented throughout Section 4.

1.4.2 Funding

The funding for implementation of the INRMP will come from the installation, Chief of Naval Education and Training (Major Claimant as appropriate), or Naval Facilities Engineering Command (NAVFAC) natural resources fund sources. The natural resources programs and projects described in this INRMP are divided into mandatory and stewardship categories to reflect implementation priorities. Every effort will be made to acquire operation and maintenance, Navy

[O&M(N)], environmental, or other funding to implement DoD mandatory projects, in the timeliest manner possible. Stewardship-type projects will be funded through forestry, agricultural outlease, fish and wildlife, Legacy Fund, or other fund sources.

1.4.3 Implementation Responsibilities

The NAVSTA Mayport Commanding Officer (CO) is responsible for management of all natural resources. The CO has delegated implementation authority for natural resources management activities to the installation Environmental Program Director (IEPD). Other installation personnel within Security, Morale, Welfare, and Recreation (MWR), Housing, Air Operations, Harbor Operations, and Safety have functions overlapping the natural resources program (see Section 2.4) and will coordinate with the IEPD on natural resources related issues.

1.4.4 Technical Assistance

Technical assistance to NAVSTA Mayport and the NFD may be provided from within the DoN or by outside agencies. Assistance from outside agencies is normally provided through individual agency requests and formal cooperative agreements, while assistance from within DoN is normally less formal. During the 10-year management period of this INRMP, additional cooperative agreements may be implemented.

Technical assistance from organizations outside the DoN will include:

- The U.S. Fish and Wildlife Service (USFWS) and the Florida Fish and Wildlife Conservation Commission (FFWCC), under a Cooperative Agreement among the Navy, the U.S. Department of the Interior (DoI), and the State of Florida;
- The Nature Conservancy (TNC), under a Cooperative Agreement between DoD and TNC; and
- Other government agencies, such as the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), U.S. Forest Service (USFS); Florida Department of Agriculture and Consumer Services (FDACS), Florida Division of Forestry; Florida Department of Environmental Protection (FDEP); Duval County foresters and land management professionals; and City of Jacksonville (COJ).

Technical assistance from within the Navy will be provided by:

- Naval Air Station (NAS) Jacksonville's and Submarine Base (SUBASE) Kings Bay's Public Works managers and foresters;
- NAVSTA Mayport Natural Resources personnel;
- Command Navy Region Southeast (COMNAVREG Southeast) Natural Resources staff; and

- Foresters, fish and wildlife biologists, and soil conservationists from the LMD of NAVFAC Southeast.

1.4.5 Labor Resources

Options for supplemental labor resources from outside the DoN for implementation of the INRMP include volunteers from local organizations and groups such as:

- Scout troops;
- Elementary, middle, or high school students;
- College students;
- Ecology clubs and conservation programs/groups (*e.g.*, the Student Conservation Association);
- Businesses/Homeowners' associations; and
- Retired/senior citizens.

Options for supplemental labor resources from within the installation include the Natural Resources Manager and volunteer civilian and military personnel, and their dependents.

1.5 APPROVAL, FUNCTION, USE, AND REVISION PROCESS OF THE INRMP

1.5.1 Approval of the INRMP

The INRMP is required to be signature-endorsed by the subject NAVSTA Mayport CO and IEPD, the Natural Resources Manager, the NAVFAC Southeast Natural Resources Manager, and COMNAVREG Southeast. According to the SAIA, the INRMP must reflect mutual agreement by the USFWS and the FFWCC. Mutual agreement will concern conservation, protection, and management of fish and wildlife resources and will be indicated by the signing of the appropriate agency representatives.

1.5.2 Function and Use of the INRMP

The INRMP will outline the management of the natural resources at NAVSTA Mayport and NFD for the next 10 years. To accomplish this, the INRMP presents long-term management concepts that are consistent with the management of natural resources and fulfillment of the military mission. The long-term management concepts do not represent any incremental or specific approach to management, but rather to provide a philosophy and direction for the Natural Resources Manager and DoN decision-makers to ensure long-term sustainability of natural resources. It is not necessarily the function of the INRMP to define specific projects for specific

locations, nor to define specific practices or schedules for the individual components of natural resources management, which include land management, forestry, fish and wildlife, and outdoor recreation.

Specific practices and schedules are addressed in the existing management plans. The programs are developed for, but not limited to, grounds maintenance and stormwater pollution and prevention. These plans and programs adhere to Federal and state regulatory requirements and will be utilized as tools for implementing this plan. These plans are dynamic, updated periodically, and will be inclusive of the goals and objectives identified in this INRMP.

1.5.3 Revision Process

In accordance with OPNAVINST 5090.1D, 12-3.4(c)(10), the INRMP for the NAVSTA Mayport and NFD will be reviewed and updated on a yearly basis and re-approved every 5 years. The review and update process will take into account changes in military mission requirements, legal mandates, and information obtained from monitoring programs and surveys. Revisions will be reviewed for consistency with the military mission, Federal and state laws, and the ecosystem management goals and objectives of the INRMP.

NAVSTA Mayport must complete an evaluation of the effectiveness of this INRMP annually. Using the web-based Metrics Builder tool on the Natural Resources Data Call Station website (https://clients.emainc.com/dcs/navfac/), the evaluation can be readily completed. The Metrics Builder provides the means to evaluate performance in seven areas:

- INRMP Implementation
- Partnership/Cooperation and Effectiveness
- Team Adequacy
- INRMP Impact on the installation Mission
- Status of Federally Listed Species and Critical Habitat
- Ecosystem Integrity
- Fish and Wildlife Management and Public Use

Annual reviews of the NAVSTA Mayport INRMP will include annual revisions so that the review and revision processes are integrated.

The revision process will be conducted under the direction of the installation CO. Revisions will require consultation with and approval by the installation CO, IEPD, the installation Natural

Resources Manager, the Natural Resources Manager of the Engineering Field Division (EFD) of NAVFAC Southeast, the USFWS, and the FFWCC.

1.6 NECESSARY ELEMENTS OF THE INRMP ADDRESSED

1.6.1 Essential Fish Habitat

NAVSTA Mayport and NFD

The Magnuson-Stevens Fishery Conservation and Management Act of 1996 (MSFCMA) suggest that the National Marine Fisheries Service (NMFS), the regional fishery management councils, and the Secretary of Commerce describe and identify essential fish habitat (EFH) for important marine and anadromous fish habitat for species under Federal Fishery Management Plans. EFH includes all waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity and extends from offshore habitats to inland areas to where the salt-water influence subsides.

The St. Johns River contains important areas of submerged aquatic vegetation (SAV) that provide nursery and refuge areas for commercially important fish and invertebrates (St. Johns River Water Management District [SJRWMD] 1993). In fact, the St. Johns River contains a high potential for EFH designation. Over 115 euryhaline species, species that tolerate a wide range of salinity, including shads, herrings, drums, weakfish, spot, croaker, and others, are found within the St. Johns River (NOAA 1998). In accordance with the consultation requirements of §305(b) of the Magnuson-Stevens Act (16 U.S.C. 1855[b]), NAVSTA Mayport, as a Federal entity, must consult with the Secretary of Commerce on all actions or proposed actions authorized, funded, or undertaken that may adversely affect EFH.

The Atlantic Ocean also contains areas of EFH located around NAVSTA Mayport. However, it is determined that the implementation of this INRMP will not result in management actions or projects that will adversely affect EFH, but will improve water quality through implementation of the actions of this INRMP.

1.6.2 Coral Reefs

NAVSTA Mayport and NFD

In accordance with Executive Order (EO) 13089, Coral Reef Protection of 11 June 1998, which requires Federal agencies to protect and enhance coral reefs and coral reef systems, the DoN

recognizes that coral reefs and related endemic mangrove and sea grass ecosystems are biologically rich and diverse habitats. There are no coral reef systems within the area of influence of this INRMP.

1.6.3 Clean Water Action Plan

NAVSTA Mayport and NFD

The Clean Water Action Plan (CWAP) focuses on watersheds with the most critical water quality problems and takes a cooperative approach to developing and implementing effective strategies to solve those problems. Unified watershed assessments (UWAs) provide the foundation for this approach to restoring and protecting water quality and are vehicles to identify:

- watersheds that will be targeted to receive new resources to clean up waters that are not meeting water quality goals;
- pristine or sensitive watersheds on Federal lands where core Federal and state programs can be brought together to prevent degradation of water quality; and
- threatened watersheds that need an extra measure of protection and attention.

The U.S. Environmental Protection Agency (EPA) categorizes the LSJRB as a Highest Restoration Priority UWA. Implementation of this INRMP will not adversely affect water quality, but would be expected to protect and enhance water quality on and in areas surrounding NAVSTA Mayport and NFD.

1.6.4 Bird Air Strike Hazard (BASH) Reduction

NAVSTA Mayport

The BASH reduction plan addresses all actions to identify, reduce, or eliminate bird and/or other animal hazards to aviation within NAVSTA Mayport. The plan establishes procedures to minimize the hazards of a bird aircraft strike; procedures include identifying high hazard situations and bird watch conditions, establishing airfield operating procedures to avoid high hazard situations, decreasing airfield attractiveness to birds, and providing guidelines for dispersing birds on the airfield. The BASH Plan for NAVSTA Mayport is discussed in further detail in Section 4 of this INRMP.

NFD

A BASH management plan is not required for NFD because of the absence of air operations requiring a management program.

1.6.5 Critical Habitat

NAVSTA Mayport and NFD

Section 1532 (5) (A) of the Endangered Species Act (ESA) defines critical habitat for threatened or endangered species. At NAVSTA Mayport and NFD, there are no areas designated as critical habitat for threatened or endangered species. However, the St. Johns River establishes the northern and northwestern boundary of NAVSTA Mayport and the southern boundary of NFD and is designated by the USFWS as critical habitat for the Florida manatee (*Trichechus manatus latirostris*). Coastal waters of the western Atlantic have been designated as critical habitat for the North Atlantic right whale (*Eubalaena glacialis)*. Actions outlined in this INRMP should improve critical habitat conditions by improving water quality, preserving wetlands, and educating the public, through community outreach, about critical habitat in the area.

1.6.6 Public Access

NAVSTA Mayport

In accordance with OPNAVINST, the Navy shall provide controlled public access to hunting, fishing and other recreational resources on the installation, where such access can be granted without conflicting with the military mission. In granting access privileges to persons other than those assigned to or living on military installation, usage will vary, depending upon the amount of suitable land and water resources available.

In general, access for all outdoor recreation pursuits is available to active duty military personnel assigned to NAVSTA Mayport, their dependents and accompanied guests, Federal civilian employees assigned to the NAVSTA Mayport, and military retirees. However, NAVSTA Mayport may be off limits during certain security conditions which may change without notice.

The general public is also allowed access to Helen Cooper Floyd Memorial Park (formerly known as Little Jetties Park) through lease agreements with the COJ Parks and Recreation Department. These agreements convey maintenance and operation responsibilities of these properties to the COJ. Helen Cooper Floyd Memorial Park provides unrestricted public access for recreational activities. School groups, conservation groups, and other interested individuals are allowed access to nature trails.

NAVSTA Mayport also offers guest passes to the general public. Applicants do not have to have any affiliation to the base. They have to apply for the pass and go through a background check.

The guest passes allow access to all NAVSTA Mayport facilities such as: golf course, beach, and fishing ponds and piers.

Because of the location of NAVSTA Mayport and its proximity to numerous fishing resources, fishing is one of the more popular recreational activities. Therefore, fishing within all authorized areas on NAVSTA Mayport are available to persons holding a military identification card, their dependents and persons holding a Government Common Access Card (CAC). Special Fishing Pass holders may fish from the South Jetty only. All fishing activities are limited from sunrise to sunset (times as published in the Station Plan of the Day).

NFD

Public access to the NFD is limited to active duty/retired military personnel and Federal civilian employees. No recreational opportunities are present at the NFD.

1.6.7 Law Enforcement

NAVSTA Mayport and NFD

Enforcement of laws protecting or conserving natural resources is an integral part of the natural resources program. The installation does not have a Wildlife Protection Officer; rather wildlife compliance, stranding, and safety issues are handled by environmental and security personnel. Environmental personnel address permit compliance, such as for sea turtle nesting and migratory birds. Since the game warden billet was dropped in 2012, Environmental personnel also address injured wildlife and strandings. Support includes:

- Sea Turtle Recovery (Allen Foley): 904-591-1285
- Marine Mammal Issues (Nadia Gordon): 904-237-4088
- Alligator Emergencies (FWC): 866-FWC-GATOR (866-392-4286)

1.6.8 Agricultural Outleasing

NAVSTA Mayport and NFD

Neither the NAVSTA Mayport nor the NFD engage in agricultural outleasing. Because of the absence of available land for agricultural outleasing, the conservation of land for agricultural outleasing is not discussed in further detail in this INRMP.

1.6.9 Florida Coastal Management Program

NAVSTA Mayport and NFD

The Florida Coastal Management Program (FCMP), the State of Florida's Federally approved management program for the implementation of the Coastal Zone Management Act (CZMA) of 1972, 16 U.S.C. 1451 et seq., was approved in 1981 by NOAA. The FCMP compiles 23 Florida Statutes (F.S.), which are administered by 11 state agencies and four of the five state water management districts, to ensure the wise use and protection of the state's water, cultural, historic and biological resources; to minimize the state's vulnerability to coastal hazards; to ensure compliance with the state's growth management laws; to protect the state's transportation system; and to protect the state's proprietary interest as the owner of sovereign submerged lands.

1.6.10 Migratory Birds

NAVSTA Mayport and NFD

Migratory birds are specifically protected under the Migratory Bird Treaty Act (MBTA) of 1918, as amended and EO 13186 of January 10, 2001, *Responsibilities of Federal Agencies to Protect Migratory Birds.* The MBTA makes it illegal to pursue, hunt, kill, capture, possess, buy, sell, purchase, or barter any migratory bird, including the feathers or other parts, nests, eggs, or migratory bird products, except as allowed by the implementing regulations. EO 13186 requires that Federal agencies avoid or minimize the impacts of their activities on migratory birds and make efforts to protect birds and their habitat. In December 2017, the Principal Deputy Solicitor released a memorandum stating that the acts prohibited under MBTA are only prohibited if done so intentionally, which is a different legal opinion than previous administrations held. However, the Navy is beholden to Section 315 of the 2003 National Defense Authorization Act (NDAA), which provides an exemption to the Navy for the incidental taking of migratory birds during military readiness activities authorized by the Secretary of Defense or the Secretary of the Navy. Under this statute, the Navy must still assess impacts, through the NEPA process, of proposed or ongoing military readiness activities on migratory bird species likely to occur in the action areas. Implementation of the INRMP will not adversely affect migratory birds at NAVSTA Mayport or NFD. INRMP implementation will benefit migratory bird species through the implementation of projects, including surveys to determine migratory bird use on NAVSTA Mayport.

1.7 MISSION ACTIVITIES IMPACTING NATURAL RESOURCES

Although this document will be primarily used as a natural resources planning document, a significant emphasis is placed upon the installation's ability to successfully perform its military mission. To accomplish its mission, NAVSTA Mayport has several construction projects planned that will minimally impact natural resources; these projects are explained below. Projects require consultation with the U.S. Fish and Wildlife Service (USFWS) and/or National Marine Fisheries Service (NMFS) if they may affect listed species and prior consultation has not been completed. Several construction projects are planned at NFD; however, none of them will have an impact on natural resources since the construction will occupy existing industrial areas of the site.

1.7.1 Littoral Combat Ship (LCS) Support Facilities

The Navy is constructing logistics support facilities with reinforced concrete foundation, masonry walls, and pitched standing seam metal roofs. The facilities will include classrooms, operations watch floors, reference libraries, storage, administrative office space, video-teleconference (VTC) conference rooms and crew lounges to support the LCS mission at Naval Station Mayport.

1.7.2 South Quay Wall Recapitalization

The existing concrete pile cap, wharf deck, and utilities at the South Quay Wall (between Wharves Delta and Foxtrot) are being demolished and replaced, and a new bulkhead will be constructed around the wharf.

1.7.3 NFD Pipeline Replacement

All existing below ground piping will be replaced at the NFD (6 lines; up to 1,800 linear feet each) located between the fuel pier and the JP-5 pump station. New above-ground piping will also be installed (3 lines; up to 1,800 linear feet each).

1.7.4 Routine Maintenance Dredging Activities

NAVSTA Mayport performs routine dredging to ensure the continuance of the military mission at the installation through permits with the USACE and the FDEP. These permits ensure that all mitigation measures to protect the environment and associated species have been considered. This INRMP will not regulate dredging activities on the installation.

The storage of dredged material on the installation has recently become a concern because of the lack of storage space for the dredged material. Currently, all dredged material is disposed of offshore under a USACE permit. A feasibility study is planned for other uses of dredged materials.

All options concerning the disposition of dredged material will be distributed to the appropriate agencies to ensure that the selected use will not have adverse environmental impacts.

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2.0 LOCATION AND HISTORY

2.1 LOCATION

NAVSTA Mayport

NAVSTA Mayport is located at the mouth of the St. Johns River, approximately 15 miles east of the Jacksonville Central Business District in Duval County, Florida. It is bordered to the north by the St. Johns River, to the south by the COJ, to the east by the Atlantic Ocean, and to the west by the Village of Mayport and the Atlantic Intracoastal Waterway (ICW) (Figure 2-1). As mentioned earlier, NAVSTA Mayport also includes two off-base areas: Greenfield Plantation and Ribault Bay Village Housing. The Ribault Bay Village Housing area is located off base on Navy-owned property approximately 3 miles south of NAVSTA Mayport's main gate, west of Mayport Road, near the end of Asissi Lane. The Greenfield Plantation is located off base to the west of the installation.

NFD

The NFD is located in Duval County approximately 7 miles north of downtown Jacksonville and approximately 1 mile east of the intersection of Interstate 95 and State Highway 105 (Figure 2-2). The facility is located on a 180-acre parcel on the northern bank of the St. Johns River.

History

NAVSTA Mayport

The history of the Navy in Mayport began during the early stages of World War II when Mayport was selected to become the second southeast naval installation. When the base was commissioned in 1942, it occupied less than one quarter of the present acreage. In 1943, Mayport was reclassified as a Naval Section Base. During 1942, a landing field and taxiway were completed and Mayport became a maintenance and fueling facility for submarines. The Naval Auxiliary Air Station was commissioned at Mayport on April 1, 1944. In 1945, the air station encompassed the entire site, including the pier and docking facilities. At the end of World War II, Mayport was decommissioned and placed in a caretaker status.

In June 1948, Mayport was reactivated as a Naval Outlying Landing Field. By 1951, construction had begun for a carrier pier. USS Tarawa (CVS-40) was stationed at Mayport after the pier was

completed. By July 1, 1955, Mayport became a Naval Auxiliary Air Station once again and had grown considerably in land area, command importance and activity representing an investment of nearly $10 million. The Naval Auxiliary Station included a jet runway, 8,000 feet long, as well as an additional 4,200-foot runway. After completion of this infrastructure, Mayport was redesignated as NAVSTA Mayport.

NAVSTA Mayport received national exposure in 1962 during the Cuban missile crisis when NAVSTA Mayport served as an advanced staging area. From 1982 to 1984, ships homeported at NAVSTA Mayport were involved in operations off the coast of Beirut, Lebanon and in Grenada. In October 1982, Naval Air Facility Mayport was established. NAVSTA Mayport is now the East Coast home for the Light Airborne Multi-Purpose System (LAMPS) MK III community. As a reflection of its growth, Mayport Naval Air Facility was redesignated as a Naval Air Station in September 1988. In August 1990, after the Iraqi invasion of Kuwait, Mayport units in the USS *Saratoga* Battle Group and other ships from Mayport, including USS *Leyte Gulf*, USS *Vreeland*, USS *Impervious*, and USS *McInerney* deployed to the region.

NAVSTA Mayport is currently home to more than 70 tenant commands including the aircraft carrier USS *John F. Kennedy*, 22 other naval vessels, one battle group staff, two destroyer squadrons, the U.S. Forces Southern Command, three commercial shipyards and six helicopter squadrons for a total of more than 15,000 sailors and civilians making NAVSTA Mayport the third largest fleet concentration area in the U.S.

NFD

In 1949, the Navy acquired the NFD. The facility had four tanks and was operated under NAS Jacksonville as a Fleet Refueling Unit. Nine additional tanks, seven 80,000-barrel floating roof tanks, and two 20,000-barrel tanks were added to the fuel depot as part of an expansion program in 1952. By 1982, the NFD became Navy Supply Center Jacksonville, and in 1992 was renamed NFD. The NFD is currently owned by NAVSTA Mayport, operated by Fleet Logistics Center (FLC) JAX, and distributes fuel to multiple locations throughout the southeast.

Figure 2-1. Base Map of Naval Station Mayport.

Figure 2-2. Base Map of Fleet and Industrial Supply Center Jacksonville Navy Fuel Depot (NFD).

2.2 ORGANIZATION AND STRUCTURE

NAVSTA Mayport

NAVSTA Mayport supports a variety of tenant and support commands that provide various services toward the successful achievement of the military mission. NAVSTA Mayport's major operational tenant commands include one battle group staff, two destroyer squadrons, 23 ships (including an aircraft carrier), and six helicopter squadrons. Additionally, the installation has major training and repair tenant commands and facilities.

NFD

The NFD personnel are part of the FLC command which reports to NAVSUP. As such, it is responsible for the operation of the Government-owned, Government-operated (GOGO) fuel terminal, including maintenance of the facility in compliance with Federal, state, and local laws and regulations. As a GOGO facility, the NFD operates with a government staff and various contracted personnel (*e.g.*, security).

Control of the NFD real estate (Class I) and facilities (Class II) has been transferred to NAVSTA Mayport. However, fuel operations, including management and daily activities, continue to function under the NAVSUP Systems Command. As a Class I property owner, NAVSTA Mayport is responsible for managing the natural resources program at NFD. The forest management program for the NFD is the responsibility of the NAVSTA Mayport IEPD who may require assistance from the NAS Jacksonville Forestry Technician or the NAVFAC Southeast Natural Resources Department.

The NFD is part of a DoD worldwide bulk petroleum management mission. NAVSUP is tasked by the DoD, through the Navy, to plan, program, budget, and fund operations, maintenance, and repair for all FLCs. The NFD is operated and maintained by FLC JAX and receives funding from Defense Logistics Agency (DLA) Energy for fuel management projects. DLA Energy funds projects related to the maintenance, repair, and environmental cleanup of the bulk petroleum, oil, and lubricants (POL) facilities. Other funding and technical assistance may be requested from NAVFAC Southeast. When necessary, NAVFAC Southeast and COMNAVREG Southeast will provide specific assistance, which may include contract support, plan preparation and implementation, technical and natural resources personnel, and overall guidance. DLA Energy has jurisdiction over the NFD's fuels management.

2.3 OVERVIEW OF NATURAL RESOURCES MANAGEMENT

NAVSTA Mayport and NFD

Funding, preparation, and implementation of natural resources management are ultimately the responsibility of the NAVSTA Mayport CO. In order to implement its INRMP, the CO has delegated authority to various departments under his/her command. The Environmental Department manages natural resources and is directly involved in the implementation of the cooperative agreement and specific management actions. Grounds maintenance activities are maintained by the PWC Jacksonville through a service contractor. The BASH requirements are the responsibility of the Air Operations Officer (AOO), with the cooperation of the Natural Resources Manager. The forest management program for NAVSTA Mayport is the responsibility of the Environmental Department with the cooperation of the Jacksonville Complex and SUBASE Kings Bay, and implementation of the land management plan is carried out by the Public Works Officer (PWO). Outdoor recreation resource management is the joint responsibility of the CO and the MWR Director, with the cooperation of the Environmental Department.

NAVSTA Mayport's commands provide various services toward the successful achievement of the military mission. Presently, tenant commands on the installation are required to coordinate any facility modification activities with the Public Works Office.

Funding and technical assistance may be requested from NAVFAC Southeast. When necessary, NAVFAC Southeast and COMNAVREG Southeast will provide specific assistance, which may include contract support, plan preparation and implementation, technical and natural resources personnel, and overall guidance.

2.4 STAKEHOLDERS AND PARTNERS

Stakeholders are those organizations or individuals who have a vested interest in the natural resources and/or management of natural resources on the installation; stakeholders primarily include adjacent landowners. NAVSTA Mayport and NFD understand the importance of participating with the surrounding community in addressing natural resources conservation and protection and in maintaining communications among the installation, stakeholders, and other interested parties. Such efforts complement the overall philosophy of active partnering and sharing of information and resources with other resource management agencies and

organizations, including Federal, state, and local governmental agencies, and other non-governmental organizations.

- Federal stakeholders include the NRCS, USACE, the NPS, Timucuan Ecological and Historic Preserve (TIMU), and the USFWS.
- State stakeholders include FDEP, FFWCC, SJRWMD, and the Florida Division of Forestry (FDOF).
- Other stakeholders include the Village of Mayport, numerous City of Jacksonville (COJ) and Duval County governmental entities, environmental conservation organizations, and various individual landowners.

Partnerships and cooperative arrangements include Federal and state agencies and volunteer organizations and provide various levels of technical assistance, such as personnel, planning, monitoring, and inventories of natural resources. Agreements between Federal agencies and NAVSTA Mayport exist with the USFWS, the NPS, NRCS, and USDA. Agreements between state agencies and NAVSTA Mayport exist with the Florida Division of Parks and Recreation for recreation planning assistance and the FDOF for technical assistance in forestry management. The FFWCC works with the USFWS to provide fishery and wildlife biologists. NAVSTA Mayport also coordinates efforts with volunteer organizations to supplement its limited personnel resources.

The Navy is a member of several conservation partnerships, including Partners in Flight (PIF), which focuses on bird conservation (www.partnersinflight.org) and DOD Partners in Amphibian and Reptile Conservation (DoD-PARC), which focuses on herpetofauna conservation (www.dodnaturalresources.net/DoD-PARC.html). Additionally, the Marine Resources Support Group (MRSG) is a network of Navy environmental professionals who work together to meet the environmental planning and compliance requirements for Navy at-sea training and testing (www.navfac.navy.mil/products_and_services/ev/products_and_services/marine_resources.html). All of these partnerships offer excellent networking opportunities to help manage fish and wildlife on NAVSTA Mayport.

2.5 PLANS, PROGRAMS, AND STUDIES

2.5.1 Installation Restoration Program

NAVSTA Mayport

Before Federal environmental remediation laws existed, the DoD developed a proactive program to address the environmental conditions created by the release of chemicals and petroleum products, or contaminants, from past spills, and disposal practices. This program is known as the Installation Restoration (IR) Program and is conducted at NAVSTA Mayport to comply with the Resource Conservation and Recovery Act (RCRA) of 1976 as amended by the Hazardous and Solid Waste Amendments (HSWA).

Wastes generated by the installation are normally associated with ship, on-shore maintenance and flight operation activities. Under the IR program, NAVSTA Mayport has identified contaminated solid waste management units (SWMU) or Area of Concern (AOC) to facilitate the cleanup evaluation. The NAVSTA Mayport restoration sites are shown in Figure 2-3.

NFD

The NFD has identified a total of 16 IR sites within the installation; their locations are illustrated in Figure 2-4.

2.5.2 Stormwater Pollution Prevention Plan

NAVSTA Mayport

Stormwater on NAVSTA Mayport is managed according to the NAVSTA Mayport Stormwater Pollution Prevention Plan (SWPPP). The SWPPP establishes engineering and management strategies to improve the quality of the stormwater runoff from the installation's industrial areas. The SWPPP was prepared in accordance with OPNAVINST 5090.1D and the EPA National Pollutant Discharge Elimination System (NPDES) program under the Federal Water Pollution Control Act (FWPCA), as amended by the Clean Water Act (CWA) of 1977. The EPA has issued an NPDES Multi-Sector Permit (# FLR05A970) to NAVSTA Mayport.

The SWPPP divides NAVSTA Mayport into 61 drainage basins, 40 of which contain industrial activities. Each of these basins drain primarily into one of the following: northerly to the Turning Basin and St. Johns River; southerly toward Lake Wonderwood and a marsh area; or westerly toward Chicopit Bay. Within these three areas, there are approximately 40 direct discharges (*e.g.*,

Figure 2-3. Installation Restoration Sites at Naval Station Mayport.

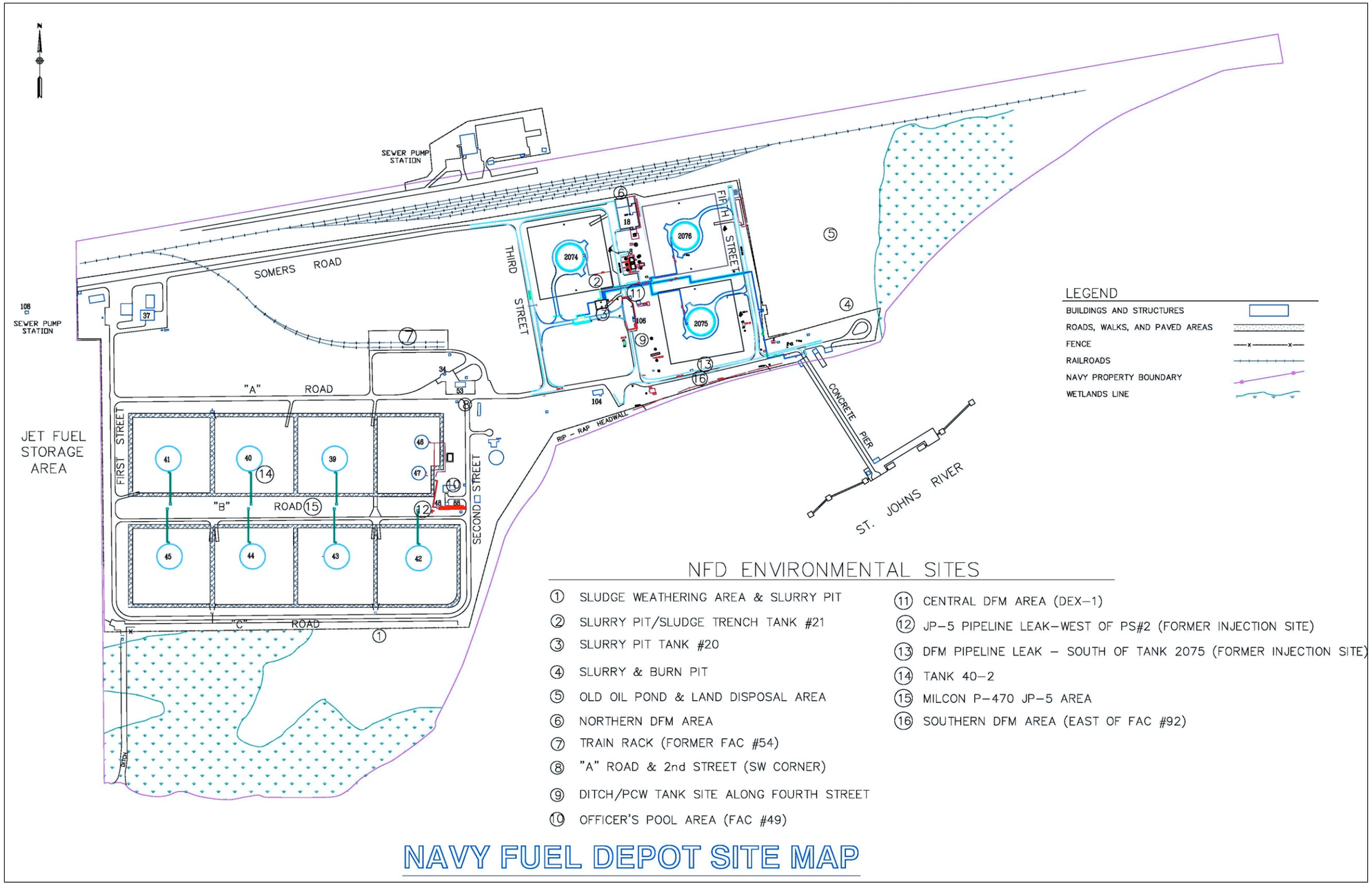

Figure 2-4. Installation Restoration Sites at Fleet and Industrial Supply Center Jacksonville Navy Fuel Depot (NFD).

drainage pipes or concrete ditch flow) and 21 locations that drain by sheet flow to low points with no apparent outfall (Navy 1997). For each industrial activity, the SWPPP performs three major functions:

(1) stormwater monitoring;
(2) best management practices (BMP) implementation; and
(3) comprehensive site compliance evaluations.

The SWPPP does not address stormwater management in non-industrial drainage basins on NAVSTA Mayport. The stormwater in the non-industrial basins are managed by the Municipal Separate Storm Water Sewer System (MS4) permit number FLRO4E056. Stormwater run-off at the Ribault Bay Village Housing area flows naturally over the site to the west and south, eventually discharging into the ICW.

NFD

Stormwater on the installation is managed in accordance with the NFD SWPPP. The SWPPP establishes engineering and management strategies to improve the quality of the stormwater runoff from the facility's industrial areas, and was prepared according to 5090.1C and to comply with the EPA NPDES program under the FWPCA, as amended by the CWA of 1977. The NFD holds NPDES Industrial Wastewater Permit No. FL0032492 and NPDES MSGP Facility ID FLR05F756-002, as issued by the EPA and, subsequently, delegated to FDEP.

The pollution prevention approach of the SWPPP focuses on three major objectives:

1) identification of pollution sources;
2) minimization and control of stormwater pollutants; and
3) ensuring compliance with permit conditions.

The SWPPP is managed by various facility personnel, including the IEPD, Fuel Department Head, Hazardous Materials Coordinator, and Safety Manager, with delegated authority from the CO.

The SWPPP has three major components for industrial areas: stormwater monitoring, site compliance evaluation, and the implementation of BMPs. The SWPPP divides the installation into

eight drainage basins; industrial activities occur on seven of the basins. The stormwater in the non-industrial basin is managed by MSG permit number FLR05F756.

2.5.3 Pest Management Plan

NAVSTA Mayport and NFD

NFD and NAVSTA Mayport's pest management and control services are provided through a NAVFAC Southeast service contract. The final draft Pest Management Plan (PMP) was prepared for NAVSTA Mayport with technical support from NAVFAC Southeast in 2008; it is being updated in 2013. Services addressed by the PMP are:

- maintaining all structures through subterranean termite and nuisance pest control;
- maintaining the safety and security of the industrial, airfield, and storage areas through weed control;
- controlling weed and insect pests in all maintained areas;
- providing control of mosquitoes, flies, and other potential disease vectors; and
- providing vertebrate pest control, including rodent control, to all areas of the base. This includes the control of birds in and around buildings and runways where they interfere with airplane take-offs and landings, in accordance with the BASH Reduction Plan.

2.5.4 Landscaping/Grounds Maintenance Plan

NAVSTA Mayport and NFD

The grounds maintenance program at NAVSTA Mayport and NFD is maintained by NAVFAC Southeast through a service contract agreement. In accordance with the agreement, the contractor provides all labor, supervision, equipment, and materials necessary to perform all maintenance activities for improved and semi-improved grounds. Maintenance activities include, but are not limited to, grass cutting, edging, and fertilizing; cultivation and mulching of shrubbery, hedgerows and flowerbeds; tree and shrub pruning; raking; and pest control. The contractor is also responsible for the inspection, operation, and maintenance of all primary installation surface-drainage systems. Smaller drains are maintained on an as-needed basis.

2.5.5 Surface Water Improvement and Management Plan

NAVSTA Mayport and NFD

In 1987, the Florida Legislature enacted the Surface Water Improvement and Management (SWIM) Act (Chapter 87-97, Laws of Florida, and Chapter 373.451-373.4596, F.S. amended). The SWIM Act declared several of Florida's water bodies as being seriously degraded and in

need of restoration and management. An interim SWIM plan was developed for the LSJRB in 1988; all of the NFD and NAVSTA Mayport is within the LSJRB (SJRWMD 1999). The goals of the LSJRB SWIM plan include:

- protecting and restoring the LSJRB's surface water quality to Class III standards or better by controlling point and non-point sources of pollution;
- restoring and protecting natural systems associated with the basin's surface waters;
- increasing public awareness of water resource problems and generating public support for restoration and protection efforts; and
- enhancing interagency coordination and management of water resources throughout the basin.

The LSJRB SWIM plan outlines various projects including monitoring activities, assessment efforts, feasibility studies, and restoration or clean-up projects to achieve the goals. Both the NFD and NAVSTA Mayport have similar plans.

2.5.6 Surveys of Rare Plants, Rare Vertebrates, and Natural Communities-Naval Station Mayport

NAVSTA Mayport

Rare, threatened and endangered (RTE) plant and animal surveys were conducted at NAVSTA Mayport in 1995 and 2010-11 (FNAI 1995; GSRC 2011), and comprehensive bird surveys were conducted in 2002-04, 2006-07, and 2014-15 (NAVFAC Southdiv. 2004; GSRC 2015). Federally-threatened piping plovers (*Charadrius melodus*), rufa red knots (*Calidris canutus* ssp. *rufa*), and wood storks (*Mycteria americana*) were observed, as was the federal-candidate gopher tortoise (*Gopherus polyphemus*), and the bald eagle (*Haliaeetus leucocephalus*), which is federally-protected under the Bald and Golden Eagle Protection Act. The federally-threatened Florida manatee (*Trichechus manatus latirostris*) is also regularly observed in the Turning Basin, the federally-endangered North Atlantic right whale (*Eubalaena glacialis*) has entered the St Johns River on rare occasions, and the federally-endangered Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) and shortnose sturgeon (*Acipenser brevirostrum*) are assumed to frequently transit the mouth of the river. Six species that are state-listed as threatened were also observed: the black skimmer (*Rynchops niger*), least tern (*Sternula antillarum*), little blue heron (*Egretta caerulea*), reddish egret (*Egretta rufescens*), roseate spoonbill (*Platalea ajaja*), and tricolored heron (*Egretta tricolor*). No rare plant species were identified on NAVSTA Mayport during any surveys (see Section 3.5).

NFD

A rare species survey was conducted on the NFD only in 2010-11 and the 2014-15 bird survey also included the NFD (GSRC 2011; GSRC 2015). Rare vertebrates observed were all birds, including the wood stork, bald eagle, least tern, little blue heron, and tricolored heron (GSRC 2011; GSRC 2015). The Florida manatee and Atlantic and shortnose sturgeons are also assumed to occur in the adjacent portion of the St Johns River.

2.5.7 Wetlands Delineation Study

NAVSTA Mayport

A wetlands delineation survey was performed at NAVSTA Mayport in 2009 to update the jurisdictional wetland boundaries. Nine hundred (900.0) acres of potential jurisdictional wetlands were identified and an additional 509.5 were identified as Waters of the United States (Figure 2-5; GSRC 2009). The total acreage of all of the NAVSTA Mayport facility is approximately 3,409 acres (see Section 3.4.5). Installation-wide wetlands delineations are no longer performed at NAVSTA Mayport; rather delineations are performed as needed when required during the NEPA process for a project or operation on the installation.

NFD

A wetlands delineation survey was performed at the NFD in 2009. Results concluded that there are 23.8 acres of potential jurisdictional wetlands and an additional 0.46 acres of Waters of the United States on the property (Figure 2-6; GSRC 2009). The total acreage of all of the NFD property is approximately 181 acres (see Section 3.4.5).

2.5.8 Hazardous Waste Management Plan (HWMP)

NAVSTA Mayport

A HWMP was prepared in accordance with OPNAVINST 5090.1D, Ch. 39, which requires activities to develop an HWMP in accordance with all applicable Federal, state and local regulations, and OPNAVINST 5100.19C. The purpose of this HWMP is to provide proper identification and management of all hazardous waste generated at NAVSTA Mayport and stored at Temporary Hazardous Waste Storage Areas.

Presently, NAVSTA Mayport holds an EPA ID number as a large quantity generator. In 2012, the station reported 474,192 pounds of hazardous waste disposed in its annual report to Naval Facilities Engineering Service Center.

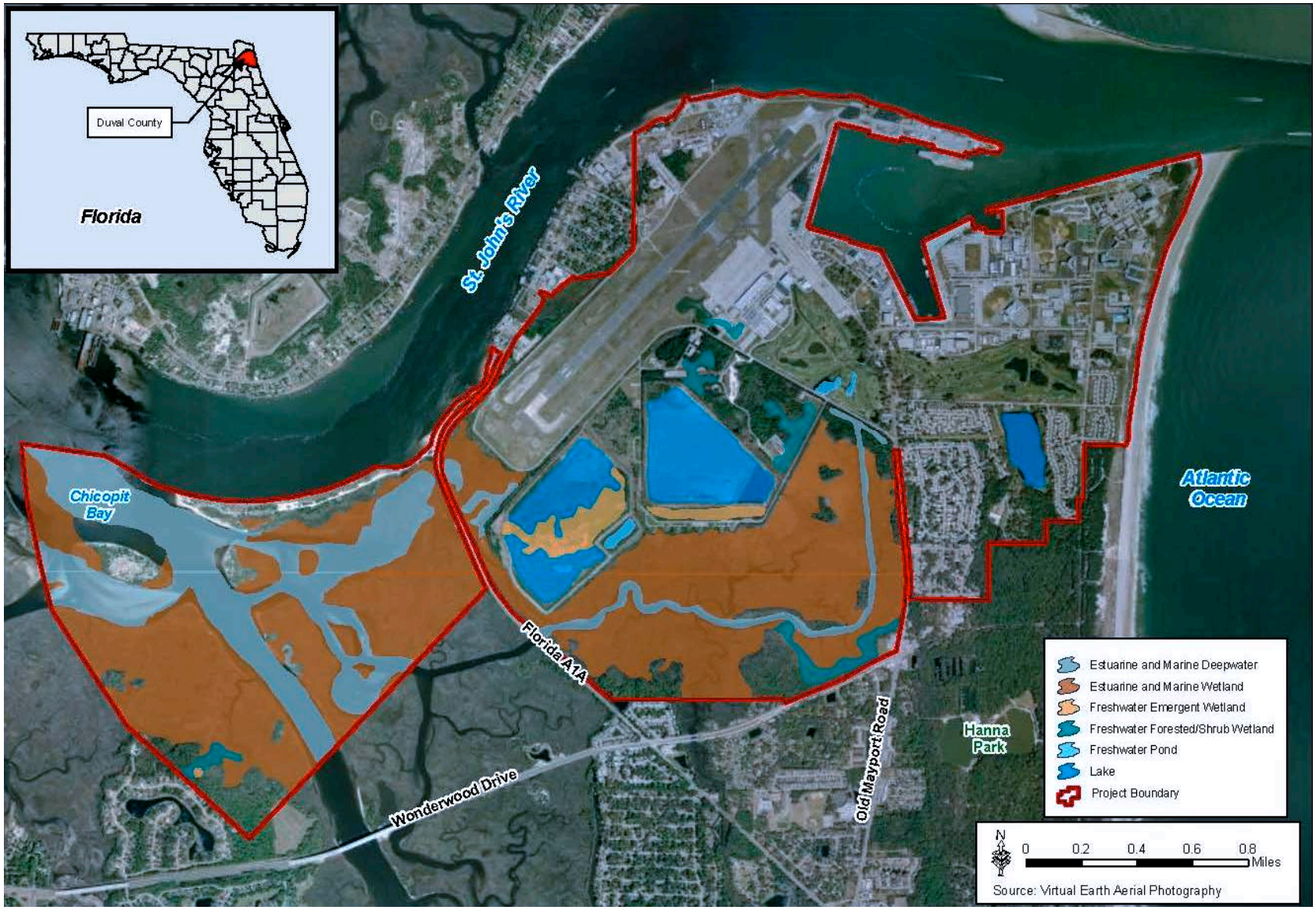

Figure 2-5. Wetlands Map of Naval Station Mayport.

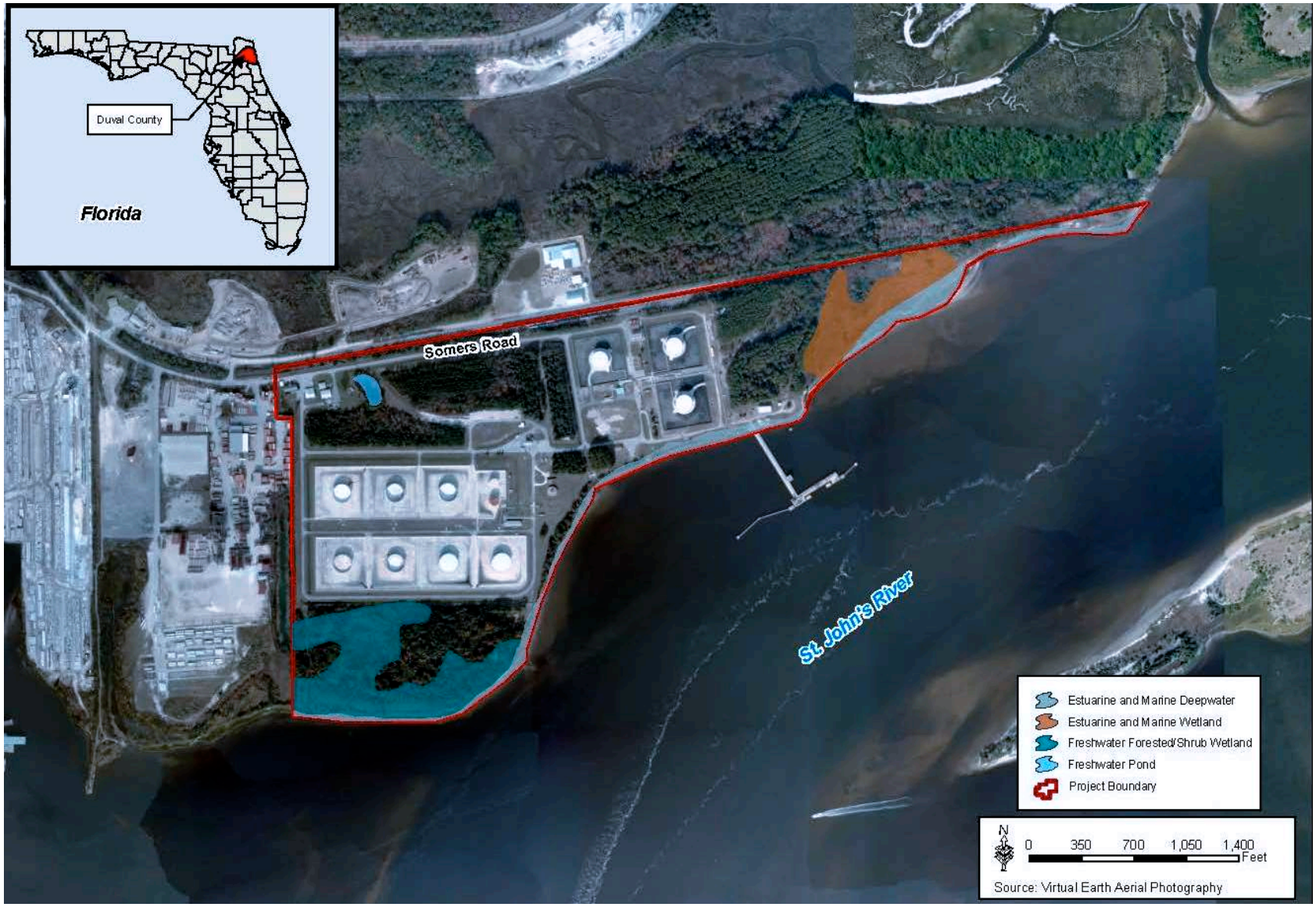

Figure 2-6. Wetlands Map of Fleet and Industrial Supply Center Jacksonville Navy Fuel Depot (NFD).

NFD

The HWMP provides guidance in the operation and management of generation, storage, and disposal of hazardous waste on the NFD. The plan was prepared in 1998 and updated in 2009 in compliance with Federal and state regulations. The long-term goal of the plan includes the elimination of hazardous waste disposal to the maximum extent possible by eliminating the use of hazardous waste and/or by implementing BMPs and best demonstrated technologies. NFD is classified as a small quantity generator (SQG).

2.5.9 Facility Response Plan

NAVSTA Mayport

The NAVSTA Mayport Facility Response Plan was prepared in 2009 and updated in 2013. It provides a contingency plan that establishes the policy, responsibilities, and procedures for the control and clean-up of oil and hazardous substance releases within the NAVSTA Mayport jurisdiction. The response plan identifies natural resources potentially affected, personnel duties, notification protocol, disposal plan, and evacuation routes. The plan provides a uniform, Navy-wide approach for planning requirements and responses in the event of a spill under the requirements of the Oil Pollution Act of 1990 (OPA 90) regulations at the shore facility level. The plan is reviewed and updated after each incident involving activation of the plan, and no less often than annually.

NFD

The NFD Facility Response Plan was prepared in 2010 and provides a similar contingency plan as NAVSTA Mayport that establishes the policy, responsibilities, and procedures for the control and clean-up of oil and/or hazardous substance releases within the NFD jurisdiction. plan is reviewed and updated after each incident involving activation of the plan, and no less often than annually.

NAVSTA Mayport and NFD

The Spill Prevention Control and Countermeasure (SPCC) Plan establishes standard procedures for addressing and treating potential spills of hazardous wastes on the NFD installation. Both NAVSTA Mayport and NFD have SPCC plans, prepared in 2008 and updated in 2013, to control, contain, and remediate hazardous wastes spills in the event of a accidental discharge.

2.5.11 Urban Tree and Shrub Planting Assessment

NAVSTA Mayport

The Urban Tree and Shrub Planting Assessment was prepared in conjunction with a site visit from NAVFAC Southeast and NAS Cecil Field foresters (prior to closure of Cecil Field). The purpose of the visit was to identify areas that could be improved and maintained by planting native low maintenance species of trees and shrubs and to provide guidance for improving existing plantings. The objective of the assessment was twofold: (1) identify past problems encountered in coordinating a planned tree and shrub planting program and the lack of success in past urban tree planting projects; and (2) develop a set of recommendations to overcome those problems and provide guidance for a successful, well-coordinated urban tree and shrub planting program.

NFD

No Urban Tree and Shrub Assessment has been conducted at NFD. However, the grounds maintenance program at the NFD is integrating xeriscaping. To integrate the principles of xeriscaping into existing landscaped areas, the NFD will evaluate current landscaping practices and sites to predict the effectiveness of xeriscaping toward improving existing conditions. The NFD will evaluate whether the implementation of xeriscaping principles will: 1) provide sufficient benefits to justify any additional cost; 2) achieve the desired results; or 3) continue to achieve desired results. Where xeriscaping is introduced into existing landscaped areas, the NFD will monitor the success of integrating the xeriscaping principles into these areas and adjust management practices as necessary.

2.5.12 Bird Survey

NAVSTA Mayport

Annual Shorebird Nesting Surveys are conducted at NAVSTA Mayport between March and August in partnership with the National Shorebird Alliance at the beach and on specific rooftops. Christmas Bird Counts are also performed annually by volunteers. Additionally, three comprehensive neotropical migratory bird surveys have been completed at NAVSTA Mayport. The first, conducted weekly from June 2002 through June 2004, was completed by the NAVSTA Mayport Natural Resources Biologist in partnership with Timucuan Ecological and Historic Preserve personnel, an SCA intern, and Duval Audubon Society Annual Christmas Count participants. That survey identified 166 neotropical migratory and resident bird species at NS Mayport, with the highest diversity occurring in April (NAVFAC Southdiv. 2004). A similar survey

was completed in 2006-07, finding 174 species present on NS Mayport. The third survey was carried out seasonally from June 2014 to April 2015 on both NS Mayport and the NFD. That survey recorded 129 species (GSRC 2015). All total, 189 bird species were identified on NAVSTA Mayport since 2002. As is the case for all natural resources at NAVSTA Mayport, future migratory and resident bird surveys serve as an important tool to insure compliance with state and Federal regulations, and support of the installation's INRMP.

NFD

An informal bird survey was conducted in 1998 for the NFD facility by NAVFAC Southeast biologists. These surveys identified 13 bird species occurring on the installation. Formal surveys in 2014-15 identified 73 bird species at the NFD (GSRC 2015).

2.5.13 NAVSTA Mayport Beachfront Environmental Analysis

NAVSTA Mayport prepared a Beachfront Environmental Analysis Report in 2006 to provide guidance for future planning, protection and restoration of the beachfront area east of Baltimore Road. The report recommended the elimination or minimization of vehicle traffic adjacent to the dune area, the placement of native materials within dune breaches, the elimination of mowing and fertilizer use adjacent to the coastal dune system, creation of a buffer along the coastal dune system and the eradication of non-native plant species.

2.5.14 Invasive Species Survey

NAVSTA Mayport

Invasive exotic species surveys of NAVSTA Mayport were performed in 2004 and 2010-11 (FNAI 2004; GSRC 2011). Sixteen exotic plant species were identified at NAVSTA Mayport in both surveys. The results of these invasive species surveys are described in Section 3.5.4.

NFD

Invasive exotic species surveys of the NFD were performed in 2004 and 2010-11 (FNAI 2004; GSRC 2011). Eleven exotic plant species were identified at NFD in both surveys. Additional information about the invasive species survey is provided in Section 3.5.4.

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3.0 EXISTING ENVIRONMENT

3.1 CLIMATE

Climatic conditions at NAVSTA Mayport are influenced by several different weather patterns during the year. Generally, weather conditions are mild with average temperatures around 70 degrees Fahrenheit (°F) with humidity ranging between 70 and 80 percent. The coldest month of the year is typically January while the warmest temperatures occur during the months of July and August. Table 3-1 summarizes the average temperatures and rainfall on NAVSTA Mayport. Hurricane season runs from June through November. Although Jacksonville has not been impacted by a major hurricane since before 1900, Duval County has been impacted by four lower category hurricanes since 1900.

Table 3-1. Average Temperature and Precipitation at NAVSTA Mayport

Month	Average Temp (°F)	Avg Low Temp (°F)	Avg High Temp (°F)	Avg Rainfall (inches)
January	56	47	69	3.33
February	59	50	67	3.06
March	64	55	72	3.68
April	69	60	77	2.50
May	76	68	83	2.74
June	80	73	87	5.38
July	83	75	90	4.93
August	82	75	89	6.86
September	80	74	86	7.43
October	74	67	80	5.15
November	65	57	73	2.41
December	59	50	67	2.62

Source: http://www.weather.com/weather/climatology/monthly/USFL0307

NFD

NFD is located 13 miles inland from NAVSTA Mayport and experiences the same climatic conditions as NAVSTA Mayport.

3.1.1 Climate Change

Climate change is causing rising sea level, altering precipitation patterns, and changing ecological systems, and will shape strategic, infrastructure, and natural resources considerations for the foreseeable future. NAVSTA Mayport must have the land, air, and water necessary to train and operate to successfully execute its military mission. The frequent and intense heat extremes projected to occur with climate change may limit outdoor training, strain personnel efficiency,

degrade air quality through elevated ozone caused by higher temperature, and strain electricity supply due to the increased demand on the grid for cooling. Changes in precipitation patterns will reduce water supply, increase the frequency and intensity of drought and severe weather, damage local ecosystems, and cause shifts in species composition or geographic range.

3.2 AIR QUALITY

NAVSTA Mayport

The Clean Air Act (CAA) provides the principal framework for national, state, and local efforts to protect air quality. In accordance with the CAA, national ambient air quality standards (NAAQS) have been established by EPA and FDEP. Criteria pollutants include particulate matter, carbon monoxide, sulfur dioxide, nitrogen oxides, lead, and ozone. Areas that do not meet NAAQS for criteria pollutants are designated as "non-attainment areas" for that pollutant. Areas that achieve the air quality standard after being designated non-attainment are redesignated as attainment following EPA approval of a maintenance plan. Duval County is classified by EPA as being in attainment for ozone, nitrogen oxides, and carbon monoxide.

NFD

NFD stores and distributes fuel to the naval fleet. There are ten bulk fuel tanks grouped into two tank areas. Seven JP-5 tanks are in one area and three DFM tanks are in the other area. All of the fuel tanks have fixed external roofs and floating internal pans, except for one DFM tank that has the internal pan removed. Volatile organics escape from the petroleum products and can create air pollution concerns. Fugitive emissions can combine with other molecules and exacerbate existing air quality concerns. Air quality is fairly good in Duval County. It is in attainment for ozone, volatiles, and $PM_{2.5}$. The NFD is exempt from having an air permit, per a City of Jacksonville determination.

3.3 GEOLOGY, TOPOGRAPHY, AND SOILS

3.3.1 Geology

NAVSTA Mayport

NAVSTA Mayport and the surrounding vicinity fall within the coastal lowland physiographic division of northeast Florida, which runs roughly parallel to the coastline and extends from the

Atlantic Ocean to just west of downtown Jacksonville. In general, the surface and near surface deposits in this division consist of limestone, shell, sand, and clay.

Duval County is underlain by a thick sequence of Eocene and younger siliciclastic and marine carbonate sediments, which consist of, in descending order, surficial deposits, the Hawthorn Group, and an Eocene marine carbonate sequence (Scott *et al.* 1991). Surficial deposits in Duval County consist of Holocene to Pleistocene age sands, silts, clays and shell beds, and sands, silty clays, shell beds, and limestone beds of the Pliocene aged Cypresshead Formation and Nashua Formation, where present (Scott *et al.* 1991). In the NAVSTA Mayport vicinity, surficial deposits are approximately 70 feet thick (Causey and Phelps 1978; Fairchild 1972).

The Hawthorn Group consists of interbedded variably phosphatic and silty clayey sands, and sandy clays interbedded with phosphatic sands and variably phosphatic, sandy, silty dolostones and limestones (Scott 1988). The Hawthorn Group is approximately 500 feet thick in the NAVSTA Mayport vicinity (Scott *et al.* 1991).

The Eocene age marine carbonate sequence consists, in descending order, of the Ocala Limestone, the Avon Park Formation, and the Oldsmar Formation (Franks and Phelps 1979). The Ocala Limestone consists of massive fossiliferous, chalky to granular limestone (Franks and Phelps 1979). The Avon Park and Oldsmar Formations consist of interbedded limestones and dolostones. The Eocene age marine carbonate sequence is more than 1,500 feet thick in Duval County (Scott *et al.* 1991).

NFD

NFD resides upon the same geologic formations as NAVSTA Mayport.

3.3.2 Topography

NAVSTA Mayport

NAVSTA Mayport is located along the St. Johns River in Duval County, which lies in northeast Florida. This area is defined as the Northern Coastal Strip and is part of the Sea Island District, where elevations range from sea level to approximately 30 feet above mean sea level (msl) (SJRWMD 1993). Land elevations on NAVSTA Mayport are relatively flat, cresting at 10 feet above msl with very little topographical relief. Notable exceptions to this range include the small

hill along Alpha wharves, the Harbor Operations Building and the sandy ridge east of Baltimore Street at NAVSTA Mayport.

NFD

NFD is located approximately 13 miles west of NAVSTA Mayport and the topographical formations at NFD are similar to those found at NAVSTA Mayport.

3.3.3 Soils

Soils on NAVSTA Mayport are comprised of a variety of soil series consisting of medium to fine sands to mucky peats (Figure 3-1). In general, the soils located on NAVSTA Mayport are high in permeability and tend to be low in organic content. The exception is the mucky peat soils which can be found near the low lying areas next to the St. Johns River. For additional information on these and other soil classifications refer to the *Soil Survey of City of Jacksonville, Duval County, Florida, Area* (USDA 1978). The major soil series, descriptions, uses and ratings found at the installation are presented in Table 3-2.

Table 3-2. Soil Map Units Occurring on NAVSTA Mayport and NFD

Type of Soil	Location	Description
Aquic Quartzipsamments and Arent soils	Most large developed areas including the golf course and the runway areas and adjacent clear zones at NAVSTA Mayport	These soils are generally characterized by being reworked during manmade earth moving operations.
The beaches, Fripp fine sand (2% to 8% slopes) and the Kureb fine sand (2% to 8% slopes)	Occurs along the Atlantic beaches and dune and ridge areas immediately behind the beaches.	These fine sands are characterized by a depth to water table over 6 feet in natural conditions.
Leon, Mandarin, Kershaw, Ortega, and Pottsburg fine sand soils	Occurs in broad flatwood areas, on ridges and on isolated knolls. Most of these soil groups on NAVSTA Mayport are heavily vegetated.	These soils tend to have moderate depth to water table ranging between 10 to 60 inches depending upon the season.
The Tisonia mucky peat and Wesconnett fine sand	Occur in wetland areas on NAVSTA Mayport and NFD	These are characterized by a depth to water table of less than 10 inches and, in many instances, are covered with water or inundated for the entire year.

Source: USDA 1978.

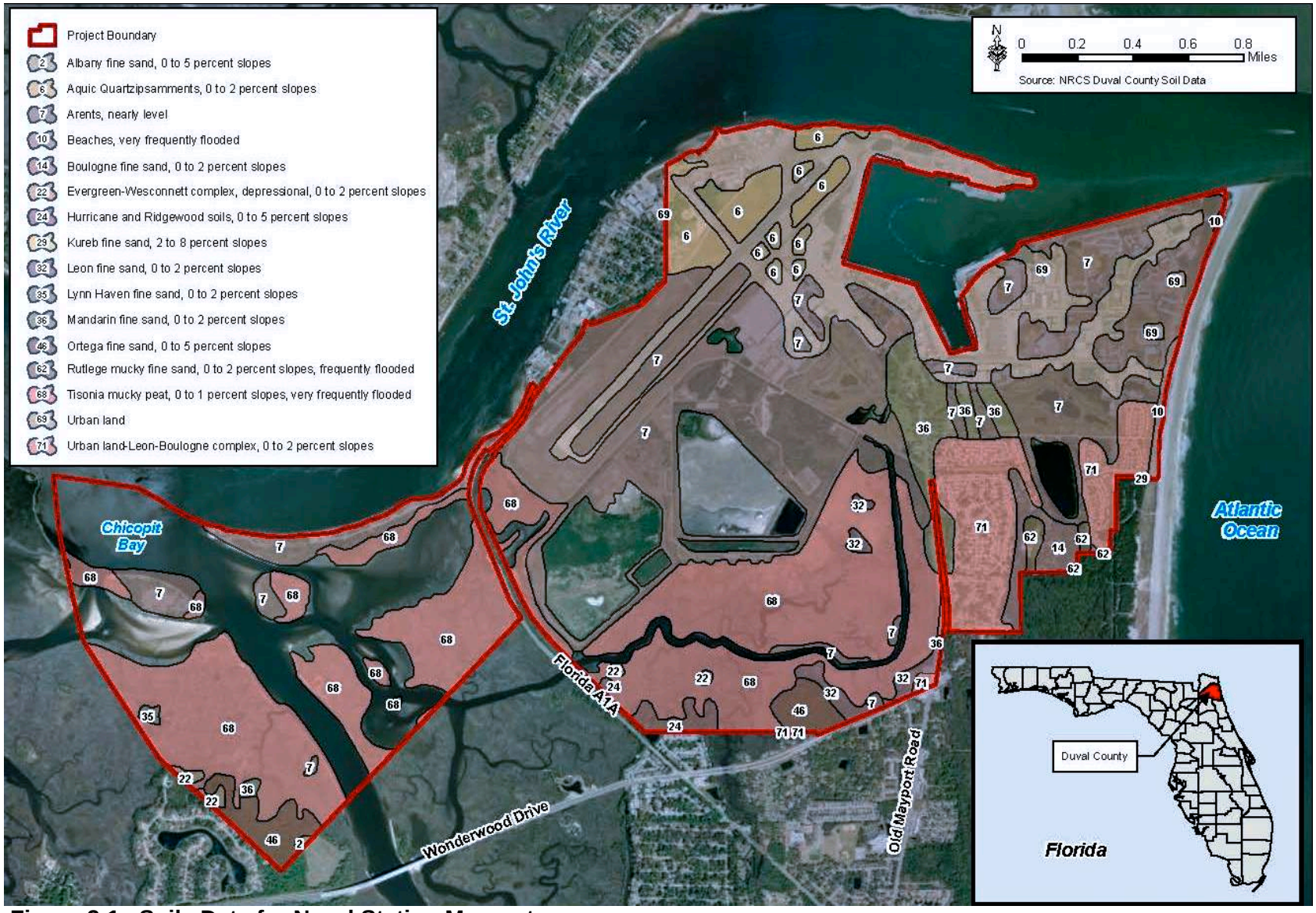

Figure 3-1. Soils Data for Naval Station Mayport.

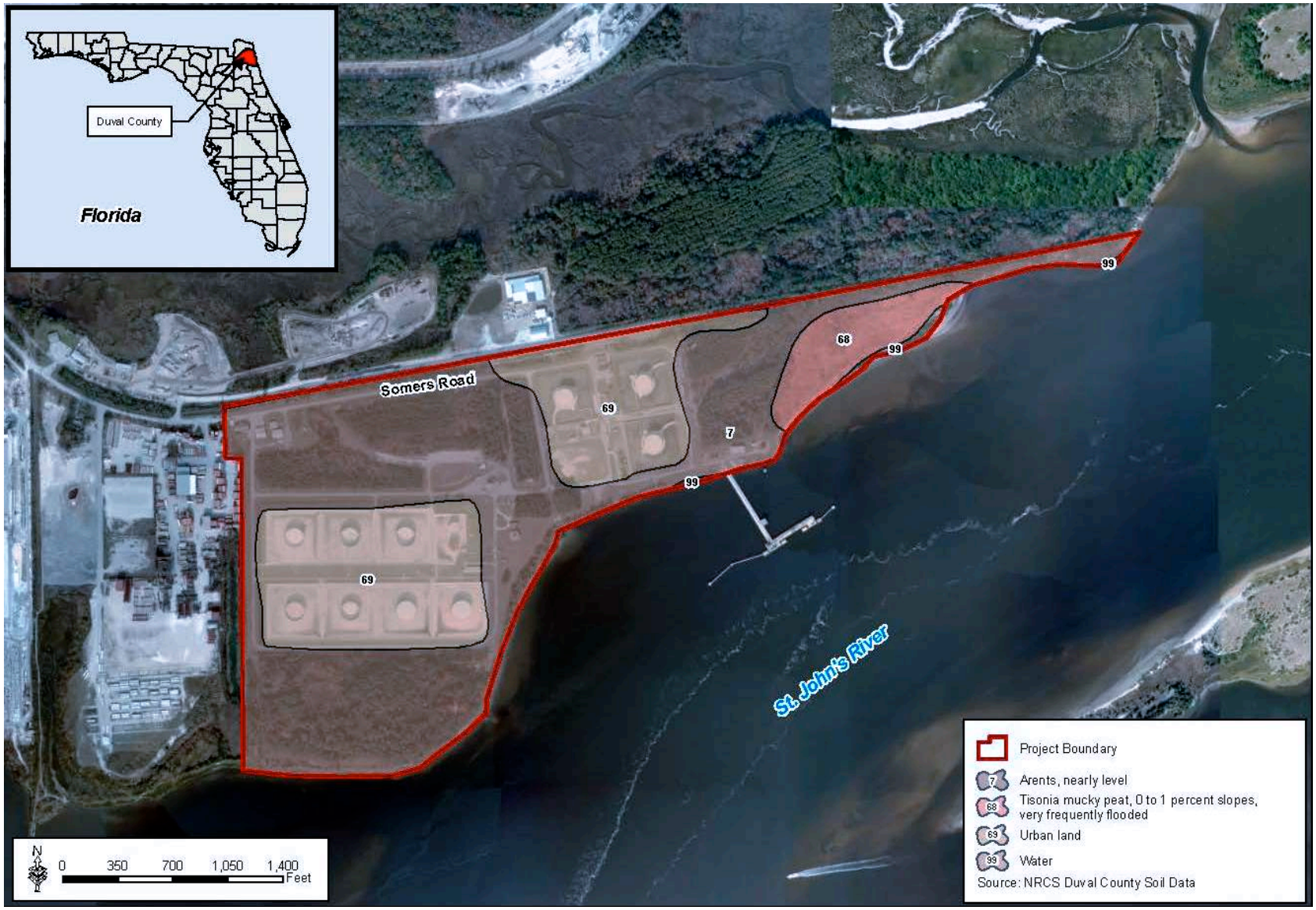

Figure 3-2. Soils Data for Fleet and Industrial Supply Center Jacksonville Navy Fuel Depot (NFD).

NFD

Soils on NFD are comprised of a variety of soil series consisting of medium to fine sands to mucky peats (Figure 3-2). In general, the soils located on NFD are high in permeability and tend to be low in organic content. The exception is the mucky peat soils which can be found near the low lying areas next to the St. Johns River. The major soil series, descriptions, uses and ratings found at the installation are presented in Table 3.

3.4 HYDROLOGY AND WATER QUALITY

3.4.1 Watersheds

NAVSTA Mayport

Duval County is located entirely within the LSJRB watershed, which is located in northeast Florida and encompasses approximately 2,777 square miles of land and 25 rivers and streams.According to the EPA's Index of Watershed Indicators (IWI), which determines the health of aquatic resources in the U.S., the LSJRB watershed is classified as having "more serious water quality problems" and "high vulnerability." The FDEP classifies the LSJRB as a Category I (Highest Restoration Priority).

FDEP included the LSJRB on the 303(d) list which are water bodies that are not attaining designated uses such as primary contact recreation, propagation of fish and wildlife, etc. The stream segments of the St. Johns River adjacent to NAVSTA Mayport, water body identification number (WBID) 2213A and 2213B, are not meeting criteria for nutrients and a Total Maximum Daily Load (TMDL) for nutrients has been established for the watershed.

NFD

NFD is located within the LSJRB watershed and resides on the banks of the St. John's River (WBID 2213C). This stream subsegment 2213C is in violation of nutrient standards.

3.4.2 Surface Waters

Freshwater Resources

NAVSTA Mayport

At NAVSTA Mayport, the freshwater resources include manmade lakes and stormwater drainage canals and ditches associated with the construction and continued drainage of the installation.

Storm water canals and holding basins located within the improved grounds on the northeast section of the installation generally drain toward the St. Johns River. Other drainage canals and ditches occur along major roadways, the golf course, entering and exiting Lake Wonderwood, adjacent to some residential housing, and along the perimeters of the two on-site dredged material containment areas. Lake Wonderwood is a manmade lake approximately 20 acres in size located within the Wonderwood housing area. Lake Wonderwood is composed of varying salinities. It contains fresh water on and near the surface and is brackish with increasing salinities near the bottom.

The lake receives stormwater runoff from the surrounding watershed which includes a golf course north of the lake, housing areas on the east, west and south shores and a portion of Kathryn Abbey Hanna Park, which is a facility owned and operated by the COJ. The lake supports a wide variety of fish species and is accessible to station personnel for recreational fishing. Lake Wonderwood is also surrounded on two sides (west and south) by a walking/jogging trail. A dock and concrete boat ramp exist at the north end of the lake.

NFD

One shallow freshwater pond, Hatchet Pond, is located in the northwest portion of the facility boundaries. Originally intended for recreational fishing, the pond has been plagued by weeds and over growth. The pond is no longer stocked with fish or maintained and has become overgrown with aquatic vegetation such as cattails.

Estuarine Resources

NAVSTA Mayport

The St. Johns River establishes the northern and northwestern boundaries of the NAVSTA Mayport, while the ICW is to the west of the Ribault Bay Village Housing area. The St. Johns River and its tributaries are the main sources of surface water in the region. It creates the southeast boundary of NFD.

Pablo and Sherman Creeks, the ICW, Chicopit Bay, Mayport Turning Basin, and the estuarine resources associated with the TIMU represent the remainder of estuarine and near marine waters associated with the NAVSTA Mayport. Their existence or configuration is largely the direct or indirect result of past dredging. Sherman Creek is the primary drainage for developed and

undeveloped uplands, spoil areas, and intertidal saltwater marshes in the south-central portion of the installation. Sherman Creek flows into the original Pablo Creek watercourse, which empties into the Chicopit Bay just east of where the ICW meets that embayment. With the exception of the SR A1A Bridge over Sherman Creek, these waterways are contiguous with significant expanses of undeveloped habitat. The Mayport Turning Basin is a deepwater surface ship berthing facility whose entrance channel meets the main navigation channel at the mouth of the St. Johns River. The Mayport Basin water quality typically meets FDEP Class III Marine Water Quality Standards.

Estuarine resources at the Ribault Bay Village Housing area include Garden and De Blieu Creeks, the ICW, and extensive salt marshes located to the west of the property. Salt marshes lie between the housing area and the ICW. Garden and De Blieu Creeks discharge into the ICW. The ICW flows north approximately 2.3 miles and empties into the St. Johns River about 4 miles west of the Atlantic Ocean.

NFD

The St. Johns River flows along the southeast border of NFD. The channel is dredged to allow deep-draft vessels to tie up to the fueling pier to load diesel and jet fuel. The shoreline around the pier is reinforced with hard materials and rocks. Flow is influenced by runoff from the watershed during rain events, upstream distributaries and tides.

Coastal Resources

NAVSTA Mayport

A number of coastal environments are associated with NAVSTA Mayport, including beaches comprised of various substrate materials (*e.g.*, sand and rocks). One swimming beach exists adjacent to the Atlantic Ocean and includes the area approximately from mean low water to the base of the primary dune extending over one mile south of St. Johns Point at the mouth of the St. Johns River to the northern border of Kathryn Abbey Hanna City Park. Other beaches occur along the St. Johns River at the northern boundary of NAVSTA Mayport, at Helen Cooper Floyd Memorial Park along both the river and Chicopit Bay. A small beach is also located west of St. Johns Point and landward of the south jetty.

NFD

There are no coastal resources at NFD.

3.4.3 Groundwater

NAVSTA Mayport

Groundwater in Duval County is obtained from three principal hydrogeologic units. These units include in descending order, the Surficial aquifer system, the Intermediate system, and the Floridan aquifer system.

The Surficial aquifer system is a permeable hydrologic unit contiguous with the land surface and is comprised principally of unconsolidated siliciclastic and carbonate sediments. The depth of the Surficial aquifer at NAVSTA Mayport is approximately 100 feet. The lower limit of the Surficial aquifer system coincides with the upper sandy-clay units of the Hawthorn Group.

The Intermediate aquifer system consists of sand and limestone layers interbedded in clayey sand and sandy clay of the Hawthorn Group and is situated between the Surficial aquifer and the underlying Floridan aquifer system. The Intermediate system is about 500 feet thick in the NAVSTA Mayport vicinity (Scott *et al.* 1991) and functions as a confining unit between the Surficial aquifer system and the Floridan aquifer system. Recharge to the Intermediate system occurs primarily from precipitation in areas approximately 30 miles west of the NAVSTA Mayport site in Baker and Clay counties where Hawthorn Group sediment occurs at shallow depths beneath the surface (approximately 30 feet).

The principal source of potable water for Duval County is the artesian wells that tap into the Floridan aquifer system. In the NAVSTA Mayport vicinity, the top of the Floridan aquifer system occurs at 550 feet below land surface (Scott *et al.* 1991). The Floridan aquifer is composed of the Oldsmar and Avon Park formations; the Ocala Limestone; and a few discontinuous thin water-bearing zones in the lower part of the Hawthorn Group. Most of the aquifer is recharged west and southwest of Jacksonville by rainfall.

Groundwater quality is dependent on the location of the well. Good quality water (soft water) is available in or near recharge areas located in western Duval County, while water along the St. Johns River and Atlantic coastline have higher concentrations of chlorides and other constituents. An additional threat to groundwater quality is declining water tables, which increase the threat of saltwater intrusion in coastal areas.

NAVSTA Mayport has its own groundwater well system and water treatment system. The facility's potable water supply is almost entirely supplied by groundwater. Three wells provide water for NAVSTA Mayport to the Water Treatment Plant operated by NAVFAC Southeast.

NFD

Three on-site artesian water wells previously existed at NAVSTA Mayport, but have been grouted and abandoned.

3.4.4 Floodplains

NAVSTA Mayport

The Federal Emergency Management Agency (FEMA) defines floodplains as areas subject to a 1 percent or greater chance of flooding in any given year. Because of the generally flat topography and low-lying land in the eastern portion of Duval County, floodplains and flood hazard areas are significant environmental factors affecting existing and future development in the region (Navy 1987). Current FEMA maps indicate 100-year flood hazard elevations around the NAVSTA Mayport to be between 6 feet and 14 feet above msl. On NAVSTA Mayport, low-lying areas adjacent to the St. Johns River and the Atlantic Ocean are subject to varying degrees of flooding (Navy 1987). Flood zones on the Ribault Bay Village Housing area reach a base flood elevation of 7 feet above msl. At this height, most of the site, except for two small sections in the southwest quarter and the northeast quarter are located within the 100-year flood hazard zone.

NFD

Flood-prone areas on the NFD property are primarily associated with the northern banks of the St. Johns River. Based on maps supplied by the SJRWMD, approximately 25 percent of the NFD lies within the 100-year floodplain.

3.4.5 Wetlands

NAVSTA Mayport

Wetlands serve as a valuable resource for groundwater recharge within the region and are currently regulated by USACE under Section 404 of the CWA of 1972. Wetlands are defined by USACE as "…those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."

Wetlands delineation surveys were completed in 2004 and 2009 (CZR 2004; GSRC 2009). The most recent survey identified 900.0 acres of jurisdictional wetlands on NAVSTA Mayport freshwater and 509.5 acres of Waters of the United States (see Figure 6 in Section 2; GSRC 2009). Four wetlands classes were observed according to the Cowardin classification system: Estuarine Intertidal Emergent Wetland (EIEW), Palustrine Emergent Wetland (PEW), Palustrine Scrub-Shrub Wetland (PSSW), and Palustrine Forested Wetland (PFW) (Cowardin 1979; GSRC 2009). In addition, Tidal Flats and Oyster Bars occur throughout the estuarine environment. Major wetland areas at NAVSTA Mayport exist in the southwestern portion of the installation property in the area west of Mayport Road and south of the magazine area, and along the western edge of the Ribault Bay Village property. The majority of wetlands at NAVSTA Mayport consist of salt marsh and tidal creeks. Freshwater wetlands within NAVSTA Mayport boundaries are comprised of lakes, drainage areas, herbaceous marsh, and mixed hardwoods. NAVSTA Mayport also contains two dredged material holding sites, which were not identified as jurisdictional wetlands (CZR 2004).

Wetland surveys for the Ribault Bay Village housing area in 2004 concluded that approximately 19.6 acres of jurisdictional wetlands occurred within the 54.9 acres surveyed. Wetland communities on this site are characteristic of a hydric hammock. Hydric hammock communities are generally characterized by a well-developed hardwood and cabbage palm (*Sabal palmetto*) canopy and an understory dominated by palms and ferns. Field surveys did not include delineation of the saltwater marshes located along the western edge of the property (CZR 2004).

NFD

The 2009 wetland delineation survey at the NFD determined the site contained 23.8 acres of jurisdictional wetlands and 0.46 acre of Waters of the United States (see Figure 7 in Section 2; GSRC 2009). Wetland communities on the NFD are mostly mixed pine hardwood forests and are primarily composed of loblolly pine (*Pinus taeda*), red maple *(Acer rubrum)*, sweetgum (*Liquidambar styraciflua*), willow (*Salix* sp.), groundsel tree (*Baccharus halimifolia*), and waxmyrtle *(Myrica cerifera*). Man-made ditches and canals occurring on the installation are not mapped as wetlands as they are part of the permitted stormwater management systems and were constructed through upland areas (CZR 1997).

3.5 VEGETATION AND NATURAL COMMUNITIES

3.5.1 Vegetation

NAVSTA Mayport

Primary vegetation communities located on NAVSTA Mayport include live oak (*Quercus virginiana*) hammocks, planted slash pine (*Pinus elliottii*), saltwater wetlands, freshwater lake, beach and beach dunes. The north and northeast portion of NAVSTA Mayport, including the waterfront area of the NAVSTA Mayport Turning Basin, have been previously disturbed leaving only a few natural areas available for habitat and growth of terrestrial systems. Open areas adjacent to buildings and roadways consist of planted and landscaped grasses with a few shrubs and trees.

Vegetation at the proposed Ribault Bay Village Housing area consists of mixed hardwood forest vegetation communities, characterized by a large number of overstory species, including live oak, laurel oak (*Quercus hemisphaerica*), water oak (*Q. nigra*), and slash pine. Much of this vegetation will be removed during housing construction, but will be restored to the maximum amount practicable following construction. The remaining acreage of the Ribault Bay Village Housing area contains a housing development and associated land uses with urban type vegetation (*i.e.*, grasses and trees).

NFD

The facility is located within areas historically dominated by pine flatwoods and scrub habitat, most of the areas on the NFD are heavily developed and maintained. The forest communities on the NFD exist as small fragments (56 acres total) that have escaped extensive land clearing activities to accommodate base buildings, roads, tank farms, etc. The forested areas are pines with some intermittent old growth hardwoods. Remaining areas are heavily maintained lawns that surround tank containments.

3.5.2 Natural Communities

The annual INRMP review metrics adhere to the ecosystem classification nomenclature prescribed online at natureserve.org. Due to the length of some of the ecosystem names provided by that system, this INRMP maintains fidelity to its original, less-cumbersome, nomenclature throughout the text. Table 2-4 provides a convenient cross-reference table in order to synch the INRMP's terminology with that used by natureserve.org and the annual metrics.

NAVSTA Mayport

Beaches and Dunes

One occurrence of a beaches and dune community exists extending more than one mile south from St. Johns Point at the mouth of the St. Johns River to the northern border of Kathryn Abbey Hanna City Park. This beaches and dune community is of marginal rank due to the encroachment by roads, exotic turf grasses, and other development activities (*e.g.*, houses, parking facilities).

Beaches and dune communities occur in a harsh environment. Because of this, plant communities are broken into vegetation zones. According to FNAI, three zones were identified within the NAVSTA Mayport beach dune community including the foredune, herbaceoous flat, and the shrub zone.

- The *foredune* is the most easily recognized, being clearly controlled by physical processes. This community is dominated by sea oats (*Uniola paniculata*), beach hydrocotyle, beach ten (*Croton punctatus*), and seaside evening primrose (*Oenothera humifusa*).
- The *herbaceous flat* is immediately landward of the foredune and is an area of low wind and wave energy allowing a variety of plants to grow. This community is dominated by sea oats, camphor weed (*Heterotheca subaxillaris*), sand bean (*Strophostyles helvola*), prickly pear (*Opuntia stricta*), beach hydrocotyle and contains a small area dominated by saltmeadow cordgrass (*Spartina patens*).
- The *shrub zone* is landward of the herbaceous flat and represents an area with no wave and very little wind action allowing a more hammock-type vegetation. This community is dominated by waxmyrtle, beach elder (*Iva imbricata*), cabbage palm, salt bush (*Bacchaiis angustiflia*), muscadine (*Vitis rotundifolia*) and passion flower (*Passiflora incarnata*).

Table 3-3. Natural Community Nomenclature

Nomenclature Used in this INRMP	Nomenclature Used by the Annual Metrics	Natural Community Description	Present at: M	Present at: F
Beaches and Dunes	Southern Atlantic Coastal Plain Florida Beach	This beach system is found along the Atlantic Coast from the St. Johns River in northeastern Florida to approximately Cape Canaveral. This system is subject to higher wave energy and a greater component of sand than other Atlantic Coast Florida beaches. Vegetation is also different, lacking the tropical element found south of Cape Canaveral.	X	
Hydric Hammock	Southern Coastal Plain Hydric Hammock	This ecological system occupies flat lowlands, usually over limestone substrates. The vegetation of this system is characterized by mixed hardwood species, often with hydric oak species common. Examples of this system are often found adjacent to the floodplain of rivers with relatively constant flows.	X	X
Maritime Hammock	Southern Atlantic Coastal Plain Maritime Forest	This system encompasses a range of woody vegetation present on stabilized upland dunes and near-coastal strand. It includes vegetation whose structure and composition are influenced by salt spray, extreme disturbance events, and the distinctive climate of the immediate coast. Most typical stands are dominated by oaks. Vegetation may also include different woodland communities often dominated by southern pine species. These examples tend to have densely shrubby subcanopies and understories.	X	
Wetlands	Southern Atlantic Coastal Plain Salt and Brackish Tidal Marsh	This ecological system represents tidally influenced freshwater herbaceous marshes and tidal shrublands. This system occurs where there is adequate river flow and discharge to maintain oligohaline conditions, while still within tidal range. These marshes most often occur well inside the mouths of tidal creeks and rivers. Elevation differences within the marsh correspond to the occurrence of different vegetation types.	X	X
Ponds and Lakes	Southern Atlantic Coastal Plain Depression Pondshore	This system consists of wetlands in small basins formed in unconsolidated sediments. Most basins are formed by solution in underlying limestone. Others may be formed as swales in mainland eolian sands and blockage of small drainages. Soils are generally sandy, with mucky surfaces in the wettest areas. Vegetation is often zonal. Vegetation usually ranges from open water or floating-leaved aquatics in the center to emergent marsh zones, to dense shrub or woodland edges.	X	
Rivers and Streams	Estuarine Tidal Riverine Deep	This system encompasses the mouth of the St Johns River. Jetties and rip rap fortify the shoreline against erosion and help maintain water depths that support a major port at Jacksonville. Shorelines that are not fortified are typically characterized as emergent marsh dominated by species of cordgrass and rushes.	X	X

M = Naval Station Mayport F = Navy Fuel Depot

Hydric Hammock

Hydric hammocks are best described as evergreen hardwood forests growing on poorly-drained soils where shallow flooding is seasonally common. Hydric hammocks occur in a variety of lowland situations often in association with springs or karst seepage, and in lowlands just inland of coastal communities (FNAI 2010).

Three occurrences of hydric hammock occur on NAVSTA Mayport. The Buckhorn Hammock is located adjacent to Buckhorn Creek in the southwestern section of the installation. This community has been fragmented due to continuous development. The canopy is dominated by live oak and myrtle oak, with scattered slash pines. The sub-canopy and tall shrub layer is dominated by red bay (*Persea palustris*), sweet bay (*Magnolia virginiana*), and cabbage palm. Dominant short shrub species include bumelia (*Bumelia* spp.), saw palmetto (*Serenoa repens*), and red bay. Herbaceous cover is sparse, dominated by panic grasses (*Panicum* spp.).

Five, small 2-to-5-acre island (hydric hammock) occurrences are located within the tidal marsh associated with Sherman Creek. Although these hammock areas are completely surrounded by tidal marsh, negative impacts have occurred from surrounding development in Jacksonville and Jacksonville Beach. In addition, the hydrology of these areas may have been impacted by past ditching and dredging activities on NAVSTA Mayport. The FNAI study ranked these communities as “good”. Plant species and composition are similar for each site. The canopy is predominantly live oak and laurel oak interspersed with pignut hickory (*Carya glabra*), cabbage palm, southern magnolia (*Magnolia grandiflora*), slash pine, and long-leaf pine (*P. palustris*). A moderately dense tall shrub layer is dominated by waxmyrtle, staggerbush (*Lyonia fruticosa*), yaupon holly (*Ilex vomitoria*), American holly (*Ilex opaca*), wild olive (*Osmanthus americana*), and devil’s walking stick (*Aralia spinosa*). Short shrub coverage is dominated by saw palmetto, cabbage palm, waxmyrtle and blueberry (*Vaccinium corymbosum*). Herbaceous cover is dominated by cinnamon fern (*Osmunda cinnamomea*) and chasmanthium grass (*Chasmanthium laxum*).

The occurrence of another hydric hammock is located on the southern boundary of NAVSTA Mayport; bounded to the south and east by development, to the north by an approximately 300-acre tidal marsh complex contiguous with marshes along Pablo Creek to the west. This hammock received a ranking of “good” primarily due to the undisturbed nature. The canopy is dominated by live oak and cabbage palm interspersed with laurel oak. The tall shrub layer is dominated by

wild olive, red bay, water oak, red mulberry (*Morus rubra*), and younger cabbage palms. Short shrub coverage is dominated by cabbage palm, red bay, wild olive, beautyberry (*Callicarpa americana*), saw palmetto, laurel oak and water oak. Herbaceous cover is sparse and dominated by green dragon (*Arisaema dracontium*), bears foot (*Polymnia uvedalia*), and St. Andrews cross (*Hypericum hypericoide*).

Maritime Hammock

Maritime hammock is best described as an evergreen hardwood forest growing on stabilized coastal dunes composed of deep well-drained sands mixed with shell fragments that rarely flood (FNAI 2010). Species composition at NAVSTA Mayport is dominated by temperate species such as live oak, cabbage palm, and red bay (*Persea borbonia*). The low, streamlined profile of this canopy deflects winds and generally prevents hurricanes from uprooting the trees. Characteristic subcanopy species are red cedar (*Juniperus virginiana*) and American holly. Yaupon holly, tough bully (*Sideroxylon tenax*), waxmyrtle, and saw palmetto are typical shrubs. Herbaceous cover is generally sparse.

Maritime hammocks serve as crucial resting and foraging areas for songbirds on their fall and spring migrations. Although not primary habitat, maritime hammocks may also be used by gopher tortoises.

Wetlands

Wetlands are shallow intertidal or supratidal submerged areas dominated by herbaceous or woody aquatic vascular plants (FNAI 2010). Wetlands on NAVSTA Mayport are primarily estuarine tidal marsh communities in the southern and western portion of the station. These communities are divided into vegetative zones, which correspond with elevations, resulting in the subtle changes in the depth, duration, and frequency of inundation by saline water. These zones include the low marsh, upper marsh, and the higher areas of the upper marsh. The low marsh area is dominated by black-needle rush (*Juncus roemerianus*) and smooth cordgrass (*Spartina alterniflora*). The upper marsh is dominated by saltwort (*Batis maritima*) and perennial glasswort (*Salicornia virginica*). Higher areas of the upper marsh are covered by a dense cover of salt grass (*Distichlis spicata*).

Ponds and Lakes

Ponds and Lakes are non-flowing freshwater areas in natural or man-made depressions. They differ from wetlands, as described above, in that they lack persistent emergent vegetation except around their perimeters (FNAI 2010). Lake Wonderwood is the largest lake on NAVSTA Mayport, at approximately 19 acres. There are also several ponds on the base, particularly on the golf course and housing area. They support freshwater vascular plants such as cattails (*Typha* spp.), arrowhead (*Sagittaria latifolia*), and sawgrass (*Cladium* spp.), as well as American alligators and numerous species of mammals, freshwater turtles, wading birds, and migratory birds.

Rivers and Streams

Rivers and Streams are natural, flowing waters from their source to the downstream limits of tidal influence. They are bounded by channel banks (FNAI 2010). The St. Johns River flows along the northern boundary of NAVSTA Mayport. Its environment is typical of an estuarine river mouth, with moderate, fluctuating salinity and a water level that fluctuates with the diurnal tide. It serves as a migratory corridor and foraging area for marine fishes, marine mammals, and sea turtles, and also supports foraging by various species of seabirds.

NFD

A total of 56 acres of forested area occur within NFD. These areas are minimal in size and consist mainly of planted pine (slash pine with some live oak). All NFD forest stands have been inventoried as part of overall forestry resources management.

3.6 FISH AND WILDLIFE

3.6.1 Fish and Aquatic Species

NAVSTA Mayport

The estuaries of the St. Johns River connect with the open waters of the Atlantic Ocean. The estuarine habitat exists predominantly in the form of salt and brackish waters. Estuaries provide crucial habitat for a wide variety of fish, shell fish and other invertebrates. Tidal estuaries provide critical habitat for target recreational fisheries such as red drum (*Sciaenops ocellatus*) and spotted seatrout (*Cynoscion nebulosus*), as well as the commercial shrimp and oyster fishery. Furthermore, marsh nutrients, detritus and prey species are filtered into the open waters of the Atlantic thereby adding to the support of coastal migratory, demersal and pelagic fishery (*e.g.*, snapper, grouper, mackerel).

Estuarine habitat dependence is directly as well as indirectly linked to species. Some organisms are dependent on the emergent vascular plants on which they attach. Some species of mussels and oysters utilize the shell and sediment of tidal pools. Some feed directly on the vegetation while others feed on the detritus that is flowing to the open ocean. There are resident species that derive their entire life cycle within the estuary and there are transients such as the red drum and the snapper that spawn elsewhere, yet their larva and juveniles are critically tied to the estuary for survival.

Bottlenose dolphins (*Tursiops truncatus*) frequent the NAVSTA Mayport basin and adjacent Atlantic coast. New regulatory interpretations of Level B behavioral harassment under the Marine Mammal Protection Act (MMPA) now require the station to estimate behavioral takes of marine mammals, especially the ubiquitous bottlenose dolphin, during projects that require in-water pile driving. A dolphin density survey was completed in the basin in 2014, and this data can be used to facilitate analyses of behavioral takes (GSRC 2014).

NFD

The St. Johns River runs along the southeast perimeter of NFD and is brackish estuarine habitat. Coastal and estuarine fish and invertebrates inhabit the saline waters. NFD is approximately 13 miles upstream of NAVSTA Mayport and many of the organisms found near the main facility can be found along the St. Johns River next to NFD.

3.6.2 Terrestrial Wildlife

NAVSTA Mayport

FNAI performed an invasive and exotic species survey of NAVSTA Mayport in September and October 2004 (Russo and Hipes 2004a). Gulf South Research Corporation (GSRC) conducted a follow-up survey in 2010-2011 (GSRC 2011). Numerous invasive species were found throughout NAVSTA Mayport (Figure 3-3). The most prominent were shrub verbena (*Lantana camara*) and purple sesban (*Sesbania punicea*). Shrub verbena was found in almost all areas of NAVSTA Mayport, including around Lake Wonderwood, along the coast and beaches, along the golf course, along the entrance road to the main gate, and along the magazine/levee system. Shrub verbena often forms thickets in open, sunny areas and commonly invades disturbed sites such as roadsides, spoil islands, pastures, citrus groves, and cultivated woodlands (Langeland and Burks 1998).

Purple sesban was found at the southwestern end of the runway and along the southern side of the runway clear zone at NAVSTA Mayport. This plant was also found throughout the installation, including around Lake Wonderwood, and within ditches and drainages.

Several of the invasive and exotic species, such as alligator weed (*Alternanthera philoxeroides*) and torpedo grass (*Panicum repens*), are commonly found at aquatic sites, including open water lakes. Alligator weed was noted in many of the ponds on the golf course, while torpedo grass was found within several ditches adjacent to the magazine area.

NFD

The NFD was included in the 2004 FNAI and 2010-2011 GSRC Surveys (GSRC 2011; Russo and Hipes 2004b). Invasive and exotic species are found in much of the remaining natural habitat at NFD. Chinese tallow (*Sapium sebiferum*) and camphor tree (*Cinnamomum camphora*) are the most prevalent on the facility. Chinese tallow was noted throughout the forested areas in the northwestern portion of the facility and along the northern boundary fence, as well as in the forested area adjacent to the St. Johns River.

3.6.3 Birds

NAVSTA Mayport

Three comprehensive neotropical migratory bird surveys have been completed at NS Mayport. The first, conducted weekly from June 2002 through June 2004, was completed by the NS Mayport Natural Resources Biologist in partnership with Timucuan Ecological and Historic Preserve personnel, an SCA intern, and Duval Audubon Society Annual Christmas Count participants. That survey identified 166 neotropical migratory and resident bird species at NS Mayport, with the highest diversity occurring in April (NAVFAC Southdiv. 2004). A similar survey was completed in 2006-07, finding 174 species present on NS Mayport. The third survey was carried out seasonally from June 2014 to April 2015 on both NS Mayport and the NFD. That survey recorded 129 species (GSRC 2015). In a fourth instance, in 2010-11, opportunistic, non-rigid, bird surveys were conducted during a survey of rare species and identified four species that were not observed during any of the other surveys. All total, 193 bird species were identified on NS Mayport since 2002 (Table 3-4). Of those, the piping plover, rufa red knot, and wood stork are federally-threatened, and the bald eagle is federally-protected under the Bald and Golden Eagle Protection Act. Six species are protected in Florida as state-threatened: the black skimmer, least tern, little blue heron, reddish egret, roseate spoonbill, and tricolored heron. Three other species

– the brown pelican (*Pelecanus occidentalis*), snowy egret (*Egretta thula*), and white ibis (*Eudocimus albus*) – have no formal state-listed designation, but they are included in the FWC's Imperiled Species Management Plan.

NFD

A formal survey of birds at the NFD was only conducted in 2014-15, observing 74 species, two of which - the blue-headed vireo (*Vireo solitaries*) and ovenbird (*Seiurus aurocapilla*) - had never been recorded at NS Mayport. The federally-threatened wood stork and state-threatened little blue heron and tricolored heron were also observed at the NFD, as were the snowy egret and white ibis, which are included in the FWC's Imperiled Species Management Plan although they have no formal state-listing designation (Table 3-4).

Table 3-4. Birds Observed at NS Mayport in 2002-04, 2006-07, and 2014-15.

Common Name	*Scientific Name*	Winter	Spring	Summer	Fall
American Black Duck	*Anas rubripes*				07
American Coot	*Fulica americana*	04 , 07	04 , 07		04 , 07
American Crow	*Corvus brachyrhynchos*	04 , 15	07 , 15	15	15
American Golden Plover	*Pluvialis dominica*	04			
American Goldfinch	*Spinus tristis*				04
American Kestrel	*Falco sparverius*	04 , 07 , 15	04 , 15		04 , 07
American Oystercatcher	*Haematopus palliatus*			04	
American Pipit	*Anthus rubescens*	07			
American Redstart	*Setophaga ruticilla*		07		04 , 15
American Robin	*Turdus migratorius*	04 , 07 , 15	04	15	
American White Pelican	*Pelecanus erythrorhynchos*	04 , 15	15		
American Woodcock	*Scolopax minor*				04
Anhinga	*Anhinga anhinga*	07 , 15	04 , 07 , 15	04 , 07 , 15	07 , 15
Bald Eagle	*Haliaeetus leucocephalus*	04 , 07 , 15	07 , 15	15[N]	07 , 15
Barn Swallow	*Hirundo rustica*		04 , 07 , 15	04 , 07 , 15	
Barred Owl	*Strix varia*			15	
Belted Kingfisher	*Megaceryle alcyon*	04 , 07 , 15	04 , 07 , 15	04 , 07	04 , 07 , 15
Black and White Warbler	*Mniotilta varia*	04	07		
Black Skimmer [ST]	*Rynchops niger*	04 , 07 , 15	04 , 07	04	04 , 07 , 15
Black Tern	*Chlidonias niger*			04	
Black Vulture	*Coragyps atratus*	15	07 , 15	04 , 07 , 15	15
Black-and-white Warbler	*Mniotilta varia*	15[N]	15		
Black-bellied Plover	*Pluvialis squatarola*	04 , 15	04 , 07	04	04
Black-crowned Night Heron	*Nycticorax nycticorax*	07 , 15	04 , 07	04 , 07 , 15[N]	07 , 15
Black-necked Stilt	*Himantopus mexicanus*		04 , 07	04 , 07	
Black-throated Blue Warbler	*Setophaga caerulescens*		04 , 07	04	
Blackburninan Warbler	*Dendroica fusca*		*11*		

Table 3-4. Birds Observed at NS Mayport in 2002-04, 2006-07, and 2014-15.

Common Name	*Scientific Name*	Winter	Spring	Summer	Fall
Blue Grosbeak	*Passerina caerulea*			04	
Blue Jay	*Cyanocitta cristata*	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15
Blue-gray gnatcatcher	*Polioptila caerulea*	07 , 15	04 , 07 , 15	04	07 , 15
Blue-headed Vireo	*Vireo solitarius*	15[N]			
Blue-winged Teal	*Anas discors*		04	04	
Boat-tailed Grackle	*Quiscalus major*	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15
Bonoparte's Gull	*Chroicocephalus philadelphia*	04 , 07			04 , 07
Broad-winged Hawk	*Buteo platypterus*				15
Brown Pelican	*Pelecanus occidentalis*	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15
Brown Thrasher	*Toxostoma rufum*	04	04 , 07 , 15	04 , 15	
Brown-headed Cowbird	*Molothrus ater*	7	04 , 07 , 15		04 , 07
Brown-headed Nuthatch	*Sitta pusilla*		*11*		
Bufflehead	*Bucephala albeola*				04
Canada Goose	*Branta canadensis*	07 , 15[N]	04 , 07 , 15	07 , 15[N]	15[N]
Cape May Warbler	*Setophaga tigrina*		15		
Carolina Chickadee	*Poecile carolinensis*	07 , 15[N]	07 , 15	15	15
Carolina Wren	*Thryothorus ludovicianus*	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15
Caspian Tern	*Hydroprogne caspia*			04 , 15	04 , 15
Cattle Egret	*Bubulcus ibis*	07	04 , 07	04 , 07	7
Cedar Waxwing	*Bombycilla cedrorum*	07	04 , 07 , 15		04
Chimney Swift	*Chaetura pelagica*		04 , 07	04 , 07 , 15	
Clapper Rail	*Rallus crepitans*	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15
Clay-colored Sparrow	*Spizella pallida*			04	
Common Grackle	*Quiscalus quiscula*	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15
Common Ground Dove	*Columbina passerina*	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15
Common Merganser	*Mergus merganser*				04
Common Moorhen	*Gallinula chloropus*	04	04 , 07		
Common Nighthawk	*Chordeiles minor*		04	04	
Common Snipe	*Gallinago gallinago*				04
Common Tern	*Sterna hirundo*		*11*		
Common Yellowthroat	*Geothlypis trichas*	07 , 15[N]	04 , 07 , 15		04 , 07 , 15
Cooper's Hawk	*Accipiter cooperii*	04 , 07, 15	04		04 , 15
Double-crested Cormorant	*Phalacrocorax auritus*	04 , 07 , 15	04 , 07 , 15	04 , 07	04 , 07 , 15
Downy Woodpecker	*Picoides pubescens*	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15
Dunlin	*Calidris alpina*	04 , 07 , 15	04 , 07		04
Eastern Bluebird	*Sialia sialis*	15	15	15	15
Eastern Kingbird	*Tyrannus tyrannus*		04 , 07	04 , 07 , 15	04
Eastern Meadowlark	*Sturnella magna*				04 , 07
Eastern Phoebe	*Sayornis phoebe*	04 , 07 , 15	15[N]		04 , 07
Eastern Screech Owl	*Megascops asio*	04	04	04	04 , 07
Eastern Towhee	*Pipilo erythrophthalmus*	15[N]	15	04 , 15	
Eurasian Collared-Dove	*Streptopelia decaocto*	04 , 07	04 , 07 , 15	04 , 07	04 , 07
European Starling	*Sturnus vulgaris*	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15
Fish Crow	*Corvus ossifragus*	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15	04 , 07
Forster's Tern	*Sterna forsteri*	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15

Table 3-4. Birds Observed at NS Mayport in 2002-04, 2006-07, and 2014-15.

Common Name	*Scientific Name*	Winter	Spring	Summer	Fall
Fox Sparrow	*Passerella iliaca*				07
Franklin's Gull	*Leucophaeus pipixcan*				04
Glossy Ibis	*Plegadis falcinellus*		04 , 15	04	
Gray Catbird	*Dumetella carolinensis*	04 , 07 , 15	04		04 , 07
Gray Kingbird	*Tyrannus dominicensis*		04 , 07	04 , 07	
Great Black-backed Gull	*Larus marinus*	04 , 07	04 , 07 , 15	04 , 07 , 15	04 , 07
Great Blue Heron	*Ardea herodias*	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15
Great Crested Flycatcher	*Myiarchus crinitus*		04 , 07 , 15	04 , 15	
Great Egret	*Ardea alba*	04 , 07 , 15	04 , 07 , 15[N]	04 , 07 , 15[N]	04
Great Horned Owl	*Bubo virginianus*	04	04	04	04
Greater Yellowlegs	*Tringa melanoleuca*		04	04	04 , 07
Green Heron	*Butorides virescens*		04 , 07 , 15	04 , 07 , 15	15
Green-winged Teal	*Anas carolinensis*	04			
Gull-billed Tern	*Gelochelidon nilotica*		04 , 07	04	
Hairy Woodpecker	*Picoides villosus*	15			15[N]
Hermit Thrush	*Catharus guttatus*	04 , 15[N]		04	
Herring Gull	*Larus argentatus*	04 , 07 , 15	04 , 07 , 15	04 , 07	04 , 07 , 15
Hooded Merganser	*Lophodytes cucullatus*	04 , 07 , 15	04		04 , 07
Hooded Warbler	*Wilsonia citrina*		*11*		
Horned Grebe	*Podiceps auritus*	15			
House Finch	*Haemorhous mexicanus*	07 , 15[N]	07	04 , 15	
House Sparrow	*Passer domesticus*	04 , 07	04 , 07	04 , 07	04 , 07 , 15[N]
House Wren	*Troglodytes aedon*	15	15		04 , 15
Indigo Bunting	*Passerina cyanea*		15	15	
Killdeer	*Charadrius vociferus*	04 , 07 , 15	04 , 07	04 , 07 , 15	04 , 07 , 15
Laughing Gull	*Leucophaeus atricilla*	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15
Least Sandpiper	*Calidris minutilla*			04	
Least Tern [ST]	*Sternula antillarum*		04 , 07 , 15	04 , 07 , 15	15
Lesser Scaup	*Aythya affinis*	04 , 07 , 15	04		
Lesser Yellowlegs	*Tringa flavipes*		04	04	
Lincoln's Sparrow	*Melospiza lincolnii*		15		
Little Blue Heron [ST]	*Egretta caerulea*	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15
Loggerhead Shrike	*Lanius ludovicianus*	04 , 07	04 , 07	04 , 07 , 15	04 , 07
Long-billed Dowitcher	*Limnodromus scolopaceus*				04
Mallard	*Anas platyrhynchos*	04 , 07	04 , 07 , 15[N]	15	
Manx Shearwater	*Puffinus puffinus*			07	
Marsh Wren	*Cistothorus palustris*	15	15		
Merlin	*Falco columbarius*		07		07
Mottled Duck	*Anas fulvigula*	04	04 , 07 , 15	04	04
Mourning Dove	*Zenaida macroura*	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15
Nelson's Sparrow	*Ammodramus nelsoni*	15			
Northern Bobwhite	*Colinus virginianus*		04		
Northern Cardinal	*Cardinalis cardinalis*	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15
Northern Flicker	*Colaptes auratus*	07	07	04	04 , 07
Northern Gannet	*Morus bassanus*	04 , 07	04 , 07		
Northern Harrier	*Circus cyaneus*	04 , 07 , 15	04		04 , 07

Table 3-4. Birds Observed at NS Mayport in 2002-04, 2006-07, and 2014-15.

Common Name	*Scientific Name*	Winter	Spring	Summer	Fall
Northern Mockingbird	*Mimus polyglottos*	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15
Northern Parula	*Setophaga americana*		04 , 07 , 15		
Northern Shoveler	*Anas clypeata*	04			
Orange-crowned Warbler	*Vermivora celata*	15			15
Orchard Oriole	*Icterus spurius*		04 , 15	04 , 15	
Osprey	*Pandion haliaetus*	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15
Ovenbird	*Seiurus aurocapilla*		15[N]		
Painted Bunting	*Passerina ciris*	15	04 , 15	04 , 15	15
Palm Warbler	*Setophaga palmarum*	04 , 07 , 15	04 , 07 , 15		04 , 07 , 15
Pectoral Sandpiper	*Calidris melanotos*			04	
Peregrine Falcon	*Falco peregrinus*		04		04
Pied-billed Grebe	*Podilymbus podices*	04 , 07 , 15	07		04 , 15
Pileated Woodpecker	*Hylatomus pileatus*	04 , 07 , 15	07 , 15	04 , 15	04 , 15
Pine Warbler	*Setophaga pinus*	15[N]	15		15[N]
Piping Plover [FT]	*Charadrius melodus*	07	07		
Prairie Warbler	*Setophaga pinus*		15	04 , 15	04 , 15
Purple Martin	*Progne subis*			04	
Red Knot [FT]	*Calidris canutus*		07	04	
Red-bellied Woodpecker	*Melanerpes carolinus*	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15
Red-breasted Merganser	*Mergus serrator*	04 , 07 , 15	15		04 , 07
Reddish Egret [ST]	*Egretta rufescens*	15	07	04 , 07	15
Red-eyed Vireo	*Vireo olivaceus*				04
Redhead	*Aythya americana*				04
Red-shouldered Hawk	*Buteo lineatus*	04 , 07 , 15[N]	04 , 07 , 15[N]	04 , 07	04 , 07 , 15[N]
Red-tailed Hawk	*Buteo jamaicensis*	04 , 07	07 , 15		04 , 15
Red-winged Blackbird	*Agelaius phoeniceus*	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15
Ring-billed Gull	*Larus delawarensis*	04 , 07 , 15	04 , 07 , 15	04 , 07	04 , 07 , 15
Rock Dove	*Columba livia*	04 , 07	04 , 07, 15	04 , 07	04 , 07
Roseate Spoonbill [ST]	*Platalea ajaja*			04 , 07	15
Royal Tern	*Thalasseus maximus*	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15
Ruby-crowned Kinglet	*Regalus calendula*	04 , 07 , 15			7
Ruby-throated hummingbird	*Archilochus colubris*		15		
Ruddy Duck	*Oxyura jamaicensis*				04
Ruddy Turnstone	*Actitis macularius*	04 , 07 , 15	04 , 07 , 15	04 , 07	04 , 07 , 15
Saltmarsh Sharptailed Sparrow	*Ammodramus caudacutus*				04 , 07
Sanderling	*Calidris alba*	04 , 07	04 , 07	04 , 07	04 , 07 , 15
Sandhill Crane	*Grus canadensis*		07		
Sandwich Tern	*Thallasseus sandvicensis*	15[N]	04 , 07 , 15	04 , 07	04 , 07 , 15
Savannah Sparrow	*Passerculus sandwichensis*	04 , 07 , 15	04 , 07 , 15		04 , 07
Seaside Sparrow	*Ammodramus maritimus*				04 , 07
Sedge Wren	*Cistothorus platensis*	07		15	07
Semipalmated Plover	*Charadrius semipalmatus*		04 , 07		04 , 07
Semipalmated Sandpiper	*Calidris pusilla*		07	04 , 07	

Table 3-4. Birds Observed at NS Mayport in 2002-04, 2006-07, and 2014-15.

Common Name	*Scientific Name*	Winter	Spring	Summer	Fall
Sharp-shinned Hawk	*Accipiter striatus*	04			04 , 07 , 15
Short-billed Dowitcher	*Limnodromus griseus*	04	04 , 07	04	
Snowy Egret	*Egretta thula*	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15
Solitary Sandpiper	*Tringa solitaria*			04	
Song Sparrow	*Melospiza melodia*	04 , 07 , 15	04		04 , 07
Spotted Sandpiper	*Actitis macularius*		04 , 07 , 15	04	
Stilt Sandpiper	*Calidris himantopus*			04	
Swallow-tailed Kite	*Elanoides forficatus*		04	04 , 07 , 15	
Swamp Sparrow	*Melospiza georgiana*	07 , 15^{N}	15		
Tree Swallow	*Tachycineta bicolor*	04 , 07	04 , 07	7	04 , 07
Tricolored Heron ST	*Egretta tricolor*	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15	04 , 07
Tufted Titmouse	*Baeolophus bicolor*	04 , 07 , 15	04 , 07 , 15	04 , 07	04 , 07 , 15
Turkey Vulture	*Cathartes aura*	04 , 07 , 15	04 , 07	04 , 07 , 15	04 , 07 , 15
Western Kingbird	*Tyrannus verticalis*		15		07
Western Sandpiper	*Calidris mauri*			04	
White Ibis	*Eudocimus albus*	04 , 07 , 15	04 , 07 , 15	04 , 07	04 , 07 , 15
White-crowned Sparrow	*Zonotrichia leucophrys*				07
White-eyed Vireo	*Vireo griseus*	04 , 07	04 , 07 , 15	04 , 07 , 15	04 , 07 , 15
White-rumped Sandpiper	*Calidris fuscicollis*			04	
White-throated Sparrow	*Zonotrichia albicollis*	15			
Willet	*Tringa semipalmata*	07	04 , 07 , 15	04 , 07 , 15	07 , 15
Wilson's Plover	*Charadrius wilsonia*	04	07		
Wilson's Snipe	*Gallinago delicata*				07
Wood Duck	*Aix sponsa*		04 , 15	04	
Wood Stork ^{FT}	*Mycteria americana*	04 , 07 , 15	04 , 07	04 , 07 , 15^{N}	04 , 07 , 15
Yellow Warbler	*Setophaga petechia*				15
Yellow-bellied Sapsucker	*Sphyrapicus varius*	07			07
Yellow-billed Cuckoo	*Coccyzus americanus*		04		
Yellow-breasted Chat	*Icteria virens*			15	
Yellow-crowned Night	*Nyctanassa violacea*		07	04 , 07	
Yellow-rumped Warbler	*Setophaga coronata*	04 , 07 , 15	04 , 07		04 , 07
Yellow-rumped Warbler	*Setophaga coronata*	07	07		07
Yellow-throated Warbler	*Setophaga dominica*	15			15^{N}

04 = The species was observed during the 2002-04 surveys during the indicated season.
07 = The species was observed during the 2006-07 surveys during the indicated season.
15 = The species was observed during the 2014-15 surveys during the indicated season.
15^{N} = The species was observed only at the NFD during 2014-15 during the indicated season.
11 = The species was only observed during opportunistic sightings in Spring 2011.
FT = Federally-threatened ST = State-threatened

3.6.4 Invasive and Exotic Species

NAVSTA Mayport

FNAI performed an invasive and exotic species survey of NAVSTA Mayport in September and October 2004 (Russo and Hipes 2004a). Gulf South Research Corporation (GSRC) conducted a follow-up survey in 2010-2011 (GSRC 2011). Numerous invasive species were found

throughout NAVSTA Mayport (Figure 3-3). The most prominent were shrub verbena (*Lantana camara*) and purple sesban (*Sesbania punicea*). Shrub verbena was found in almost all areas of NAVSTA Mayport, including around Lake Wonderwood, along the coast and beaches, along the golf course, along the entrance road to the main gate, and along the magazine/levee system. Shrub verbena often forms thickets in open, sunny areas and commonly invades disturbed sites such as roadsides, spoil islands, pastures, citrus groves, and cultivated woodlands (Langeland and Burks 1998).

Purple sesban was found at the southwestern end of the runway and along the southern side of the runway clear zone at NAVSTA Mayport. This plant was also found throughout the installation, including around Lake Wonderwood, and within ditches and drainages.

Several of the invasive and exotic species, such as alligator weed (*Alternanthera philoxeroides*) and torpedo grass (*Panicum repens*), are commonly found at aquatic sites, including open water lakes. Alligator weed was noted in many of the ponds on the golf course, while torpedo grass was found within several ditches adjacent to the magazine area.

NFD

The NFD was included in the 2004 FNAI and 2010-2011 GSRC Surveys (GSRC 2011; Russo and Hipes 2004b). Invasive and exotic species are found in much of the remaining natural habitat at NFD. Chinese tallow (*Sapium sebiferum*) and camphor tree (*Cinnamomum camphora*) are the most prevalent on the facility. Chinese tallow was noted throughout the forested areas in the northwestern portion of the facility and along the northern boundary fence, as well as in the forested area adjacent to the St. Johns River.

Camphor tree is commonly found in disturbed areas like fencerows and roadsides (Langeland and Burks 1998); however, similar to the Chinese tallow, this species is found throughout the forested areas at NFD. Other invasive plants noted at NFD include alligator weed, chinaberry (*Melia azedarach*), Japanese honeysuckle (*Lonicera japonica*), Japanese climbing fern (*Lygodium japonicum*), shrub verbena, and torpedo grass (Figure 3-4).

3.6 THREATENED AND ENDANGERED SPECIES

NAVSTA Mayport

Rare, threatened and endangered (RTE) plant and animal surveys were conducted at NAVSTA Mayport in 1995 and 2010-11 (FNAI 1995; GSRC 2011). NAVSTA Mayport is within

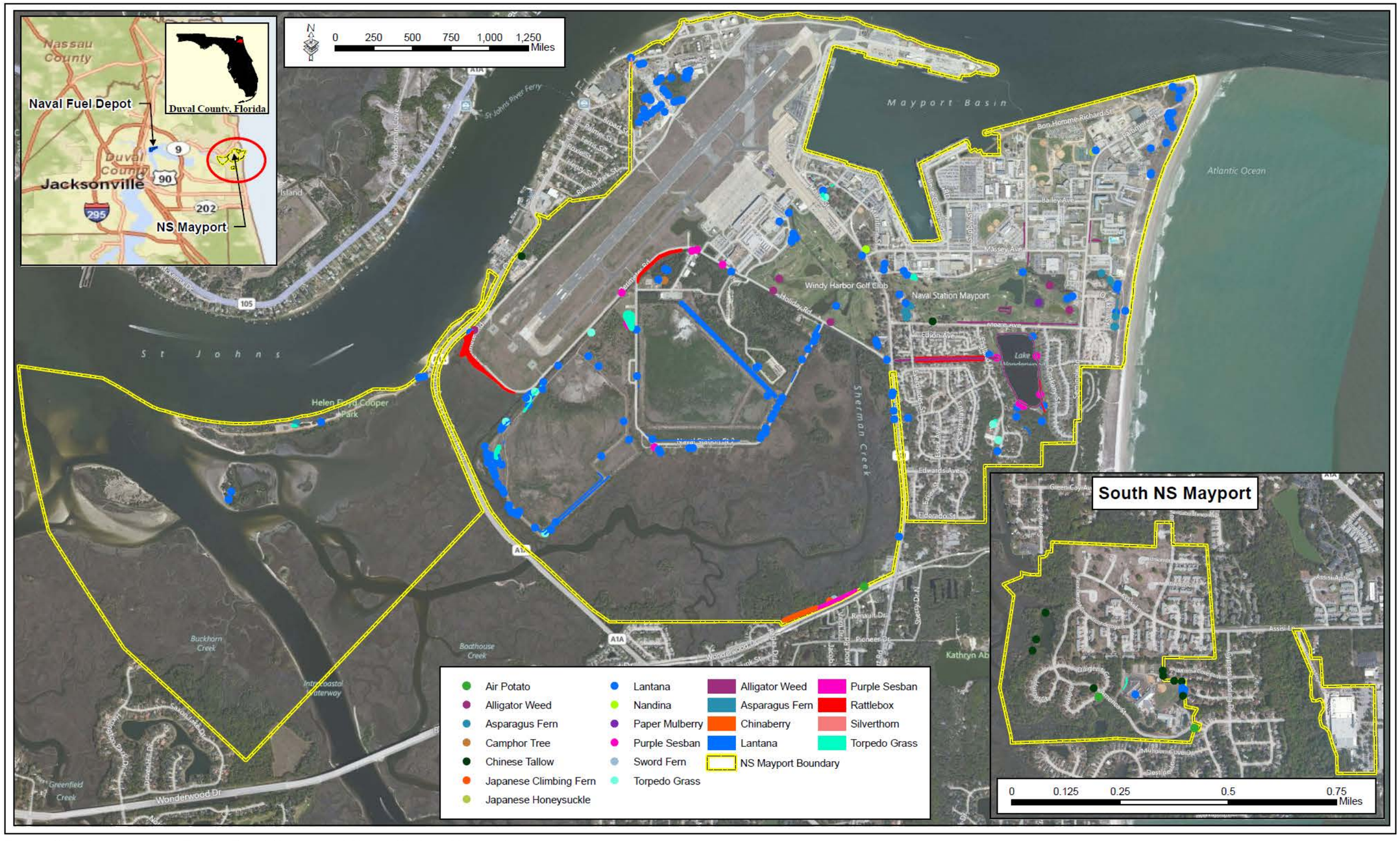

Figure 3-3. Invasive and Exotic Plant Species at Naval Station Mayport

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Figure 3-4. Invasive and Exotic Plant Species at Fleet and Industrial Supply Center Jacksonville Navy Fuel Depot (NFD).

approached by the range of at least 25 rare plants and 28 rare vertebrates. Fourteen of the 28 rare vertebrates were observed on NAVSTA Mayport between the two surveys (see Section 3.6). These are presented in Table 4 in Chapter 3. The red knot, a federally-listed threatened species, and the Florida burrowing owl, a state-listed threatened species, were specifically targeted but not observed in either survey. No rare plant species were identified on NAVSTA Mayport during either survey (see Section 3.5). The installation is adjacent to the St Johns River. Although RTE surveys for marine and riverine animals have not been conducted, sea turtles, rays, Florida manatees, North Atlantic right whales, Atlantic sturgeon, and shortnose sturgeon are known to traverse the river and may enter the basin.

NFD

A threatened and endangered species survey was conducted on the NFD only in 2010-11. The only RTE vertebrates observed were birds, including the bald eagle, least tern, snowy egret, tricolored heron, wood stork, and Worthington's marsh wren (GSRC 2011). No gopher tortoises or eastern diamondback rattlesnakes were observed, but it may be assumed that eastern diamondbacks do occur on the property occasionally. There is a wood stork rookery at the nearby Jacksonville Zoo, so foraging wood storks may occur near the NFD. The St Johns River flows along the southern border of the NFD and Florida manatees, Atlantic sturgeon and shortnose sturgeon may be expected to transit past the property at least on occasion.

3.6.1 Federal and State-Protected Plants

NAVSTA Mayport

The 1995 and 2010-11 surveys concluded that no threatened or endangered plant species are located on NAVSTA Mayport (FNAI 1995; GSRC 2011). This is largely attributable to the lack of appropriate habitat on NAVSTA Mayport. The Ribault Bay Village housing area contains no suitable habitat for Federally threatened and endangered plant species. Although not present on NAVSTA Mayport, the plant species most likely to occur on NAVSTA Mayport include the Southern lip fern (*Cheilanthes microphylla*) and slender-leaved dragon head (*Physostegia leptophylla*). Colonization of these species may occur within the hydric hammocks and the transition zone between the hammocks and tidal marsh.

NFD

No Federal or state protected plants are known to inhabit the grounds at NFD. The facility has only scattered areas of natural communities, therefore it is expected that there are few, if any, protected species occurrences on the facility.

3.6.2 Federally and State-Protected Vertebrates

NAVSTA Mayport

The 1995 FNAI survey also concluded that 10 species of rare, threatened, or endangered terrestrial vertebrates occur on NAVSTA Mayport. Table 3-5 presents the rare, threatened and endangered terrestrial species identified on NAVSTA Mayport and was updated utilizing the 2006 FNAI and 2011 GSRC occurrence records. Although the FNAI survey did not include the Ribault Bay Village Housing site specifically, the survey did include similar habitats in the nearby vicinity.

Additionally, field reconnaissance performed in January 1999 in association with the *Environmental Assessment for the Construction of Family Housing Assigned to NS Mayport*, confirmed the presence of a wood stork at the stormwater pond located at the Ribault Bay Village Housing area. In addition, burrows belonging to the gopher tortoise, a state-listed threatened species, have been identified within the uplands at the Ribault Bay Village Housing area (Dial Cordy and Associates, Inc. 1998). Also, the Worthington's marsh wren, wood stork, tricolored heron, snowy egret, little blue heron, and white ibis (*Eudocimus albus*) inhabit wetland areas throughout NAVSTA Mayport (including the Ribault Bay Village Housing area). The Federally protected terrestrial species with known occurrences at NAVSTA Mayport are described on the following pages.

Table 3-5. Threatened and Endangered Terrestrial Vertebrate Species Known to Occur in the Vicinity of both NAVSTA Mayport and NFD

Species	Listing Status	Potential to Occur at NAVSTA Mayport	Potential to Occur at NFD
Birds			
Bald Eagle *(Haliaeetus leucocephalus)*	BGE	Known to occur near the project corridor but the nearest recorded nest in 2005 and 2006 is over 1 mile south of NAVSTA Mayport	Yes
Black Skimmer (*Rynchops niger*)	ST	Known to occur along beaches at NAVSTA Mayport	Yes
Brown Pelican (*Pelecanus occidentalis*)	N	Known to occur in tidal marshes, along beaches and other aquatic sites at NAVSTA Mayport	Yes

Table 3-5, continued.

Species	Listing Status	Potential to Occur at NAVSTA Mayport	Potential to Occur at NFD
Florida Burrowing Owl (*Speotyto cunicularia floridian*)	ST	Limited potential, not currently known from NAVSTA Mayport	No
Least Tern (*Sterna antillarum*)	ST	Has nested on westernmost dredge material disposal site off the perimeter road and on Buildings 191, 337, 451, 1552, 1553, 1554, and 1555.	Yes
Little Blue Heron (*Egretta caerulea*)	ST	Frequently observed at most aquatic habitats	Yes
Piping Plover (*Charadrius melodus*)	FT	Critical Habitat is designated at Hugenot Park on north side of the St Johns River	No
Red Knot (*Calidris canutus* ssp. *rufa*)	FT	Potential to occur on beaches April to October	No
Reddish Egret (*Egretta rufescens*)	ST	Occurs in tidal marshes and other aquatic habitats	Yes
Roseate Spoonbill (*Platalea ajaja*)	ST	Occasionally occurs seasonally in tidal marshes.	Yes
Snowy Egret *(Egretta thula)*	N	Frequently observed at most aquatic habitats	Yes
Tricolored Heron (Egretta tricolor)	ST	Frequently observed at most aquatic habitats	Yes
White Ibis (Eudocimus albus)	N	Occurs at golf course and most aquatic habitats	Yes
Wood Stork *(Mycteria americana)*	FT	Known to occur at NAVSTA Mayport	Yes
Worthington's Marsh wren *(Cistothorus palustris griseus)*	ST	Known to occur in tidal marsh (nest found southeast of western dredge material disposal site)	Yes
Reptiles			
Eastern Diamondback *(Crotalus adamanteus)*	FP	A specimen was observed during the 1994 FNAI survey	Yes
Gopher Frog (*Lithobates capito*)	FP	Unlikely due to the small gopher tortoise population on the installation	No
Gopher Tortoise *(Gopher polyphemus)*	FC ST	Known to occur at Buckhorn Hammock, grassy area north of Building 436	No
Southern Hog-nosed Snake (*Heterodon simus*)	FP	Unlikely due to the small gopher tortoise population on the installation	No
Spotted Turtle (*Clemmys guttata*)	FP	Limited potential, not currently known from NAVSTA Mayport	Yes

Sources: FNAI 2006; GSRC 2011; USFWS 2012

BGE = Bald and Golden Eagle Protection Act; FC = Federal Candidate; FE = Federally Endangered; FP = Petitioned for Federal Listing; FT = Federally Threatened; ST = State Threatened

Bald Eagle

The bald eagle is the only species of sea eagle that regularly occurs on the North American continent (USFWS 1987). Its range extends from central Alaska and Canada to northern Mexico. The current range is limited, with most breeding pairs in the southeast U.S. occurring in peninsular Florida and Louisiana, and some in South Carolina, Alabama, and east Texas. Sporadic breeding takes place in the rest of the southeastern states. The bald eagle was listed as endangered in 1967 (32 FR 4001) under the Endangered Species Preservation Act of 1966. It was reclassified from endangered to threatened in 1995 and, in 2007, was delisted. However, the USFWS continues to work with state wildlife agencies to monitor bald eagles, and the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act continue to provide the species protection. In 2017, the FWC approved revisions to Florida's bald eagle rule (68A-16.002, F.A.C.), eliminating the need to obtain a state permit to take or disturb bald eagle and their nests such that only USFWS permits are required now. Bald eagles primarily eat fish, and opportunistically prey upon birds, reptiles, mammals, and carrion. Bald eagles tend to be winter breeders in the south, with a shift toward spring breeding in northern locations. Nesting begins in early September in the southeast (USFWS 1987) and eggs are laid as early as late October, peaking in late December (USFWS 1987). The historical nesting range of the bald eagle in the southeast includes the entire coastal plain and shores of major rivers and lakes (USFWS 1987). Certain general elements seem to be consistent in nest site selection, including the proximity to large waterbodies (usually within 0.5 mile) and a clear flight path to the water, large living trees, and an open view of the surrounding area. The proximity of good perching trees also may be a factor in site selection. Bald eagles may not use an otherwise suitable site if there is excessive human activity in the area. They are known to actively nest adjacent to the Navy Exchange and Commissary facility on property owned by NAVSTA Mayport, located about 1 mile south of the Installation.

Piping Plover

The piping plover was listed as threatened in 1985. Designated critical habitat for wintering piping plovers is found north of NAVSTA Mayport and includes a portion of the St. Johns River on Fort George Island within Huguenot Memorial Park. They forage, shelter, and rest above the high tide line on coastal beaches, sand flats at the ends of sandpits and barrier islands, gently sloping dunes, blowout areas behind dunes, and wash-over areas cut into or between dunes. They may occur at beach habitat on NAVSTA Mayport in winter, but do not breed or nest in the area.

Red Knot

The red knot is one of the longest-distance migrants in the world, annually covering more than 9,000 miles between southern non-breeding habitats, as far south as southern South America, and nesting habitats in the Canadian arctic tundra. Flocks migrate north and south through the contiguous United States from April through October, with most breeding taking place in Canada between late May and mid-August. Red knots primarily utilize tidal flats and beaches along seacoasts during their migration so could occur on coastal habitats at NAVSTA Mayport. It became a candidate for listing under the ESA in 2006.

Wood Stork

The wood stork was listed as endangered on 28 February 1984 (49 FR 7332-7335) and reclassified as threatened on 30 June 2014 (79 FR 37078). Wood storks feed in the salt marshes near NAVSTA Mayport. The U.S. population occurs in Florida, Georgia, and coastal South Carolina; the stork also occurs in Central and South America and the Caribbean. The species depends on freshwater and estuarine wetlands for nesting, feeding, and roosting. The wood stork is a colonial species and typically nests in large rookeries and feed in large flocks. Nesting sites must remain inundated throughout the nesting cycle, which in north Florida occurs from March through August, and foraging sites are typically shallow, open water. Appropriate nesting and foraging habitats are present on NAVSTA Mayport.

Gopher Tortoise

The gopher tortoise is a state-listed threatened species in Florida; it is also a federal candidate for listing as threatened. In other parts of their range, they are already federally-listed as threatened. Surveys conducted by GSRC in 2010-2011, recorded seven burrows across four locations (Figure 3-5), five of which were active (GSRC 2011). Most active burrows were located near the beach along the eastern facing slope of a relic dune-scrub habitat just east of the Coast Guard tower. A down-hole camera was not used to examine the burrows for occupancy, but two tortoises were observed associated with the burrows.

NAVSTA Mayport

The 1995 FNAI survey excludes fish and marine species; however, the *NAVSTA Mayport Command Duty Officer (CDO) Standard Operating Procedures for Endangered and Threatened Species* (NAVSTA Mayport 1997) identifies a list of Federally and state-protected species which

includes ten marine vertebrate species (Table 5); this list was updated in 2010 with information from FNAI occurrence records and USFWS species list for Duval County.

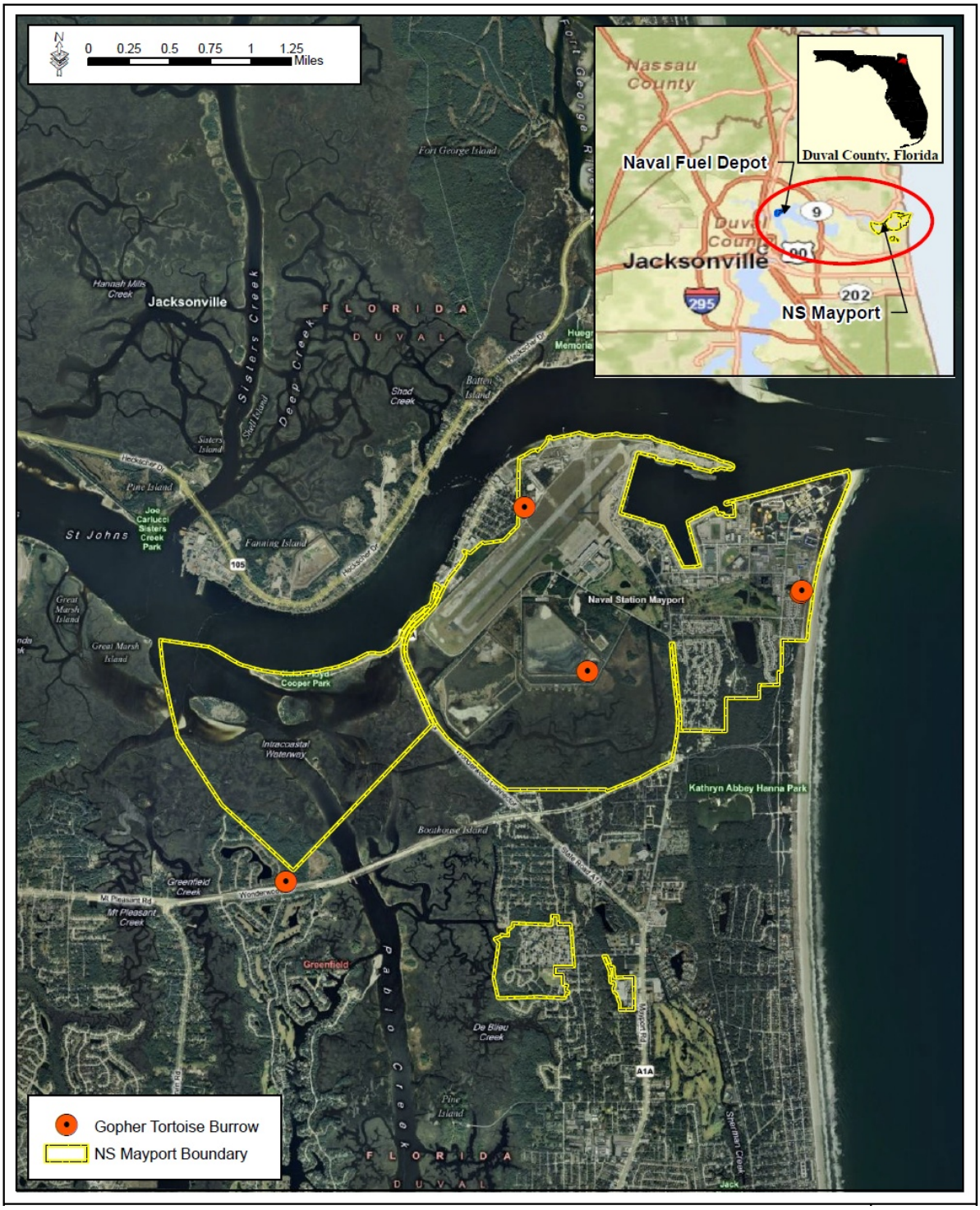

Figure 3-5. Locations of gopher tortoise burrows at Naval Station Mayport.

NFD

A threatened and endangered species survey has not been conducted on the NFD. The facility has only scattered areas of natural communities; however, military personnel have reported that bald eagles, herons, wood storks, and egrets have been seen at NFD. A list of rare, threatened, and endangered species known to occur in the region, or potentially occurring on the installation, is provided in Table 3-5. Bald eagle nests and a wood stork rookery occur at the Jacksonville Zoo, approximately 1 mile from the NFD.

3.6.3 Federally and State-Protected Aquatic Species

Florida manatees and sea turtles are the most commonly-encountered protected aquatic species at NAVSTA Mayport. Loggerhead sea turtles *(Caretta caretta)* and, to a lesser extent, green sea turtles (*Chelonia mydas*) and (leatherback sea turtles (*Dermochelys coriacea coriaccea*) are known to nest on NAVSTA Mayport beach and on beaches north and south of the station (NAVSTA Mayport 1997; NRM, pers. comm.). The nesting season is from May through October. The ranges of the Kemp's Ridley (*Lepidochelys kempi*) and hawksbill sea turtles (*Eremochelys imbricata*) overlap NAVSTA Mayport, but they do not nest on beaches in the area and are primarily open-water pelagic species that may occasionally occur on near-shore reefs and in tidal waters. The following are descriptions of the Federally-listed aquatic species known to occur at NAVSTA Mayport (Table 3-6).

Table 3-6. Threatened and Endangered Aquatic Vertebrate Species that Potentially Occur on or Near NAVSTA Mayport or NFD

Species	Listing Status	Potential to Occur at NAVSTA Mayport	Potential to Occur at NFD
Fish			
Atlantic Sturgeon (*Acipenser oxyrhynchus*)	FE	Mouth of St. Johns River to Bostwick Area north of Palatka	Yes
Dwarf Seahorse (*Hippocampus zosterae*)	FP	Unlikely, as there are no local seagrass beds	No
Giant Manta Ray (*Manta birostris*)	FT	Possible transient off the beach, unlikely in the St Johns River	No
Shortnose Sturgeon (*Acipenser brevirostrum*)	FE	Mouth of St. Johns River to Lake George including Crescent Lake	Yes
Smalltooth Sawfish (*Pristis pectinata*)	FE	Atlantic Ocean	No
Mammals			
Florida manatee (*Tricheus manatus latirostris*)	FT	Transient in the St Johns River Observed in the Turning Basin	Yes

Table 3-6, continued.

Species	Listing Status	Potential to Occur at NAVSTA Mayport	Potential to Occur at NFD
North Atlantic Right Whale (*Eubalena glacialis*)	FE	Atlantic Ocean	No
Reptiles			
Green Sea Turtle (*Chelonia mydas*)	FT	Known to nest at NAVSTA Mayport	No
Hawksbill Sea Turtle (*Eremochelys imbricata*)	FE	Unlikely	No
Kemp's Ridley Sea Turtle (*Lepidochelys kempi*)	FE	Unlikely	No
Leatherback Sea Turtle (*Dermochelys coriacea coriaccea*)	FE	Known to nest at NAVSTA Mayport	No
Loggerhead Sea Turtle *(Caretta caretta)*	FT	Known to nest at NAVSTA Mayport	No

Source: USFWS 2012; NOAA Fisheries 2012
FC = Federal Candidate; FE = Federally Endangered; FP = Petitioned for Federal Listing; FT = Federally Threatened

Atlantic Sturgeon

The South Atlantic DPS of Atlantic sturgeon was listed as endangered under the ESA on 6 February 2012 (77 FR 5914). Critical habitat for this species was not designated in the St Johns River (82 FR 39160). Atlantic sturgeon spawn in freshwater and migrate into coastal waters as adults. Mature individuals make spring migrations up rivers to spawn. Males may remain in rivers until autumn, but females generally return to the ocean within several weeks. The Navy funded an effort to capture and acoustically detect Atlantic sturgeon in the St Johns River in 2014-15. Captures were attempted with trammel nets and experimental gill nets, totaling 150 net sets and more than 170 hours of soak time. A single Atlantic sturgeon was captured approximately 40 kilometers upriver. Genetic analysis assigned it to the Altamaha River population with 98% probability. An array of seven passive acoustic receivers was deployed in the St Johns River and detected eight other Atlantic Sturgeon, all of which were adults tagged in other river systems. There was no evidence of a juvenile cohort of Atlantic sturgeon in the St Johns River (Fox et al. 2016).

Dwarf Seahorse

Dwarf seahorses (*Hippocampus zosterae*) were petitioned for listing under the ESA on 4 May 2012 (77 FR 26478). They require seagrass habitat for forage and shelter, so are very unlikely to occur in vicinity of NAVSTA Mayport, which has no such habitat. However, dwarf seahorses may also inhabit floating Sargassum seaweed mats, which occur seasonally at NAVSTA Mayport, creating potential for the species to enter NAVSTA jurisdiction during late summer, when floating

Sargassum mats are most prevalent. Sargassum is federally protected as an essential fish habitat under the Magnusson-Stevens Act (MSA), and its harvest is subject to policies established by the South Atlantic Fisheries Management Council.

Florida Manatee

The Florida manatee, a subspecies of the West Indian manatee (*Trichechus manatus*), frequents the turning basin at NAVSTA Mayport. It was listed as endangered in 1967 (32 FR 4001) under the Endangered Species Preservation Act of 1966. After adoption of the Endangered Species Conservation Act of 1969 (ESCA), the listing was amended in 1970 to expand the Florida manatee listing to include the West Indian manatee throughout its range. Species listed under the ESCA, including the West Indian manatee, were subsequently grandfathered into the List of Endangered and Threatened Wildlife under the Endangered Species Act of 1973 (ESA), and the West Indian manatee remained listed as an endangered species under the ESA until 2017 when it was reclassified as threatened (82 FR 16668). The Florida manatee is also protected by the State of Florida under the Florida Manatee Sanctuary Act of 1978, as amended (§ 379.2431(2), FS).

A USGS-led status and threats analysis for the Florida manatee was updated in 2016. This effort considers the demographic effects of the major threats to Florida manatees and evaluates how those demographic effects influence the risk of extinction. The analysis forecasts the status of the manatee population under different threat scenarios using the Manatee Core Biological Model. Under the status quo scenario, the statewide manatee population is expected to increase slowly, nearly doubling over 50 years, and then stabilize as the population reaches statewide carrying capacity. Under this scenario, the model predicts that it is unlikely (< 2.5 percent chance) that the statewide population will fall below 4,000 total individuals over the next 100 years, assuming current threats remain constant indefinitely (Runge et al. 2015).

Giant Manta Ray

The giant manta ray (*Manta birostris*) was listed as threatened under the ESA on 22 January 2018 (83 FR 2916). It has a circumglobal range in temperate and tropical waters, and is frequently sighted near shore in Florida. There are several anecdotal accounts of manta rays caught on the Jacksonville Beach pier, a few miles south of NAVSTA Mayport, although many of those accounts may be inaccurate since “manta ray” is a colloquialism that could be applied to several ray species. Giant manta rays are filter feeders that eat plankton. Its principal threat is overfishing, especially as it is a long-lived species with a relatively low rate of reproduction.

North Atlantic Right Whale

The North Atlantic right whale (NARW; *Eubalena glacialis*) occurs offshore from NAVSTA Mayport. It is estimated that approximately 300 North Atlantic right whales remain. The NARW can be 50 feet long and weigh up to 70 tons. In the North Atlantic, calving usually occurs from December through March. The biggest threats to the species today are ship strikes and entanglement in fishing gear. Coastal Florida and Georgia represent one of five "high use" areas for the NARW (NOAA Fisheries 2006a). Critical habitat is designated from Sebastian Inlet, Florida north to the Altamaha River, Georgia (NOAA Fisheries 2006a). The Navy implements protective measures when operating in the critical habitat area and associated coastal waters, extending approximately 80 nautical miles off of the coast, during the calving season. These measures include the use of dedicated watch-standers that have completed marine species awareness training, reducing north/south transits in the critical habitat area, and remaining at least 500 yards away from any observed NARWs. When operating within the critical habitat area during the calving season, Navy vessels exercise extreme caution and use slow safe speeds consistent with mission, training and operational needs. The Navy also supports the NMFS Early Warning System (EWS) for the detection of NARWs during the calving season (generally December 1 through March 31). As a participant, the Navy funds aerial surveys and operates a fusion center that receives all aerial and shipboard sightings from multiple sources and then disseminates the information to Navy, USACE, U.S. Coast Guard and commercial vessels operating in the area.

Sea Turtles

The North Atlantic DPS of green sea turtles were listed as threatened on 6 April 2016 (81 FR 20058). Green sea turtles occupy three habitat types: high energy oceanic beaches (nesting), convergence zones in pelagic habitat (juvenile foraging), and benthic feeding grounds in relatively shallow, protected waters (adult foraging) (USFWS 1993). Common adult foraging habitats are pastures of seagrasses and algae, but small green turtles can also be found over coral reefs, worm reefs, and rocky bottoms. In the southeastern U.S., green sea turtles nest from June through September and incubation ranges from 45 to 75 days, depending on incubation temperatures. One green sea turtle nest was recorded on the NAVSTA Mayport beach during the 2016 nesting season and it produced 107 hatchlings.

The hawksbill sea turtle was listed as endangered on 14 April 1970 (35 FR 6069). Hawksbill sea turtle adults average about 2.5 feet in length and weigh between 95 to 165 pounds (USFWS 1993). Hawksbill sea turtles nest on low and high-energy beaches in tropical oceans of the world.

Hawksbill sea turtles may occur offshore from NAVSTA Mayport, but other than isolated strandings, beaches within Duval County are not utilized by these turtles.

Leatherback sea turtles were first listed on 2 June 1970 (35 FR 6069). The leatherback sea turtle nests on the shores of the Atlantic, Pacific, and Indian Oceans. The adult leatherback can reach 6.5 feet in length and 500 to 2,000 pounds in weight and is commonly found in cool, as well as in subtropical-tropical waters (NOAA Fisheries 2006c). Although it is generally a deep-diving oceanic species that forages on gelatinous planktonic animals, leatherbacks seasonally move into coastal waters, including estuaries, to feed on large jellyfish associated with rivers and frontal boundaries. Small numbers of leatherback sea turtles nest on barrier islands and mainland beaches in the northeastern Gulf of Mexico, as well as on the east coast of Florida. Nesting typically occurs between March and July in the southeastern U.S. with incubation requiring between 55 and 75 days, depending on incubation temperatures. Suitable nesting habitat occurs on NAVSTA Mayport; five nests have been confirmed there since 2003.

The North Atlantic DPS of loggerhead sea turtles were listed as threatened on 22 July 2011 (76 FR 58868). Loggerhead sea turtles are found in temperate and tropical waters worldwide. Following a 1 to 2-year pelagic stage, adults inhabit nearshore continental shelf and estuarine environments in the Atlantic, Pacific, and Indian Oceans (NOAA Fisheries 2006d). Loggerhead sea turtles generally nest on high- to moderate-energy beaches and may favor steeply sloped beaches with gradually sloped offshore approaches. Loggerhead sea turtle nests are common on the northeastern Gulf of Mexico coasts of Alabama and Florida and the second-largest population of this species in the world nests on Florida's east coast. Suitable nesting habitat occurs on NAVSTA Mayport and nesting typically occurs between May and September with hatching occurring 50 to 60 days later. Loggerheads have nested at NAVSTA Mayport since recordkeeping began in 1998 when two nests were recorded. Nesting rates have gradually increased over the years due to active management initiatives including beachfront light reductions, driving restrictions, dune protection measures, daily beach surveys, and an installation education program. The 2016 nesting season produced 14 loggerhead nests at NAVSTA Mayport with a total of 1,095 hatchlings.

The Kemp's ridley sea turtle is found only in the Gulf of Mexico and North Atlantic Ocean, north of the Caribbean Sea. This, the smallest species of Atlantic Ocean sea turtles, has but a single primary nesting area, a 10-mile stretch of beach near Rancho Nuevo, on the Gulf of Mexico coast

of Mexico, where large aggregations of nesting females come ashore together. Occasional nesting has been reported along the Texas, Alabama, and Florida coasts. Crustaceans, especially crabs, are reported to be its preferred food, and both juveniles and adults are found in nearshore waters, including estuaries, throughout the northern Gulf of Mexico. The once critically small population of Kemp's ridley sea turtle has increased in recent years due to management programs of the USFWS and the NOAA Fisheries.

Shortnose Sturgeon

The shortnose sturgeon was listed as endangered on March 11, 1967 (32 FR 4001). Shortnose sturgeons inhabit the main stems of their natal rivers, migrating between freshwater and mesohaline river reaches. Spawning occurs in upper, freshwater areas, while feeding and overwintering activities may occur in both fresh and saline habitats. Habitat degradation or loss (resulting, for example, from dams, bridge construction, channel dredging, and pollutant discharges), and mortality (for example, from impingement on cooling water intake screens, dredging, and incidental capture in other fisheries) are principal threats to the species' survival (NOAA Fisheries 2006b). The St. Johns River near NAVSTA Mayport is potentially suitable habitat for the shortnose sturgeon. The Navy funded an effort to capture and acoustically detect shortnose sturgeon in the lower St Johns River in 2014-15. Captures were attempted with trammel nets and experimental gill nets, totaling 150 net sets and more than 170 hours of soak time. An array of seven passive acoustic receivers was also deployed in the St Johns River to detect shortnose sturgeon that had been previously tagged in other river systems. No shortnose sturgeon were captured or acoustically-detected in the lower St Johns River during this study (Fox et al. 2016).

Smalltooth Sawfish

Smalltooth sawfish (*Pristis pectinata*) were listed as endangered under the ESA on 1 April 2003 (68 FR 15674). They were historically common in the shallow waters of the eastern seaboard to North Carolina. Currently, however, they are only found with regularity off extreme southern Florida. There has been one documented capture of a smalltooth sawfish as far north as Georgia since 2002, caught by the bottom longline fishery in water depths greater than 45 m (NMFS 2009). Literature describing habitat use by juvenile smalltooth sawfish indicates they prefer shallow-water mangrove habitat as is found in south Florida. This habitat is not present in north Florida. Larger juveniles utilize soft sediment and progressively deeper waters as they grow. Adults range from shallow coastal waters to deeper shelf waters, feeding on small

schooling fish as well as crustaceans and other benthic prey (NMFS 2009). Smalltooth sawfish occurrence in the waters adjacent to NAVSTA Mayport is possible, but unlikely.

NFD

A threatened and endangered species survey has not been conducted on the NFD. Table 5 contains a list of threatened and endangered aquatic species known in the vicinity of NFD. It is probable that Florida manatee and Atlantic and shortnose sturgeons have transited the waters of the St. Johns River along the banks of NFD.

3.7 FOREST RESOURCES

NAVSTA Mayport

NAVSTA Mayport manages approximately 178 acres of forestland (includes NAVSTA Mayport and the Ribault Bay Village Housing area). Forestland at NAVSTA Mayport and NFD are to be managed for multiple-use forest purposes (see Section 4). NAVSTA Mayport is classified as a "non-commercial" forestry installation since forest product sales are periodic rather than annual. All forest stands at NAVSTA Mayport have been inventoried as a part of overall forest resource management. Figure 3-6 depicts the locations of forest stands on NAVSTA Mayport.

NFD

A total of 56 acres of forested area occur within the NFD facility. These areas are minimal in size and consist mainly of planted pine (slash pine with some live oak). All NFD forest stands have been inventoried as part of overall forestry resources management. Figure 3-7 shows the forested areas on the NFD facility.

3.8 LAND USE

3.8.1 Regional Land Use

NAVSTA Mayport

NAVSTA Mayport is located in Duval County, Florida near the confluence of the St. Johns River and the Atlantic Ocean, approximately 15 miles east of downtown Jacksonville. Population statistics indicate that Duval County and the COJ are growing at a rapid pace with these trends expected to continue over the next several years. Table 3-7 indicates the population changes in Duval County and in the COJ.

Table 3-7. Population of Duval County and the City of Jacksonville

Population Area	2000	2010	Percent Change
Duval County	778,866	864,263	11.0
City of Jacksonville	736,462	821,784	11.6

Source: U.S. Census Bureau 2010.

Both NAVSTA Mayport and the Ribault Bay Village Housing area are surrounded by development. NAVSTA Mayport is located adjacent to the community of Mayport, which is situated on a narrow strip of land along the St. Johns River, northwest of NAVSTA Mayport between Chicopit Bay and the ferry boat station. The community of Mayport is comprised predominantly of single family homes, with limited commercial and industrial uses along the riverfront. Residential densities are mostly low to medium (up to 15 units per acre). The southern edge of NAVSTA Mayport is bordered by State Road A1A, Wonderwood Drive, and Kathryn Abbey Hanna City Park.

North of the St. Johns River are Huguenot Park, Little Talbot Island Park, and Fort George Island. Land uses along the boundary to the station generally provide good buffers between NAVSTA Mayport and surrounding communities, particularly, to the north and west of the installation where much of the undeveloped land is included within the TIMU. Commercial development around NAVSTA Mayport is located primarily in the community of Mayport, along State Road A1A, and south of the installation along Mayport Road.

NFD

NFD is located in an commercial and industrial corridor. The Marine Corps Reserve Center is adjacent to NFD. It approximately 13 miles due west from NAVSTA Mayport and part of the COJ.

3.8.2 Land Use

Land-use on NAVSTA Mayport and NFD are segregated into four basic categories:

- **Improved lands or grounds** include residential, commercial, and industrial areas; linear infrastructure facilities, such as transportation, communications, and utilities; and recreational and construction sites.
- **Semi-improved grounds** include altered lands, road shoulders, and other land use areas that require little maintenance.
- **Unimproved areas** include forestlands, wetlands, waterways, and other non-developed areas.

- **Other lands** include areas not available for productive use such as buildings, streets, parking areas, and sidewalks and other paved areas.

NAVSTA Mayport

Presently, NAVSTA Mayport occupies 3,349 acres of land, which has been divided into four general categories based on operational needs and the intensity of maintenance required (Table 3-8). Existing land use at NAVSTA Mayport is the result of planned incremental development of facilities for supporting the mission of the installation. In general, administration, maintenance, and repair functions are located adjacent to the waterfront, providing a logical grouping of activities around the berths and the turning basin. Airfield operations lie to the west of the turning basin between the existing Harbor Ops administration building and the community of Mayport. Housing and community facilities are separated from the industrial areas by the roadway network, administration facilities and the golf course. Much of the southwestern section of NAVSTA Mayport is open land including wetland areas, dredge material and weapons areas.

Family housing assigned to NAVSTA Mayport includes permanent on-base and off-base housing. There are 681 housing units on base for use by Navy families, 628 of which are duplexes and 53 of which are single-family units. In addition, 48 recreational vehicle (RV) sites on base are available for use at Pelican Roost, as are 50 RV sites at Osprey Cove, which also has bathrooms, a laundry, and meeting room. All mobile homes are privately owned. Off base, at Ribault Bay Village, there are 400 two-, three-, four-, and five-bedroom units. Total family housing units assigned to NAVSTA Mayport are 1,131 (includes mobile home pads).

Table 3-8. NAVSTA Mayport Present Land Use

Location	Areas in Acres				Total Acres
	Improved	Semi Improved	Unimproved	Other	
Housing	162	0	0	0	162
Recreation	209	0	0	0	209
Administration	165	0	0	0	165
Runway; Taxiway; Road Shoulders etc.	8	420	0	0	428
Off Station Housing	46	0	12	20	78
Building, paving	0	0	0	357	357
Forest Management	0	0	357	0	357
Unimproved	0	0	1,675	0	1,675
Total	527	420	1,962	377	3,349

Source: NAVSTA Mayport

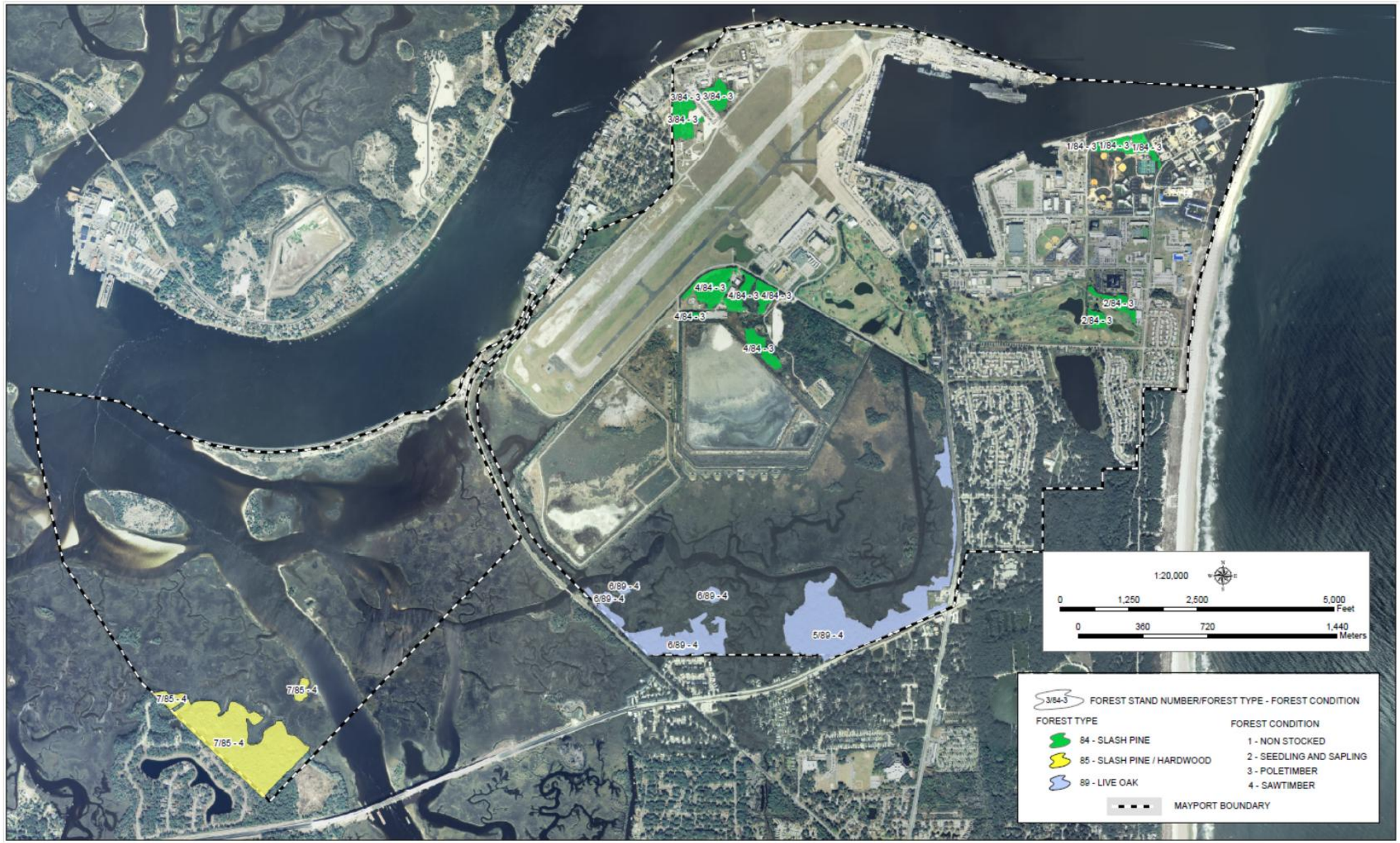

Figure 3-6. Forest Stands at Naval Station Mayport.

Figure 3-7. Forest Stands at Fleet and Industrial Supply Center Jacksonville Navy Fuel Depot (NFD).

NFD

Presently, the NFD property totals approximately 180 acres of land. The land areas are divided into four general categories based on operational needs and the intensity of required maintenance.

The NFD facilities can be divided into general land-use categories (Table 3-9). In support of the military mission of the NFD, the primary land use on the installation is operations. Operations includes fuel operations (*e.g.*, tank farm, fuel pier, tank truck racks, pump stations), operations maintenance, training, and storage.

The NFD facilities are composed of three major components: the terminal and tank farms, the fuel pier, and the connecting pipeline facilities. The terminal consists of administration and control buildings, tank farms and the associated piping and pumping facilities, tank truck loading facilities, fire protection piping, and other operations support facilities. The tank farms contain seven JP-5 bulk fuel tanks and three DFM tanks. All have fixed external roofs with floating internal pans, except one DFM tank that has the internal tank removed. Pumping facilities consist of four systems located within the terminal area, and pumping facilities are provided by marine vessel pumps at the fuel dock. The fuel pier is concrete and supported by concrete-bearing piles and is approximately 600 feet from shore to loading area. The fuel pier has an advanced energy absorbing fendering system and is equipped with manual double counter weighted and hydraulically-operated loading arms. The fuel pier can accommodate vessels up to 754 feet long.

Table 3-9. NFD Land Use Type, Acreage, and Percentage of Total

Location	Areas in Acres				Total Acres
	Improved	Semi Improved	Unimproved	Other	
Lawns	2	0	0	0	2
Picnic Areas	2	0	0	0	2
Road Shoulders	0	8	0	0	8
Fuel Dikes	0	7	0	0	7
Drain Ditches	0	4	0	0	4
Open Flat Areas	0	35	0	0	35
Managed Forest	0	0	56	0	56
Unimproved Area	0	0	27	0	27
Buildings, Roads, Paving	0	0	0	9	9
Total	4	54	83	9	180

3.9 OUTDOOR RECREATION

3.9.1 Regional Recreation Resources

NAVSTA Mayport and NFD

Various recreational opportunities exist close to NAVSTA Mayport and NFD. Numerous state and city parks and recreational areas offer a variety of outdoor recreational activities, including fishing, swimming, camping, nature studies, hiking, picnicking, canoeing, kayaking, and hunting. Larger parks in proximity to NAVSTA Mayport include:

- **Kathryn Abbey Hanna City Park.** The park is 450 acres located on the sandy shores of the Atlantic Ocean and contains beaches, freshwater lakes, wooded campsites, numerous trails (for hiking biking and other outdoor recreational activities), and a host of other amenities.
- **TIMU.** The preserve is 46,000 acres of salt marsh and waterways, wooded islands and scenic vistas of the flat horizon. Approximately 75 percent of the preserve is comprised of wetlands and waterways that form an extensive estuarine system between the Nassau and St. Johns River. The Preserve is located entirely within the COJ and Duval County, with a portion of the preserve being located within NAVSTA Mayport boundaries. This estuarine system is predominantly salt marsh, coastal hammock, and marine and brackish waters. Much of the salt marsh is among the least disturbed on the southern Atlantic Coast. Many resident, migratory, and rare species rely on the habitats in the preserve. Recreational activities within these areas include interpretive opportunities, trails, beaches, fishing, swimming, and boating.
- **Helen Cooper Floyd Memorial Park.** The park is approximately 33 acres in size and is leased to the COJ by the Navy. The COJ is responsible for all operational and maintenance activities. Recreational activities within this area include fishing.
- **Modesky Park, Mayport/Ocean Street Park, and Oak Harbor Park.** These parks are urban-type parks with small acreage and contain playgrounds, basketball courts and boat ramps.
- **Fort Caroline National Memorial.** Fort Caroline National Memorial is located 10 miles east of Jacksonville. Fort Caroline National Memorial, administered by the National Park Service, memorializes the French presence in Florida.
- **Kingsley Plantation.** The Kingsley Plantation, administered by the National Park Service is located on Fort George Island and includes the plantation house, a kitchen house, a barn and the ruins of 25 of the original slave cabins.
- **Little Talbot Island State Park.** Located 20 miles from downtown Jacksonville, Little Talbot Island, Florida is one of the few remaining undeveloped barrier islands in Northeast Florida. The entire 2,500-acre island is a state park. Recreation activities include camping, fishing, hiking, bird watching, swimming, canoeing, and bicycling.
- **Huguenot Memorial Park.** Huguenot Memorial Park is a 450-acre linear horseshoe shaped peninsula surrounded by Fort George Inlet, St. Johns River and the Atlantic

Ocean. Recreation activities include camping, surfing, windsurfing, fishing, and bird watching.

- **Fort Clinch State Park.** Fort Clinch is one of the oldest state parks being acquired in September 1935. Recreation activities include camping, fishing, hiking, bird watching, swimming, canoeing, and bicycling.

3.9.2 Onsite Recreation Resources

NAVSTA Mayport

The geographic and natural settings at NAVSTA Mayport combine to provide an abundance of outdoor recreational opportunities. Recreation activities occur primarily in water resources and include the Atlantic Ocean, the St. Johns River, the ICW, Chicopit Bay, Lake Wonderwood and Buckhorn, Sherman, Pablo, Garden and Sisters Creek. Additional water recreation sites are available at Hanna Park, a city park located south of the installation along the Atlantic Ocean.

Helen Cooper Floyd Memorial Park lands were acquired by the Navy in 1976 to control development encroachment into the NAVSTA Mayport Aircraft Installation Compatible Use Zones (AICUZ). NAVSTA Mayport entered into a lease with the COJ, granting the city use of the property exclusively as a public park. Recreation activities include primarily fishing with some bird watching and other passive recreational activities available to Navy service members and the general public. Chicopit Point is leased to the COJ for recreation purposes and is also used by the Mayport Marine Science Center for educational purposes.

Dispersed recreational activities (*e.g.*, freshwater fishing, saltwater fishing, nature study, bicycling, and non-motorized boating [canoeing and kayaking]) on NAVSTA Mayport include:

- Saltwater fishing is available at the southern jetties (Pelican Point), Chicopit/Sherman Point (open to the general public during daylight hours) Areas. Other resources available include the Atlantic Ocean, St. Johns River, ICW, and tidal creeks.
- Freshwater fishing and boating are allowed in Lake Wonderwood. These activities are controlled and authorized by the MWR Department. A Florida state freshwater fishing license is required to fish in Lake Wonderwood and any other ponds located on the station.
- Scenic walking opportunities exist on the Atlantic beachfront, the south jetty, the path at the front gate of NAVSTA Mayport, service road behind beach dunes and at paths along Chicopit/Sherman Point.

Concentrated recreational activities (*e.g.*, picnicking, jogging, swimming, motorized boating, outdoor camping, and target shooting) on NAVSTA Mayport include:

- Several picnic areas exist on NAVSTA Mayport. Each location is available by reservation and is adjacent to other recreational type facilities. Additional sites are planned for construction.
- Jogging opportunities exist along an 8-foot wide fitness/jogging trail around the perimeter of Lake Wonderwood extending for 1 mile; around FTC via Bon Homme Richard; along Patrol Road around the airfield and a first class 0.25 mile jogging track.
- Facilities are available for skeet shooting.
- Tidal wetlands south of Chicopit/Sherman Point and west of State Route A1A are open to motorized boating.
- Swimming is allowed at the beach adjacent to the Atlantic Ocean.

NFD

There are no recreational facilities onsite at the NFD facility.

4.0 NATURAL RESOURCES GOALS, OBJECTIVES, AND MANAGEMENT STRATEGIES

4.1 INTRODUCTION

This section presents the goals, objectives, and management strategies for natural resources at NAVSTA Mayport and NFD over the next 10 years. To ensure success in achieving these goals, a framework or "road map" of goals, objectives, management strategies and initiatives, and related projects is discussed in this section. The goals, objectives, strategies, initiatives and projects are referenced throughout the INRMP where appropriate and relevant.

4.2 DEFINITIONS

Goals. Goals are general expressions that represent the long-range aim of management. For this INRMP, goals are compatible with the military mission of NAVSTA Mayport and NFD and provide conservation and ecosystem management targets and direction.

Issues. To establish objectives for achieving the stated INRMP goals, issues that must be addressed were identified and are described in Section 4.3. Issues may include the presence, abundance, distribution, function, condition, and sensitivity of a particular natural resource feature, resource-based human function, or other attribute on the Installation, or within the broader ecological or community setting. Issues may also include the effectiveness or ineffectiveness of existing or past practices regarding management and use of resources on the Installation, and the requirements for regulatory compliance regarding the management and use of natural resources.

Objectives. Objectives can be defined as defensible targets or specific components of a goal, the achievement of which represents measurable progress toward that goal. Objectives help to focus management activities, and provide a yardstick against which to evaluate and communicate results. One or more objectives may be identified for successfully achieving a particular goal. Objectives are comprised of strategies and defined actions or projects.

Strategies. Strategies establish the approach and expected end result for the actions that are necessary to accomplish stated objectives. One or more strategies may be identified for accomplishing a particular objective. Strategies involve certain actions to be taken by the DoN, such as the completion of specific projects and/or the implementation of other management initiatives at NAVSTA Mayport and NFD. Strategies usually specify timeframes for completion of various actions.

Projects. Discrete actions for fulfilling a particular strategy are identified as projects. Projects may be required to fulfill obligations by NAVSTA Mayport and NFD in meeting regulatory requirements regarding natural resources management or may enhance existing measures for ensuring compliance. Other projects are not compliance-driven, but may allow for more effective and efficient management of natural resources and/or simply provide for sound natural resources stewardship. Projects require labor resources and funding, in addition to the day-to-day requirements of the Installation.

Other Management Initiatives. Some strategies identify the need for incorporating sound natural resources management principles into the day-to-day decision-making processes and other actions of the various departments at the Installation. These types of initiatives typically strive to elevate awareness throughout the NAVSTA Mayport and NFD organization, avoid potentially reactive approaches to natural resources issues at both the sites, and facilitate a proactive approach to addressing natural resources within the mission of the Installation. Initiatives are fundamental, non-measurable actions recommended for successful implementation of a strategy. Initiatives attempt to solve problems that preclude meeting specific strategies.

4.3 GOALS AND OBJECTIVES

Five Goals and 15 Objectives have been identified for NAVSTA Mayport and NFD. These goals, objectives, and associated issues are shown in Tables 4-1 through 4-5.

Goal 1: Protect and maintain natural resources at NAVSTA Mayport and NFD.

Issue 1: Present-day support and future development of aviation and afloat training and maintenance tenant command operations require a substantial commitment at NAVSTA Mayport. These military operations potentially could impact natural resources. To minimize the impact, NAVSTA Mayport and NFD must enforce appropriate measures to ensure the protection of habitats, such as the beach dune community, numerous hydric hammocks, and vast areas of salt marsh.

Table 4-1. Objectives for Goal 1

Objectives	Discussion
1.1 To continue existing and establish new programs and procedures to monitor, maintain, and enhance wetlands and water quality.	Wetland and water quality may be improved through the management of stormwater runoff, soil erosion, and pesticides and fertilizer use at NAVSTA Mayport and NFD.
1.2 To identify, reduce, and control invasive and exotic plant species and pests.	Invasive and exotic species and pests need to be identified and controlled to insure the do not interfere with military and recreational activities, quality or function of wildlife habitats, forests, wetlands, or other natural resources.
1.3 To maintain attenuation capacity of the remaining undisturbed acreage within 100 year floodplain.	Floodplains provide many important functions, such as temporary storage of floodwaters, moderation of peak flows, maintenance of water quality, and provision of habitat for wildlife.
1.4 To ensure that land management and land use decisions comply with all applicable laws, executive orders, regulations, directives, and instructions, and that adverse impacts to the natural environment are minimized.	Mission-related land use activities and facilities should be located in a way to avoid or minimize impacts to the natural environment. Arbitrary location of activities and facilities may undermine ecological processes by separating and isolating plant and wildlife populations, and can render the fragmented parcels unsuitable as wildlife habitat. An arbitrary method of locating activities and facilities also increases costs associated with daily land management practices and infrastructure improvements.
1.5 To protect and enhance existing shorelines through existing and new programs.	NAVSTA Mayport contains various types of shorelines. Along the eastern side of NAVSTA Mayport is a beach dune community that extends approximately one mile. Other shorelines on NAVSTA Mayport include rocky jetties and disturbed shoreline areas along the St. Johns River. The NFD has a shoreline area along the St. Johns River.
1.6 To implement environmentally beneficial landscaping, grounds maintenance, and urban forestry practices.	By using native species and xeriscaping concepts, the Navy can reduce the need for irrigation, pesticides, and fertilizers. In addition, urban forests provide numerous quality of life benefits to both humans and wildlife.

Goal 2: Protect, maintain, and restore native vegetative communities, and plant and wildlife populations.

Issue 2: Although much of the natural communities on NAVSTA Mayport and NFD have been disturbed by development activities, the FNAI survey concluded that five occurrences of three natural communities (*e.g.*, beach dune, hydric hammock, wetlands and tidal marsh) were located on the Installation.

Table 4-2. Objectives for Goal 2

Objectives	Discussion
2.1 To maintain the ecological integrity of wetlands, forest stands and upland natural communities, to protect the communities and their native plant and animal species consistent with the military mission.	NAVSTA Mayport and NFD can implement timber and wildlife stand improvement practices to enhance habitat functions, maximize sustained yield, enhance multiple use management, reduce the potential for wildfires, and control diseases and insect pests. Water quality protection and maintenance should continue for support of wetlands, freshwater ponds, and St. Johns River.
2.2 To preserve and protect threatened and endangered species and species of concern to ensure no reduction in population sizes.	Federal and state listed threatened and endangered species, species of concern, neotropical migratory bird species and rare species are important components of the ecosystem management for the Installation. NAVSTA Mayport and NFD can continue to update species surveys as necessary to manage for these species and habitat and can implement programs and activities for the protection and enhancement of all habitat for animal and plant species.
2.3 To control nuisance wildlife and wildlife diseases that may adversely affect human health or welfare, the health of the ecosystem and/or the military mission.	Numerous exotic species occur on the Installation and the control of these pests and exotics is an integral ecosystem management practice on the NAVSTA Mayport and NFD. The Installation can periodically update the existing IPM plan to incorporate the most recent research on monitoring and forecasting methods and removal of exotic faunal pests on the Installation. The Installation can use education and research, as well as training, for on-base land managers.

Goal 3: Encourage recreational and educational uses of natural resources.

Issue 3: The SAIA requires that military Installation evaluate the potential for providing outdoor recreational resources to the general public. This presents a unique opportunity to evaluate the area for potential public access (*e.g.*, interpretive opportunities) if consistent with the military mission.

Table 4-3. Objectives for Goal 3

Objectives	Discussion
3.1 To establish an outdoor recreation planning team to study recreational needs of NAVSTA Mayport personnel and the general public.	Current access to NAVSTA Mayport's existing recreational resources is limited to NAVSTA Mayport DoD civilians, uniformed military personnel and dependents, and retired military personnel. However, the general public is allowed access to some natural and cultural resources at NAVSTA Mayport. The CO authorizes access for educational and outdoor natural resource recreational activities consistent with the military mission and security levels. Access to NFD is limited to Installation civilians and military personnel; no recreational opportunities are available at NFD.
3.2 To maintain existing and develop additional outdoor recreational facilities at NAVSTA Mayport.	Currently, on the NAVSTA Mayport facility, public access is granted to fishing and beach facilities. In addition, the public is allowed access to Helen Cooper Floyd Memorial Park, a Navy owned land leased to the COJ for use as a public park.

Goal 4: Conserve and enhance the ecological value and diversity of natural resources through ecosystem management.

Issue 4: Existing programs and plans for maintaining and managing natural resources within NAVSTA Mayport and NFD must consider relationships among resources. Rather, existing programs and plans have typically focused on the management of individual resources in accordance with Federal or state laws.

Table 4-4. Objectives for Goal 4

Objectives	Discussion
4.1 Provide adequate staffing, equipment, technology, and training to the Natural Resources Program to ensure proper implementation of this INRMP.	The Natural Resources Manager must maintain the level of management required at NAVSTA Mayport and NFD to adequately address natural resources programs. Non-compliance with laws and instructions, such as the Sikes Act, could lead to violation of Federal laws such as the National Environmental Policy Act, CWA, and the ESA.
4.2 Incorporate the concept of ecosystem management into all planning and management processes.	Ecosystem management is a holistic, adaptive management concept that transcends human-made boundaries both internal and external to NAVSTA Mayport and NFD. Management for a sustainable ecosystem requires awareness, education and training, and responsible participation of all individuals potentially affecting the ecosystem, as well as adjustments in management principles and practices to respond to new knowledge and dynamic conditions.
4.3 Implement training, education, and stewardship initiatives for ecosystem management. Ecosystem management cannot be accomplished solely through the implementation of programs and plans focused on individual resources.	Ecosystem management cannot be accomplished solely through the implementation of programs and plans focused on individual resources. A coordinated effort among all programs and personnel from tenant commands as well as decision-making authorities at NAVSTA Mayport and NFD is necessary to protect the interdependent components of communities that define an ecosystem. The coordinated effort can address the consequences of actions on related resources, and can resolve conflicts between competing programs and plans for use of the natural resources.

Goal 5: Manage natural resources in a manner that ensures consistency with the use of the Installation to support military preparedness while providing for the conservation and rehabilitation of natural resources, the sustainable multipurpose use of natural resources, and public access consistent with security and mission requirements.

Issue 5: All the natural and recreational resources should be balanced with the military mission of NAVSTA Mayport and NFD. A BASH management plan is an example of integrating military mission and natural resource planning. Installation and management activities that are detrimental to wetland functions, such as storage and filtration of water, on NAVSTA Mayport and NFD can potentially affect the military mission, and is another example of integration of the military mission with natural resources planning. Improper stormwater management could lead to excess water on runways and adjacent to runways and erosion problems at the edges of airfields. Inappropriate floodplain management practices have the potential to decrease the flood attenuation capacity of the floodplain and increase the amount and rate at which flooding occurs. Flooding has the potential to adversely affect necessary infrastructure components of the military mission. Forest management practices such as harvesting, forest protection, mechanical removal of understory, and thinning activities decrease forest fuel loads, thus decreasing fuel available to wildfires. Wildfires could threaten the military mission activities of NAVSTA Mayport and NFD, their facilities and housing. The over-utilization or improper location of an outdoor recreation area could impact natural resources and the military mission.

Table 4-5. Objectives for Goal 5

Objective	Discussion
5.1 Ensure that natural resource and recreational management does not compromise the military mission.	Uncontrolled soil erosion and stormwater management has the potential to increase sediment loading in stormwater runoff, which may increase turbidity and reduce water quality in the St. Johns River and other aquatic resources, thus jeopardizing vital aquatic habitat. In addition, erosion adjacent to the airstrips may interrupt activities in support of the military mission. Without a complete understanding of impacts on fish and wildlife species, especially threatened and endangered species, actions and activities implemented by NAVSTA Mayport may counter Federal or state legal requirements and thus threaten the continuation of the military mission.

4.4 NATURAL RESOURCES MANAGEMENT STRATEGIES

The natural resources management strategies described in this INRMP are for the benefit of the plants, animals, and ecosystems occurring on the installation. Special attention is given to rare, threatened, and endangered (RTE) species, and their habitats, through management actions referenced in Table 4-6. These actions are long-term conservation measures that provide benefits for terrestrial and aquatic habitats on the installation. Management actions such as soil conservation and storm water management, for example, control sediment and pollutant runoff to protect nearshore water quality for species such as Florida manatees, shorebirds, and fish.

Table 4-6. Habitat Management Actions at NAVSTA Mayport

Habitat Management Actions	Sections
Wetlands Management	4.4.1.1
Soil Conservation and Erosion Control	4.4.1.2
Stormwater and Water Quality Control	4.4.1.3
Landscaping and Grounds Maintenance	4.4.1.4
Floodplain Management	4.4.1.5
Invasive and Exotic Species	4.4.1.6
Urban Forestry and Tree Mitigation	4.4.1.7
Forest Management	4.4.2
Fisheries Management	4.4.3.1
Biotic Communities Management	4.4.3.2
Wildlife Damage and Wildlife Disease	4.4.3.4

This INRMP includes goals, objectives, strategies, and projects for the benefit and long-term conservation of RTE species found, or potentially found, on the installation. Species explicitly accounted under the Threatened and Endangered Species subheading of the *Biotic Communities Management* section of this INRMP (section 4.5.3.3) are:

- Atlantic Sturgeon (fish)
- Bald Eagle
- Common Thresher Shark
- Dwarf Seahorse (fish)
- Eastern Diamondback Rattlesnake
- Florida Manatee
- Giant Manta Ray (fish)
- Gopher Frog
- Gopher Tortoise
- Least Tern (bird)
- Monarch Butterfly
- North Atlantic Right Whale
- Piping Plover (bird)
- Red Knot (bird)
- Sea Turtles
  - Green Sea Turtle
  - Hawksbill Sea Turtle
  - Kemp's Ridley Sea Turtle
  - Leatherback Sea Turtle
  - Loggerhead Sea Turtle
- Shortnose Sturgeon (fish)
- Smalltooth Sawfish
- Southern Hog-nosed Snake
- Spotted Turtle
- Wood Stork (bird)
- Worthington's Marsh Wren (bird)

The management actions listed in Table 14 fall within four units: land management, forest management, fish and wildlife, and outdoor recreation. For example, the land management discussion addresses wetlands, invasive and exotic species, soil conservation and erosion

control, stormwater and water quality control, landscaping and grounds maintenance, urban forestry and tree mitigation, and floodplain management.

Section 4.4 discusses the issue(s), long-term management of the issue(s) and the relationship of the issue(s) to ecosystem management on Mayport and NFD. This section also correlates the Goals, Issues, and Objectives presented in Section 4.3 with the Strategies, Projects and Initiatives for each unit and management action and identifies the relationship to other ecosystem management focus units discussed in this chapter. Detailed information about each specific project to be implemented is presented in Section 6.

4.4.1 Land Management

This section addresses the development and implementation of programs and techniques for managing lands. The land management issues of this INRMP are wetlands, invasive and exotic species, soil conservation and erosion control, stormwater and water quality control, landscaping and grounds maintenance, urban forestry and tree mitigation, and floodplain management. The land management issues contained within this plan are not intended for directing land use activity (*i.e.*, where buildings or activities should be located), but rather to provide managers with directions and general techniques (*e.g.*, regarding soil conservation, stormwater management) to protect and enhance the natural environment, while continuing to provide for the needs associated with the military mission of NAVSTA Mayport and NFD.

Agriculture outleasing is also often considered a component of land management. According to DoD Directive (DoDDIR) 4700.1, NAVSTA Mayport is to promote agriculture outleasing on the Installation. However, following their recent evaluation of agricultural outleasing potential, NAVSTA Mayport Natural Resources concluded that suitable lands are not available for this type of program.

4.4.1.1 Wetlands

Wetlands serve as a valuable resource for groundwater recharge within the region and are currently regulated by USACE under Section 404 of the CWA of 1972.

Issue

The majority of NAVSTA Mayport and NFD wetlands consist of salt marsh and tidal creeks. Wetland areas located in the southwestern portion of NAVSTA Mayport are incorporated within the TIMU. Each wetland area on NAVSTA Mayport is considered to be important to the conservation program and to the protection of many species. In addition, these areas provide

water quality and flood protection. However, because of various site constraints (*e.g.*, BASH requirements and archeological sites) and the need for future development of lands, NAVSTA Mayport will need to balance the need for protecting the Installation's wetland resources with supporting the military mission. Proper management of wetland areas at both facilities is necessary to enjoy the benefit provided by wetlands and comply with Federal laws and regulations.

Objectives, Strategies, and/or Projects

Table 4-7 identifies the ecosystem Objectives and Strategies that are most directly relevant to wetland issue(s) and related long-term management as well as identify relationships to other focus units in Section 4.4.

Table 4-7. Natural Resources Management Objectives and Strategies Related to Wetlands

Objectives	Strategies	Applicable to Ecosystem Focus and Sub Units
1.1 To continue existing and establish new programs and procedures to monitor, maintain, and enhance wetlands and water quality.	a. Evaluate existing SWPPP (NAVSTA 2011) and implement BMPs (FDEP 2008; FDOT and FDEP 2007; NAVSTA 2011) to minimize sedimentation and stormwater pollution. b. Develop soil erosion plan and implement BMPs c. Inventory use of pesticides and fertilizers to reduce usage. d. Use less-toxic pesticides and fertilizers when able. e. Monitor and restore wetlands.	Soil Conservation Stormwater Floodplain Management Freshwater Fisheries Land Impact
1.2 To identify, reduce, and control invasive and exotic plant species and pests.	Implement a plan to control and remove invasive and exotic plants.	Landscaping Invasive Species Urban Forestry Forest Management Land Impact
2.2 To maintain the ecological integrity of wetlands, forest stands and upland natural communities, to protect the communities and their native plant and animal species consistent with the military mission.	Continue to conduct surveys of rare, threatened and endangered species.	Forest Management Wildlife Management Land Impact

Projects and Initiatives

Participation in the following projects and initiatives can occur in support of the goals, objectives and strategies for wetlands management:

Projects

- Project No. 6 – GIS Database

Initiatives

Continue to implement the best management practices (BMPs) in the SWPPP (NAVSTA 2011), the *Florida Stormwater Erosion and Sedimentation Control Inspector's Manual* (FDEP 2008), and the *Florida Erosion and Sediment Control Designer and Reviewer Manual* (FDOT and FDEP 2007) to protect wetlands and water quality. NAVSTA Mayport is responsible for the implementation of the SWPPP by evaluating, monitoring, and identifying all Section 313 Federal Facilities Pollution Control CWA water priority chemicals used or stored on NAVSTA Mayport.

- Continue to assess the adequacy of the SWPPP and conduct annual updates and re-certifications of the SWPPP.
- Continue to cooperate with the SJRWMD LSJRB Water Quality Technical Advisory Committee and other entities in implementing the SWIM plan for the LSJRB by participating in interagency meetings, work groups, coordinated monitoring activities, and enforcement.
- The Environmental Department should review stormwater discharges into wetlands and water bodies to address the protection of water quality.
- Manage stormwater runoff from new development to achieve no net increase in stormwater discharge volume from NAVSTA Mayport, unless no means are available to do so that would comply with the military mission.
- Consider, where feasible, retrofitting existing stormwater infrastructure to provide natural stormwater infiltration through the use of grass swales, or to increase retention time prior to discharge.
- Use natural or created chemical free buffers around stormwater ponds to minimize the potential of harmful pollutants and facilitate infiltration prior to discharge into water bodies.
- Where feasible, NAVSTA Mayport should use permeable alternatives to impervious surfaces, for example, use wood decks rather than concrete patios, or grass swales instead of concrete.
- Monitor wetlands.
- Adhere to BMPs in the *Florida Stormwater Erosion and Sedimentation Control Inspector's Manual* (FDEP 2008) and the *Florida Erosion and Sediment Control Designer and Reviewer Manual* (FDOT and FDEP 2007)
- Educate selected personnel on wetland functions.

Long-Term Management

Although some wetlands on NAVSTA Mayport overlap the established boundaries of the TIMU, management of these wetlands can be accomplished by the same long-term management practices identified for other wetland areas on NAVSTA Mayport. Long-term management practices for the protection and enhancement of all Installation wetlands should include:

- Continue to periodically identify and delineate wetland areas within NAVSTA Mayport and NFD.
- Ensuring compliance with the Navy's policy of no net loss of wetlands.
- Monitoring water quality within existing wetlands to ensure that no contamination exists.
- Maintaining and/or developing chemical free vegetation buffers with widths of 50 feet around wetlands, except where sufficient acreage is not available as determined by the Natural Resources Manager, or where wetland buffers would interfere with the military mission for instance, by attracting wildlife to the vicinity of an airfield.

NAVSTA Mayport and NFD may increase the width of existing vegetation buffers that are less than 50 feet wide to a minimum of 50 feet, providing that buffer acreage is available and that buffers would not interfere with the military mission. Buffers may not be removed if any portion of the buffer is less than 50 feet wide. Buffer areas can be designated as chemical-free areas. A minimum buffer width of 50 feet is required to provide the basic physical and chemical buffering needed to help to reduce siltation into the wetland, retain the natural attenuation and filtering capacity of the wetland, and maintain the wetland's biological communities.

In areas where the acreage for buffering is not sufficient, or greater protection is needed, other appropriate measures can be employed. These protective measures could include: (1) redirecting, discouraging, or prohibiting pedestrian and pet access to the wetland or buffer area by the placement of hedges, fences, or signs; and (2) planting vegetated filter strips, swaths of land planted with native grasses and trees, to intercept uniform sheet flows of runoff before the runoff reaches a wetland. Either of these methods can be used individually or in combination along the perimeters of wetlands.

In addition to creating and maintaining buffers to protect wetland quality, NAVSTA Mayport and NFD can use the practice of aquascaping. Aquascaping is the planting of native aquatic and wetland plant species to enhance and restore wetlands or may be used in creating new wetlands. NAVSTA Mayport can also consider the use of hydrologic restoration to restore or mitigate

existing wetlands. Creation and expansion of wetlands can occur only if land and funding are available.

Ecosystem Management

Wetlands management is an essential component of ecosystem management because proper management of wetlands can maintain or improve surface water quality; preserve, enhance, and create habitat for a variety of wildlife species, and provide aesthetic and potential educational values. Changes to hydrology, geochemistry, substrate, or species composition may impair the ability of a wetland area to function properly. Such alterations can affect the ability of the wetland area to filter excess sedimentation and nutrients from surface water, which can result in deteriorated surface water quality.

Vegetation buffers between wetland and upland vegetative communities can help maintain and improve water quality by filtering some sediments and other pollutants from runoff prior to discharge into the wetland. Vegetation buffers can also provide habitat for a diversity of species that are ecologically linked to and important to the healthy functioning of the ecosystem.

4.4.1.2 Soil Conservation and Erosion Control

Soil conservation involves the identification (*e.g.*, type, location, and amount) and appropriate use of soils within the limits of their physical characteristics. Knowing the physical characteristics is important to selecting the most appropriate use and management of soils for construction, forestry practices, recreational facilities, and wildlife habitat.

Issue

Soil erosion can effectively undermine roadways, runways, helicopter landing pads, and other military structures, and often contributes to water quality problems (*e.g.*, increased turbidity) and higher maintenance costs associated with stormwater facilities. In general, vegetative cover on NAVSTA Mayport and NFD is adequate to minimize soil erosion. Exceptions include a strip of sparsely vegetated dune at NAVSTA Mayport and a sandy, poorly covered lawn surrounding the waterfront areas. Actions contributing to soil erosion on NAVSTA Mayport and NFD include:

- Human-made alterations to the vegetative cover and topography, including the channeling of water flow (*e.g.*, ditches) which increases the quantity and rate of flow; the exposure of soils and increased soil slopes; and or the creation of impervious surfaces.
- Wave and wake action along NAVSTA Mayport shoreline areas.
- Operational activities (*e.g.*, clearing for construction purposes).

- Pedestrian traffic on grassy areas of low sustainability due to poor soil conditions or other environmental conditions (*e.g.*, excessive wind and salt spray). These factors result in a turf of thin grass interspersed with bare sandy areas.
- Excessive and improper mowing practices.

Objectives, Strategies, and/or Projects

Table 4-8 shows the ecosystem management goals, objectives, and strategies that are most directly relevant to soil erosion and conservation issue(s) and related long-term management.

Table 4-8. Natural Resources Management Objectives and Strategies Related to Soil Conservation and Erosion Control

Objectives	Strategies	Applicable to Ecosystem Focus Units
1.1 To continue existing and establish new programs and procedures to monitor, maintain, and enhance wetlands and water quality.	Evaluate existing SWPPP (NAVSTA 2011) and implement BMPs (FDEP 2008; FDOT and FDEP 2007; NAVSTA 2011) to minimize sedimentation and stormwater pollution.	Wetlands Stormwater Floodplain Management Freshwater Fisheries Land Impact
2.1 To maintain the ecological integrity of wetlands, forest stands and upland natural communities, to protect the communities and their native plant and animal species consistent with the military mission.	Uses thinnings and natural selection, to improve habitat quality, reduce the potential for wildfires, control diseases and insect pests.	Invasive Species
4.1 Provide adequate staffing, equipment, technology, and training to the Natural Resources Program to ensure proper implementation of this INRMP.	Ensure that natural resource personnel obtain proper training and certification as applicable.	Stormwater Landscaping Invasive Species Forest Management Wildlife Management Land Impact

Projects and Initiatives

Participation in the following projects and initiatives can occur in support of the objectives and strategies for soil erosion management:

Projects

- Project No. 6 – GIS Database

Initiatives

- Implementation of soil erosion BMPs and conservation measures (*e.g.*, six soil erosion principles).
- Educate personnel on soil erosion and consult USDA NRCS.

Long-Term Management

The long-term management strategy to control soil erosion and conserve soil is to reduce inland and shoreline erosion problems on NAVSTA Mayport and NFD. Long-term management can include identifying and understanding the suitability and sustainability of each soil unit for a proposed action. USDA NRCS soil surveys provide an essential evaluative planning tool by identifying the specific limitations and hazards, improvements necessary to overcome these limitations, and the impacts of selected land uses on soils. The Duval County Soil Survey (USDA 1978) provides information about potential erosion hazards; groundwater contamination; engineering constraints; productivity of cultivated crops, trees, and grass; and the protection of water quality, wetlands, and wildlife habitat. Over the long term, proper grounds maintenance, emphasizing total coverage and vigorous growth of vegetation, is the best and most economical means of erosion control. Impacts to the existing landscape should be minimized to prevent erosion and natural barriers should be used instead of artificial barriers whenever possible. To minimize soil erosion, NAVSTA Mayport and NFD adhere to several BMPs, including those in the SWPPP (NAVSTA 2011), the *Florida Stormwater Erosion and Sedimentation Control Inspector's Manual* (FDEP 2008), and the *Florida Erosion and Sediment Control Designer and Reviewer Manual* (FDOT and FDEP 2007). Additionally, NAVSTA Mayport continues to operate its soil conservation and erosion control program by:

- Using the six principles for soil conservation and erosion management presented in Smoot and Smith (1999):
    1. Minimizing areas of disturbance by leaving intact stream buffers, forest conservation areas, vegetated shorelines, wetlands, highly erodible soils, steep slopes, environmental features, and stormwater filtration areas.
    2. Stabilizing and protecting disturbed areas from raindrop and runoff energies as soon as practicable.
    3. Minimizing runoff velocities.
    4. Protecting waterways and stabilizing drainage ways that may be particularly susceptible to sedimentation.
    5. Retaining sediment within construction sites.
    6. Reducing exposure time.
- Updating its SWPPP to include control measures for shoreline areas.
- Reducing mowing and increase grass height and coverage consistent with the military mission.
- Evaluating and mapping erosion control problem areas.
- Controlling potential erosion problems by:

- Using vegetative and structural protective covers (*e.g.*, permanent seeding, groundcover).
- Using sediment barriers (*e.g.*, straw bales, silt fence, brush).
- Creating sediment detention ponds and basins (*e.g.*, sediment traps and basins).
- Implementing stream and shore-bank protection (*e.g.*, riprap).
- Constructing pervious surface walkways in areas of high pedestrian traffic.
- Constructing water conveyances (*e.g.*, slope drains, check dam inlet and outlet protection).
- Repairing bare and slightly eroded areas quickly.

Ecosystem Management

Soil conservation is an essential component of ecosystem management. Soils are particularly susceptible to erosion from uncontrolled stormwater runoff, and may discharge into water bodies from point and non-point sources. Sediments and debris in stormwater runoff have the capacity to obstruct drainage infrastructure and to reduce the volume capacity of wetlands, potentially resulting in damaging flood conditions and lowering water quality. Turbidity pollution derived from soil erosion also may affect fishery resources and other associated aquatic communities on the Installation, in the St. Johns River, and in adjacent wetlands.

4.4.1.3 Stormwater and Water Quality Control

Stormwater runoff is precipitation that falls onto surfaces, roofs, streets, the ground, and is not absorbed or retained by that surface, but flows off, collecting volume and energy. Stormwater runoff management addresses measures to reduce flow energy and pollutants in stormwater, and to control discharge from point and non-point sources. Nonpoint source pollution is pollution of surface-water and groundwater resources by diffuse sources; point source pollution is pollution from a single, “point” source. Point and nonpoint source pollutants are commonly associated with construction and development. These pollutants routinely include sediments from land disturbance; pesticides and nutrients from urban lawns and landscaping; and oil, grease, heavy metals, and other toxic materials from streets, rooftops, and parking lots.

Issue

Stormwater discharges have been increasingly identified as a significant source of water pollution in numerous nationwide studies on water quality. As development increases at NAVSTA Mayport and NFD, the control of stormwater drainage becomes an increasingly important aspect of water quality control. More impermeable surface area, less land available for absorption and filtration, translates to faster runoff rates and increased pollution loads. More development means more

land clearing and landscaping activities that require appropriate stormwater management practices. It is especially important to have effective stormwater management where developed areas are proximate to surface water bodies such as the St. Johns River, a SWIM water body.

Objectives, Strategies, and/or Projects

Table 4-9 shows the ecosystem management objectives, and strategies that are most directly relevant to stormwater and water quality issue(s) and long-term management.

Table 4-9. Natural Resources Management Objectives and Strategies Related to Stormwater and Water Quality

Objectives	Strategies	Applicable to Ecosystem Focus Units
1.1 To continue existing and establish new programs and procedures to monitor, maintain, and enhance wetlands and water quality.	a. Evaluate existing SWPPP (NAVSTA 2011) and implement BMPs (FDEP 2008; FDOT and FDEP 2007; NAVSTA 2011) to minimize sedimentation and stormwater pollution. b. Develop soil erosion plan and implement BMPs c. Inventory use of pesticides and fertilizers to reduce usage. d. Use less-toxic pesticides and fertilizers when able. e. Monitor and restore wetlands.	Soil Conservation Stormwater Floodplain Management Freshwater Fisheries Land Impact
1.3 To maintain attenuation capacity of the remaining undisturbed acreage within 100 year floodplain.	Avoid harm to attenuation capacity of floodplain. If development is necessary, minimize loss of attenuation capacity.	Floodplain Management Land Impact
1.5 To protect and enhance existing shorelines through existing and new programs.	Prevent further degradation of shorelines.	Landscaping
2.1 To maintain the ecological integrity of wetlands, forest stands and upland natural communities, to protect the communities and their native plant and animal species consistent with the military mission.	Continue programs for the protection of wetlands, forestlands and upland natural communities.	Floodplain Management Forest Management

Projects and Initiatives

Participation in the following projects and initiatives can occur in support of the objectives and strategies for stormwater management:

Projects

- Project No. 6 – GIS Database
- Project No. 8 – Species Protection and Habitat Development

Initiatives

- Identify priority chemicals (313 CWA) used or stored at sites.
- Strive to use less quantity of chemicals and replace existing chemicals with less-toxic chemicals when practicable.
- Create standard operating procedures (SOPs) addressing storm water quality.
- Assist government agencies with implementation of SWIM plan.
- Chemical free buffer zones around surface waters and wetlands.

Long-Term Management

NAVSTA Mayport and NFD should operate, as applicable, under the following management guidelines for stormwater runoff and water quality control:

- Continue to manage point and non-point stormwater in industrial areas consistent with BMPs described in the SWPPP (NAVSTA 2011), to the extent practicable.
- Update the SWPPP to include stormwater management practices for non-industrial areas (*e.g.*, golf courses, urban land uses, forested and shoreline areas) and for non-industrial activities (*e.g.*, golf course pesticide application, and timber stand improvement).
- Adhere to BMPs in the *Florida Stormwater Erosion and Sedimentation Control Inspector's Manual* (FDEP 2008) and the *Florida Erosion and Sediment Control Designer and Reviewer Manual* (FDOT and FDEP 2007).
- Establish and maintain a chemical free buffer area adjacent to the St. Johns River and retention pond areas. Where feasible, a natural chemical free vegetated buffer can be maintained from the normal high water line 50 feet landward or 50 feet upland, whichever is greater. Allowances may be made for essential military mission requirements.
- As part of the Oil and Hazardous Substance Spill Contingency Plan, establish a natural resource damage assessment (NRDA) program for assessing natural resource damages arising from the release of oil or hazardous substances that injure or threaten to injure natural resources of the United States.
- Manage stormwater runoff from new development, where feasible, to achieve *no net increase* in stormwater discharge volume from the Installation, unless doing so would conflict with the military mission. To accomplish no net increase in stormwater discharge, NAVSTA Mayport should:
    - Coordinate with Grounds Maintenance personnel to ensure appropriate cleaning and maintenance of stormwater drainage mechanisms (*e.g.*, ditches, canals, culverts and swales).

- Retrofit stormwater infrastructure to provide natural infiltration (*e.g.*, grass swales, shallow retention ponds adjacent to intakes) of stormwater or to increase detention time prior to discharge.
- Use natural or planted buffers around newly created stormwater ponds. Vegetation can provide wildlife habitat and can reduce impacts associated with runoff by filtering sediments and sediment-bound pollutants, and by facilitating infiltration prior to discharge into surface water. Reducing sediment loading can increase the longevity of the retention ponds and can reduce future maintenance costs.
- Use permeable alternatives to impervious surfaces; for example, wood decks instead of concrete patios, grass swales instead of concrete.
- Assess alternatives to pesticides, herbicides, and fertilizers with the intent of protecting water quality. NAVSTA Mayport intends to use a combination of organic and mineral fertilizers to minimize the potential for nutrient loading in stormwater runoff while ensuring the growth of landscape plants and trees on the Installation properties.

- Fertilizers or pesticides should not be applied before or during rain events due to the strong likelihood of runoff. Fertilizers and pesticides should be applied during maximum plant uptake periods to minimize phosphate runoff.

Ecosystem Management

Similar to soil conservation, effective management of stormwater and associated pollutant loading is essential to realizing the ecosystem management concept. Implementation of BMPs in developed, semi-developed, and natural areas can help protect water quality and habitat for aquatic life. BMPs address the reduction of soil runoff, nutrient loading, bacterial and parasitic pests, and harmful chemicals in stormwater. Construction of any new stormwater ponds shall be consistent with SJRWMD regulations, may increase wildlife habitat consistent with the military mission, and shall reduce the potential for additional discharge from new development into existing water bodies.

4.4.1.4 Landscaping and Grounds Maintenance

The landscaping and grounds maintenance program on NAVSTA Mayport and NFD is primarily aimed at maintaining improved and semi-improved grounds on the Installation. Most improved and semi-improved grassy areas support a wide variety of grass species and other broad-leaved plants whose type and maintenance schedule are compatible with mission functions and fish and wildlife resources. Specifically, this document discusses the landscaping design and grounds maintenance practices that are intended to benefit the environment while also generating long-term cost savings. Such practices emphasize the use of native species to reduce irrigation and fertilization requirements, to stabilize soil, and to improve wildlife habitat.

Issue

Landscaping and grounds maintenance efforts are needed for aesthetic reasons as well as to prevent erosion and protect soils via maintained, stable ground covers and to provide non-game wildlife habitat. NAVSTA Mayport and NFD need to continue to minimize landscaping and grounds maintenance costs while continuing to ensure the quality of aesthetic and environmental resources.

Objectives, and Strategies

Table 4-10 presents the natural resources management objectives, and strategies that are most directly relevant to landscaping and grounds maintenance issues and long-term management.

Table 4-10. Natural Resources Management Objectives and Strategies Related to Landscaping and Grounds Maintenance

Objectives	Strategies	Applicable to Ecosystem Focus Units
1.1 To continue existing and establish new programs and procedures to monitor, maintain, and enhance wetlands and water quality.	Inventory use of pesticides and fertilizers to reduce usage. Use less-toxic pesticides and fertilizers when practicable.	Stormwater
1.2 To identify, reduce, and control invasive and exotic plant species and pests.	Prepare and implement a plan to identify, control and remove invasive and exotic plants.	Landscaping Invasive Species Urban Forestry Forest Management Land Impact
1.5 To protect and enhance existing shorelines through existing and new programs.	Participate in coastal conservation programs and educational activities to promote stewardship of coastal environments.	
1.6 To implement environmentally beneficial landscaping, grounds maintenance, and urban forestry practices.	NAVSTA Mayport can implement urban forestry projects to enhance wildlife habitat and aesthetics in developed areas.	Urban Forestry
4.1 Provide adequate staffing, equipment, technology, and training to the Natural Resources Program to ensure proper implementation of this INRMP.	Ensure that natural resource personnel obtain proper training and certification as applicable.	Stormwater Landscaping Invasive Species Forest Management Wildlife Management Land Impact

Projects and Initiatives

Participation in the following projects and initiatives may occur in support of the objectives and strategies for landscaping and grounds management:

Projects

- Project No. 1 – Control Invasive, Exotic, and Noxious Species
- Project No. 2 – Rare, Threatened, and Endangered Species
- Project No. 4 – Neotropical Migratory Bird Survey
- Project No. 5 – Feral Animal Control to Support the Military Mission
- Project No. 6 – GIS Database

Initiatives

- Educate grounds maintenance personnel on the principles of landscaping discussed in this INRMP.
- Coordinate with the Installation Cultural Resources Manager to provide or establish methods for acquiring qualified professionals for identifying, evaluating, documenting and preserving historic landscapes.
- Integrate the concept of xeriscaping into the Grounds Maintenance Plan and/or contract specifications.
- Remove invasive and exotic species.

Long-Term Management

The landscaping and grounds maintenance program at NAVSTA Mayport and NFD should be administered in accordance with the White House Memorandum, Environmentally and Economically Beneficial Practices on Federal Landscaped Grounds, 26 April 1994. This memorandum directs Federal agencies, where cost-effective and practicable, to: (1) use regionally native plants for landscaping; (2) promote construction practices that minimize adverse effects on the natural habitat; and (3) prevent pollution by reducing fertilizer and pesticide use and minimizing runoff.

The primary long-term management concept at NAVSTA Mayport and NFD should be incorporating the principles of xeriscaping into all grounds maintenance and landscaping activities. Xeriscaping can be utilized in all new construction activities and can be phased into existing landscape areas. Xeriscaping offers a viable alternative to the typically high-volume water requirements of other landscaping approaches by conserving water through creative landscaping. Xeriscaping uses native plants, which are typically better adapted to local climatic conditions and variations; more resistant to drought, disease, and pests; and require less water than non-native species. Potential benefits of xeriscaping include reduced water use (typically 30 to 80 percent), decreased stormwater and irrigation runoff, fewer pesticide and fertilizer applications, less yard waste, increased habitat for native plants and animals, and lower labor and maintenance effort, thus reducing costs.

Xeriscaping incorporates seven principles (Xeriscape Colorado, Inc. 1999):

1. Planning and design for water conservation and aesthetics.
2. Creating practical turf areas using manageable sizes, shapes, and appropriate grass species.
3. Selecting plants with low water requirements and grouping plants with similar water needs, then experimenting to determine how much and how often to water the plants.
4. Using soil amenities, such as compost or manure, appropriate to site and plant needs.
5. Using mulches such as wood chips to reduce evaporation and keep the soil cool.
6. Irrigating efficiently with properly designed systems (including hose-end equipment) and by applying the right amount of water at the right time.
7. Maintaining the landscape properly by mowing, weeding, pruning, and fertilizing properly.

To integrate the principles of xeriscaping into existing landscaped areas, NAVSTA Mayport and NFD can evaluate current landscaping practices and sites to predict the effectiveness of xeriscaping toward improving existing conditions. The Installation can evaluate whether the implementation of xeriscaping principles can: (1) provide sufficient benefits to justify any additional cost; (2) achieve the desired results; or (3) continue to achieve desired results. Where xeriscaping is introduced into existing landscaped areas, NAVSTA Mayport can monitor the success of integrating the xeriscaping principles into these areas and adjust management practices as necessary. Pesticide and fertilizer applications during xeriscaping can be consistent with the long-term management concepts pertaining to pesticides and fertilizers.

Recommended native trees and shrubs for landscaping are provided in Table 4-11. Non-native species that are non-invasive and well adapted to north Florida may be found on the xeriscape plant lists on the SJRWMD web page at http://sjr.state.fl.us/info/xeriscape/index.html.

Table 4-11. Native Trees and Shrubs of North Florida

Scientific Name	Common Name
Trees	
Taxodium distichum	Bald cypress
Sabal palmetto	Cabbage palm
Prunus angustifolia	Chickasaw plum
Ulmus alata	Winged elm
Carya glabra	Pignut hickory
Ilex attenuata	East Palatka holly
Ilex vomitoria	Yaupon holly
Quercus hemispherica	Laurel oak
Quercus virginiana	Live oak
Quercus myrtifolia	Myrtle oak

Scientific Name	Common Name
Quercus shumardii	Shumard oak
Pinus palustris	Longleaf pine
Pinus clausa	Sand pine
Pinus elliottii	Slash pine
Persea bobonia	Redbay
Cersis canadensis	Redbud
Juniperus laevigata	Southern red cedar
Celtis laevigata	Sugarberry
Liquidambar styriciflua	Sweetgum
Bumelia tenax	Tough bumelia
Shrubs	
Illicium parviflorum	Star anise
Callicarpa americana	Beautyberry
Forestiera segregata	Florida privet
Ilex glabra	Gallberry
Ilex vomitoria	Yaupon holly
Sabal minor	Cabbage palmetto
Serenoa repens	Saw palmetto
Osmanthus fragrans	Sweet olive
Calycanthus floridus	Sweetshrub
Viburnum obovatum	Walters viburnum
Myrica cerifera	Waxmyrtle

Source: SJRWMD 2000.

Note: Native trees are adapted to local climate conditions; however, species require specific site conditions that must be considered during landscaping.

Landscaping and Urban Wildlife Habitat

Although urban areas on NAVSTA Mayport are relatively limited in actual and potential contributions to native wildlife, some birds, small mammals, reptiles and invertebrates may benefit from certain management guidelines applied to the urban community. Limiting factors include scarce natural or undeveloped habitat and high human disturbance. To maximize the benefits for wildlife in urban areas, NAVSTA Mayport can implement the following guidelines during landscaping, as long as these benefits do not conflict with the military mission, including BASH requirements.

- Properties can be framed with a backdrop of native trees to simulate a forest canopy to provide nesting sites, protective cover, and food for small mammals and birds. Deciduous trees can be planted on the south and west sides of buildings for summer shade.
- Construction projects can have built in conservation measures to protect existing vegetation on construction sites.
- Smaller trees can be surrounded with masses of shrubs, brambles, or ground covers. These can provide protective areas for ground-feeding birds and mammals.
- Shrubs and ground covers can be planted around building foundations.

- Lawn areas can be surrounded with trees and shrubs. Small shrubs and ground covers can be planted around solitary trees. Irregular borders can be used to create more wildlife edge.
- Trees and shrubs can be mulched with leaf litter, lawn clippings, tree trimmings, or wood chips. Mulches are a rich food source for ground foragers like towhees and thrushes; provide cover for small mammals, reptiles, and amphibians; also enrich the soil.
- Birds prefer unclipped, informal hedges, so old growth can be selectively cut to assure that the plants do not overcrowd one another. Pruning can be avoided during the nesting season. Early flowering shrubs that bloom from buds formed during the previous summer can be selectively pruned or cut back only every few years.
- The planting of evergreens such as juniper (*Juniperus virginica* and *J. silicicola*), waxmyrtle, pines, and hollies can be considered to provide sound barriers from roads and other land uses. In the planting of all tree and shrub species consideration can be given to the ability of the species to provide food for wildlife and habitat for targeted bird species (*e.g.*, loggerhead shrike, painted bunting).
- Aquascaping can be utilized in aquatic environments (*e.g.*, wetlands, stormwater ponds, freshwater fisheries and shoreline areas) to improve the wildlife quality by planting native emergent vegetation.

Grounds Maintenance

Grounds maintenance can be accomplished by contract. Guidelines incorporated into the contract can include:

- Avoiding excessive mowing of improved and semi-improved areas to the minimum needed to comply with health and safety requirements and aesthetic standards. Grass mowing should be scheduled on the basis of height, rather than by arbitrarily specified time intervals and can be coordinated with seasonal wildlife habitat requirements (*e.g.*, songbird nesting) to the extent that doing so does not conflict with BASH requirements (see below).
- To prevent erosion, maintaining good ground cover and healthy over and under stories through proper fertilization and irrigation. If erosion occurs, the problem can be fixed as soon as possible.
- Minimize mowing of areas where native vegetation could become established (*e.g.*, coastal dune system, wetlands).
- Maintaining healthy plantings to prevent insect infestations and disease.
- Minimizing hand trimming and pruning.
- Implementing grounds maintenance activities in the vicinity of airfields to reduce BASH-related incidents (see below).

Landscaping and Grounds Maintenance to Reduce BASH

Around airfields, one of the primary purposes for landscaping decisions and grounds maintenance activities is to reduce BASH. Therefore, landscaping and maintenance around airfields should be

implemented to discourage vertebrate wildlife by eliminating or reducing essential habitat elements (*e.g.*, water, food and shelter). Some recommendations include:

- **Grass Height Management**. Mowing operations can maintain a uniform grass height between 7 and 14 inches, where appropriate. Grass must be cut before it goes to seed to discourage seed eating birds from utilizing the airfield. Long grass discourages flocking species from entering the airfield because reduced visibility disrupts inter-flock communication and flock integrity and also prevents predator detection. Grass normally should not exceed 14 inches, as high grass can attract some bird species and rodents, which in turn attract raptors.
- **Drainage Ditches**. Ditches should be inspected routinely and kept clear of obstructions. Remove obstructions (debris or vegetation) to water flow in ditches, gutters, catch basins, storm drain curb inlets and gratings. Open drainage channels are to be free of vegetation. Vegetated channels are to be maintained at a height of 10 to 12 inches. Ditch sides should be maintained as steeply as possible to discourage wading birds and emergent vegetation.
- **Removal of Remains from Airfield**. Dead birds and animals should be removed from the field to avoid attracting vultures or carrion feeders. The remains shall be delivered to the Air Operations Office and logged and disposed of in a sanitary manner.
- **Removal of Dead Vegetation**. Dead vegetation such as brush piles and grass clippings should be removed as soon as possible to avoid providing cover for small animals.
- **Proper Erosion Control Vegetation**. Use vegetation that is appropriate to the base and supports BASH reduction philosophy. Do not use plants that produce seeds at heights below 12 inches.
- **Clear Zones**. Clear zones are to meet operational standards at all times. Trees provide hunting perches for large birds of prey and other birds. Encroachment of trees from edges into the clear zone, “edge creep”, can be eliminated according to the Removal of Vegetation Guidelines below.
- **Removal of Vegetation**. Surveys should be conducted to determine sites for potential hazards. Trees and shrub, clumps of brush, and tall weeds can be removed either by cutting or herbicide. A grinder can be utilized to remove stump, unless the stumps are adjacent to a structure, in which case herbicides can be applied. Some shrub/brush areas may be most efficiently removed by hand cutting.
- **Elimination of Standing Water**. Altering wetlands requires permits and mitigation. Standing water must be eliminated to reduce/eliminate its attractiveness to a variety of animals. Wetland areas provide a source of freshwater for all species of wildlife and a feeding area for water birds, such as ducks, egrets and herons. The recommended action is to remove all trees and stumps (see methods above) in and around a wetland, then replant with grass. Next, install culvert pipes in place of the open drainage and fill over, or partially fill the open drainage to make it deeper and narrower, thereby making it less attractive to water birds and waders.

Golf Course

While the NAVSTA Mayport golf course requires intensive management considerably different from regular installation grounds maintenance, all management practices should be consistent with this INRMP. Such practices can include allowing more areas to revert to natural conditions and the implementation of integrated pest management practices to reduce grounds maintenance costs, minimize impacts to wildlife and habitat, and to minimize pesticide and herbicide use.

NAVSTA Mayport should also manage golf course ponds, which serve as stormwater retention ponds, for aesthetics and habitat for wading birds and other wildlife. To accomplish this, NAVSTA Mayport can utilize aquascaping to manage vegetation in and around the ponds and to increase native habitat for wildlife. In addition, NAVSTA Mayport can implement a 50-foot chemical-free vegetative buffer around these water bodies. Management activities relating to water quality monitoring, protection, and management are addressed within this INRMP.

Ecosystem Management

Xeriscaping and landscaping for urban wildlife habitat are consistent with ecosystem management principles because they reduce the need for irrigation, pesticides, and fertilizers by relying on the functions and characteristics of native plant species; enhance the presence of native plant and wildlife species; and reduce pollutant loading to stormwater runoff and surrounding surface waters and aquatic communities. The use of native species is also recommended for the reduction and control of invasive species. The lower costs of irrigation, pesticide and fertilizer applications, and grounds maintenance associated with xeriscaping allow limited funds to be used elsewhere.

4.4.1.5 Floodplain Management

Floodplain management is the operation of an overall program of corrective and preventive measures for reducing flood damage. Floodplain management aims to achieve a reduction in the loss of life, disruption, and damage caused by floods; and the preservation and restoration of natural resources and functions of floodplains.

Issues

Substantial development (*i.e.*, grading, filling, dredging, extraction, storage, soil mixing, and the construction or improvement of structures) has occurred within the 100-year floodplain at NAVSTA Mayport and NFD.

Objectives, Strategies, and/or Projects

Table 4-12 presents the natural resources management objectives, and strategies that are most directly relevant to floodplain management issues and long-term management.

Table 4-12. Natural Resources Management Objectives and Strategies Related to Floodplain Management

Objectives	Strategies	Applicable to Ecosystem Focus Units
1.1 To continue existing and establish new programs and procedures to monitor, maintain, and enhance wetlands and water quality.	Evaluate existing SWPPP (NAVSTA 2011) and implement BMPs (FDEP 2008; FDOT and FDEP 2007; NAVSTA 2011) to minimize sedimentation and stormwater pollution.	Wetlands Soil Conservation Stormwater Freshwater Fisheries Land Impact
1.3 To maintain attenuation capacity of the remaining undisturbed acreage within 100 year floodplain.	Avoid harm to attenuation capacity of floodplain. If development is necessary, minimize loss of attenuation capacity.	Stormwater Land Impact
2.1 To maintain the ecological integrity of wetlands, forest stands and upland natural communities, to protect the communities and their native plant and animal species consistent with the military mission.	Implement programs for the protection of wetlands, forestlands and upland natural communities.	Stormwater Forest Management

Projects and Initiatives

Participation in the following projects and initiatives can occur in support of the objectives and strategies for Floodplain management:

Projects

- Project No. 6 – GIS Database

Initiatives

- It should be the responsibility of the Natural Resources Manager to work with Facility and Environmental personnel to ensure implementation of the floodplain management strategy.
- Map undisturbed and disturbed areas of the 100-year floodplain for use in the decision-making process.
- To retain and/or increase the natural attenuation and filtering capacity of wetlands within the 100-year floodplain, NAVSTA Mayport can:
- Ensure *no net loss* of wetlands.
- Ensure that appropriate management techniques (*e.g.*, provision of adequate chemical free buffers exist around Installation wetlands) are implemented to maintain wetland attenuation capacity.

Long-Term Management

NAVSTA Mayport and NFD should avoid construction or management practices that can adversely affect the attenuation capacity of the 100-year floodplain unless it finds that: (1) there is no practical alternative; or (2) the proposed action has been designed to minimize harm to the floodplain. To enforce this, preferred sites for development can be outside the 100-year floodplain. If there is no suitable location outside the 100-year floodplain that can satisfy the need of the military mission (for example, proximity to dependent function), preferred sites for development can be within previously disturbed areas of the 100-year floodplain. For all development within the 100-year floodplain, NAVSTA Mayport can evaluate alternatives and techniques for controlling and reducing the potential for flood damages. NAVSTA Mayport and NFD can evaluate the use of the city/county's floodplain regulation as guidance for development in the floodplain. Consistent with the Navy's policy of *no net loss* of wetlands, NAVSTA Mayport and NFD can avoid any construction in wetlands within the 100-year floodplain.

Ecosystem Management

Proper management of the 100-year floodplain is an essential ecosystem management concept. Floodplains perform important natural functions, including temporary storage of floodwaters, moderation of peak flows, maintenance of water quality, groundwater recharge, and erosion prevention. Also, floodplains provide habitat for wildlife, recreational opportunities, aesthetic benefits, and areas of archeological significance.

4.4.1.6 Invasive and Exotic Species

Species should be categorized as exotic, native, exotic and invasive, and/or native and invasive.

- An exotic species is defined as a non-indigenous (non-native) species that was either purposefully or accidentally introduced into an area outside its natural range.
- A native species in Florida is defined as a species already occurring at the time of European contact in 1500 (Florida Exotic Pest Council 1999).
- Invasive species are species that have been introduced into an environment in which they did not evolve and thus have no natural enemies to limit their reproduction and spread. In natural areas, the definition of invasive species is expanded to include aggressive plants that produce a significant change in composition, structure, or ecosystem functions (Cronk and Fuller 1995).

EO 13112, Invasive Species, of 3 February 1999, requires executive agencies to restrict the introduction of exotic organisms into natural ecosystems.

The Federal Noxious Weed Act of 1974 (7 U.S.C. 2801-2814) provides for the control and eradication of noxious weeds and regulates their interstate and foreign commerce. It defines noxious weeds as "any living stage (including, but not limited to, seeds and reproductive parts) of any parasitic or other plant of a kind, or subdivision of a kind, which is of foreign origin, is new to or not widely prevalent in the United States, and can directly or indirectly injure crops, other useful plants, livestock, or poultry or other interests of agriculture, including irrigation, or navigation or the fish and wildlife resources of the United States or the public health, and includes kudzu (7 U.S.C. 2802 [c])."

According to the *Naval Air Station Jacksonville Pest Management Plan* (U.S. Navy 1993), the following pests occur at NAVSTA Mayport and NFD:

- **Household and urban nuisance pests:** Cockroaches, ants, fleas, spiders, silverfish, etc.
- **Structural pests:** Subterranean termites, powder post beetles, wood borers, and wood destroying fungi, etc.
- **Stored products pests:** Grain, meal, and flour moths; rice and granary weevils; and saw-toothed grain and confused flour beetles, etc.
- **Health-related pests;** Mosquitoes and filth flies.
- **Pests of ornamental plants and turf:** Soil and root infesting insects, leaf-chewing insects, plant-sucking insects, wood-boring insects, etc.
- **Vertebrate pests:** Rodents, feral cats, opossums, and armadillos.
- **Bird pests:** Starlings and pigeons.

Issue

Invasive species and pests have the potential to interfere with military and recreational activities, wildlife habitats, forests, wetlands, other natural areas, and ecosystem functions. Both NAVSTA Mayport and NFD completed Invasive and Exotic Species Survey in 2004 and 2011. The higher temperatures and changes in precipitation patterns associated with climate change are anticipated to cause shifts in species composition and geographic range. Among the species shifts anticipated are movement of wildlife to more favorable habitat, shifts in vector-borne diseases, and expansion of invasive grasses and shrubs.

Objectives, and Strategies

Table 4-13 presents the natural resources management objectives, and strategies that are most directly relevant to invasive and exotic species issues and related long-term management.

Table 4-13. Natural Resources Management Objectives and Strategies Related to Invasive and Exotic Species

Objectives	Strategies	Applicable to Ecosystem Focus Units
1.2 To identify, reduce, and control invasive and exotic plant species and pests.	Prepare and implement a plan to identify, control and remove invasive and exotic plants.	Landscaping Urban Forestry Forest Management Land Impact
1.6 To implement environmentally beneficial landscaping, grounds maintenance, and urban forestry practices.	a. Implement landscape management practices consistent with concepts presented in this INRMP. b. Use xeriscaping principles using native species for new landscaping.	Urban Forestry
2.1 To maintain the ecological integrity of wetlands, forest stands and upland natural communities, to protect the communities and their native plant and animal species consistent with the military mission.	Can continue existing efforts and can establish a program/plan, which uses thinnings and natural selection, to improve habitat quality, reduce the potential for wildfires, control diseases and insect pests.	Floodplain Management Forest Management
4.1 Provide adequate staffing, equipment, technology, and training to the Natural Resources Program to ensure proper implementation of this INRMP.	Ensure that natural resource personnel obtain proper training and certification as applicable.	Stormwater Landscaping Forest Management Wildlife Management Land Impact

Projects and Initiatives

Participation in the following projects and initiatives can occur in support of the objectives and strategies for invasive and exotic species management:

Projects

- Project No. 1 – Control Invasive, Exotic, and Noxious Species
- Project No. 5 – Feral Animal Control to Support the Military Mission
- Project No. 6 – GIS Database

Initiatives

Develop an invasive and exotic species management strategy. The strategy should involve surveying, monitoring and the removal of invasive and exotic species on NAVSTA Mayport. Inventories provide baseline information on presence, distribution and size of exotic plant populations.

- Consider non-pesticide removal methods and removal methods using pesticides with lower toxicity and applied at reduced rates.
- Identify individuals or groups who would contribute to the removal effort:
  - NAVSTA Mayport and Regional natural resources staff members.
  - Contractor and Installation personnel.
  - Volunteer groups (*e.g.*, Scout Troops, SCA) during non-chemical control portions of the work.
  - Special Interest Groups (*e.g.*, TNC).
- Educate Installation personnel about invasive and exotic plant species impacts on NAVSTA Mayport natural resources.
- Ensure that all grounds maintenance personnel, as well as pesticide applicators are trained on the identification and management of invasive and exotic species.
- Educate military and dependant persons on the introduction of invasive and exotic species.

Long-Term Management

Pest management can be provided in accordance with the NAVSTA Mayport Pest Management Plan. Although this plan requires updating, this document can provide pest management guidance for NAVSTA Mayport and NFD until the new document is completed. The new plan should incorporate the most recent research on monitoring, forecasting and removal methods and information discussed within this INRMP.

Invasive and exotic species should be managed through the removal of the species and restrictions on the introduction of the species to the Installation, in accordance with EO 13112. NAVSTA Mayport and NFD can implement effective control measures, and the schedule removal of invasive and exotic species based on the 2004 survey results and recommendations. Selected measures can reflect (1) the level of infestation; (2) the effectiveness at controlling the species; and (3) the sensitivity to the ecosystem.

An example of a control measure for invasive and exotic species is the use of pesticides. Pesticides should be used at the discretion of the Natural Resources Manager to remove invasive and exotic species and in accordance with state and Federal laws regulating the use of pesticides. According to the EPA (EPA 1997), a “pesticide is any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest. Pests may be mice, and other animals, unwanted plants (weeds), fungi, or microorganisms like bacteria and viruses. The

term pesticide also applies to herbicides, insecticides, fungicides, and various other substances used to control pests."

Under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), 7 U.S.C. 136, pesticides are registered at the Federal level and by individual states. Therefore, a particular pesticide product that is Federally registered by the EPA is not legal for use until it is also registered by the individual state. FIFRA allows individual state registrations to be more restrictive than Federal registrations. Therefore, prior to the use of a FIFRA-regulated pesticide, the NAVSTA Mayport's Natural Resources Manager can contact Navy technical reps or the FDACS Pesticide Division (850/487-2130) for information regarding approved pesticides, locations for use, amount and concentrations, and application methods. For special pesticide use, NAVSTA Mayport and NFD should contact the FDEP Bureau of Invasive Plant Management (850/488-5631) about special use licenses.

To ensure that the application of pesticides does not contaminate surface waters and/or inadvertently affect non-targeted flora or fauna, pesticides should be applied by skilled, DoD-certified workers and according to label instructions. Careful prescription of the type and amount of chemical to be applied and the use of chemical free buffer areas around surface waters can also help prevent misdirected application or deposition. NAVSTA Mayport should use pesticides with lower toxicity and apply them at rates below those specified on the label when it is believed that such modifications can adequately address the problem. The Installation can evaluate the effectiveness of the lower rates and toxicity, and can apply pesticides in accordance with label instructions if the lower rate applications are not adequately controlling the problem. The Installation should also consider the applicability of non-pesticide removal methods, which could be implemented by volunteers.

Ecosystem Management

The management of invasive species is a fundamental component of ecosystem management. Because invasive species, by definition, typically out-reproduce native species and have a propensity to spread into unstable or disturbed areas (*e.g.*, highway and utility right-of-ways), the eradication of invasive species and their replacement with native species at NAVSTA Mayport and NFD is essential for the protection and enhancement of regional biodiversity.

4.4.1.7 Urban Forestry and Tree Mitigation

Urban forestry is the management of forests and related natural resources within human communities. Urban forests include trees, groups of trees, or stands of trees occurring within improved and semi-improved lands, exclusive of forest stands. Successful urban forestry programs manage these resources to ensure that natural and infrastructure features enhance each other. NAVSTA Mayport can also mitigate the loss of healthy tree species in accordance with their tree mitigation policy.

Issue

Trees and vegetation in urban areas of NAVSTA Mayport and NFD, when properly managed contribute to ecological and social health. The NAVSTA Mayport Natural Resources Manager and NAVFAC Southeast foresters completed an Urban Tree & Shrub Planting Assessment for NAVSTA Mayport. The objective of this assessment was two-fold: (1) to identify past problems encountered in coordinating a planned tree and shrub planting program and the lack of success in past urban tree planting projects; and (2) to develop a set of recommendations to overcome those problems and provide guidance for a successful, well-coordinated urban tree and shrub planting program.

Objectives, Strategies, and/or Projects

Table 4-14 presents the ecosystem management objectives, and strategies relevant to urban forestry and tree mitigation issue(s) and long-term management.

Table 4-14. Natural Resources Management Objectives and Strategies Related to Urban Forestry and Tree Mitigation

Objectives	Strategies	Applicable to Ecosystem Focus Units
1.2 To identify, reduce, and control invasive and exotic plant species and pests.	Prepare and implement a plan to identify, control and remove invasive and exotic plants.	Landscaping Invasive Species Forest Management Land Impact
1.6 To implement environmentally beneficial landscaping, grounds maintenance, and urban forestry practices.	a. Implement landscape management practices consistent with concepts presented in this INRMP. b. Use xeriscaping principles using native species for new landscaping.	Invasive Species

Projects and Initiatives

Participation in the following projects and initiatives can occur in support of the goals, objectives and strategies for urban forestry and tree management:

Projects

- Project No. 2 – Rare, Threatened, and Endangered Species Survey
- Project No. 4 – Neotropical Migratory Bird Survey
- Project No. 6 – GIS Database

Initiatives

- Implement the Urban Forestry Plan.
- Use volunteers (*e.g.*, Scout troops, SCA) for planting.
- Train and educate grounds-maintenance personnel on the principles of urban forest management.
- Ensure that Installation planning, construction, and maintenance is coordinated with the Natural Resources Manager to ensure a positive effect on urban forests. Construction and facility managers should coordinate with the Natural Resources Manager concerning replacement of trees removed for any reason, except due to natural causes.
- Continue to implement NAVSTA Mayport Tree Mitigation Policy.

Long-Term Management

The Urban Tree and Shrub Assessment for NAVSTA Mayport identified several recommendations for the establishment of a successful well-coordinated tree and shrub program, which have been integrated into an Urban Forestry Plan.

Three recommendations from the Urban Tree and Shrub Assessment include:

1. **Project Review**. The Natural Resources Manager should have an active role in reviewing all site approvals, plans and specifications for all construction with landscaping planned prior to advertisement. This can also apply to any in-house planting by self-help or volunteer personnel. This procedure can ensure the proposed list of plant materials and planting procedures meet with the site. It also ensures that the specifications and inspections efforts are sufficient to produce a quality job, including cleanup and maintenance for the specified time.
2. **Inspections**. Inspections of plant materials, planting procedures, and plant maintenance should be stressed to ensure that the proper and acceptable plant material is used, adequate preparation for planting is followed, and sufficient water and nutrients are provided during the maintenance period to maximize survival chances.
3. **Future Plantings**. Future plantings can emphasize the following items.

- **Plant and Tree Quality** – Florida grade number one for form, size, and shape.
- **Adapted to Locality –** Select plant species from the recommended list.
- **Complete Site Evaluation** – The evaluation can include drainage, soil texture, soil test, additives required, and available water for irrigation.
- **Maintenance** – A routine maintenance schedule using appropriate maintenance measures (pruning, fertilizing, watering) for new plantings and established trees can be prepared.
- **Volunteer Organizations –** Use of volunteer organizations for assistance with planting and maintenance activities.

Tree Mitigation

NAVSTA Mayport implemented a Tree Mitigation Policy in accordance with DoD Instruction 4715.3 and OPNAVINST 5090.1D to compensate for the loss of healthy, established trees on the Installation (see Appendix A). NAVSTA Mayport can also consider broadening this policy to include shrubs. Specific locations for replacement tree plantings can be the responsibility of the Natural Resources Manager. Removal of healthy, established trees at NAVSTA Mayport shall be mitigated in accordance with the DoD policy, with the exception of the following:

- Tree removal in conjunction with ongoing maintenance of flightline clear zones, right-of-ways, and permitted stormwater features.
- Removal of any tree identified by the FDEP, Bureau of Invasive Plant Management as invasive and not native to North or Central America, including Chinese tallow, Chinaberry, Camphor, and golden raintree (*Koelreuteria bipinnata*).
- Removal of trees determined by the Natural Resources Manager to be dead or deteriorated as a result of insect infestation, disease, or damaged by storms or other acts of nature, or that pose a specific threat to public safety.

Ecosystem Management

Urban forestry supports ecosystem management by providing wildlife habitat through the development of new greenways and managing urban areas for the enhancement of wildlife. Urban forestry also helps reduce stormwater runoff and soil erosion, and can implement the principles of xeriscaping.

4.4.2 Forest Management

NAVSTA Mayport is classified as a “noncommercial” forest Installation because of the small amount of forest resources located on the Installation. There are approximately 172 acres of forestland at NAVSTA Mayport and approximately 56 acres of forestland at the NFD.

Under Navy regionalization efforts, actual forestry planning should be accomplished by the NAVSTA Mayport Natural Resources Manager with the assistance of regional forestry assets from the NAS Jacksonville Complex and SUBASE Kings Bay, Georgia. Forest management provides for the protection and development of other natural resources in an ecosystem management concept.

Forest resources at NAVSTA Mayport and NFD may be divided into two classifications: pine-dominated stands requiring maintenance and hardwood-dominated stands requiring less maintenance. Forest stands include slash, slash/hardwood and live oak associated with southern hardwood species. The stands will require maintenance activities (*e.g.*, thinnings) and protection and prevention of physical hazards (*e.g.*, wildfires, insects and disease). These stands are small, isolated, and dispersed throughout the properties. NAVSTA Mayport contains a small number of hardwood upland areas and island hammocks. These hardwood uplands and island hardwood communities have received little management and none is any prescribed in the near future. Hardwood upland stands may be subject to salvage cuts to remove dead, injured, or deteriorating trees.

Issue

The minimal amount of forest resources located on NAVSTA Mayport and NFD require only a small amount of periodic maintenance (*e.g.*, cuttings). All forest resources require protection from the physical hazards associated with wildfires, insects and disease by implementing proper management techniques to ensure the continuation of healthy forest communities.

Objectives, Strategies, and/or Projects

Table 4-15 presents the natural resources management objectives, and strategies that are most directly relevant to forest management.

Table 4-15. Natural Resources Management Objectives and Strategies Related to Forest Management

Objectives	Strategies	Applicable to Ecosystem Focus and Sub Units
1.2 To identify, reduce, and control invasive and exotic plant species and pests.	Implement a plan to control and remove invasive and exotic plants.	Stormwater, Landscaping, Invasive Species, Urban Forestry, Land Impact

Table 4-15, continued.

Objectives	Strategies	Applicable to Ecosystem Focus and Sub Units
2.1 To maintain the ecological integrity of wetlands, forest stands and upland natural communities, to protect the communities and their native plant and animal species consistent with the military mission.	Continue programs for the protection of wetlands, forestlands and upland natural communities.	Stormwater, Floodplain Management
2.2 To maintain the ecological integrity of wetlands, forest stands and upland natural communities, to protect the communities and their native plant and animal species consistent with the military mission.	Continue to conduct surveys of rare, threatened and endangered species.	Wildlife Management, Land Impact

Projects and Initiatives

Participation in the following projects and initiatives can occur in support of the objectives and strategies for forest management:

Projects

- Project No. 1 – Control Invasive, Exotic, and Noxious Species
- Project No. 6 – GIS Database

Initiatives

- Prepare a Forestry Plan for distribution.
- Ensure that Installation planning, construction, and maintenance is coordinated with the Natural Resources Manager to ensure a positive effect on forests. Construction and facility managers should coordinate with the Natural Resources Manager concerning replacement of trees removed for any reason, except due to natural causes.
- Continue to implement NAVSTA Mayport and NFD Tree Mitigation Policy.

Long-Term Management

The NAVSTA Mayport Natural Resources Manager will continue to implement thinnings, monitor forest health, and diagnose potential forest issues with assistance from foresters and assets at NAVFAC SE and at nearby NAS Jacksonville, Florida, and SUBASE Kings Bay, Georgia. NAVSTA Mayport would adhere to the Florida Silviculture BMPs (FDCAS 2003) for forest management activities to ensure watershed protection.

Thinnings

Thinnings are cuttings in immature stands to increase the rate of growth of timber products in planted stands and maintain stand composition. A thinning can be a removal of every other row

of trees or the removal of selected trees that are ready for the market, and low-value trees that are competing with future crops. In either case, a thinning can redistribute the growth potential of the site to the best trees so that they grow at a faster rate with increased sunlight penetration to the forest floor, which stimulates herbaceous understory growth and creates food and cover for wildlife.

The objective of scheduled thinnings is to reduce the number of trees per acre and stand density as measured by "basal area" in square feet per acre. The desired reduction in density should be determined by the forester, and should reflect the needs of the forest stand and the associated ecosystem represented by the stand and surrounding area. In general, thinnings should be designed to promote future natural regeneration of the forest stand by leaving quality seed trees spaced appropriately. A target basal area for pine regeneration at rotation age can be from 20-60 square feet of basal area per acre. In pine communities, the cutting cycle can begin when the stand reaches merchantable size (approximately 18 to 20 years) and can continue every 7 to 10 years based on individual stand prescriptions until the rotation age of 80 years. Stands older than 80 years should be evaluated by the Natural Resources Manager, as well as by NAVFAC Southeast wildlife biologists, for their wildlife habitat value.

Forest Protection

Protection of NAVSTA Mayport and NFD's forest stands involves protection and prevention of physical hazards to trees from wildfires, insects, and diseases.

- Wildfires are uncontained fires in forested or open areas. Wildfires may result from human activities or weather events. The potential for wildfires can be decreased by implementing management techniques to reduce fuel loads within timber stands.
- Insects such as the Southern Pine, Ips, and Black Turpentine beetles attack and kill pine trees. The attack intensity depends on the field conditions, tree vigor, and weather.
- Diseases, such as fusiform rust (*Cronartium fusiforme*), are present on the complex. Galls are the first signs of the disease. These grow on branches and trunks of trees, eventually encircling the tree or branch and killing it. Thinnings can emphasize salvage and removal of diseased trees.

Forest protection may also involve other environmental and aesthetic constraints, such as the need to leave picturesque or old growth trees near a roadside, buildings, golf course, scenic designations or recreational areas. Forest stands at NAVSTA Mayport should be managed with an ecosystem approach toward sustainability and health. For the long-term protection of forest resources, the Jacksonville Complex should prepare timber prescriptions for silviculture activities

and ensure that equipment or agreements are in place for the protection of forestry resources from damaging events such as wildfires.

Ecosystem Management

Forest management activities are essential to maintaining healthy forests that provide quality wildlife habitat and sustainable forest resources. Thinning redistributes a site's growth potential to the best trees so they grow healthier and at a faster rate. Thinning also stimulates herbaceous understory growth, which creates food, cover and habitat for wildlife, including rare, threatened, and endangered species.

4.4.3 Fish and Wildlife

Fish and wildlife management actions are designed to preserve, enhance, and manage indigenous wildlife and their habitats. These wildlife management actions include the conservation of protected species and non-game species, management and harvest of game fish species, BASH reduction, and animal damage and disease control. Fish and wildlife management at NAVSTA Mayport and NFD includes: (1) fisheries management; (2) biotic communities/threatened and endangered species management; and (3) wildlife damage and wildlife disease management.

The fish and wildlife program is managed with the assistance of the USFWS and the FFWCC, as well as other conservation organizations through cooperative agreements. Under the cooperative agreement with the USFWS and the FFWCC, an annual meeting should be conducted between the signatory agencies mentioned above in February of each year to review progress and to prepare an annual increment and plan of work for the coming year. Annual plans can be prepared identifying: (a) fish and wildlife habitat improvement and development; (b) provisions for balanced ecological conditions; (c) regulated systematic harvests; (d) provision for stocking and or restocking of fish and wildlife as necessary; (e) estimated costs and professional services required; (f) amount and source of funds available to implement the annual increment.

General Information

Although there is a limited program for fish and wildlife management on NAVSTA Mayport and NFD, nearly all the land provides habitat for wildlife species. According to the Fish and Wildlife Section of the Natural Resources Plan for Naval Station Mayport, Florida (USFWS 1998), the USFWS divides the installation into biotic communities. These biotic community types include

beach, coastal sand dunes, salt marsh, estuarine and brackish tidal waters, freshwater marsh, freshwater impoundments, dredge material, mixed grass areas, hardwood forests, and planted pine stands.

Habitat management is the basis on which fish and wildlife programs are conducted at NAVSTA Mayport and NFD. To most effectively manage fish and wildlife resources, conservation priorities can be developed that address the diversity of types, qualities, and quantities of habitat, as well as individual species, that occur on NAVSTA Mayport and NFD. Because the facilities have limited opportunities for wildlife, the Installation can primarily manage for small, non-game animals, the Florida manatee, various turtle species and priority neo-tropical migratory bird species identified during the neotropical migratory evaluation project. Many of the management activities on NAVSTA Mayport can focus on urban habitat enhancement activities, such as artificial nest installation and tree and shrub planting. A second objective of the fish and wildlife management program at NAVSTA Mayport is to prevent nuisance wildlife populations from interfering with the military mission or other natural resources programs through the identification and elimination of nuisance wildlife.

There are current demands on wildlife resources and long-term needs for wildlife surveys and programs at NAVSTA Mayport. There is a demand on:

- Fish and wildlife resources for education and recreation; and
- Fish resources, because fishing is permitted at NAVSTA Mayport.

There is a need for the continuation of surveys and programs for:

- Protection of neotropical migratory birds;
- Wildlife habitat development;
- Protection of threatened and endangered species and natural communities;
- Addressing wildlife damage and diseases; and
- Control of BASH-related incidences.

4.4.3.1 Fisheries Management

Fisheries resources are to be managed in order to maintain harvestable populations of native fish to ensure that when harvest occurs it provides a beneficial experience to the individual and facilitates future management.

Issue

In 1998, NAVSTA Mayport entered into a cooperative program with the Florida Game and Fish Commission (GFC, presently known as the FFWCC) to manage Lake Wonderwood and other freshwater fisheries resources as a part of the Jacksonville Urban Ponds Project. Under this program, the FFWCC performed an extensive evaluation of existing characteristics (*e.g.*, fish, water quality and sediments) and made recommendations on future management to ensure the success of this lake as a freshwater sport fishery.

Objectives, Strategies, and/or Projects

Table 4-16 shows natural resources management objectives, and strategies (Section 4) relevant to freshwater fisheries issue(s) and long-term management.

Table 4-16. Natural Resources Management Objectives and Strategies Related to Freshwater Fisheries

Objectives	Strategies	Applicable to Ecosystem Focus Units
1.1 To continue existing and establish new programs and procedures to monitor, maintain, and enhance wetlands and water quality.	a. Evaluate existing SWPPP (NAVSTA 2011) and implement BMPs (FDEP 2008; FDOT and FDEP 2007; NAVSTA 2011) to minimize sedimentation and stormwater pollution. b. Inventory use of pesticides and fertilizers to reduce usage. c. Use less-toxic pesticides and fertilizers when practicable.	Wetlands Soil Conservation Stormwater Floodplain Management Land Impact

Projects and Initiatives

Participation in the following projects and initiatives can occur in support of the objectives and strategies for fisheries management:

Projects

- Project No. 6 – GIS Database

Initiatives

There are no initiatives for these goals and objectives.

Long-Term Management

The Fish and Wildlife Section of the Natural Resources Plan for NAVSTA Mayport, Florida (USFWS 1998), suggests numerous management recommendations to enhance future

freshwater fisheries management at Lake Wonderwood. These management recommendations include:

- Continuing the Urban Pond Project and maintaining the lake in present condition until estuarine water is completely diminished. NAVSTA Mayport is converting Lake Wonderwood from estuarine to freshwater to assist with irrigation for the Installation golf course.
- Continuing cattail control program around Lake Wonderwood on an as needed basis.
- Planting low maintenance, low growing native shrubs and scattered canopy trees appropriate to the habitat around Lake Wonderwood.
- Catching and releasing largemouth bass for 1 year. Evaluate after 1 year.
- Monitoring fishing pressure for freshwater sport fishery.
- Performing annual fish population estimates and water quality analysis and monitor changes in fish species and water quality.
- Constructing at least two "T" or "U" shaped fishing piers.
- Establishing native emergent aquatic vegetation in approximately 35 percent of all shallow areas.
- Adding physical structures (*e.g.*, docks, piers, fallen logs, brush piles, rock reefs) for fish cover in slopes of deep areas. After construction, mark with floats and evaluate after one year.
- Constructing an interpretive kiosk describing ecology of lake.
- Monitoring the implementation of the above recommendations to ensure the future success of Lake Wonderwood as a recreational sport fishery.

Ecosystem Management

Various wildlife species can benefit from the habitat provided by a properly managed fish pond. Well-managed ponds can also provide outstanding recreational resources, including educational and interpretive opportunities.

4.4.3.2 Wildlife Management

Wildlife management on NAVSTA Mayport and NFD involves biotic communities and threatened and endangered species management. The natural resource management actions described in this chapter of the INRMP are for the benefit of the wildlife occurring on the installation. Special attention is given to rare, threatened, and endangered (RTE) species.

4.4.3.3 Biotic Communities Management

The USFWS, in preparation of the Fish and Wildlife Management Plan for NAVSTA Mayport and NFD, divided the Installation into biotic communities. These biotic communities are based upon the Florida Land Use, Cover and Forms Classification System (FLUCFCS) Level III (DoT 1985).

As mentioned earlier, NAVSTA Mayport biotic communities include the swimming beach, coastal scrub, military/golf course, upland forests, streams and waterways, reservoirs, wetlands, non-swimming beaches, and spoil areas. FNAI surveys designated the beach dune community, hydric hammock, and tidal marsh community as natural communities.

Issue

Biotic communities on NAVSTA Mayport and NFD require the implementation of specific management practices intended to benefit non-listed species as well as identified conservation priorities.

Objectives, Strategies, and/or Projects

Table 4-17 shows natural resources management objectives, and strategies relevant to wildlife management issue(s) and long-term management.

Table 4-17. Natural Resources Management Objectives and Strategies Related to Wildlife Management

Objectives	Strategies	Applicable to Ecosystem Focus and Sub Units
2.1 To maintain the ecological integrity of wetlands, forest stands and upland natural communities, to protect the communities and their native plant and animal species consistent with the military mission.	Restore native species.	Floodplain Management
2.2 To maintain the ecological integrity of wetlands, forest stands and upland natural communities, to protect the communities and their native plant and animal species consistent with the military mission.	Continue to conduct surveys of and protect rare, threatened and endangered species.	Wildlife Management Land Impact
4.1 Provide adequate staffing, equipment, technology, and training to the Natural Resources Program to ensure proper implementation of this INRMP.	Ensure that natural resource personnel obtain proper training and certification as applicable.	Stormwater Landscaping Invasive Species Forest Management Wildlife Management Land Impact

Projects and Initiatives

Implement the following projects and initiatives in support of the strategies for wildlife management:

Projects

- Project No. 1 – Control Invasive, Exotic, and Noxious Species

- Project No. 2 – Rare, Threatened, and Endangered Species Survey
- Project No. 4 – Neotropical Migratory Bird Survey
- Project No. 5 – Feral Animal Control to Support the Military Mission
- Project No. 6 – GIS Database
- Project No. 7 – Sea Turtle Management Program to Eliminate Disorientation

Initiatives

- Implement habitat management initiatives, with emphasis on those supporting listed species.
- Use volunteers (*e.g.*, Scout troops, SCA, Audubon Society) for constructing habitat enhancement projects and bird watching projects.
- Institute wildlife and education stewardship projects and programs, with emphasis on listed species. Examples include Florida manatee and North Atlantic right whale signage and the distribution of information relating to those species.
- Post 3' x 4' North Atlantic right whale signs at the MWR Outdoor Recreation facility and Harbors Operations that include information about the 500-yard restricted distance and speed restrictions. Signs will be targeted at Navy users as well as recreational users (e.g., boat, kayak, and surf board rentals).
- Ensure that the phone number to call for North Atlantic right whale sightings (877-433-8299) is posted on signs at the sand dune crossover boardwalks.

Long-Term Management

As mentioned previously, NAVSTA Mayport has been divided into nine biotic classifications by the USFWS. Below, each biotic classification is addressed including general descriptions, associated threatened and endangered species, and management strategies. Any sightings of threatened or endangered species during any activities on NAVSTA Mayport should be handled in accordance with the Command Duty Officer (CDO) Standard Operating Procedures (SOP).

NFD should actively manage for the conservation of urban and non-game species, as well as any rare, threatened, and endangered species found. NFD should conduct species surveys to identify existing populations and habitats within the area. Information about species provided by the surveys can be used to establish management practices for Federally and state protected species. Modifications to management practices should be undertaken, as appropriate and as indicated by follow-up surveys and monitoring programs.

Beach/Marine Environment

The beach at NAVSTA Mayport includes the area approximately from mean low water to the base of the primary dune, and extending over 1 mile south of St. Johns Point at the mouth of the St.

Johns River, to the northern border of Kathryn Abbey Hanna City Park. A portion of the rock jetty along the southern shore of the river mouth extends approximately from the mouth of the NAVSTA Mayport ship basin eastward to St. Johns Point nearly one-mile.

4.4.3.3.1 Threatened and Endangered Species

The natural resource management actions described throughout Section 4 of this INRMP are for the benefit of the plants, animals, and ecosystems occurring on the installation. Special attention is given to rare, threatened, and endangered species, and their habitats. Management actions such as soil conservation, for example, control sediment and pollutant runoff to protect nearshore water quality for species such as Florida manatees, shorebirds, and fish. This INRMP includes goals, objectives, management actions, and projects for the benefit and long-term conservation of RTE species found, or potentially found, on the installation (Table 4-18).

Atlantic Sturgeon

Status: Endangered (Federal)

Adult Atlantic sturgeon reside in marine waters, but migrate up rivers in late spring to spawn. A second spawning run may occur in autumn. Spawning occurs between the salt front and fall line. Larvae move down river after hatching and juveniles settle out in brackish estuarine waters where they may reside for months or years. Subadults move into nearshore coastal waters and adults may make migrations of more than 1,000 miles before returning to their natal rivers to spawn. Atlantic sturgeon may utilize the waterways adjacent to NAVSTA Mayport as juveniles. This INRMP protects habitat for Atlantic sturgeon by managing water quality through factors such as wetlands (Section 4.4.1.1; *i.e.*, control pesticide runoff, maintain chemical-free vegetative buffers), erosion control (Section 4.4.1.2; *i.e.*, prevent sedimentation), stormwater control (Section 4.4.1.3; *i.e.*, manage non-point and point source pollution), and floodplains (Section 4.4.1.5; *i.e.*, maintain attenuation and filtering capacity of wetlands within the floodplain). Projects described in this INRMP that benefit and conserve the Atlantic sturgeon and water quality include INRMP Update, GIS Database, and Species Protection and Habitat Development (see Chapter 6 for descriptions).

Dwarf Seahorse

Status: Petitioned (Federal)

The coastal waters adjacent to NAVSTA Mayport are at the extreme northern limit of the dwarf seahorse's range. Moreover, ideal dwarf seahorse habitats are subtidal seagrass beds, which do not occur in vicinity of the installation. Regardless of whether or not the species occurs in the area, this INRMP protects water quality for dwarf seahorses through factors such as wetlands

(Section 4.4.1.1; *i.e.*, control pesticide runoff, maintain chemical-free vegetative buffers), erosion control (Section 4.4.1.2; *i.e.*, prevent sedimentation), stormwater control (Section 4.4.1.3; *i.e.*, manage non-point and point source pollution), and floodplains (Section 4.4.1.5; *i.e.*, maintain attenuation and filtering capacity of wetlands within the floodplain). Projects described in this INRMP that would benefit and conserve the dwarf seahorse and water quality include INRMP Update, GIS Database, and Species Protection and Habitat Development (see Chapter 6 for descriptions).

Eastern Diamondback Rattlesnake

Status: Petitioned (Federal)

Eastern diamondback rattlesnakes are assumed present on NS Mayport and the NFD. They live in dry pine flatwoods, sandy woodlands, and scrub habitats, and often inhabit gopher tortoise burrows. Natural resources management at NS Mayport actively manage habitat to benefit gopher tortoises and these actions also protect habitat for eastern diamondbacks. Although the eastern diamondback is not endangered, indiscriminate killing and widespread loss of habitat have decreased its numbers. This INRMP protects habitat for eastern diamondbacks through active management of factors such as landscaping and grounds (Section 4.4.1.4; *i.e.*, xeriscape with native vegetation, minimize mowing in native areas), invasive and exotic species (Section 4.4.1.6; *i.e.*, treat fire ants, eliminate exotic vegetative ground cover), and forest management (Section 4.4.2; *i.e.*, thin trees to reduce canopy cover). Projects described in this INRMP that benefit and conserve eastern diamondback habitat include Control Invasive, Exotic, and Noxious Species, Rare, Threatened, and Endangered Species Survey, INRMP Update, Feral Animal Control, GIS Database, and Species Protection and Habitat Development (see Chapter 6 for descriptions).

Florida Manatee

Status: Threatened (Federal)

Manatees are frequently sighted in rivers, estuaries, bays, creeks, and canals in coastal Florida between the months of April and October. Specific threats to manatee populations are related to vessel collisions. To minimize these threats, NAVSTA Mayport implemented the following protective measures: 1) retrofitting station-owned small craft vessels with manatee guards; 2) minimizing basin speed limits in accordance with security posture; 3) reducing or eliminating freshwater sources; 4) establishing a formal manatee notification protocol to report sightings in the basin to Harbor Operations and other ships; and 5) manatee awareness training for personnel. This INRMP protects habitat for manatees by managing water quality through factors such as

wetlands (Section 4.4.1.1; *i.e.*, control pesticide runoff, maintain chemical-free vegetative buffers), erosion control (Section 4.4.1.2; *i.e.*, prevent sedimentation), stormwater control (Section 4.4.1.3; *i.e.*, manage non-point and point source pollution), and floodplains (Section 4.4.1.5; *i.e.*, maintain attenuation and filtering capacity of wetlands within the floodplain). Projects described in this INRMP that benefit and conserve the manatee and its habitat include Control Invasive, Exotic, and Noxious Species, Rare, Threatened, and Endangered Species Survey, INRMP Update, GIS Database, and Species Protection and Habitat Development (see Chapter 6 for descriptions).

Giant Manta Ray

Status: Threatened (Federal)

The giant manta ray has a worldwide distribution in tropical and temperate climates. It spends most of its time in offshore waters, but occasionally ventures into to coastal waters, where it may come in vicinity of NAVSTA Mayport, although the likelihood is low. This INRMP protects water quality, which benefits giant manta rays, through active management of factors such as wetlands (Section 4.4.1.1; i.e., control pesticide runoff, maintain chemical-free vegetative buffers), erosion control (Section 4.4.1.2; i.e., prevent sedimentation), stormwater control (Section 4.4.1.3; i.e., manage non-point and point source pollution), and floodplains (Section 4.4.1.5; i.e., maintain attenuation and filtering capacity of wetlands within the floodplain). Projects described in this INRMP that would benefit giant manta rays and their habitats include INRMP Update, GIS Database, and Species Protection and Habitat Development (see Chapter 6 for descriptions).

Table 4-18. INRMP Management Activities and Projects That Benefit Rare, Threatened, and Endangered Species Potentially Occurring on NAVSTA Mayport and NFD

Species (in alphabetical order by common name)	Status	Category	Cross-reference to text	Management Activities that Benefit the Species and its Habitat												INRMP Projects that Benefit the Species and its Habitat							
				Wetlands Management	Soil Conservation and Erosion Control	Stormwater and Water Quality Control	Landscaping and Grounds Maintenance	Floodplain Management	Invasive and Exotic Species	Urban Forestry and Tree Mitigation	Forest Management	Fisheries Management	Biotic Communities Management	Wildlife Damage and Wildlife Disease		Control Invasive, Exotic, and Noxious Species	Rare, Threatened, and Endangered Species Survey	Mayport INRMP Update	Neotropical Migratory Bird Survey	Feral Animal Control	GIS Database	Sea Turtle Management Program	Species Protection and Habitat Development
Atlantic Sturgeon (*Acipenser oxyrhynchus*)	FE	Anadromous Fish	Table 3-6 pp. 2-13,3-37,4-44	M	M	M	M	M					M					P			P		P
Bald Eagle (*Haliaeetus leucocephalus)*	BGE	Wetland and Forest Bird	Tables 3-4 & 3-5 pp. 2-13,3-20,3-33,4-63	M	M	M	M	M	M	M	M	M	M	M		P	P	P	P		P		P
Black Skimmer (*Rynchops niger*)	ST	Coastal Bird	Tables 3-4 & 3-5 pp. 2-13,3.20	M	M	M	M	M				M	M	M			P	P	P		P		P
Brown Pelican (*Pelecanus occidentalis*)	N	Coastal Bird	Tables 3-4 & 3-5 p. 3-21	M	M	M	M	M				M	M	M			P	P	P	P	P		P
Dwarf Seahorse (*Hippocampus zosterae*)	FP	Fish in Seagrass	Table 3-6 pp. 3-37,4-45	M	M	M	M	M					M					P			P		P
Eastern Diamondback (*Crotalus adamanteus*)	FP	Uplands snake	Table 3-5 pp. 3-30,4-45	M	M		M		M	M	M		M	M		P	P	P		P	P		P
Florida Burrowing Owl (*Speotyto cunicularia floridian*)	ST	Ground-nesting Bird in Uplands	Table 3-5 p. 3-30		M		M	M	M	M	M		M	M		P	P	P	P	P	P		P
Florida Manatee (*Tricheus manatus latirostris*)	FT	Coastal Migrant	Table 3-6 pp. 1-11,2-13,3-36, 3-38,4-39,4-46,4-64	M	M	M	M	M					M	M			P	P			P		P
Giant Manta Ray (*Manta birostris*)	FT	Transient Coastal Fish	Table 3-6 pp. 3-38,4-46	M	M	M	M	M					M					P			P		P
Gopher Frog (*Lithobates capito*)	FP	Uplands amphibian	Table 3-5	M	M	M	M	M	M	M	M		M	M		P	P	P		P	P		P
Gopher Tortoise (*Gopher polyphemus*)	FC, ST	Upland Burrower	Table 3-5, Fig 3-5 pp. 2-13,3-31,3-34,4-49		M		M	M	M	M	M		M	M		P	P	P		P	P		P
Green Sea Turtle (*Chelonia mydas*)	FT	Coastal, Nests on Beaches	Tables 3-6 & 4-19 pp. 3-36,3-39,4-54	M	M	M	M	M					M	M			P	P		P	P	P	P
Hawksbill Sea Turtle (*Eremochelys imbricata*)	FE	Coastal Turtle	Table 3-6 pp. 3-36,3-39,4-54	M	M	M	M	M					M	M			P	P		P	P	P	P
Kemp's Ridley Sea Turtle (*Lepidochelys kempi*)	FE	Coastal Turtle	Table 3-6 pp. 3-36,3-40,4-54	M	M	M	M	M					M	M			P	P		P	P	P	P
Least Tern (*Sterna antillarum*)	ST	Coastal Bird	Tables 3-4, 3-5, Fig 4-1 pp. 2-13,3-20,4-49,4-58	M	M	M	M	M	M				M	M			P	P	P	P	P		P
Leatherback Sea Turtle (*Dermochelys coriacea coriaccea*)	FE	Coastal, Nests on Beaches	Tables 3-6 & 4-19 pp. 3-36,3-40,4-54	M	M	M	M	M					M	M			P	P		P	P	P	P
Little Blue Heron (*Egretta caerulea*)	ST	Wetland Bird	Tables 3-4 & 3-5 pp. 2-13,3-20,3-31	M	M	M	M	M	M	M	M	M	M	M		P	P	P	P	P	P		P
Loggerhead Sea Turtle (*Caretta caretta*)	FT	Coastal, Nests on Beaches	Tables 3-6 & 4-19 pp. 3-36,3-40,4-54	M	M	M	M	M					M	M			P	P		P	P	P	P
Monarch Butterfly (*Danaus plexippus*)	FP	Migratory butterfly	p. 4-51	M	M	M	M	M	M	M			M	M		P	P	P			P		P
North Atlantic Right Whale (*Eubalena glacialis*)	FE	Usually Oceanic	Table 3-6 pp. 1-11,2-13,3-30,3-39 4-51,4-64	M	M	M	M	M					M					P			P		P

Species (in alphabetical order by common name)	Status	Category	Cross-reference to text	Management Activities that Benefit the Species and its Habitat												INRMP Projects that Benefit the Species and its Habitat							
				Wetlands Management	Soil Conservation and Erosion Control	Stormwater and Water Quality Control	Landscaping and Grounds Maintenance	Floodplain Management	Invasive and Exotic Species	Urban Forestry and Tree Mitigation	Forest Management	Fisheries Management	Biotic Communities Management	Wildlife Damage and Wildlife Disease		Control Invasive, Exotic, and Noxious Species	Rare, Threatened, and Endangered Species Survey	Mayport INRMP Update	Neotropical Migratory Bird Survey	Feral Animal Control	GIS Database	Sea Turtle Management Program	Species Protection and Habitat Development
Piping Plover (*Charadrius melodus*)	FT	Coastal Bird	Tables 3-4 & 3-5 pp. 2-13,3-20,3-33, 4-52, 4-58	M	M	M	M	M	M				M	M		P	P	P	P	P	P		P
Red Knot (*Calidris canutus* ssp. *rufa*)	FT	Coastal Bird	Tables 3-4 & 3-5 pp. 2-13,3-20,3-30, 3-34,4-53	M	M	M	M	M	M				M	M		P	P	P	P	P	P		P
Reddish Egret (*Egretta rufescens*)	ST	Wetland Bird	Tables 3-4 & 3-5 pp.2-13,3-20	M	M	M	M	M	M	M	M	M	M	M		P	P	P	P	P	P		P
Roseate Spoonbill (*Platalea ajaja*)	ST	Wetland Bird	Tables 3-4 & 3-5 pp. 2-13,3-20	M	M	M	M	M	M	M	M	M	M	M		P	P	P	P	P	P		P
Shortnose Sturgeon (*Acipenser brevirostrum*)	FE	Anadromous Fish	Table 3-6 pp. 2-13,3-30,3-41,4-54	M	M	M	M	M					M					P			P		P
Smalltooth Sawfish (*Pristis pectinata*)	FE	Coastal Fish	Table 3-6 pp. 3-41,4-55	M	M	M	M	M					M					P			P		P
Southern Hog-nosed Snake (*Heterodon simus*)	FP	Uplands Snake	Table 3-5 p. 4-55	M	M	M	M	M	M	M			M	M		P	P	P			P		P
Spotted Turtle (*Clemmys guttata*)	FP	Wetlands Turtle	Table 3-5 p. 4-56	M	M	M	M	M	M	M			M	M		P	P	P			P		P
Snowy Egret (*Egretta thula*)	N	Wetland Bird	Tables 3-4 & 3-5 pp. 3-21,3-31,4-65	M	M	M	M	M	M	M	M	M	M	M		P	P	P	P	P	P		P
Tricolored Heron (*Egretta tricolor*)	ST	Wetland Bird	Tables 3-4 & 3-5 pp. 3-21,3-31	M	M	M	M	M	M	M	M	M	M	M		P	P	P	P	P	P		P
White Ibis (*Eudocimus albus*)	N	Wetland Bird	Tables 3-4 & 3-5 pp. 3-21,3-31	M	M	M	M	M	M	M	M	M	M	M		P	P	P	P	P	P		P
Wood Stork (*Mycteria americana*)	FT	Wetland and Forest Bird	Tables 3-4 & 3-5 pp. 3-21,3-31,3-34, 4-56,4-63	M	M	M	M	M	M	M	M	M	M	M		P	P	P	P	P	P		P
Worthington's Marsh Wren (*Cistothorus palustris griseus*)	ST	Wetland Bird	Table 3-5 pp. 3-30,4-57	M	M	M	M	M	M				M	M		P	P	P	P	P	P		P

M = The denoted management activity benefits the denoted species and its habitat.
P = The denoted project benefits the denoted species and its habitat.

Status Key:
FC = Federal Candidate; FE = Federally Endangered; FP = Federally Petitioned; FT = Federally Threatened
GBE = Bald and Golden Eagle Protection Act; ST = State Threatened

Gopher Tortoise

Status: Candidate (Federal); Threatened (State)

Gopher tortoises prefer areas of well-drained sandy soils with plenty of herbaceous groundcover. Suitable habitat for the gopher tortoise is limited on NAVSTA Mayport due to its low elevation, high water table, and lack of pine forests. Surveys conducted by GSRC in 2010-2011, recorded seven gopher tortoise burrows across four locations (see Figure 3-5), five of which were active (GSRC 2011). This INRMP protects existing habitat for gopher tortoises through active management of factors such as landscaping and grounds (Section 4.4.1.4; *i.e.*, xeriscape with native vegetation, minimize mowing in native areas), invasive and exotic species (Section 4.4.1.6; *i.e.*, treat fire ants, eliminate exotic vegetative ground cover), and forest management (Section 4.4.2; *i.e.*, thin trees to reduce canopy cover). Projects described in this INRMP that benefit and conserve the gopher tortoise and its habitat include Control Invasive, Exotic, and Noxious Species, Rare, Threatened, and Endangered Species Survey, INRMP Update, Feral Animal Control, GIS Database, and Species Protection and Habitat Development (see Chapter 6 for descriptions).

Least Tern

Status: Threatened (State)

The least tern occurs throughout coastal Florida and in some inland locations. Its natural breeding habitat is coastal beaches with little or no existing vegetation, a light colored, sand or gravel substrate containing less than 20 percent shell fragments. Artificial habitats, such as dredged material deposits, gravel-covered roofs, ground cleared by land disturbing activities (*e.g.*, mining, construction and other activities), also appeal to the least tern. Least terns have been observed nesting within the westernmost spoil disposal site at NAVSTA Mayport in the past, and on the rooftops of Building 191, 337, 451, 1552, 1553, 1554, and 1555 (Figure 4-1). Rooftop and beach surveys are completed annually between March and August to assess least tern nesting at NAVSTA Mayport. Surveys are uploaded to the Shorebird Alliance Database.

Rooftop least tern colonies are susceptible to human disturbance. Human presence on a rooftop may lead to the loss of chicks and eggs as the result of being crushed, exposed to the elements, taken by opportunistic predators, or abandoned. Consequently, FWC has requested that all maintenance rooftop and HVAC repairs where least terns nest should be completed prior to the start of the nesting season (before March 15) to minimize the risk of any unnecessary disturbance

during the breeding season, which lasts from March 15 to September 1. The FWC Regional Shorebird Biologist shall be contacted when emergency repairs arise on an active rooftop[1].

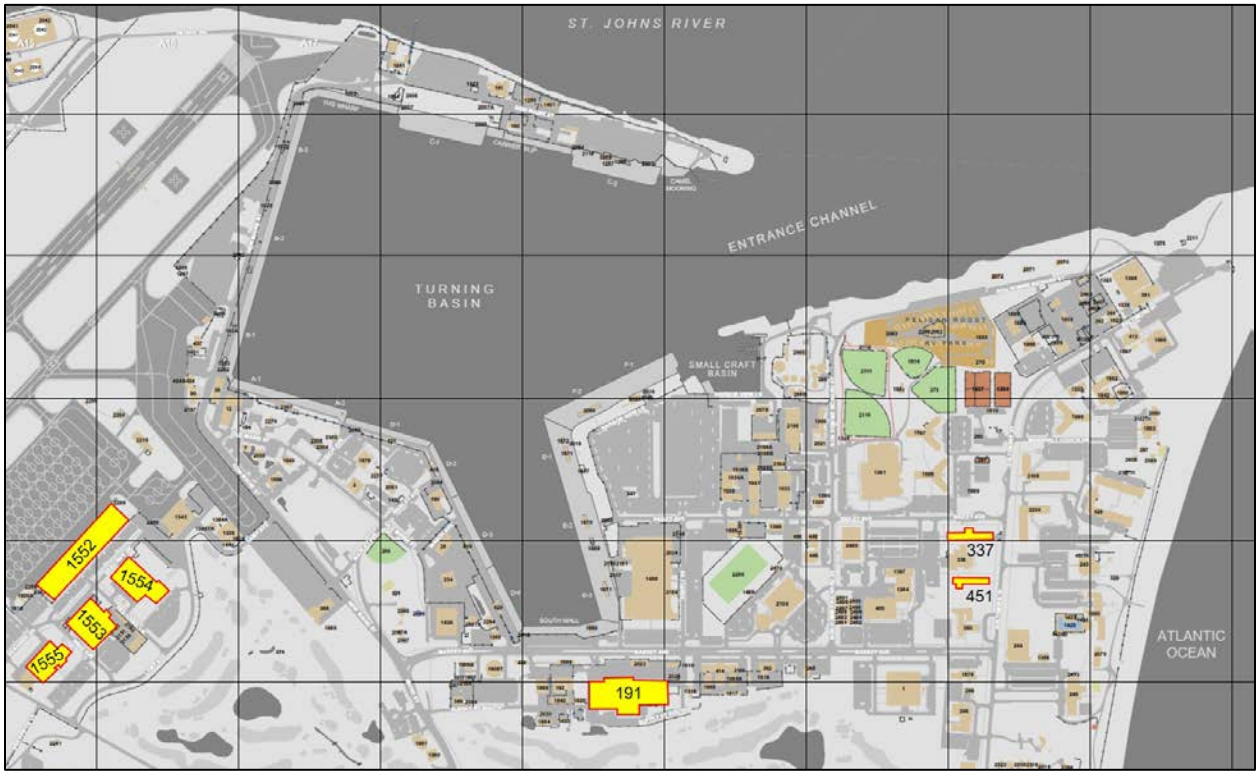

Figure 4-1. Potential least tern nesting rooftops (yellow structures) at NAVSTA Mayport.

Rooftop nests will benefit from removing predator access (e.g., removing tree limbs or other points of contact that allow for predator access), covering any holes/gaps in roof that may entrap chicks, covering exposed tar with additional gravel, and ensuring proper rooftop drainage. If ground nesting is detected, the FWC recommends that the area be posted with twine and FWC "Do Not Enter" signs with designated buffer zones delineated according to the Florida Shorebird Alliance (FSA) Posting Guidelines:

http://www.flshorebirdalliance.org/resources/instructions-manuals.aspx.

The FWC recommends that breeding season surveys be conducted in potential least tern nesting habitats. The person monitoring shall be familiar with the general information, data collection protocols, and procedures outlined on the FWC's Florida Shorebird Database (FSD) website and may be accessed through online webinars. All data should be uploaded to the FSD site within

[1] The FWC Regional Shorebird Biologist, as of 2019, is Jean Olbert, Jean.Olbert@MyFWC.com or 352.644.3539.

one week of collection. If it necessary to conduct a survey on an active nesting rooftop, a scientific collection permit would be necessary.

This INRMP protects habitat for least terns through management actions such as wetlands (Section 4.4.1.1; *i.e.*, control pesticide runoff and maintain chemical-free vegetative buffers to protect forage areas), erosion control (Section 4.4.1.2; *i.e.*, prevent sedimentation into forage areas, protect roosting areas from erosion), stormwater control (Section 4.4.1.3; *i.e.*, manage non-point and point source pollution into forage areas), and floodplains (Section 4.4.1.5; *i.e.*, evaluate all alternatives before constructing new development in undisturbed floodplain areas). Projects described in this INRMP that benefit and conserve the least tern and its habitat include Control Invasive, Exotic, and Noxious Species, Neotropical Migratory Bird Survey, Rare, Threatened, and Endangered Species Survey, INRMP Update, Feral Animal Control, GIS Database, and Species Protection and Habitat Development (see Chapter 6 for descriptions).

Monarch Butterfly

Status: Petitioned (Federal)

The monarch butterfly is found throughout the United States during warm months, but migrates to Mexico during winter. Monarch caterpillars exclusively eat milkweed leaves, so the presence of milkweed (*Asclepias* spp.) is a crucial habitat requirement. Milkweed protection is therefore a key component of monarch butterfly conservation. This INRMP protects existing habitat for monarch butterflies through active management of factors such as wetlands (Section 4.4.1.1; *i.e.*, control pesticide runoff, maintain chemical-free vegetative buffers), landscaping and grounds (Section 4.4.1.4; *i.e.*, xeriscape with native vegetation, maintain milkweed where appropriate), invasive and exotic species (Section 4.4.1.6; *i.e.*, eliminate exotic vegetative ground cover), and forest management (Section 4.4.2; *i.e.*, thin trees to promote herbaceous growth). Projects described in this INRMP that benefit and conserve the monarch butterfly and/or its habitat include Control Invasive, Exotic, and Noxious Species, Rare, Threatened, and Endangered Species Survey, INRMP Update, GIS Database, and Species Protection and Habitat Development (see Chapter 6 for descriptions).

North Atlantic Right Whale

Status: Endangered (Federal)

The North Atlantic right whale is one of the world's most endangered whales. The Western North Atlantic population size was estimated to be at least 444 individuals in 2009. Examination of the minimum number alive population index calculated from the individual sightings database for the

years 1990 - 2009 suggests a positive and slowly accelerating trend in population size. These data reveal a significant increase in the number of catalogued whales with a geometric mean growth rate for the period of 2.6% (Waring et al. 2012). The NMFS has designated three right whale critical habitats along the east coast of the U.S.: Cape Cod Bay, the Great South Channel, and the waters off the coast of Georgia and Florida from the Altamaha Sound, Georgia, to Sebastian Inlet, Florida (NOAA Fisheries 2006a). Because of their importance as seasonal feeding and nursery areas, these areas are critical to the survival of the right whales. As designated critical habitat, these areas must be managed to permit the recovery of the North Atlantic right whale from the danger of extinction to a safe level for the foreseeable future. Threats to the North Atlantic right whale population include collisions with ships, entanglement in fishing nets, and habitat degradation by vessels. North Atlantic right whales are generally found in the critical habitat area and associated coastal areas from December 1 through March 31. While this INRMP does not cover those areas, the protective measures implemented by the Navy during the calving season include the use of dedicated watch-standers that have completed marine species awareness training, reducing north/south transits in the critical habitat area, and remaining at least 500 yards away from any observed whales. A 3' x 4' North Atlantic right whale sign will be posted at the MWR Outdoor Recreation facility and Harbors Operations that includes information about the 500-yard restricted distance, speed restrictions, and phone number to call for sightings (877-433-8299). Signs will be targeted at Navy users as well as recreational users. Informational literature and stickers will be disseminated to ensure that surf and paddle boarders are aware they are subject to the 500-yard approach rule for North Atlantic right whales and can be fined for violations. When operating within the critical habitat area during the calving season, Navy vessels exercise extreme caution and use slow safe speeds consistent with mission, training and operational needs. The Navy also supports the NMFS EWS for the detection of North Atlantic right whales during the calving sea. As a participant, the Navy funds aerial surveys and operates a fusion center that receives all aerial and shipboard sightings from multiple sources and then disseminates the information to Navy, USACE, U.S. Coast Guard and commercial vessels operating in the area.

Piping Plover

Status: Threatened (Federal)

The piping plover overwinters along both the Gulf and Atlantic coasts of Florida. Winter foraging sites are primarily sand and mud flats, sandy mud flats, lower beach and foreshore, and dredge material disposal areas. Roosting birds primarily occur along the upper beach or berm area

adjacent to intertidal feeding areas. Piping plovers were observed on the installation during the winter and spring of 2007 but were not observed during surveys conducted in 1991, 1996, 2002-04, and 2014-15. Wintering birds have also been observed along the sandy flats at Huguenot Memorial Park, a designated critical habitat located directly across from NAVSTA Mayport on the north shore of the mouth of the St. Johns River. This INRMP protects habitat for piping plovers through management actions such as wetlands (Section 4.4.1.1; *i.e.*, control pesticide runoff and maintain chemical-free vegetative buffers to protect forage areas), erosion control (Section 4.4.1.2; *i.e.*, prevent sedimentation into forage areas, protect roosting areas from erosion), stormwater control (Section 4.4.1.3; *i.e.*, manage non-point and point source pollution into forage areas), and floodplains (Section 4.4.1.5; *i.e.*, evaluate all alternatives before constructing new development in undisturbed floodplain areas). Projects described in this INRMP that benefit and conserve the piping plover and its habitat include Control Invasive, Exotic, and Noxious Species, Neotropical Migratory Bird Survey, Rare, Threatened, and Endangered Species Survey, INRMP Update, Feral Animal Control, GIS Database, and Species Protection and Habitat Development (see Chapter 6 for descriptions).

Red Knot

Status: Threatened (Federal)

The red knot migrates between South America and Canada from April to October, passing over the Atlantic seaboard of the United States. Red knots primarily utilize tidal flats and beaches during their migrations, which presents the possibility for them to occur at these habitats on NAVSTA Mayport. This INRMP protects habitat for red knots through management actions such as wetlands (Section 4.4.1.1; *i.e.*, control pesticide runoff and maintain chemical-free vegetative buffers to protect forage areas), erosion control (Section 4.4.1.2; *i.e.*, prevent sedimentation into forage areas, protect roosting areas from erosion), stormwater control (Section 4.4.1.3; *i.e.*, manage non-point and point source pollution into forage areas), and floodplains (Section 4.4.1.5; *i.e.*, evaluate all alternatives before constructing new development in undisturbed floodplain areas). Projects described in this INRMP that benefit and conserve the red knot and its habitat include Control Invasive, Exotic, and Noxious Species, Neotropical Migratory Bird Survey, Rare, Threatened, and Endangered Species Survey, INRMP Update, Feral Animal Control, GIS Database, and Species Protection and Habitat Development (see Chapter 6 for descriptions).

Sea Turtles

Status: Loggerhead and Green are Threatened (Federal); all others are Endangered (Federal)

Several sea turtle species occur in waters adjacent to the NAVSTA Mayport, including the loggerhead turtle, green sea turtle, and leatherback sea turtle. Each of these turtle species is especially prone to collisions with boat propellers; entanglement in fishing nets and lobster lines; poaching; and loss of habitat due to human activities (*e.g.*, development, vehicles, and bright lights). Dredging activities are also hazardous to several sea turtle species.

Turtle species nest on sand beaches above the mean high tide line and in areas not inundated by rising ground water. The nesting and hatching season for all three species in northern Florida, begins in late spring and lasts through the end of November (USFWS 1998). According to the State of Florida's statewide sea turtle nesting database, only two loggerhead nests were laid on NAVSTA Mayport's beach in 1998 but had increased to 21 nests in 2006 (FFWCC, pers. comm., 29 January 2001; Burt, pers. comm., 2001).

This INRMP protects habitat for sea turtles by managing water quality through factors such as wetlands (Section 4.4.1.1; *i.e.*, control pesticide runoff, maintain chemical-free vegetative buffers), erosion control (Section 4.4.1.2; *i.e.*, prevent sedimentation), stormwater control (Section 4.4.1.3; *i.e.*, manage non-point and point source pollution), and floodplains (Section 4.4.1.5; *i.e.*, maintain attenuation and filtering capacity of wetlands within the floodplain). Projects described in this INRMP that benefit and conserve sea turtles and their habitat include Sea Turtle Management Program, Control Invasive, Exotic, and Noxious Species, Rare, Threatened, and Endangered Species Survey, INRMP Update, Feral Animal Control, GIS Database, and Species Protection and Habitat Development (see Chapter 6 for descriptions).

Shortnose Sturgeon

Status: Endangered (Federal)

The shortnose sturgeon is the smallest of sturgeons, rarely exceeding 3.5 feet in length and 14 pounds in weight. It has a short, conical snout with four barbels in front of its large subterminal mouth. The shortnose sturgeon's life history is complex. Much of its spawning behavior and early life stages are still not fully understood. The shortnose sturgeon is anadromous, migrating from salt water to spawn in freshwater. Unlike most fish species, spawning is not a yearly event for most shortnose sturgeon. Males spawn every other year and females every third year. Females lay between 40,000-200,000 eggs which hatch in approximately 13 days. Newly-hatched fry are poor swimmers and drift with the currents along the bottom. As they grow and mature, the fish

move downriver into the most brackish parts of estuarine systems. Shortnose sturgeon potentially utilize the waterways adjacent to NAVSTA Mayport as juveniles. This INRMP protects habitat for shortnose sturgeon by managing water quality through factors such as wetlands (Section 4.4.1.1; *i.e.*, control pesticide runoff, maintain chemical-free vegetative buffers), erosion control (Section 4.4.1.2; *i.e.*, prevent sedimentation), stormwater control (Section 4.4.1.3; *i.e.*, manage non-point and point source pollution), and floodplains (Section 4.4.1.5; *i.e.*, maintain attenuation and filtering capacity of wetlands within the floodplain). Projects described in this INRMP that benefit and conserve the shortnose sturgeon and its habitat include INRMP Update, GIS Database, and Species Protection and Habitat Development (see Chapter 6 for descriptions).

Smalltooth Sawfish

Status: Endangered (Federal)

The waters around NAVSTA Mayport are within the historical range of the smalltooth sawfish, but only one specimen has been captured as far north as Georgia since 2002, and it was caught offshore at a depth greater than 45 m (NMFS 2009). Ideal habitats for juveniles are shallow-water mangrove lagoons, which do not exist in northern Florida. It is possible, however, that adult sawfish may transit and forage in the waters adjacent to NAVSTA Mayport. This INRMP protects water quality for smalltooth sawfish through factors such as wetlands (Section 4.4.1.1; *i.e.*, control pesticide runoff, maintain chemical-free vegetative buffers), erosion control (Section 4.4.1.2; *i.e.*, prevent sedimentation), stormwater control (Section 4.4.1.3; *i.e.*, manage non-point and point source pollution), and floodplains (Section 4.4.1.5; *i.e.*, maintain attenuation and filtering capacity of wetlands within the floodplain). Projects described in this INRMP that benefit and conserve the smalltooth sawfish and its habitat include INRMP Update, GIS Database, and Species Protection and Habitat Development (see Chapter 6 for descriptions).

Southern Hog-nosed Snake

Status: Petitioned (Federal)

Southern hog-nosed snakes are most often associated with well drained, xeric, sandy soils where longleaf pine and scrub oaks are the characteristic woody vegetation. Wiregrass is often a significant component of the groundcover. Such habitats are necessarily fire-maintained. Ruderal habitats, including fallow fields, may also be used. Management activities directed at gopher tortoises on the Complex would also benefit Southern hog-nosed snakes. This INRMP protects existing habitat for Southern hog-nosed snakes through active management of factors such as landscaping and grounds (Section 4.4.1.4; *i.e.*, xeriscape with native vegetation, minimize mowing in native areas), invasive and exotic species (Section 4.4.1.6; *i.e.*, treat fire ants, eliminate exotic

vegetative ground cover), and forest management (Section 4.4.2; *i.e.*, thin trees to reduce canopy cover). Projects described in this INRMP that benefit and conserve the Southern hog-nosed snake and its habitat include Control Invasive, Exotic, and Noxious Species, Rare, Threatened, and Endangered Species Survey, INRMP Update, Feral Animal Control, GIS Database, and Species Protection and Habitat Development (see Chapter 6 for descriptions).

Spotted Turtle

Status: Petitioned (Federal)

The spotted turtles is a small turtle (max carapace length is about 15 cm) that inhabits a variety of wetland types, including vernal pools, swamps, marshes, small streams, wet meadows, and wet forests. Loss of wetlands habitat and invasive plants in wetlands habitats are the principal threats to the species. This INRMP protects water quality for spotted turtles through factors such as wetlands (Section 4.4.1.1; *i.e.*, control pesticide runoff, maintain chemical-free vegetative buffers), erosion control (Section 4.4.1.2; *i.e.*, prevent sedimentation), stormwater control (Section 4.4.1.3; *i.e.*, manage non-point and point source pollution), and floodplains (Section 4.4.1.5; *i.e.*, maintain attenuation and filtering capacity of wetlands within the floodplain). Projects described in this INRMP that benefit and conserve the spotted turtle and its habitat include Mayport INRMP Update, GIS Database, and Species Protection and Habitat Development (see Chapter 6 for descriptions).

Wood Stork

Status: Threatened (Federal)

Wood storks depend upon freshwater and estuarine wetlands for nesting, feeding, and roosting. They are colonial and typically nest in large rookeries and feed in large flocks. Nesting sites must remain inundated throughout the nesting cycle, which occurs from March through August in north Florida, and foraging sites are typically shallow, open water. Appropriate nesting and foraging sites are present on NAVSTA Mayport, although no rookeries occur on the property and foraging has not been observed. This INRMP protects habitat for wood storks through management actions such as wetlands (Section 4.4.1.1; *i.e.*, control pesticide runoff and maintain chemical-free vegetative buffers to protect forage areas), erosion control (Section 4.4.1.2; *i.e.*, prevent sedimentation into forage areas, protect roosting areas from erosion), stormwater control (Section 4.4.1.3; *i.e.*, manage non-point and point source pollution into forage areas), and floodplains (Section 4.4.1.5; *i.e.*, evaluate all alternatives before constructing new development in undisturbed floodplain areas). Projects described in this INRMP that benefit and conserve the wood stork and its habitat include Control Invasive, Exotic, and Noxious Species, Rare,

Threatened, and Endangered Species Survey, INRMP Update, Neotropical Migratory Bird Survey, Feral Animal Control, GIS Database, and Species Protection and Habitat Development (see Chapter 6 for descriptions).

Worthington's Marsh Wren

Status: Threatened (State)

Worthington's marsh wrens are small birds, measuring up to five inches long, and have a white band above their eyes and a white-streaked black triangle on their backs. They inhabit tidal marshes on the Georgia coast south to the northern edge of the St. Johns River. They build dome-shaped nests in March and April in tall grasses adjacent to salt marsh creeks. The Worthington's marsh wren is known to nest on NAVSTA Mayport in the tidal marshes near the western dredge deposit site. This INRMP protects habitat for Worthington's marsh wren through management actions such as wetlands (Section 4.4.1.1; *i.e.*, control pesticide runoff and maintain chemical-free vegetative buffers to protect forage areas), erosion control (Section 4.4.1.2; *i.e.*, prevent sedimentation into forage areas, protect roosting areas from erosion), stormwater control (Section 4.4.1.3; *i.e.*, manage non-point and point source pollution into forage areas), and floodplains (Section 4.4.1.5; *i.e.*, evaluate all alternatives before constructing new development in undisturbed floodplain areas). Projects described in this INRMP that benefit and conserve the Worthington's marsh wren and its habitat include Control Invasive, Exotic, and Noxious Species, Rare, Threatened, and Endangered Species Survey, INRMP Update, Neotropical Migratory Bird Survey, Feral Animal Control, GIS Database, and Species Protection and Habitat Development (see Chapter 6 for descriptions).

Management Strategies

The beach has the potential to support further sea turtle and least tern nesting activity and foraging and roosting by piping plovers. Limiting factors include beach driving, human disturbance from unrestricted pedestrian access, artificial lighting and predation by free-ranging domestic cats and other predators. In September 2001, NAVSTA Mayport requested formal Section 7 Consultation with the USFWS regarding beach driving, other mission-related beach activities and light pollution on the base subsequent effects on nesting sea turtles. A formal Biological Opinion was never rendered by USFWS due to the fast pace that corrective actions were put in place to remedy these situations. Details of these actions are provided below.

The following five management strategies were undertaken:

1. In April 2002, NAVSTA Mayport instituted a base-wide instruction on vehicle traffic and strictly limited driving on the beach to Life Guards and Security vehicles. Driving is to

be accomplished at or just above high tide mark where feasible, is limited to day-time driving unless security threat is documented, and requires removal of any tire ruts.

2. Training units that accessed the beachfront area were trained on sea turtle nesting precautions and were limited to day time operations only.
3. Developed an installation sea turtle education program that included seasonal articles in the local paper and Housing newsletter, volunteer training for monitoring nests sites, informational 'door knocker' signs for lodging areas about precautions to take during nesting season.
4. Nests are clearly marked with posts and orange netting and as the hatching date approaches, volunteer personnel conduct daily removal of debris or uneven sand in the vicinity of the nests. Numbers of nests, hatchlings, and false crawls have been documented since 2003 (Table 4-19).
5. A project was initiated in 2012 to manage light emission at NAVSTA Mayport in order to eliminate sea turtle disorientation.

The following management strategies for piping plovers and least terns are underway:

- Record least tern nesting in non-beach areas and protect, to the maximum extent practicable, from human disturbance.
- Conduct annual piping plover surveys throughout January and February and protect from disturbance any identified high use areas.

Table 4-19. Numbers of Sea Turtle Nests, Hatchlings, and False Crawls Documented at NAVSTA Mayport Since 2003

	Loggerhead			Leatherback			Green		
Year	No. of Nests	No. of Hatchlings	False Crawls	No. of Nests	No. of Hatchlings	False Crawls	No. of Nests	No. of Hatchlings	False Crawls
2018	10	679	11	1	0	0	0	0	0
2017	6	452	4	1	67	0	2	90	0
2016	14	1095	6	0	0	0	1	107	5
2015	6	368	25	1	57	1	0	0	1
2014	6	563	3	0	0	0	0	0	0
2013	8	0	4	1	unknown	0	2	0	2
2012	13	375	19	1	0	0	0	0	0
2011	14	944	4	1	97	0	1	84	0
2010	13	1095	15	0	0	0	0	0	0
2009	10	845	8	1	76	0	0	0	0
2008	11	755	1	0	0	0	0	0	0
2007	3	211	3	0	0	0	0	0	0
2006	21	1963	8	0	0	0	0	0	0
2005	12	1247	0	0	0	0	0	0	0
2004	5	unknown	2	0	0	0	0	0	0
2003	14	873	6	0	0	0	0	0	0

4.4.3.3.2 Migratory Birds

The Migratory Bird Treaty Act (MBTA) prohibits the taking, killing, or possessing of migratory birds unless permitted by the USFWS. In December 2017, the Principal Deputy Solicitor released a memorandum stating that the acts prohibited under MBTA are only prohibited if done so intentionally, which is a different legal opinion than previous administrations held. However, the Navy is beholden to Section 315 of the 2003 National Defense Authorization Act (NDAA), which provides as exemption to the Navy for the incidental taking of migratory birds during military readiness activities authorized by the Secretary of Defense or the Secretary of the Navy. Under this statute, the Navy must still assess through the NEPA process, or other environmental requirements, the expected impact of proposed or ongoing military readiness activities on migratory bird species likely to occur in the action areas. Military readiness activities are defined under the NDAA as 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. This does not include the routine operation of installation operating support functions, such as administrative offices, military exchanges, commissaries, water treatment facilities, storage facilities, motor pools, morale, welfare, and recreation activities, and mess halls; the operation of industrial activities; or the construction or demolition of facilities listed above.

Current MBTA regulations authorize permits for direct take of migratory birds for activities such as scientific research, education, and depredation control. However, the MBTA does not expressly address the issuance of permits for incidental take, so the Navy is compelled to exercise due diligence for activities requiring NEPA analysis and must develop appropriate and reasonable conservation measures to avoid, minimize, and mitigate identified significant adverse effects to migratory birds and their nests resulting from such activities.

Issue

Migratory birds at the NAVSTA Mayport are protected under the MBTA against take for normal and routine operations such as installation support functions. Take includes pesticide application, nest or egg removal, and occasionally, tree removal. The temporal and spatial presence of migratory bird species must therefore be considered when carrying out all management activities described in this INRMP. Nest removal outside of nesting season would not constitute take.

Projects and Initiatives

Implement the following projects and initiatives in support of the strategies for migratory bird management:

Projects

- Project No. 1 – Control Invasive, Exotic, and Noxious Species
- Project No. 2 – Rare, Threatened, and Endangered Species Survey
- Project No. 4 – Neotropical Migratory Bird Survey
- Project No. 5 – Feral Animal Control to Support the Military Mission
- Project No. 6 – GIS Database
- Project No. 7 – Sea Turtle Management Program to Eliminate Disorientation (which also benefits birds)

Initiatives

- Complete surveys for neotropical migratory birds by using the recommendations provided in the DOD Coordinated Bird Monitoring Plan to guide survey design and data management;
- Notify the NRM of installation support actions that may affect migratory bird species so that impacts to birds may be avoided and minimized in accordance with the MBTA;
- Update rare, threatened, and endangered species surveys;
- Seek opportunities create conservation partnerships with federal, state, local agencies and non-governmental organizations to improve habitat and allow for bird research at NAVSTA Mayport;
- Utilized the IPM Plan to reduce pesticide use to the benefit of migratory birds;
- Where possible, site military readiness activities to avoid migratory birds and their nests;
- Routinely update and monitor the BASH Plan and implement grounds maintenance practices consistent with the BASH Plan; and
- Establish procedures for the BASH to deliver regularly scheduled updates and reports to the NRM.

Long-Term Management

Avoiding and minimizing impacts to migratory birds begins with an up-to-date working knowledge of species presence, seasonality, nesting habits, and habitat condition on the installation. The NRM will therefore ensure that migratory bird surveys are regularly completed on the Station. These surveys shall follow the guidance and recommendations in the DOD Coordinated Bird

Monitoring Plan for survey design and data management. Additional guidance and information is available on the DOD Partners in Flight Monitoring Working Group website (www.dodpif.org). The NRM and Regional Natural Resources support staff will use collected data to avoid, minimize, and mitigate impacts to migratory birds resulting from activities on NAVSTA Mayport. Because most migratory birds cross installation and state boundaries, data sharing is a vital component to their management. Data collected at NAVSTA Mayport will be shared with federal and state agencies through participation in programs such as the Breeding Bird Research and Monitoring Database (BBIRD), eBird, and Monitoring Avian Productivity and Survivorship (MAPS). Public outreach opportunities, such as Christmas Bird Counts and wildlife viewing opportunities will continue to be promoted on the Complex.

The Commanding Officer maintains a depredation permit so a BASH control agent at NAVSTA Mayport may legally take migratory birds that pose a BASH threat. The agent needs to cooperate with the NRM to ensure that the goals, objectives, and strategies for migratory bird management are achieved in concert with the goals, objectives, and strategies of BASH control.

4.4.3.3.3 Natural Communities

Coastal Scrub

This community includes the primary dune, a landward herbaceous flat, and a small area of secondary and shrub dunes adjacent to the south jetty. The primary dune is nearly continuous and extends to the northern boundary of the City Park. Dominant dune vegetation includes sea oats, beach-tea, seaside pennywort and dunes evening-primrose. The herbaceous flat contains some sea oats, camphor weed, sand bean, prickly pear, and seaside pennywort. Various turf grasses planted on improved grounds adjacent to this flat have invaded the flat. Generally, compared to the primary dunes, the secondary dunes contain a denser, though similar vegetative community. The shrub area is dominated by wax myrtle, beach elder, cabbage palm, and salt bush.

The coastal scrub community is landward of the beach, so access to the beach is through the coastal scrub community. As a result, the coastal scrub has been heavily impacted by both vehicular and pedestrian access to the beach. Therefore, management strategies for this community can be aimed at reducing the number of access points and redirecting access to designated boardwalk areas.

Management Strategies

Management strategies to protect, conserve, and enhance the coastal scrub habitat are as follows:

- Eliminate or minimize to the extent practicable all vehicle traffic on the beach, especially along the backbeach. Vehicle traffic (except emergency vehicles) on the beach causes erosion to the backbeach and primary dune, limiting the expansion of these portions of the coastal scrub habitat eastward.
- Placement of native materials within dune breaches. By placing woody debris in existing dune breaches, as well as in any dune breaches created by pedestrian traffic in the future, pedestrian traffic through the dune breaches should be discouraged, woody material can help trap wind-blown sand and the degradation of native material can contribute organic matter to the coastal scrub habitat soils.
- Eliminate mowing and the use of fertilizer adjacent to the coastal scrub habitat. Once turf grass is not maintained along the boundaries of the coastal scrub habitat it can likely be replaced naturally by native dune plant species.
- Creation of a buffer between the coastal scrub habitat and areas managed for lawn species. The buffer may require protection by the installation of a post and cable fence or some other type of physical barrier.
- Survey for and eradication of non-native species and establishment of a restricted planting species list.

Military/Golf Course

This category includes urban areas such as residences, the airfield, and other land-based administrative and operational facilities. Specific land uses include buildings, roadways and shoulders, parking lots, wharves, fine turf and other landscaped areas, and airfield runways. There are no Federal or state threatened or endangered species specific to the above urban community at the Installation. Least terns occasionally forage within golf course ponds and the endangered wood stork also forages at the pond edges as well as within golf course ditches.

The urban area is relatively limited in actual and potential contributions to native wildlife. Limiting factors include scarce natural or undeveloped habitat, high human disturbance and other forms of disturbance. However, some birds, small mammals, reptiles, and invertebrates may benefit from certain management strategies applied in the urban community. Management strategies include grounds maintenance, urban forestry, stormwater management, integrated pest management and tree mitigation.

Upland Forests

There are three types of undeveloped, forested upland communities: coniferous forest (slash pine), pine/hardwood forest, and live oak. Threatened and endangered species potentially occurring in upland habitats on NAVSTA Mayport include the wood stork, and Federal and state threatened Eastern indigo snake, bald eagle, and state threatened Southeastern American kestrel. Non-breeding wood storks may roost at upland edges or on islands. Eastern indigo snakes usually require extensive undeveloped areas containing a mosaic of wetland and upland habitats and having gopher tortoise burrows in which to avoid extreme temperatures, which are not available on NAVSTA Mayport. Bald eagles have been observed foraging over the tidal marsh, however, no nests currently exist. The Southeastern American kestrel is limited by the availability of nesting cavities and adequate foraging habitat on NAVSTA Mayport.

Streams and Waterways

Included in this category are the following linear water bodies: stormwater canals and ditches; Buckhorn, Pablo, and Sherman Creeks and other brackish meanders; ICW; Chicopit Bay; and the Mayport Basin. Other drainage canals and ditches occur along major roadways, the golf course, adjacent to Lake Wonderwood and residential housing, as well as along most of the perimeters of the two on-site dredged material containment areas. These areas provide important sources of freshwater for laughing gulls (*Larus atricilla*) and terns (*Sterna sp.*) and foraging habitat for wood storks, other wading birds, and various waterfowl. Long-term management practices for streams and waterways include monitoring of sediment and water quality, implementation of riparian buffer areas, and proper cleaning of debris.

Federal and/or state threatened and endangered species that are associated or potentially associated with these aquatic habitats include the wood stork, bald eagle, least tern, Florida manatee, loggerhead, green, and leatherback sea turtles, Atlantic sturgeon, and shortnose sturgeon. Manatees are known to occur within the Mayport Basin, Chicopit Bay, Pablo Creek and the ICW. Numbers within the Chicopit Bay, Pablo Creek, and ICW usually peak in the fall and spring. According to NAVSTA Mayport Natural Resources personnel, stranded sea turtles have been found within the ship basin. Immature green turtles have also been collected at power generating stations upriver from the Installation (USFWS 1998).

Recent research has indicated that the primary North Atlantic right whale mother/calf wintering area for the entire east coast of the U.S. appears to be approximately 15 miles off the coast between Cumberland Island and Jacksonville Beach. Primary limiting factors include competition from other plankton eating fish, collisions with ships, disturbance from vessels, entrapment and entanglement in fishing gear, and habitat degradation.

Management Strategies

Management strategies for this biotic community are focused on the protection of species and water quality. As mentioned earlier, the two primary species include the Florida manatee and the North Atlantic right whales.

To protect Florida manatees, NAVSTA Mayport can:

- Continue to implement the Manatee Awareness Program. This program includes the following:
  - Guidance on reporting manatee sightings and appropriate avoidance actions contained within the *Fleet Guide for Mayport, Florida* and the *Mayport SOPA*.
  - Information to new ships entering the basin marine life awareness information to further educate Navy servicemen on area marine life.
  - Annual presentations on manatees and sea turtles to Installation personnel. Continue to provide manatee and sea turtle educational material to Installation personnel owning personal watercraft and others renting equipment from MWR.

To protect the right whales, the Navy can continue to:

- Promote an awareness among the vessel commanders and pilots about the right whale wintering grounds and the potential for ship strikes;
- Educate users of MWR water recreation facilities of 500-yard approach rule and how to report a right whale sighting;
- Maintain a liaison to oversee/coordinate the awareness program, receive updated sighting reports and report sightings to the Ship Operations Officer (SOO); and,
- Maintain the posting of extra lookouts on vessels transiting the area and reducing vessel speeds during the right whale wintering season.
- To protect the Atlantic and shortnose sturgeons the Navy can:
- Include sturgeons in educational materials provided by the installation to personnel and the public.

Other management strategies for open water habitats include the protection of stormwater drainage ditches and canals from pesticides and fertilizers. NAVSTA Mayport and NFD can use the SWPPT to monitor these ditches and canals in accordance with the SWPPP.

Reservoirs

The primary water bodies included within this category are Lake Wonderwood, the golf course ponds, and two flight line retention ponds. Each of these reservoirs is connected to NAVSTA Mayport's stormwater drainage system receiving runoff from surrounding Installation development. Federal and or state threatened and endangered species associated or potentially associated with these aquatic habitats include the wood stork, bald eagle, and least tern.

Because of the proximity of the flight line retention ponds to the airfield, their management should be conducted in accordance with the BASH program. Currently, Lake Wonderwood is an estuarine fishery, however, NAVSTA Mayport is converting this reservoir to a freshwater body in accordance with the USFWS and FFWCC recommendations. Management of Lake Wonderwood can be accomplished in accordance with the FFWCC Urban Ponds Program.

Wetlands

Wetland communities on the Installation include mixed hardwood wetlands, wetland forested mixed, vegetated non-forested wetland, freshwater marsh, and saltwater marsh. In addition, tidal flats and oyster bars occur throughout the estuarine environment. Federal and/or state threatened or endangered species associated or potentially associated with Installation wetlands include the wood stork, which has been seen foraging throughout the saltwater marsh. In addition, a non-breeding roost of black-crowned night herons was observed in 1994 within non-forested wetlands adjacent to Sherman Creek and the eastern spoil disposal site. A similar roost of snowy egrets was observed in 1998 along a drainage ditch at the edge of the saltwater marsh between the airfield and western spoil disposal site.

Estuarine Beaches

Sand and rock beaches occur along the St. Johns River at the northern boundary of NAVSTA Mayport, at Little Jetties Park along both the river and Chicopit Bay. A short beach also occurs west of St. Johns Point and landward of the south jetty. At NFD, the southern and eastern boundaries are bordered by the St. Johns River. These sites provide feeding and loafing habitat for both shore birds and wading birds, and potential breeding sites for the Carolina diamondback terrapin (*Malaclemys terrapin centrata*). Federal and/or state threatened and endangered species associated or potentially associated with this habitat include the piping plover and least tern.

Dredged Material Holding Areas

Human disturbance of natural habitat from dredging, filling, and other earth working has occurred over approximately 70 percent of the area within NAVSTA Mayport. Significant areas of dredged material include the saltwater marsh adjacent to Sherman Creek, on the eastern end of Great Marsh Island and other intertidal marsh within Chicopit Bay and the ICW, and two diked containment sites centrally located on the Installation. The two containment dikes contain material removed from the Mayport Basin, while the other sites received spoil taken from the St. Johns River, ICW, or Sherman Creek extension.

Federally and/or state threatened and endangered species that are associated or potentially associated with spoil areas include the wood stork, piping plover and least tern. Wood storks forage in the depressional basins and can roost in canopy trees within spoil islands. Wintering piping plovers may occur on sand flats formed around the spoil islands and within the spoil containment dikes. Least terns are known to have nested within the diked containment sites and probably nested on the spoil islands during their formation. These sites no longer attract nesting terns due to colonization of most bare sand by various grasses and forbs.

Management Strategies

While the estuarine beaches provide excellent habitat for migrating birds and other wildlife, it must be emphasized that these areas are first and foremost essential for the continuance of the military mission. In an attempt to balance the needs of the military mission and wildlife habitat needs, NAVSTA Mayport can coordinate with the USACE and USFWS to determine improvement practices to attract wildlife to the area as long as it does not interfere with future mission requirements, training exercises, or dredging-related operations.

Ecosystem Management

The concepts presented in this section are consistent with ecosystem management. By effectively managing biotic communities on NAVSTA Mayport and NFD, it is not only enhancing wildlife communities, but may also be providing opportunities for new species, including migratory species to thrive.

4.4.3.4 Wildlife Damage and Wildlife Disease

Wildlife Damage

The prevention and control of wildlife damage involve reducing conflicts between wildlife and people or among wildlife species. These efforts include BASH and pest management.

Issue

Foxes, raccoons, armadillos, gray squirrels, feral cats and opossums are known to occur on NAVSTA Mayport and NFD. Some birds such as house sparrows, starlings, pigeons, grackles, and crows can also be considered nuisance species. NAVSTA Mayport and NFD would like to encourage non-game wildlife in urban areas, but control and minimize nuisance species. A BASH program exists on NAVSTA Mayport due to resident and migratory bird species on the Installation and within the vicinity.

Objectives, Strategies, and/or Projects

Table 4-20 shows the natural resources management objectives, and strategies relevant to wildlife damage issue(s) and long-term management.

Table 4-20. Natural Resources Management Objectives and Strategies Related to Wildlife Damage

Objectives	Strategies	Applicable to Ecosystem Focus and Sub Units
2.3 To control nuisance wildlife and wildlife diseases that may adversely affect human health or welfare, the health of the ecosystem and/or the military mission.	a. Continue to monitor the animal populations and to control nuisance wildlife populations as needed. b. Implement ground maintenance practices and ensure all other management practices/construction activities are consistent with BASH Plan.	Wildlife Disease
5.1 Ensure that natural resource and recreational management does not compromise the military mission.	Insure that military mission is not compromised by natural resource management.	All

Projects and Initiatives

Participation in the following projects and initiatives can occur in support of the objectives and strategies for wildlife damage management:

Projects

- Project No. 1 – Control Invasive, Exotic, and Noxious Species
- Project No. 2 – Rare, Threatened, and Endangered Species Survey
- Project No. 4 – Neotropical Migratory Bird Survey
- Project No. 5 – Feral Animal Control to Support the Military Mission
- Project No. 6 – GIS Database

Initiatives

- Educate all necessary personnel on practices and activities that can minimize the BASH related incidents.
- Ensure that BASH control are consistent with updates to the NAVSTA Mayport AICUZ report.
- Establish an awareness program to educate users of the Installation on indicators of wildlife population problems and diseases. Use pamphlets, flyers and command units to disseminate information.
- Continue to use IPM techniques in the Pest Management Program and emphasize the use of pesticides with low toxicity and low application.

Long-Term Management

In the event that NAVSTA Mayport and NFD identify a wildlife conflict, a damage control program can be established. The program should have four parts (Dolbeer *et al.* 1994):

1. **Problem definition**: to determine the species and number of animals causing the problem, the amount of loss or nature of the conflict, and other biological and social factors related to the problem. To accomplish this, NAVSTA Mayport can maintain records for the following:
    - Opossum, raccoon, and feral cats - Maintain records of animals that are unafraid of people and the amount of garbage raiding by these animals.
    - Squirrels - Maintain records of damage to structures.
    - Armadillos - Maintain records of damage to yards. Note roadway kills.
    - Feral cats - Maintain a record of the number of cats picked up on the Installation.
2. **Ecology of the problem species**: To understand the life history of the species, especially in relationship to the conflict.
3. **Control method**: Takes the information gained from parts 1 and 2 and develops an appropriate management program to alleviate or reduce the conflict.
4. **Evaluation of control**: Assesses the reduction in damage in relation to costs and impact of the control on target and non-target populations and the environment.

Information on damage prevention and control methods for wildlife species can be found in a series provided by the University of Nebraska Cooperative Extension Service, Great Plains

Agricultural Council, and the USDA, North Carolina State University (NCSU), and North Carolina Agricultural & Technical University(NCA&T) (NCSU & NC A&T 2001).

Bird/Aircraft Strike Hazard (BASH)

The BASH program is to reduce the potential for collisions between aircraft and birds or other animals and to minimize damage and injuries resulting from these collisions. The BASH program encompasses all actions, which identify, reduce or eliminate bird or other animal hazards to aviation.

NAVSTA Mayport will manage the BASH program in accordance with Naval Station Mayport Instruction (NSMYPTINST) 3750.1 series. NAVSTA Mayport should manage all habitats surrounding an airfield, natural or man-made, in such a way as to discourage bird/animal hazards by removing sources of food, water, and shelter. By managing areas to be less attractive to nuisance wildlife, it is possible to reduce hazards. Thorough and periodically updated ecological studies of airfields and their vicinity are vital to reduce bird/animal strike hazards.

The BASH Plan encompasses all actions, which may identify, reduce or eliminate bird or other animal hazards to aviation on NAVSTA Mayport. The NAVSTA Mayport Air Operations Department is authorized to implement the BASH Plan and instruction and they coordinate with the Natural Resources Manager and the Public Works Department to ensure compliance.

Passive and Active Control Measures

NAVSTA Mayport practices several active and passive techniques to reduce bird population levels. These techniques vary in cost and effectiveness depending upon the situation. Active controls involve dispersing birds from an airfield to provide short-term relief to an immediate safety hazard. Passive techniques are more long-range in nature and involve managing the airfield to eliminate those factors that attract birds to the airfield.

Passive controls include the following:

- **Grass Height Management**. One of the most important tools for bird reduction on airfields is the maintenance of grass height. Flocking birds must see each other to maintain flock integrity while feeding. Tall grass blocks the bird's view and also impedes raptors ability to spot prey. Grass height should be maintained between 7 and 14 inches.
- **Brush Control**. Brush attracts a variety of birds. The airfield clear zone should be kept clear of brush and weeds.

- **Standing Water.** Standing, especially fresh water, is a major attractant to birds, including gulls and waterfowl. Any areas in the clear zone that retain fresh water long enough to attract birds following a rain can be regraded to increase drainage potential. This does not include permitted stormwater ponds and drainage ditches maintained for water quality and flood protection. Vegetation control in these systems can eliminate food and cover.
- **No Feeding Policy.** It is imperative to adopt a strict no-feeding policy, not only for birds, but also for all wildlife. Ensure that all food-related trash is properly disposed of, and keep all trash covered at all times.

Active bird controls include the following:

- **Frightening the birds from the airfield.** The keys to a successful bird frightening program include the encouragement of a habitat management program to discourage birds before they become a hazard; always responding to birds on the airfield, never allowing them to loaf on the airfield; responding rapidly to bird occurrences on the airfield; and persistence in the use of the chosen control technique. Techniques include:
  - **Bio-acoustics** are taped distress or alarm calls of actual birds. The equipment required to adequately project these calls include a cassette tape deck and a speaker that can be mounted on the exterior of a vehicle. Special care must be taken to play in short intervals to prevent habituation by the birds. Play the tape for 20-30 seconds and then pause briefly. Repeat the procedure several times if necessary. The birds should respond by taking flight or becoming alert. These calls are effective for gulls, blackbirds, starlings, crows, and some shorebirds. If the birds become familiar with the tape, it should be reinforced with pyrotechnics.
  - **Pyrotechnics** are loud explosive devices, resembling a fire cracker, that are launched from assorted firearms. For example, some cartridges are 12-gauge and fired from a 12-gauge shotgun while others are smaller and fired from a pyrotechnic pistol. The cartridges are fired into or above flocks of birds to scare them from the area. Pyrotechnics are to be used in conjunction with bio-acoustics. Playing the tape and launching the cartridges can be done simultaneously.
- **Depredation of birds may sometimes be necessary.** Birds must be killed occasionally as a reinforcement of other methods and should be used as a last resort only when other methods have failed. Domestic pigeons, European starlings, and house sparrows can be killed without a permit. Shooting birds should be done while playing the bio-acoustic tape.
- If all other environmental modifications and active control measures are unsuccessful in reducing bird hazards, another option is to **alter flying operations** to reduce the bird strikes. These operational changes should be dictated by the severity of the problem, the performance capability of the aircraft and training and/or readiness requirements.

Ultrasound, rubber snakes, stuffed owls, rotating/flashing lights, loud music, and other such devices are ineffective and should not be used. Driving vehicles through a flock of birds is also

ineffective and should not be used. This technique works temporarily, but the birds can circle and land in the original area. Eliminating birds from the airfield and in hangars can be done as problems arise. Each problem can be handled individually; additional guidelines pertaining to BASH management are provided in the BASH Management Plan for NAVSTA Mayport.

Wildlife Diseases

Prevention and control of wildlife disease addresses diseases transferred between wildlife species and/or diseases transferred directly or indirectly from wildlife species to humans. Examples of wildlife diseases include rabies and distemper, which are problems related to certain wildlife species. Rabies may be problematic for humans within the area.

Issue

Wildlife diseases can cause significant illness and death to individual animals and can significantly affect wildlife populations. Wildlife species can also serve as natural hosts for certain diseases that affect humans (zoonosis). The disease agents or parasites that cause these zoonotic diseases can be contracted directly from wildlife by bites or contamination, or they can be contracted indirectly through the bite of arthropod vectors such as mosquitoes, ticks, fleas, and mites (McLean 1994).

Objectives, Strategies, and/or Projects

Table 4-21 presents the natural resources management objectives, and strategies that are most directly relevant to wildlife diseases and long-term management.

Table 4-21. Natural Resources Management Objectives and Strategies Related to Wildlife Disease Control

Objectives	Strategies	Applicable to Ecosystem Focus and Sub Units
2.3 To control nuisance wildlife and wildlife diseases that may adversely affect human health or welfare, the health of the ecosystem and/or the military mission.	Continue to monitor the animal populations and to control nuisance wildlife populations as needed.	Wildlife Management

Projects and Initiatives

Participation in the following projects and initiatives can occur in support of the objectives and strategies for wildlife disease management:

Projects

- Project No. 1 – Control Invasive, Exotic, and Noxious Species
- Project No. 4 – Neotropical Migratory Bird Survey
- Project No. 5 – Feral Animal Control to Support the Military Mission
- Project No. 6 – GIS Database

Initiatives

- Institute wildlife education and stewardship programs.
- Establish an awareness program to educate users of the Installation on indicators of wildlife population problems and diseases. Use pamphlets, flyers and command units to disseminate information.
- Continue to use IPM techniques in the Pest Management Program and emphasize the use of pesticides with low toxicity and low application.

Long-Term Management

No problem of diseases affecting wildlife or humans exists regionally or locally on NAVSTA Mayport or NFD. However, NAVSTA Mayport and NFD can implement its management policy of public awareness by informing employees and visitors of wildlife related diseases. Management can focus on, but should not be limited to, the following issues:

- Awareness of the diseases in the area and the specific times of year that present the greatest risk of exposure.
- Awareness and recognition of early symptoms of diseases and the conditions of exposure.
- Importance of using extreme caution when approaching or handling a wild animal, especially one that looks sick or acts abnormally.
- Protective measures against fungal diseases where there is an accumulation of animal feces.
- Protection from vector-borne disease in high-risk areas using measures such as mosquito or tick repellent, or wearing special clothing.
- Reduction in host populations and their ectoparasites.

Literature on wildlife diseases and humans can be found in a series of articles provided by the University of Nebraska Cooperative Extension Service, Great Plains Agricultural Council, and the USDA (McLean 1994; NCSU and NC A&T 2001).

Ecosystem Management

Supplemental food often supports abnormally elevated populations of the damaging species, which has deleterious effects on other components of the ecosystem. Diseases can also reach abnormally elevated and disruptive population levels if their host populations are inflated. Eliminating supplemental food sources and returning the host wildlife species to a balanced population level through other means can help control disease and is consistent with ecosystem management concepts.

4.4.4 Outdoor Recreation

For the purposes of this INRMP, outdoor recreation is defined as the recreational use of natural resources in a natural environment, but does include the use of indoor interpretive centers whose primary purpose is describing and explaining the natural environment, its ecology, and human application of its resources. Outdoor recreation includes nature trails, picnic and camping areas, consumptive and non-consumptive uses of natural resources, establishment and management of recreational trails, scenic river designations, equestrian areas, indoor interpretive centers, and other facilities. For the purposes of this INRMP, outdoor recreation does not include highly developed outdoor uses such as golf courses, tennis courts, ball/athletic fields, or swimming pools. Outdoor recreation opportunities may be classified as concentrated or dispersed.

- **Concentrated recreation opportunities** refer to those activities where users congregate in a specific area, for instance, when using picnic areas, campgrounds, fitness trails, archery ranges, interpretive centers, boat ramps.
- **Dispersed recreation opportunities** refer to those activities where the user moves about through an area, as during cross-country hiking, boating or hunting.

The CO ensures that an outdoor recreation program is developed and coordinated with the appropriate Federal and state agencies. The PWO develops and maintains the outdoor recreation program with the cooperation of the Natural Resources Manager and the MWR Department through the development and implementation of the Outdoor Recreation Plan. Through this plan and coordination with the appropriate Federal and state personnel, the PWO ensures the best use of recreation resources and the availability of recreational opportunities.

In 1987, a tripartite agreement between the DoD, the DoI and the State of Florida was initiated for the purpose of providing NAVSTA Mayport with professional and technical information necessary to coordinate actions pertaining to the operation, development, management, and protection of outdoor recreational resources. Based upon this agreement, the NPS and the State

of Florida can act in an advisory capacity on matters pertaining to the management of outdoor recreation resources on lands administered by NAVSTA Mayport. Additional technical assistance for the management of outdoor recreational resources is available from Southern Division and the USFWS.

Issue

Based on monthly demand figures derived by MWR, the demand for recreation activities located on NAVSTA Mayport is high and is expected to continue to increase, particularly, for the parks, jetties, beaches and picnic facilities. Because of this high demand, careful planning and consideration are needed to expand the recreation program on NAVSTA Mayport consistent with the military mission. There are no recreational opportunities at NFD.

Objectives, Strategies, and/or Projects

Table 4-22 shows the natural resources management objectives, and strategies relevant to the outdoor recreation issue(s) and long-term management.

Table 4-22. Natural Resources Management Objectives and Strategies Related to Outdoor Recreation

Objectives	Strategies	Applicable to Ecosystem Focus Units
3.1 To establish an outdoor recreation planning team to study recreational needs of NAVSTA Mayport personnel and the general public.	Establish recreation planning team that can address means for providing additional recreational activities. Membership on the team can consist of, at a minimum, the Natural Resources Manager, a representative from the PWO, and a representative from MWR.	Land Impact
3.2 To maintain existing and develop additional outdoor recreational facilities at NAVSTA Mayport.	NAVSTA Mayport can continue to develop recreational trails and/or interpretive centers in areas of NAVSTA Mayport with unique natural resources.	Land Impact

Projects and Initiatives

Participation in the following projects and initiatives can occur in support of the objectives and strategies for recreation and educational management:

Projects

- Project No. 2 – Rare, Threatened, and Endangered Species Survey
- Project No. 6 – GIS Database

Initiatives

- Conduct a survey to identify the level of use, areas of use, and participants' preferences for existing and potential outdoor recreation opportunities.
- Identify needed facilities development and their compatibility with the military mission of NAVSTA Mayport.
- Develop an Installation bicycle, jogging and pedestrian management plan.
- Explore partnership opportunities with the TIMU.
- Identify potential natural resources conflicts that could arise from increased outdoor recreational facilities.
- Determine the existing and future demand for recreational facilities on NAVSTA Mayport.
- Use volunteers and interested Installation personnel for construction of facilities.
- Establish a partnership agreement with the Duval County Public School Marine Science Center to utilize Chicopit Bay as an outdoor classroom for environmental education.
- Work with the COJ to enhance access to Chicopit Point.

Long-Term Management

The Outdoor Recreation Section of the Natural Resources Plan (NRP; NPS 1998) for NAVSTA Mayport contains numerous management recommendations for outdoor recreation at NAVSTA Mayport. Monitoring the outdoor recreation program (*e.g.*, Dispersed and Concentrated opportunities/areas) and Special Interest Areas is essential to protecting and enhancing the resource, as well as the quality of the outdoor experience. Because present data and patterns of outdoor recreation use provide insufficient data upon which to base decisions related to future needs and for carrying capacity determinations, periodic visitor surveys or other visitor analysis techniques (*e.g.*, visitor mapping, visitor observation) can be conducted to monitor the provision of quality recreational experiences. Impacts to resources can be monitored by periodic surveillance of areas where activities occur, noting changes to resources over time. Specific objectives can be stated that indicate "acceptable" and "unacceptable" resource impacts and a baseline can be established for comparison over a period of time.

Management of the outdoor recreation program at NAVSTA Mayport can focus on coordination and cooperation with surrounding landowners such as the COJ and the TIMU. Because a small portion of the natural resources on NAVSTA Mayport are also within the boundary of the TIMU, a cooperative and supporting working relationship can be fostered in order to assure access to and

preservation of natural and cultural resources. NAVSTA Mayport's outdoor recreation program can also require coordination between the MWR and the Natural Resources Manager to ensure that all future recreational activities can be developed consistent with the military mission and to not adversely impact the natural environment. Furthermore, any future recreation activities for use by the general public can be evaluated.

Projects for Outdoor Recreation Development Plan, Recommendations from the NRP Outdoor Recreation Section

The 1998 plan by NPS identified a number of areas on NAVSTA Mayport as *Special Interest Areas* because of the outdoor recreation/interpretation opportunities. These areas are important in terms of the natural resources management program (*e.g.*, archeological, botanical, ecological, historic, natural resources, scenic, zoological and/or endangered and threatened species). Specific sites include a small botanical area, an ecological area shared with the TIMU, the St. Johns and Coast Guard Lighthouses natural resource areas and a research area on Chicopit Point. The 1998 NRP also recommended projects to identify and develop *dispersed* and *concentrated* recreational opportunities on NAVSTA Mayport.

Management recommendations for special interest areas include:

- Continuing studies to identify potential archeological areas, and initiate interim studies on a case-by-case basis.
- Protecting endangered and threatened habitats and species that occupy those habitats in accordance with Fish and Wildlife Management Section.
- Maintaining close working relationship with surrounding entities to provide interpretive educational opportunities and to address joint natural resource management objectives.

Management recommendations for dispersed recreational opportunities include:

- Conducting periodic random surveys to obtain information on usage levels, fish caught, and angler preferences to effectively evaluate the existing fishing program at NAVSTA Mayport.
- Developing a base bicycle, jogging and pedestrian management plan.
- Identifying additional boat/canoe/kayak launch facilities to provide more access to surrounding water bodies. Any canoe/kayak facilities designated for general use should be reported to the NPS and/or the COJ for inclusion in the new kayaking trail system.

Management recommendations for concentrated recreational opportunities include:

- Evaluating areas on NAVSTA Mayport (*e.g.*, the car storage lot, Sherman Creek, the old spoil area and TIMU) as potential Watchable Wildlife Areas.
- Designing and preparing information pamphlets about natural resources that are relevant to outdoor recreation opportunities.
- Developing wildlife viewing stations near the base entrance at Ribault Housing area. The stations can have wildlife and natural interpretive signs and materials.
- Maintaining vistas in the southwestern portion of the Installation to view salt marsh areas within the TIMU boundary.

Integration of Regional Recreational Opportunities

Because NAVSTA Mayport actually shares land with the TIMU in the southwestern section of the installation, unique opportunities for developing recreational activities exist. These activities include the development of a Watchable Wildlife tower and other interpretive opportunities. Other areas of coordination include opportunities for interpreting the cultural heritage within the Town of Mayport by participating in the proposed boat tour spearheaded by the TIMU, which is in the preliminary planning stages. This tour can interpret natural, historical, and ecological resources while traveling from the TIMU to the Town of Mayport.

Ecosystem Management

Ecosystem management practices are enhanced by environmental stewardship and by educating the general public about environmental conservation issues, problems, and solutions. By providing natural recreational and educational opportunities on the Installation, NAVSTA Mayport can help promote public awareness of vital environmental resource issues, thus providing a regionally limited educational resource. In addition, using volunteer groups and/or Installation personnel for the physical construction of recreational and educational facilities provides opportunities for educating group members on the values and characteristics of a healthy environment and on some of the problems and solutions associated with human use of the environment.

4.4.5 Land Impact Guidelines

Land impact is defined herein as an activity (*e.g.* construction of buildings, infrastructure facilities, training or other human-made structures) which has the potential for an adverse effect on the function of ecosystems at NAVSTA Mayport and NFD.

Issue

Because approximately 70 percent of NAVSTA Mayport and NFD's natural habitat has been disturbed by human activities (*e.g.*, dredging, filling, and other earth working), remaining natural communities are of extreme importance to wildlife habitat. To protect these communities, NAVSTA Mayport can establish and implement land improvement guidelines that support the military mission, while minimizing adverse impacts to the Installation' remaining environmental and ecological resources.

Objectives, Strategies, and/or Projects

Table 4-23 presents the natural resources management objectives, and strategies that are most directly relevant to land impact guidelines and long-term management.

Table 4-23. Natural Resources Management Objectives and Strategies Related to Land Impact Guidelines

Objectives	Strategies	Applicable to Ecosystem Focus Units
1.1 To continue existing and establish new programs and procedures to monitor, maintain, and enhance wetlands and water quality.	a. Evaluate existing SWPPP and implement BMPs to minimize stormwater pollution. b. Develop soil erosion plan and implement BMPs c. Monitor and restore wetlands.	Wetlands Stormwater Floodplain Management Freshwater Fisheries
1.3 To maintain attenuation capacity of the remaining undisturbed acreage within 100 year floodplain.	Avoid harm to attenuation capacity of floodplain. If development is necessary, minimize loss of attenuation capacity.	Floodplain Management
1.4 To ensure that land management and land use decisions comply with all applicable laws, executive orders, regulations, directives, and instructions, and that adverse impacts to the natural environment are minimized.	Minimize adverse impacts to ecosystem resources from land disturbances.	Land impact Invasive Species Wildlife Mangement
2.2 To preserve and protect threatened and endangered species and species of concern to ensure no reduction in population sizes.	Continue to conduct surveys of rare, threatened and endangered species.	Wetlands Forest Management Wildlife Management
4.1 Provide adequate staffing, equipment, technology, and training to the Natural Resources Program to ensure proper implementation of this INRMP.	Ensure that natural resource personnel obtain proper training and certification as applicable.	Stormwater Landscaping Invasive Species Forest Management Wildlife Management
4.2 Incorporate the concept of ecosystem management into all planning and management processes.	Establish a facilities review board to review future construction projects.	Stormwater Landscaping Forest Management Land Impact

Projects and Initiatives

Participation in the following projects and initiatives can occur in support of the objectives and strategies for land management:

Projects

- Project No. 2 – Rare, Threatened, and Endangered Species Survey
- Project No. 4 – Neotropical Migratory Bird Survey
- Project No. 6 – GIS Database
- Project No. 7 – Sea Turtle Management Program to Eliminate Disorientation

Initiatives

Develop a working team to integrate the concepts of the INRMP into the Pest Management Plan, Urban Forestry Plan, and Grounds Maintenance Plan and/or contract specifications. The team can consist of a representative from each department who is tasked with the responsibility of implementing programs, plans, or policies related to ecosystem management. The Natural Resources Manager should be involved in the team selection process.

Long-Term Management

Activity Site Selection

According to the Master Plan, Naval Complex, Mayport, Florida, the existing developed character of the core area and numerous environmental and operational constraints limit land use development on NAVSTA Mayport. These constraints include: (1) existing infrastructure; (2) historic; (3) archeological; (4) natural; and (5) mission/installation activities. Buildable areas at NAVSTA Mayport and NFD generally can be considered those areas not limited or affected by development constraints described below, unless the area is necessary to support the military mission.

- **Existing infrastructure.** Existing infrastructure constraints are those factors that would physically limit future development, such as available space, utilities, and parking/traffic circulation.
- **Historic.** Historic constraints are those that would limit where development could occur due to the presence of protected historic structures and/or areas.
- **Archeological.** Archeological constraints are those that would restrict development siting due to the presence of artifacts or other Archeological relics.

- **Natural.** Natural constraints are those that would restrict development siting due to natural features such as floodplains, wetlands, flora and fauna, forest stands, and natural communities.
- **Mission/Installation.** Mission/Installation constraints are those that would restrict development siting due to their particular military purpose, location, or consequences thereof, including explosive safety quantity distance (ESQD) arcs, noise contours, clear zones and BASH.

Site Plan Activity Guidelines

NAVSTA Mayport and NFD can employ the following guidelines to minimize impacts to the Installation' environmental and ecological resources:

- New building and training activities can be located so that habitat fragmentation does not occur. Fragmentation undermines the ecological process through the separation of wildlife populations. Buildings and training activities can be located on the edges of forested areas and cannot be arbitrarily located within the middle of forested areas.
- Transportation infrastructure can be located so that habitat fragmentation does not occur. A linear feature bisecting a marginally sustainable habitat has the potential to render the resulting pieces unsustainable.
- A natural vegetation buffer can be maintained between new facilities or training areas and roadway frontage to provide wildlife habitat and aesthetic value.
- To protect water, wildlife and vegetative habitat quality, new facilities or training activities cannot be located within a 50-foot vegetative buffer surrounding an existing wetland, or within the undeveloped 50-foot area adjacent to water bodies.
- Wildlife habitat enhancements can be required for new activities that affect wildlife habitat.
- Only the area necessary for the building footprint, parking, and security and safety of the site can be cleared for new development. This can help preserve the natural ground cover, reduce future grounds maintenance costs, and minimize soil erosion.
- Pervious surfaces can be evaluated for use in place of impervious surfaces.

Ecosystem Management

The inevitable need for development requires that site selection and site planning be implemented to minimize impacts to the Installation's ecosystem.

5.0 ENVIRONMENTAL PLANNING AND MISSION SUITABILITY

5.1 PLANNING AND MISSION SUITABILITY

This section discusses the military mission for the NAVSTA Mayport and the NFD. This section also describes the interaction of the military mission and natural resources management at both facilities.

5.1.1 Military Mission

NAVSTA Mayport

NAVSTA Mayport is a complex organization combining an airfield and a seaport that is home to more than 14,000 sailors and civilians and is the third largest fleet concentration in the U.S. The installation serves more than 70 tenant commands, detachments, organizations and nearly 50,000 local family members and retirees. Major tenants include three battle group staffs, 20 ships and five helicopter squadrons. The station provides complete aviation maintenance services and full berthing and hotel services for the ships' forces. Other services include security, family services, housing, civil engineering, recreation, childcare, supply, religious support, information systems and fire and rescue response.

NFD

The mission statement of the NFD is to provide supply support services to fleet units as assigned, and perform such other functions as may be directed by the Commander, Naval Supply Systems Command, including those related to the goals of this INRMP. The NFD is a fuel storage and distribution facility. Responsibilities of the NFD include receiving, storing, and distributing fuels to and from various military installations in support of their military missions. NFD receives fuel from commercial suppliers via marine vessels and distributes fuel via tank truck and marine vessels. Quality, safety, and protection of the surroundings are primary considerations during operations at the installation.

5.2 ENCROACHMENT

NAVSTA Mayport

The majority of NAVSTA Mayport is surrounded by water and estuarine marshes; however, there are three separate areas that may present encroachment concerns at NAVSTA Mayport. Firstly, the town of Mayport used to be a small fishing village; however, a number of new construction

interests are installing condos along the northeast border of the facility and very near to the airport and runway (Figure 15). High rise buildings in this area could pose threats to air way navigation and safety and development could affect AICUZ.

To the northeast of the airport runway, across the St. Johns River, is Huguenot Park which is an undeveloped beach front site that is owned by the COJ. Aircraft fly directly over the park when approaching from the Atlantic. The site is currently undeveloped and does not interfere with air navigation. NAVSTA Mayport is concerned that if the COJ decides to sell the land to developers and high rise condos are constructed at the park, airway navigation and safety will be compromised. A non-development agreement with COJ would insure a safe AICUZ zone to the east of NAVSTA Mayport.

New housing developments are encroaching upon the southern border of the facility. While this development does not pose a threat to airway navigation, it is within 2 miles of the airport runway and may be subject to harm in the event of aircraft emergency landing or be affected by aircraft noise.

A portion of the TIMU encompasses the property within the NAVSTA Mayport. Many years ago, a Florida Congressman arbitrarily created the boundaries to the park which included 300 different land owners and the NAVSTA Mayport. In the TIMU General Management Plan and accompanying Environmental Impact Statement (EIS), it was recommended that the park boundaries be adjusted to exclude NAVSTA Mayport lands. This was the preferred alternative: Record of Decision March 28, 1996.

NAVSTA Mayport is currently developing an Encroachment Action Plan (EAP) to address encroachment issues on an on-going basis. See Figure 5-1 to view the areas that raise encroachment concerns.

NFD

NFD is bordered by the St. Johns River to the south and east and to the north are wetlands and Drummond Creek. West of the site is a vacant commercial parcel that formerly contained a shipping storage container facility. The NFD does not face any encroachment concerns in the immediate future.

Figure 5-1. Encroachment Areas Around Naval Station Mayport.

5.3 IMPACTS TO MILITARY MISSION FROM NATURAL RESOURCES

NAVSTA Mayport and NFD

Installation and management activities that are detrimental to the functional values of wetlands and water quality (*e.g.* fuel spills) on the facilities can potentially affect the military mission. Fuel spills during operations can affect water quality downstream and in nearby estuaries. Similarly, uncontrolled soil erosion has the potential to increase sediment loading in stormwater runoff, which may increase turbidity and reduce water quality in local rivers and estuaries, jeopardizing vital aquatic habitat.

Adjusting the effects of lighting on sea turtles has required extensive modifications to lighting use at NAVSTA Mayport. Increased effort and expense has been required to modify lighting near coastal areas. Future projects near the beach must be modified to take into account the potential impacts of light use. Lights from the turning basin may still be visible from beaches in Huguenot Park and additional efforts may be necessary to alter lighting in the turning basin to reduce the effects on sea turtles.

Driving on the beach is important to maintaining adequate security for the installation. During sea turtle nesting periods there are also restrictions placed on driving on the beach at NAVSTA Mayport. This can directly affect the safety and security operations and additional efforts are required by security personnel during the nesting season to avoid impacting sea turtles.

Outdoor recreational use by the public can affect the security and safety of NAVSTA Mayport. Outdoor recreational opportunities must be planned, developed, and implemented in a way that is consistent with the operations at NAVSTA Mayport.

Marine mammals, which are protected under Marine Mammal Protection Act and the Endangered Species Act, where applicable, can be affected by military operations and activities conducted in support of NAVSTA Mayport. The Navy therefore implements numerous protective measures to avoid impacts to protected marine mammals, some of which can affect the military mission.

5.4 IMPACTS TO NATURAL RESOURCES FROM MILITARY MISSION'

NAVSTA Mayport and NFD

Disturbance to soils and vegetated areas from operations, and the transport of items from other areas onto the facility could cause an increase in invasive and exotic flora and fauna. Invasive and exotic fauna may out-compete existing native fauna, or replace endangered or threatened species, thus affecting the ecosystem at basic trophic levels and affecting natural resources management.

Inappropriate landscaping and maintenance practices (*e.g.*, excessive use or application of inappropriate pesticides) have the potential to affect wildlife and ecosystems. The Navy avoids and minimizes those potential adverse effects by requiring application by certified applicators and utilizing the concepts of Integrated Pest Management as documented in the NAVSTA Mayport Pesticide Management Plan.

Outdoor recreational opportunities are dependent upon the environment, and the security and safety constraints of the military mission. Outdoor recreational use, especially along the beach and St. Johns River, needs to be compatible with training, operations, and safety and security.

Channel dredging for vessel access has the potential for increasing turbidity and adversely affecting wildlife within the project area. The maintenance dredging of the St. Johns River is conducted by the USACE in accordance with appropriate water quality permits and Biological Opinions relating to the protection of federally listed species.

Military support activities, including vessel movements and security patrols along the beach, have the potential to affect federally listed species such as marine mammals and nesting sea turtles. The Navy avoids affects to these species by implementing protective measures such as the use of propeller guards on tugs and the monitoring and marking of turtle nests on the beach. Protective measures/management strategies implemented at NAVSTA Mayport are further described in Chapter 4.

Security restrictions in portions of NAVSTA Mayport reduce public access to recreational resources, such as lands for hunting, bird watching, and hiking and waters for fishing and boating. Military operations may also limit recreational use of some natural areas on the Installation due to noise or resource fragmentation.

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6.0 IMPLEMENTATION

This section describes the projects to be implemented by NAVSTA Mayport. Projects were identified by the NAVSTA Mayport Natural Resources Manager in consultation with NAVFAC SE foresters, fish and wildlife biologists, and soil conservationists, as well as with federal, state, and county wildlife biologists, foresters, and land managers. For each project, this section discusses the purpose, location, description, relevance to the goals and objectives listed in Section 4, baselines, monitoring and legal requirements. It is the intent of NAVSTA Mayport to implement the projects as described in this section to the greatest extent possible.

The implementation of projects is largely dependent upon availability of funds. Funding for implementation of the INRMP will come from the Installation, CINCLANTFLT (Major Claimant as appropriate), or NAVFACENGCOM natural resources fund sources. The natural resources programs and projects described in this INRMP are divided into mandatory and stewardship categories to reflect implementation priorities. Every effort will be made to acquire O& M(N) Environmental, or other funding to implement DoD mandatory projects, in the most timely manner possible. Stewardship-type projects will be funded through forestry, agricultural outlease, fish and wildlife, Legacy, or other fund sources as funding and personnel resources become available. Table 6-1 summarizes the projects.

Table 6-1. Natural Resources Project List at NAVSTA Mayport

Project Number	EPRWeb Number	Project Description	Scheduled Implementation (FY)	Prime Legal Driver	Manda-tory (M) or Steward-ship (S)	Budget Criteria [c]	Source of Funds
1	60201B0401	Control Invasive, Exotic, and Noxious Species	2017 - 2024	1,12	M	12106	ENV, STA
2	60201B0269	Rare, Threatened, and Endangered Species Survey	2020	2, 4, 16	M	12104	ENV, STA
3	60201B0126	Mayport INRMP Update	2017 - 2024	2	M	12103	ENV
4	60201B0402	Neotropical Migratory Bird Survey	2019 and 2024	2, 7	M	12101	ENV
5	60201B0255	Feral Animal Control to Support the Military Mission	2019 - 2024	2, 4	M	12106	ENV, STA
6	60201B0274	GIS Database	2017 - 2020	2, 10	S	12101	STA, NRR
7	60201B0426	Sea Turtle Management Program to Eliminate Disorientation	2017 - 2024	2, 4, 11	M	12104	ENV
8	60201B0429	Species Protection and Habitat Development	2017 - 2024	2, 4, 16	M	12104	O&MN

Notes:

[a] From EPR "Guidebook" (Cookbook) [b] From DOD Instruction 4715.3, Enclosure (4) [c] "Guidebook Number" is from Chapter 12 of EPR Guidebook

Key:

Source of Funds

STA = Station O&MN
ENV = Environmental O&MN
AO = Agricultural Outleasing
LY = Legacy
MWR = Moral, Welfare & Recreation
SCAC = Student Conservation Association Coordinator
NRR = Natural Resources Reserve

Primary Legal Driver

(1) 7 USC 2814 Management of Undesirable Plants on Federal Lands
(2) 16 USC 670a-f Sikes Act Improvement Amendment
(3) 16 USC 1456 Coastal Zone Management Act
(4) 16 USC 1531 & 1536 Endangered Species Act
(5) 33 USC 1251 Clean Water Act
(6) 16 USC1955 Magnuson Stevenson Fisheries Management Act
(7) 6 USC 703 Migratory Bird Treaty Act
(8) 16 USC 2912 North American Wetland Conservation Act
(9) 16 USC 4408 North American Wetland Conservation Act
(10) 32 CFR 190 Natural Resources Management Program
(11) EO 13148 Greening the Government Through Environmental Management
(12) EO 13112 Invasive Species
(13) EO 13089 Coral Reef Protection
(14) EO 12962 Recreational Fisheries
(15) EO 11990 Protection of Wetlands
(16) DOD INST 4715.3 Environmental Conservation Program

Project No. 1: Control Invasive, Exotic, and Noxious Species

Purpose: To assess, control, and remove invasive, noxious and exotic species to ensure continuation of native species and viable ecosystems.

Goal and Objective: Goal 1, Objective 1.2 – Identify, reduce, and control invasive and exotic plant species and pests.

Goal 1, Objective 1.4 – Ensure land use decisions comply with all applicable laws.

Goal 1, Objective 1.6 – Implement environmentally beneficial landscaping and grounds maintenance practices.

Goal 2, Objective 2.3 – Control nuisance wildlife that may adversely affect human and ecosystem health.

Location: Installation-wide.

Description: This project entails annual evaluations and removal of invasive and exotic species. Surveys will identify areas and target species for treatment. Control strategies will be developed within a plan for control and eradication, including chemical application, physical removal and possible use of biocontrol agents. If infestation persists, spot treatments will be conducted on an as-needed basis.

Baseline: Existing invasive species information gathered during surveys.

Monitoring: This project will provide the monitoring necessary for the evaluation and removal or control of invasive, exotic, and noxious species.

Hours: This project will use primarily contract labor due to the lack of staff to be assigned for completion of the project. Estimated hours = 160.

Type: Mandatory

Funding Source: Environmental O&MN, Station O&MN

Legal Driver(s): 7 USC 2814(a)… "Each Federal agency shall – (1) designate an office or person adequately trained in the management of undesirable plant species to develop and coordinate and undesirable plants management program (2) establish and adequately fund an undesirable plants management program; (3) complete and incorporate cooperative agreements with State agencies regarding the management of undesirable species; (4) establish integrated management systems to

control or contain undesirable plant species targeted under cooperative agreements."

EO 13112 " Each Federal agency… shall, to the extent practicable and permitted by law,…subject to the availability of appropriations, and within Administrative budgetary limits, use relevant programs and authorities to: prevent the introduction of invasive species, detect and respond rapidly to and control populations of such species…; monitor invasive species populations accurately and reliably; provide for restoration of native species…; conduct research on invasive species…; and promote public education on invasive species…"

Related Legal: 16 USC 670 a-f

Accomplishments: Florida Natural Areas Inventory (FNAI) conducted a survey for invasive and exotic plants in 2004[2]. Another survey for invasive species was conducted in 2010-11 by Gulf South Research Corporation as part of a larger survey that also included RTE species[3]. Invasive plant removal around the lighthouse and along the dunes is scheduled for 2019-20.

[2] Russo, P. F. and D. L. Hipes. 2004. Exotic Species Survey of Mayport Naval Station. Florida Natural Areas Inventory, Tallahassee, Florida.
[3] Gulf South Research Corporation (GSRC). 2011. Rare, threatened, and endangered and invasive, nuisance, and exotic species surveys of Naval Station Mayport and Navy Fuel Depot, Jacksonville, Duval County, Florida. GSRC, Baton Rouge, Louisiana.

Project No. 2: Rare, Threatened, and Endangered Species Survey

Purpose: To monitor the health and population of all plant and animal species present on the Installation.

Goal and Objective: Goal 2, Objective 2.2 – Preserve and protect threatened and endangered species and species of concern.

Location: Installation-wide**.**

Description: Surveys/inventories will analyze the health and numbers of species and will assist with the identification of wildlife indicators throughout the Installation. The projects will be completed in accordance with the cooperative agreement between the DoN and the FNAI and FFWCC.

Baseline: Data obtained from existing surveys.

Monitoring: The project is to monitor the health and population of species to ensure that appropriate management practices are established. The success of these species is largely dependent upon human activities.

Hours: The five-year interval survey will use contract personnel and require an estimated 20 hours of NAVSTA Mayport staff time. The annual monitoring survey for listed species known to occur on the Installation will require an estimated 30 hours of NAVSTA Mayport staff time.

Type: Mandatory

Regulatory Driver(s): 16 USC 1536 (a) (2) “Each Federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency… is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of (critical habitat) of such species.”

Related Legal: DoD INST 4715.3.D.2.c “Biologically or geographically significant or sensitive natural resources or species shall be inventoried and managed to protect these resources and to promote biodiversity.”

Accomplishments: NAVSTA Mayport has overseen several projects to survey for rare, threatened, and endangered species. Most recently, NAVSTA Mayport contracted the University of Florida in 2008 to survey the biota and physiochemical properties of Lake

Wonderwood[4]. That was followed by another aquatic survey of dolphin density in the NAVSTA Mayport turning basin to assist in the preparation of MMPA documents[5].

[4] Cichra, C.E., D.E. Canfield, Jr., S. Fitz-Coy, and B. Gao. 2011. Water Quality and Ecological Assessment of Lake Wonderwood (Including Inlets/Outlets) Aboard Naval Station Mayport in Florida. University of Florida. Gainesville, Florida.

[5] GSRC. 2014. Dolphin survey results, density estimates, and take calculations supporting future wharf recapitalization projects within the Naval Station Mayport turning basin, Mayport, Florida. Prepared for Department of the Navy. Prepared by GSRC, Baton Rouge, Louisiana.

Project No. 3: INRMP Update and Revision

Purpose: To update and revise the INRMP as required by the Sikes Act.

Goal and Objective: All goals.

Location: NAVSTA Mayport.

Description: The Sikes Act as amended, requires INRMPs to be reviewed annually, in cooperation with regulatory partners. Every 5 years, the INRMP should be reviewed for operation and effectiveness, and updated as necessary

Baseline: Existing INRMP.

Monitoring: None.

Hours: This project will utilize contract labor and/or NAVFAC SE staff.

Program/Budget: NAVSTA Mayport staff hours for review = 80 hours.

Type: Mandatory

Regulatory Driver(s): 16 USC 670a-f

Related Legal: 16 USC 1531 & 1536

Accomplishments: This INRMP was updated in 2012-13 to make it more compliant with OSD guidance. Funding is provided annually to support yearly updates and facilitate annual reviews and natural resources metrics completion with NAVSTA Mayport's conservation partners. The last five-year update for operations and effect was completed in 2019.

Project No. 4: Neotropical Migratory Bird Survey

Purpose: This project will assist with determining the bird species present on the installation, and their seasonal occurrences, to ensure takes do not occur as defined under the Migratory Bird Treaty Act.

Goal and Objective: Goal 2, Objective 2.1 – Maintain the ecological integrity of wetlands, forest stands, and upland communities.

Goal 2, Objective 2.2 – Preserve and protect threatened and endangered species and species of concern.

Location: Installation-wide.

Description: Bird counts will include all bird species observed on the installation, their location, numbers and the date. This project will recur approximately every five years.

Baseline: The existing INRMP will provide baseline data on habitat descriptions utilized to determine potential habitat areas for neo-tropical migratory birds. The Audubon Society Christmas Bird Counts will provide data on wintering species.

Monitoring: This project will determine the need and extent of continued monitoring and habitat management for neo-tropical migratory and migratory shorebirds.

Hours: This project will utilize contract labor and/or volunteers and staff.

Program/Budget: NAVSTA Mayport staff hours for review = 10 hours.

Type: Mandatory

Regulatory Driver(s): 6 USC 703

Related Legal: USC 670 a-f.

Accomplishments: Neotropical migratory bird surveys were completed in 1995, 2004[6], 2006-07, and 2014/15[7]. The 2014/15 survey identified 129 species across both properties, including observations of the state-listed least tern and federally-listed wood stork on NAVSTA Mayport. A new migratory bird survey is being conducted in 2019-20.

[6] NAVFAC Southdiv. 2004. Neotropical migratory and resident bird survey June 2002 - June 2004.
[7] GSRC. 2015. Inventory of neotropical avian species, Naval Station Mayport, Florida, and the Navy Fuel Depot, Jacksonville, Florida. Prepared for Department of the Navy. Prepared by GSRC, Baton Rouge, Louisiana.

Project No. 5: Feral Animal Control to Support the Military Mission

Purpose: To eliminate the damaging effect that nuisance animals have on threatened and endangered species populations and the potential effects on humans through disease and property damage.

Goal and Objective: Goal 1, Objective 1.2 – Identify, reduce, and control invasive and exotic pests.

Goal 1, Objective 1.6 – Implement environmentally beneficial landscaping and grounds maintenance practices.

Goal 2, Objective 2.3 – Control nuisance wildlife that may adversely affect human and ecosystem health.

Location: Installation-wide.

Description: Capture and remove nuisance species (e.g., feral cats) from the installation natural areas that support threatened and endangered species, and from housing and park areas. The NAVSTA Mayport will also promote the education of base personnel on the importance of eliminating feral animals from base lands and restricting the movements of domestic pets. In addition the NAVSTA Mayport will enlist the services of federal, state and county personnel to assist in feral animal removal activities.

Baseline: This project will function as the baseline.

Monitoring: Monitoring methods for nuisance species are addressed within Section 4.5.1.6 of the INRMP.

Hours: This project will use contractor personnel. Estimated time = 30 labor hours for base personnel administrative oversight.

Type: Mandatory

Regulatory Driver: 16 USC 670 a-f “Each Federal agency activity within or outside the coastal zone that affects any land or water use or natural resource of the coastal zone shall be carried out in a manner which is consistent to the extent practicable with the enforceable policies of approved State management programs.”

Related Legal: OPNAVINST 6250.4B Pest Management Operations

Accomplishments: Feral cats continue to roam NAVSTA Mayport, posing threated to birds and threatened and endangered species. Actions to control the feral cat population are challenging and intermittent.

Project No. 6: GIS Database

Purpose: Update installation mapping.

Goal and Objective: Goal 4, Objective 4.1 – Provide adequate technology to ensure proper implementation of this INRMP.

Location: Installation-wide.

Description: GIS data and maps will be used to protect the natural resources on Naval Station Mayport and the Navy Fuel Depot Jacksonville. Mapping will identify areas such as wetlands, 100 year floodplain, threatened and endangered species, and other areas in need of protection from conflict with the military mission. GIS mapping and FMIS should be updated annually.

Baseline: Existing GIS layers.

Monitoring: None.

Hours: One person = 40 hours each year.

Type: Mandatory

Regulatory Driver(s): 16 USC 670a-f

Related Legal: 32 CFR 190

Accomplishments: The natural resources GIS database is updated regularly to enhance management on the installation.

Project No. 7: Sea Turtle Management Program to Eliminate Disorientation

Purpose: To reduce light emission from NAVSTA Mayport for the conservation of nesting sea turtles and hatchlings.

Goal and Objective: Goal 2, Objective 2.2 – Preserve and protect threatened and endangered species and species of concern.

Location: Parking lots and streets.

Description: This project will fund the development and implementation of an installation-wide light management plan for the benefit of nesting sea turtles and hatchling. As needed, it will also provide labor and materials to replace and shield existing parking lot, street and security lights to meet Florida Fish and Wildlife Commission (FWC) Guidelines. The ultimate project objective is to eliminate visible lights from impacting Mayport and Huguenot Beaches and to reduce the overall sky glow emanating from the installation.

FWC guidelines can be found at: http://myfwc.com/media/418417/SeaTurtle_LightingGuidelines.pdf

Baseline: Existing light levels.

Monitoring: None.

Hours: This project will utilize contract labor.

Program/Budget: NAVSTA Mayport staff hours for follow-up and review = 20 hours.

Type: Mandatory

Regulatory Driver(s): 16 USC 1531 & 1536, 16 USC 670a-f

Related Legal: EO 13148

Accomplishments: Funds are expended annually for supplies to facilitate nesting season surveys of Mayport Beach. A sea turtle light assessment of NAVSTA Mayport was conducted in 2013[8] and will be used to influence lighting decisions in the installation into the future. This project will continue to fund lighting upgrades on NAVSTA Mayport, using the assessment as guidance. A sea turtle lighting plan is currently in development.

[8] GSRC. 2014. Light management assessment for Naval Station Mayport. Prepared for Department of the Navy. Prepared by GSRC, Baton Rouge, Louisiana.

Project No. 8: Species Protection and Habitat Development

Purpose: To improve fish and wildlife habitat and resources for the benefit of protected species

Goal and Objective: Goal 2, Objective 2.1, Strategy 2.1.1 – Threatened and Endangered Species Protection

Location: Installation-wide.

Description: This project will improve fish & wildlife habitat and resources for the benefit of protected species such as gopher tortoises, sea turtles, and wood storks as well as other species including transient migratory birds on NAVSTA Mayport and the NFD.

NAVSTA Mayport has a mile of shoreline, more than 900 acres of wetlands, and more than 500 acres of additional waters of United States. This project will improve the quality of these and other habitats through activities such as plantings to control dune erosion and protect water quality, and signage to alert personnel to the presence of sensitive habitat, nests, and burrows.

Baseline: Existing species, habitat, and wetlands surveys.

Monitoring: None.

Hours: This project will use contractor personnel. Estimated time = 40 labor hours for base personnel administrative oversight.

Type: Mandatory

Regulatory Driver(s): 16 USC 1536 (a) (2) "Each Federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency… is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of (critical habitat) of such species."

Related Legal: DoD INST 4715.3.D.2.c "Biologically or geographically significant or sensitive natural resources or species shall be inventoried and managed to protect these resources and to promote biodiversity."

Accomplishments: A wetlands delineation of NAVSTA Mayport and the NFD was prepared in 2009[9].

[9] GSRC. 2009. Wetland Delineation Report, Naval Station Mayport and FISC Navy Fuel Depot, Duval County, Florida. Prepared for NAVFAC Southeast, Jacksonville, Florida. Prepared by GSRC, Baton Rouge, Louisiana.

7.0 FUNCTIONAL AREAS AND MANAGEMENT FOCUS

This section presents the functional areas of NAVSTA Mayport and NFD and the focus of natural resources management in each functional area. This section also discusses other management practices that can occur within the functional areas. Figures 7-1 and 7-2 delineate the functional areas at NAVSTA Mayport and NFD. Tables are provided throughout this section that show the objectives and strategies that can be achieved through implementation of the resource management focus in each functional area on the installation.

Functional Areas

Functional areas are established in the plan to acknowledge the use of the area for its military purpose and for considering the opportunities to achieve natural resources management goals and objectives. In classifying a functional area, it is recognized that existing facilities and activities on the land are largely fixed. Property at an installation can be classified into one or more of the following functional areas.

Protected Areas (P) - This classification can include land protected due to the unique natural, cultural or aesthetic value. Examples include rare geologic features, significant historical sites, natural heritage sites, threatened and endangered species critical habitat, unique high-value recreation areas, and exemplary natural communities.

Operational Protected Areas (OP) - This classification can include areas vital to the continuance of the military mission, and that are intensively utilized for this purpose. Examples include intensively developed/built areas, dredge spoil sites; high security restricted areas, industrial support areas, and BASH areas.

Mixed-Use Management Areas (MU) - Lands where low- or moderate-intensity military uses occur within areas that are largely in a natural condition, contain valued natural features, and/or have the potential to yield significant natural resources-based benefits through effective management practices. Consistent with the military mission, non-timber values such as wildlife habitat, water quality (wetland, stormwater and floodplains protection), recreational potential or urban forestry management is the basis for management decisions. Examples include streamside management

zones, cypress domes and ponds, fresh water fisheries, shoreline, habitat for established conservation priorities, grounds maintenance and urban forestry.

Timber/Agricultural areas (T/A) - This classification includes land where timber management is the primary objective and includes areas that may be designated for commercial harvesting. However, within each area the management intensity can be considered against factors such as regulations, economic and wildlife considerations, slope stability concerns, soils, inaccessibility, aesthetics or lower site productivity. Examples include bottomland hardwood stands, upland hardwood/softwood areas with natural regeneration, wildlife corridors, and stands with extended rotation ages.

Management Focus

The focus of natural resources management within a functional area provides geographic emphasis for the primary management practices necessary to achieve the long-term goals and objectives of the INRMP. The management focus for functional areas is determined not only with consideration for opportunities within each individual area, but also collectively for all functional areas so that the combined emphasis for all areas of the installation can achieve the ecosystem management goals and objectives established for the installation. The natural resources management focus for individual functional areas at an installation can be classified into one or more of the following: land management, forestry, fish and wildlife, and outdoor recreation.

- Land management focuses on management issues for wetlands, invasive and exotic species and noxious weeds, soil conservation and erosion control, stormwater, grounds maintenance and landscaping, integrated pest management practices, and floodplains protection.
- Forestry management focuses on management issues for the improvement of timber stands for timber production and/or wildlife habitat.
- Fish and wildlife management focuses on management issues related to actions designed to protect, conserve, enhance, and regulate indigenous wildlife and its habitats. These actions include but are not limited to, habitat manipulation, harvest control, monitoring and other actions as necessary to obtain desired values and outcomes from the wildlife resource.
- Outdoor recreation management focus on the provision of natural resource based outdoor recreational opportunities where the emphasis is the use, understanding and appreciation of the natural environment.

Figure 7-1. Functional Areas at Naval Station Mayport.

Figure 7-2. Functional Areas at Fleet and Industrial Supply Center Jacksonville Navy Fuel Depot (NFD).

Other Management Practices

Other management practices are natural resources practices that the installation can implement in a functional unit. These practices may be implemented to support the management focus for the area (*e.g.*, cuttings and prescribed burns may be conducted to support the wildlife management focus objectives for a given functional area) or may be independent of the management focus. In most cases, the success of other management practices can be dependent on the effectiveness of the management focus (*e.g.*, the success of a watchable wildlife area may largely be dependent on the effectiveness of the wildlife management focus) or vice-versa. Other management practices are an important component of the multiple use concept of ecosystem management.

7.1 NAVSTA MAYPORT FUNCTIONAL AREAS

7.1.1 Protected Area 1 (P-1)

As shown on Figure 16, the P-1 functional area is located along the eastern edge of NAVSTA Mayport, adjacent to the Atlantic Ocean. The P-1 area is bounded to the west by heavy development and to the southwest by less densely developed areas. Specifically, this area is designated as the area approximately from mean low water to the base of the primary dune extending over 1 mile south of St. Johns Point at the mouth of the St. Johns River to the northern border of Kathryn Abbey Hanna City Park. The area encompassing P-1 is designated as protected due to the presence of unique beach dune natural communities exhibiting high aesthetic and recreational value. Recreational activities include passive (*e.g.*, bird watching) and active (*e.g.*, swimming, and jogging) recreation activities.

Management Focus

In response to the presence of beach dune natural communities and various wildlife habitats, the management focus objectives for the P-1 functional area are fish and wildlife (*e.g.*, habitat enhancement and protection of threatened and endangered species) and the provision of outdoor recreational opportunities.

Specific management practices and actions include the following:

- Prohibiting all unauthorized vehicular traffic on the beach during the sea turtle nesting season.
- Implementing recommendations from the artificial light survey (see Section 2.5.9).

- Beach renourishment activities must be compatible with sea turtle and shorebird activities.
- International Coastal Cleanup and periodic beach cleanups can be conducted.
- Recording least tern nesting in non-beach areas and protect, to the maximum extent practicable, from human disturbance.
- Conducting annual piping plover surveys throughout January and February and protect from disturbance any identified high use areas.
- Establish dune protection and restoration management.
- Monitoring of sea turtle nesting.

Other Management Practices

Land management practices (*e.g.*, invasive and exotic species control, soil conservation and erosion control, stormwater and water quality control, landscaping and grounds maintenance, pest control, and urban forestry) can be implemented at the discretion of the Natural Resources Manager. Tree mitigation is accomplished in accordance with the Tree Mitigation Policy (Appendix A).

Objectives and Strategies

Table 7-1 presents the natural resources management objectives and strategies (see Section 4) to be achieved under the fish and wildlife and recreation management focuses identified for the P-1 functional area.

Table 7-1. Natural Resources Management Objectives and Strategies for the P-1 Functional Area

Objectives	Strategies	Applicable to Ecosystem Focus Units
1.1 To continue existing and establish new programs and procedures to monitor, maintain, and enhance wetlands and water quality.	a. Evaluate existing stormwater pollution prevention program (SWPPP) and implement BMPs to minimize stormwater pollution. b. Inventory use of pesticides and fertilizers to reduce usage.	Wetlands Soil Conservation Stormwater Floodplain Management Land Impact
3.1 To establish an outdoor recreation planning team to study recreational needs of NAVSTA Mayport personnel and the general public.	Establish recreation planning team that can address means for providing additional recreational activities. Membership on the team can consist of, at a minimum, the Natural Resources Manager, a representative from the PWO, and a representative from MWR.	Land Impact

Table 7-1, continued.

Objectives	Strategies	Applicable to Ecosystem Focus Units
3.2 To maintain existing and develop additional outdoor recreational facilities at NAVSTA Mayport.	NAVSTA Mayport can continue to develop recreational trails and/or interpretive centers in areas of NAVSTA Mayport with unique natural resources.	Land Impact

7.1.2 Operational Protected (OP) Area

As shown in Figure 16, the OP functional area is located in the center of NAVSTA Mayport and is bordered to the north by the St. Johns River and to the south by salt marsh and the MU areas. The area encompassing the OP area is designated as operational protected because of the presence of operations and facilities deemed vital to the military mission. This area includes the Mayport Turning Basin, the airfield, and the dredged material disposal areas. The OP area also consists primarily of operations and community support areas, including administration buildings, community facilities, public works, health facilities, operations facilities, maintenance and supply facilities, and training facilities.

Management Focus

The primary management focus for the OP functional area is land management due to the limited extent of natural resources, high military mission requirements, and the high concentrations of human activity. Natural resources management issues can be dominated by activities related to soil erosion, grounds maintenance and landscaping, urban forestry, and stormwater management practices for the protection of wetlands and water quality for fish and wildlife.

Specific management practices and actions include the following:

- Grounds maintenance activities consistent with reducing BASH-related incidents (*e.g.*, aquatic weed control, ditch maintenance, and maintaining proper grass height).
- Nuisance wildlife management activities.
- Control of invasive and exotic species.
- Implementation of the Tree Mitigation Policy (Appendix A), where applicable.
- Continued stormwater quality monitoring to ensure that runoff from the airfield does not damage wetland areas.
- Maintaining or creating 50-foot buffers adjacent to the wetlands, where feasible.

Other Management Practices

Other management practices include wildlife and forest management activities that focus on the protection and enhancement of the remaining natural and forest communities and habitats for identified conservation priorities consistent with the military mission and the BASH plan.

Forest management activities can include thinnings and protection measures at the discretion of the Natural Resources Manager in consultation with Southern Division foresters.

Objectives and Strategies

Table 7-2 presents the natural resources management objectives and strategies (see Section 4) to be achieved under the land management focus identified for the OP functional area.

Table 7-2. Natural Resources Management Objectives and Strategies for the OP Functional Area

Objectives	Strategies	Applicable to Ecosystem Focus and Sub Units
1.1 To continue existing and establish new programs and procedures to monitor, maintain, and enhance wetlands and water quality.	a. Evaluate existing stormwater pollution prevention program (SWPPP) and implement BMPs to minimize stormwater pollution. b. Develop soil erosion plan and implement BMPs c. Inventory use of pesticides and fertilizers to reduce usage. d. Monitor and restore wetlands.	Wetlands Soil Conservation Stormwater Floodplain Management Freshwater Fisheries Land Impact
1.2 To identify, reduce, and control invasive and exotic plant species and pests.	Prepare and Implement a plan to control and remove invasive and exotic plants.	Landscaping Invasive Species Urban Forestry Forest Management Land Impact
1.3 To maintain attenuation capacity of the remaining undisturbed acreage within 100 year floodplain.	Avoid harm to attenuation capacity of floodplain. If development is necessary, minimize loss of attenuation capacity.	Floodplain Management Land Impact
1.5 To protect and enhance existing shorelines through existing and new programs.	a. Prevent further degradation of shorelines. b. Participate in coastal conservation programs and educational activities to promote stewardship of coastal environments.	Landscaping

Table 7-2, continued.

Objectives	Strategies	Applicable to Ecosystem Focus and Sub Units
1.6 To implement environmentally beneficial landscaping, grounds maintenance, and urban forestry practices.	a. NAVSTA Mayport can urban forestry projects to enhance wildlife habitat and aesthetics in developed areas. b. Implement landscape management practices consistent with concepts presented in this INRMP. c. Use xeriscaping principles using native species for new landscaping.	Urban Forestry
2.1 To maintain the ecological integrity of wetlands, forest stands and upland natural communities, to protect the communities and their native plant and animal species consistent with the military mission.	a. Uses thinnings and natural selection, to improve habitat quality, reduce the potential for wildfires, control diseases and insect pests. b. Continue programs for the protection of wetlands, forestlands and upland natural communities. c. Implement programs for the protection of wetlands, forestlands and upland natural communities.	Invasive Species
2.2 To maintain the ecological integrity of wetlands, forest stands and upland natural communities, to protect the communities and their native plant and animal species consistent with the military mission.	Continue to conduct surveys of rare, threatened and endangered species.	Forest Management Wildlife Management Land Impact
4.1 Provide adequate staffing, equipment, technology, and training to the Natural Resources Program to ensure proper implementation of this INRMP.	Ensure that natural resource personnel obtain proper training and certification as applicable.	Stormwater Landscaping Invasive Species Forest Management Wildlife Management Land Impact

7.1.3 Mixed-Use (MU) Area

As shown in Figure 7-1, the MU functional area is located in the southeastern portion of NAVSTA Mayport and is bounded to the north by operational development, to the east by the Atlantic Ocean and beach area, and to the west by extensive wetlands. Although these areas are not contiguous, due to the similarity in land use and resources present, the MU functional area can also include the Ribault Bay Village Housing area and the undeveloped parcel located adjacent to the developed housing area, which offers extensive natural resources-based outdoor recreational benefits. These areas are designated as mixed use because of the low intensity operational use by the Navy and the potential for these areas to provide natural resources-based outdoor recreational benefits and wildlife opportunities. Notable features of the MU area include the Lake

Wonderwood and Ribault Bay Village Housing area, Lake Wonderwood Recreational Fishery, and the Installation golf course.

Management Focus

There are two management focuses for the MU functional area. These management focuses are land management and outdoor recreation. However, due to the availability of natural resources within the MU area, land management practices can be aimed at the enhancement of wildlife habitat as addressed in the section titled "Landscaping and Grounds Maintenance; Landscaping and Urban Wildlife Habitat". Management practices include projects to protect and enhance wildlife habitat and natural resources outdoor recreation opportunities consistent with the military mission.

Specific management objectives and actions include the following:

- Using environmentally beneficial landscaping practices (xeriscaping) to reduce the need for irrigation, fertilizers, and pesticides. Xeriscaping can include the use of native species to improve wildlife habitat, and can be required for all new buildings.
- Controlling invasive and exotic species.
- Implementing tree mitigation practices, where applicable.
- Continued stormwater quality monitoring to ensure that runoff does not damage wetland areas and Lake Wonderwood.
- Where feasible, maintaining or creating 50-foot buffers adjacent to wetlands, ponds, and shorelines. Buffer areas can provide the basic physical and chemical buffering needed to reduce siltation into the wetland, thus retaining the natural attenuation and filtering capacity.
- Evaluate areas for expansion of the natural resources outdoor recreational program to satisfy the anticipated increased demand for recreational opportunities.
- Protecting hardwood tree species located within the undeveloped portion of Ribault Bay Village Housing area. Any clearing requirements can be completed in accordance with the NAVSTA Mayport tree mitigation guidelines.
- Managing nuisance wildlife.
- Using urban forestry practices (*e.g.*, planting trees in urban areas, mitigating tree removal [Appendix A]) to stabilize soils, provide aesthetic value, and habitats for wildlife.

Other Management Objectives

In addition to implementing ecologically sound grounds maintenance practices at the golf course and in other areas to protect Lake Wonderwood, NAVSTA Mayport can manage areas for wildlife

resources. Fishery habitat and enhancement can be managed in accordance with Section 4. Wildlife habitat enhancements for the golf course can include:

- Re-establishing natural vegetation in out-of-play areas by eliminating mowing and planting native species.
- Installing nest boxes for cavity nesters indigenous to the region.
- Planting wildflower and butterfly gardens.
- Allowing snags and brush piles to remain in place to provide habitat for cavity-dwelling birds.

Objectives and Strategies

Table 7-3 presents the natural resources management objectives and strategies (see Section 4) to be achieved under the land management and outdoor recreation management focuses identified for the MU functional area.

Table 7-3. Natural Resources Management Objectives and Strategies for the MU Functional Area

Objectives	Strategies	Applicable to Ecosystem Focus and Sub Units
1.1 To continue existing and establish new programs and procedures to monitor, maintain, and enhance wetlands and water quality.	a. Evaluate existing stormwater pollution prevention program (SWPPP) and implement BMPs to minimize stormwater pollution. b. Develop soil erosion plan and implement BMPs c. Inventory use of pesticides and fertilizers to reduce usage. d. Monitor and restore wetlands.	Wetlands Soil Conservation Stormwater Floodplain Management Freshwater Fisheries Land Impact
1.2 To identify, reduce, and control invasive and exotic plant species and pests.	Prepare and Implement a plan to control and remove invasive and exotic plants.	Landscaping Invasive Species Urban Forestry Forest Management Land Impact
1.3 To maintain attenuation capacity of the remaining undisturbed acreage within 100 year floodplain.	Avoid harm to attenuation capacity of floodplain. If development is necessary, minimize loss of attenuation capacity.	Floodplain Management Land Impact
1.5 To protect and enhance existing shorelines through existing and new programs.	a. Prevent further degradation of shorelines. b. Participate in coastal conservation programs and educational activities to promote stewardship of coastal environments.	Landscaping

Table 7-3, continued.

Objectives	Strategies	Applicable to Ecosystem Focus and Sub Units
1.6 To implement environmentally beneficial landscaping, grounds maintenance, and urban forestry practices.	a. NAVSTA Mayport can urban forestry projects to enhance wildlife habitat and aesthetics in developed areas. b. Implement landscape management practices consistent with concepts presented in this INRMP. c. Use xeriscaping principles using native species for new landscaping.	Urban Forestry
2.1 To maintain the ecological integrity of wetlands, forest stands and upland natural communities, to protect the communities and their native plant and animal species consistent with the military mission.	a. Uses thinnings and natural selection, to improve habitat quality, reduce the potential for wildfires, control diseases and insect pests. b. Continue programs for the protection of wetlands, forestlands and upland natural communities. c. Implement programs for the protection of wetlands, forestlands and upland natural communities.	Invasive Species
2.2 To maintain the ecological integrity of wetlands, forest stands and upland natural communities, to protect the communities and their native plant and animal species consistent with the military mission.	Continue to conduct surveys of rare, threatened and endangered species.	Forest Management Wildlife Management Land Impact
3.1 To establish an outdoor recreation planning team to study recreational needs of NAVSTA Mayport personnel and the general public.	Establish recreation planning team that can address means for providing additional recreational activities. Membership on the team can consist of, at a minimum, the Natural Resources Manager, a representative from the PWO, and a representative from MWR.	Land Impact
3.2 To maintain existing and develop additional outdoor recreational facilities at NAVSTA Mayport.	NAVSTA Mayport can continue to develop recreational trails and/or interpretive centers in areas of NAVSTA Mayport with unique natural resources.	Land Impact
4.1 Provide adequate staffing, equipment, technology, and training to the Natural Resources Program to ensure proper implementation of this INRMP.	Ensure that natural resource personnel obtain proper training and certification as applicable.	Stormwater Landscaping Invasive Species Forest Management Wildlife Management Land Impact

7.1.4 Protected Area 2 (P-2)

As shown in Figure 7-1, the P-2 functional area is located in the southern and southwestern section of NAVSTA Mayport. The P-2 area is bounded to the north, south and west by

undeveloped salt marsh and dredge material sites, and to the east by operational development. As mentioned previously, this area is considered to be part of the TIMU. Because of the high quality natural resources and the location of this area within TIMU boundaries, NAVSTA Mayport has designated this area as protected on the Installation. Natural features within this area include vast expanses of salt marsh, surface water bodies and some upland areas. The P-2 area also includes a research area located within the Chicopit Bay.

Management Focus

In response to the presence of high quality natural communities and wildlife habitats, the management focus for the P-2 functional area is fish and wildlife (*e.g.*, habitat protection and enhancement and protection of threatened and endangered species) and the provision of outdoor recreation opportunities. Recreation opportunities can be limited to passive (*e.g.*, bird watching and interpretive) recreational activities.

Specific management practices and actions can include:

- Biological monitoring of rare, threatened, and endangered species, as well as other special monitoring projects;
- Forest management practices as applicable;
- Coordinate with surrounding entities (*e.g.*, TIMU and the COJ) to provide interpretive opportunities for this area;
- Continued cooperation with the Mayport Marine Research Center to provide ecological research opportunities;
- Perform appropriate forest management practices within this area;
- Evaluate this area for the potential implementation into the Watchable Wildlife Program; and
- Ensuring no net loss in wetlands within this area.

Other Management Objectives

Some land management practices can occur to provide a high level of protection to water quality within the P-2 functional area.

Objectives and Strategies

Table 7-4 presents the natural resources management objectives and strategies (see Section 4) to be achieved under the fish and wildlife and recreation management focuses identified for the P-2 functional area.

Table 7-4. Natural Resources Management Objectives and Strategies for the P-2 Functional Area

Objectives	Strategies	Applicable to Ecosystem Focus Units
1.1 To continue existing and establish new programs and procedures to monitor, maintain, and enhance wetlands and water quality.	a. Evaluate existing stormwater pollution prevention program (SWPPP) and implement BMPs to minimize stormwater pollution. b. Inventory use of pesticides and fertilizers to reduce usage.	Wetlands Soil Conservation Stormwater Floodplain Management Land Impact
3.1 To establish an outdoor recreation planning team to study recreational needs of NAVSTA Mayport personnel and the general public.	Establish recreation planning team that can address means for providing additional recreational activities. Membership on the team can consist of, at a minimum, the Natural Resources Manager, a representative from the PWO, and a representative from MWR.	Land Impact
3.2 To maintain existing and develop additional outdoor recreational facilities at NAVSTA Mayport.	NAVSTA Mayport can continue to develop recreational trails and/or interpretive centers in areas of NAVSTA Mayport with unique natural resources.	Land Impact

7.2 NFD FUNCTIONAL AREAS

The NFD facility is a relatively small installation. Based on geography, land uses, and natural resources, the property has been divided into two functional areas: one OP unit and one MU unit.

7.2.1 Operational Protected (OP) Unit

As shown in Figure 7-2, the OP unit includes all developed and facility operation areas on the Installation. These areas are functionally classified as operational and support areas, and include administration buildings, tank farms, the fuel pier, operations facilities, maintenance and supply facilities, training facilities, and operations support facilities (*e.g.*, tank truck racks).

Although fuel operations dominate the OP area, an area of riverfront exists in the southeast section of the OP unit along St. Johns River. The riverfront area does not have wetland vegetation, but does have a stormwater outfall drain.

Management Focus

The management focus for the OP unit is land management in accordance with the military mission requirements of the land. Land management activities in this area can include those

related to wetlands management, invasive and exotic species control, soil conservation and erosion control, stormwater and water quality control, and landscaping and grounds maintenance.

Specific management practices and actions include the following:

- Grounds maintenance activities consistent with aquatic weed control, ditch maintenance, and maintaining proper grass height;
- Monitoring soil erosion to reduce sedimentation into wetlands;
- Nuisance wildlife management activities;
- Control of invasive and exotic species;
- Shoreline erosion protection;
- Continued stormwater quality monitoring to ensure that runoff into the outfall does not adversely affect wetland areas or the adjacent St. Johns River;
- Maintaining or creating 50-foot buffers around adjacent wetlands and shoreline areas;
- Using environmentally beneficial landscaping practices (xeriscaping) to reduce the need for irrigation, fertilizers, and pesticides; and
- Minimizing the loss of floodplain habitat and attenuation capacity.

Other Management Practices

In addition to implementing ecologically sound grounds maintenance practices, the NFD also can manage areas for wildlife resources. Wildlife habitat enhancement and management can be in accordance with Section 4. Wildlife habitat enhancements can include:

- Installing nest boxes for cavity nesters indigenous to the region, and providing bird feeders and watering stations; and
- Establishing grounds maintenance practices that incorporate plant species that can attract desirable species to urban areas (*e.g.*, song birds).

Objectives and Strategies

Table 7-5 presents the natural resources management objectives and strategies (see Section 4) to be achieved under the management focuses identified for the OP unit.

Table 7-5. Natural Resources Management Objectives and Strategies for the OP Unit

Objectives	Strategies	Applicable to Ecosystem Focus and Sub Units
1.1 To continue existing and establish new programs and procedures to monitor, maintain, and enhance wetlands and water quality.	a. Evaluate existing stormwater pollution prevention program (SWPPP) and implement BMPs to minimize stormwater pollution. b. Develop soil erosion plan and implement BMPs c. Inventory use of pesticides and fertilizers to reduce usage. d. Monitor and restore wetlands.	Wetlands Soil Conservation Stormwater Floodplain Management Freshwater Fisheries Land Impact
1.2 To identify, reduce, and control invasive and exotic plant species and pests.	Prepare and Implement a plan to control and remove invasive and exotic plants.	Landscaping Invasive Species Urban Forestry Forest Management Land Impact
1.3 To maintain attenuation capacity of the remaining undisturbed acreage within 100 year floodplain.	Avoid harm to attenuation capacity of floodplain. If development is necessary, minimize loss of attenuation capacity.	Floodplain Management Land Impact
1.5 To protect and enhance existing shorelines through existing and new programs.	a. Prevent further degradation of shorelines. b. Participate in coastal conservation programs and educational activities to promote stewardship of coastal environments.	Landscaping
1.6 To implement environmentally beneficial landscaping, grounds maintenance, and urban forestry practices.	a. NAVSTA Mayport can urban forestry projects to enhance wildlife habitat and aesthetics in developed areas. b. Implement landscape management practices consistent with concepts presented in this INRMP. c. Use xeriscaping principles using native species for new landscaping.	Urban Forestry
2.1 To maintain the ecological integrity of wetlands, forest stands and upland natural communities, to protect the communities and their native plant and animal species consistent with the military mission.	a. Uses thinnings and natural selection, to improve habitat quality, reduce the potential for wildfires, control diseases and insect pests. b. Continue programs for the protection of wetlands, forestlands and upland natural communities. c. Implement programs for the protection of wetlands, forestlands and upland natural communities.	Invasive Species

Table 7-5, continued.

Objectives	Strategies	Applicable to Ecosystem Focus and Sub Units
2.2 To maintain the ecological integrity of wetlands, forest stands and upland natural communities, to protect the communities and their native plant and animal species consistent with the military mission.	Continue to conduct surveys of rare, threatened and endangered species.	Forest Management Wildlife Management Land Impact
4.1 Provide adequate staffing, equipment, technology, and training to the Natural Resources Program to ensure proper implementation of this INRMP.	Ensure that natural resource personnel obtain proper training and certification as applicable.	Stormwater Landscaping Invasive Species Forest Management Wildlife Management Land Impact

7.2.2 Mixed-Use (MU) Unit

As shown in Figure 7-2, the MU unit comprises three geographically separate areas on NFD. These areas are combined under one management unit to facilitate coordination of management efforts and practices for these areas. The areas are mostly forested lands containing both wetland areas and upland pine stands. The southwestern parcel of land is located along the 100-year floodplain associated with the St. Johns River and contains forested wetland areas, which offer potentially good wildlife habitat. In addition, this parcel is surrounded by a fence, which limits impacts from military activities. The northern parcel of the MU unit contains wetland habitats, including a small wetland pond (the remainder of Hatchet Pond), and planted pines. Disturbances to the parcel have occurred due to its proximity to the operational areas of the facility. The most western parcel of the MU unit is also surrounded by a fence, which protects it from disturbances associated with the OP unit. Natural areas on this parcel include a small area of the St. Johns River floodplain and forested upland and wetland areas.

Management Focus

The management focuses for the MU unit can be forestry and fish and wildlife. Forestry activities can enhance the quality of the forested areas as wildlife habitat. Management practices and activities can focus on coordinating and implementing projects to monitor, protect, and enhance the natural habitats and native wildlife that occur on these parcels in order to ensure their sustainability. Monitoring results can be used to formulate and implement appropriate management strategies for targeted species. Such strategies may include:

- Implementing programs to ensure the continuation of rare, threatened, and endangered species found to occur on the NFD;
- Controlling invasive and exotic species.
- Disease and pest control.
- Maintaining or creating 50-foot buffers adjacent to wetlands, ponds, and shorelines.
- Protecting the existing 100-year floodplain.
- Managing nuisance wildlife.
- Silvicultural activities, such as timber harvesting and prescribed burning. These activities can be conducted in the MU unit as long as they do not interfere with the military mission or pose a safety hazard. Silvicultural activities in the OP unit can be conducted only with the approval of the CO.

Other Management Practices

Other management practices may include land management practices deemed necessary to protect the natural resources of the area.

Objectives and Strategies

Table 7-6 presents the natural resources management objectives and strategies (see Section 4) to be achieved under the management focuses identified for the MU unit.

Table 7-6. Natural Resources Management Objectives and Strategies for the MU Unit

Objectives	Strategies	Applicable to Ecosystem Focus and Sub Units
1.1 To continue existing and establish new programs and procedures to monitor, maintain, and enhance wetlands and water quality.	a. Evaluate existing stormwater pollution prevention program (SWPPP) and implement BMPs to minimize stormwater pollution. b. Develop soil erosion plan and implement BMPs c. Inventory use of pesticides and fertilizers to reduce usage. d. Monitor and restore wetlands.	Wetlands Soil Conservation Stormwater Floodplain Management Freshwater Fisheries Land Impact
1.2 To identify, reduce, and control invasive and exotic plant species and pests.	Prepare and Implement a plan to control and remove invasive and exotic plants.	Landscaping Invasive Species Urban Forestry Forest Management Land Impact
1.3 To maintain attenuation capacity of the remaining undisturbed acreage within 100 year floodplain.	Avoid harm to attenuation capacity of floodplain. If development is necessary, minimize loss of attenuation capacity.	Floodplain Management Land Impact

Objectives	Strategies	Applicable to Ecosystem Focus and Sub Units
1.5 To protect and enhance existing shorelines through existing and new programs.	a. Prevent further degradation of shorelines. b. Participate in coastal conservation programs and educational activities to promote stewardship of coastal environments.	Landscaping
1.6 To implement environmentally beneficial landscaping, grounds maintenance, and urban forestry practices.	a. NAVSTA Mayport can urban forestry projects to enhance wildlife habitat and aesthetics in developed areas. b. Implement landscape management practices consistent with concepts presented in this INRMP. c. Use xeriscaping principles using native species for new landscaping.	Urban Forestry
2.1 To maintain the ecological integrity of wetlands, forest stands and upland natural communities, to protect the communities and their native plant and animal species consistent with the military mission.	a. Uses thinnings and natural selection, to improve habitat quality, reduce the potential for wildfires, control diseases and insect pests. b. Continue programs for the protection of wetlands, forestlands and upland natural communities. c. Implement programs for the protection of wetlands, forestlands and upland natural communities.	Invasive Species
2.2 To maintain the ecological integrity of wetlands, forest stands and upland natural communities, to protect the communities and their native plant and animal species consistent with the military mission.	Continue to conduct surveys of rare, threatened and endangered species.	Forest Management Wildlife Management Land Impact
3.1 To establish an outdoor recreation planning team to study recreational needs of NAVSTA Mayport personnel and the general public.	Establish recreation planning team that can address means for providing additional recreational activities. Membership on the team can consist of, at a minimum, the Natural Resources Manager, a representative from the PWO, and a representative from MWR.	Land Impact
3.2 To maintain existing and develop additional outdoor recreational facilities at NAVSTA Mayport.	NAVSTA Mayport can continue to develop recreational trails and/or interpretive centers in areas of NAVSTA Mayport with unique natural resources.	Land Impact
4.1 Provide adequate staffing, equipment, technology, and training to the Natural Resources Program to ensure proper implementation of this INRMP.	Ensure that natural resource personnel obtain proper training and certification as applicable.	Stormwater Landscaping Invasive Species Forest Management Wildlife Management Land Impact

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A NS Mayport Tree Mitigation Policy

NAVAL STATION MAYPORT TREE MITIGATION POLICY

1. Purpose: To provide guidance and policy regarding tree removal and replacement at Naval Station (NAVSTA) Mayport, Florida.

2. Cancelation: NAVSTA MAYPORT TREE MITIGATION POLICY DTD 20 MAR 95

3. Background:

This policy supports the goals, objectives, and strategies of the NAVSTA Mayport Integrated Natural Resources Management Plan (INRMP). In addition, these guidelines will be an effective tool for sustaining and protecting valuable established trees and vital forested lands on the Station. All proposed tree removals must be coordinated and approved by the NAVSTA Mayport Environmental Division. Following is a summary of the laws, regulations, and instructions for tree protection, removal, and mitigation on NAVSTA Mayport.

4. Definitions:

a) *Caliper* shall mean the diameter of a tree trunk measured at a point 6 inches above the existing grade for trees four 4 inches in trunk diameter and under, and 12 inches above the existing grade for trees larger than 4 inches in trunk diameter. Caliper measurement is used in reference to nursery stock for new plantings.

b) *Clear trunk* shall mean the height of a tree measured from the ground to the point where the lowest branch or green frond is attached to the trunk.

c) *DBH (Diameter at Breast Height)* shall mean the diameter of a tree trunk at a distance of 4.5 feet above ground level. DBH measurements apply to existing, established trees.

d) *Establishment Period* shall mean the period of time during which planted trees and trees within tree protection zones (TPZ) are maintained, monitored, and remain under warranty from the Contractor. Period will commence on the date that inspection by the Contracting Officer shows that the new plants furnished under contract have been satisfactorily installed and shall continue for 365 days.

e) *Establishment Period Tree Maintenance* shall include adjustment of stakes, ties, guy supports and turnbuckles, watering, mulching, and pruning for health and safety. Stakes, ties, guy supports and turnbuckles shall be inspected and adjusted to avoid girdling. All stakes, guys, and turnbuckles shall be removed at the end of the 365 day period. Required pruning include removal of dead and broken branches and correction of structural defects. Pruning of all trees shall

be accomplished by or in the presence of a ISA Certified Arborist and in accordance with ANSI A300P1 and ANSI Z133.1.

f) *Overall height* shall mean the height of a tree measured from the ground to the highest tip of the tree.

5. Exemptions:

The following tree removals are exempt from this policy:

a) Trees identified by the Florida Department of Environmental Protection, Bureau of Invasive Plant Management as invasive and non-native to North America and other nuisance trees. Common invasive species include, but are not limited to: Chinese tallow (*Sapium sebiferum*), chinaberry (*Melia azedarach*), pond willow (*Salix caroliniana*), camphor tree (*Cinnamomum camphora*), and golden raintree (*Koelreuteria bipinnata*).

b) Trees which are determined by the NAVSTA Mayport Environmental Division to be hazardous, dead, diseased, damaged by storms or other acts of nature, or pose imminent danger to public safety and security.

6. Tree Protection:

Trees and vegetation to be left standing shall be protected from damage incident to clearing, grubbing, and construction operations by the erection of barriers creating a Tree Protection Zone (TPZ) or by such other means as the circumstances require. These barriers shall be located away from the trunk at the dripline or at 1 foot for each inch of tree DBH, whichever is greater. The TPZ installation shall be approved by NAVSTA Mayport Environmental prior to construction activities.

See Figure 2, Detail B for Tree Protection Zone installation requirements.

Within the Tree Protection Zone, there shall be no grade changes, parking, washouts, building material storage, waste, excess soil, construction equipment storage, trenching, removing soil, compaction, or any other disturbance to the tree or the associated roots.

Install signs on each Tree Protection Zone fence indicating that the barrier shall not be taken down or moved without the approval of NAVSTA Mayport Environmental.

Existing trees within the TPZ that are unhealthy, that die, or have 20 percent or more of their crowns that die during the 365 day establishment period shall be replaced. The Contractor, at the direction of the Contracting Officer, shall remove the existing tree and stump and replace it as outlined in this policy.

7. Tree Removal and Mitigation:

Removal or damage of healthy, established trees having a DBH of 4 inches or greater on the Station shall be mitigated in accordance with the following guidelines. These guidelines shall be incorporated into plans and specifications for construction projects which require the removal of trees.

a) Mitigation Requirements – All trees

Removed Tree DBH	Required Replacement Inches Ratio (Replacement Inches : Removed inches)
4" – 20"	1:1 (Plant 1 inches for every inch removed)
21" – 30"	2:1 (Plant 2 inches for every inch removed)
31" or greater	3:1 (Plant 3 inches for every inch removed)

b) Tree Replacement Requirements

i. Live Oaks

- Removed live oaks shall be replaced with planted live oaks (*Quercus virginiana*).
- Minimum planting size for live oaks shall be 8 caliper inches and 20'-22' overall height.

ii. Pines

- Removed pines shall be replaced with planted slash pines (*Pinus elliottii*).
- Minimum planting size for slash pines shall be 4 caliper inches and 10'-12' overall height.

iii. Palms

- Removed palms shall be replaced with planted cabbage palms (*Sabal palmetto*) or pindo palms (*Butia capitata*).
- Minimum planting size for palms shall be 12 foot clear trunk cabbage palms and 8 foot clear trunk pindo palms.

iv. Hardwoods and All Other Trees, including established ornamental landscape trees

- Minimum planting size for all other trees (excluding live oaks, pines, and palms), shall be 6 caliper inches and 16'-18' overall height.

- Removed Hardwoods and all other trees shall be replaced with an approved replacement species from the following list:

Acer rubrum - red maple
Butia capitata - pindo palm
Carya glabra – pignut hickory
Celtis occidentalis – hackberry
Cercis canadensis – Eastern redbud
Ilex x attenuata 'East Palatka' - East Palatka holly
Ilex vomitoria - yaupon holly
Juniperus virginiana – Eastern red cedar
Juniperus virginiana silicicola – Southern red cedar
Liquidambar styraciflua - sweetgum
Magnolia grandiflora - Southern magnolia
Magnolia virginiana – sweetbay magnolia
Nyssa sylvatica – black tupleo
Pinus elliottii – slash pine
Platanus occidentalis - sycamore
Quercus hemisphaerica – laurel oak
Quercus shumardiii – shumard oak
Quercus virginiana – live oak
Sabal palmetto – cabbage palm
Taxodium ascendens – pond cypress
Taxodium distichum – bald cypress
Ulmus americana - American elm
Ulmus alata – winged elm
Any other native or indigenous tree that reaches a height at maturity of at least 40 feet and a spread at maturity of at least 25 feet.

8. Planted Trees:

The following requirements shall apply to all planted trees installed to meet the requirements of this policy:

a) Planted trees shall be native or indigenous species capable of withstanding the harsh growing conditions found on NAVSTA Mayport, which include salt spray, high winds, and dry soils.

b) It is recommended that removed trees be replaced with the same species as those removed whenever possible. In the event that commercial availability is limited for a particular species and documented by the contractor or if growing conditions don't allow a particular species, alternatives shall be considered. The preferred replacement species for this scenario is live oak (*Quercus virginiana*) due to its tolerance of the local climate and soils.

c) When selecting replacement tree species, growing conditions shall be properly considered:

i. Water, light, and salt tolerance requirements of tree species shall be the primary deciding factors when selecting replacement species.

ii. Trees shall not be planted closer than 10 feet from buildings or structures.

iii. Trees shall not be planted closer than 5 feet from sidewalks and other hardscape features.

iv. Conflicts with overhead and underground utilities shall be avoided.

v. Potential for damage caused by surface roots shall be considered.

vi. Trees shall not be planted in locations where the mature canopy will affect buildings, structures, sightlines, utilities, or other Station mission requirements.

d) Parking lot islands may have tree plantings under the following conditions:

i. Islands shall be a minimum of 8 feet wide and 18 feet long.

ii. No limerock base material shall be present in the soil.

iii. Planted trees in parking lots shall have a minimum overall height of 12-14 feet and a clear trunk height of 6 feet to avoid conflict with vehicles. See Definitions in Part 2(b) in this policy.

e) Locations for replacement trees shall be on-site, as close to the location of the removed tree as possible. Planting locations shall be coordinated and approved by the Mayport Environmental Division.

f) If a lack of adequate growing space on-site has been documented by the contractor, the required replacement tree plantings shall occur at one of the following mitigation banks at NAVSTA Mayport:

i. Beachfront Area (East of Baltimore Street): Cabbage Palm plantings only.

ii. Parking Lot Islands: All approved tree species as listed in part 5(b)(iv) and 6(d) of this policy are acceptable for use in this area.

iii. Lake Wonderwood trail system and shoreline: All approved tree species as listed in part 5(b)(iv) of this policy are acceptable for use in this area.

iv. Golf Course Boundaries: All approved species as listed in part 5(b)(iv) of this policy are acceptable for use in this area. All tree plantings shall be coordinated and approved by NAVSTA Mayport MWR.

v. Golf Course Interior: Tree plantings are acceptable to define fairways. All approved species as listed in part 5(b)(iv) of this policy are acceptable for use in

this area. All tree plantings shall be coordinated and approved by NAVSTA Mayport MWR.

vi. Parks and Recreation Field buffers: All approved tree species as listed in part 5(b)(iv) of this policy are acceptable for use in this area. All tree plantings shall be coordinated and approved by NAVSTA Mayport MWR.

vii. Pelican Roost RV Park: Cabbage Palm plantings only. All tree plantings shall be coordinated and approved by NAVSTA Mayport MWR.

viii. Other approved locations as determined by the Mayport Environmental Division. See attached map, Figure 3.

9. Monitoring:

Newly planted trees need to receive proper care and maintenance during the required 365 day establishment period. The following requirements must be implemented and incorporated into the plans and specifications on projects involving tree removal and mitigation:

a) See Figure 1, Detail A for tree planting requirements.

b) During the establishment period, adequate watering for each particular tree species planted is required at NAVSTA Mayport due to the sandy, well drained soils. Watering requirements will vary depending upon species. Tree watering bags are recommended. A watering schedule, including the filling of watering bags, shall be part of the establishment period maintenance activity requirements and submitted to NAVSTA Mayport Environmental.

c) All planted trees shall have a 3 inch thick, 36 inch diameter mulch ring. Mulch shall not touch the tree trunk and shall not be placed within 6 inches of trunk, see Figure 1, Detail A. This mulch ring preserves soil moisture, controls soil temperature, and protects the tree trunk from mechanical damage from mowing equipment. In addition, the mulch reduces competition from turf, weeds, and groundcover which compete with the tree roots for water and nutrients.

d) Staking is only recommended for planted trees with large canopies on windy sites or where people or animals may topple them. Ensure staking system does not injure the trunk and bark. All staking and guying shall be removed at the end of the 365 day establishment period.

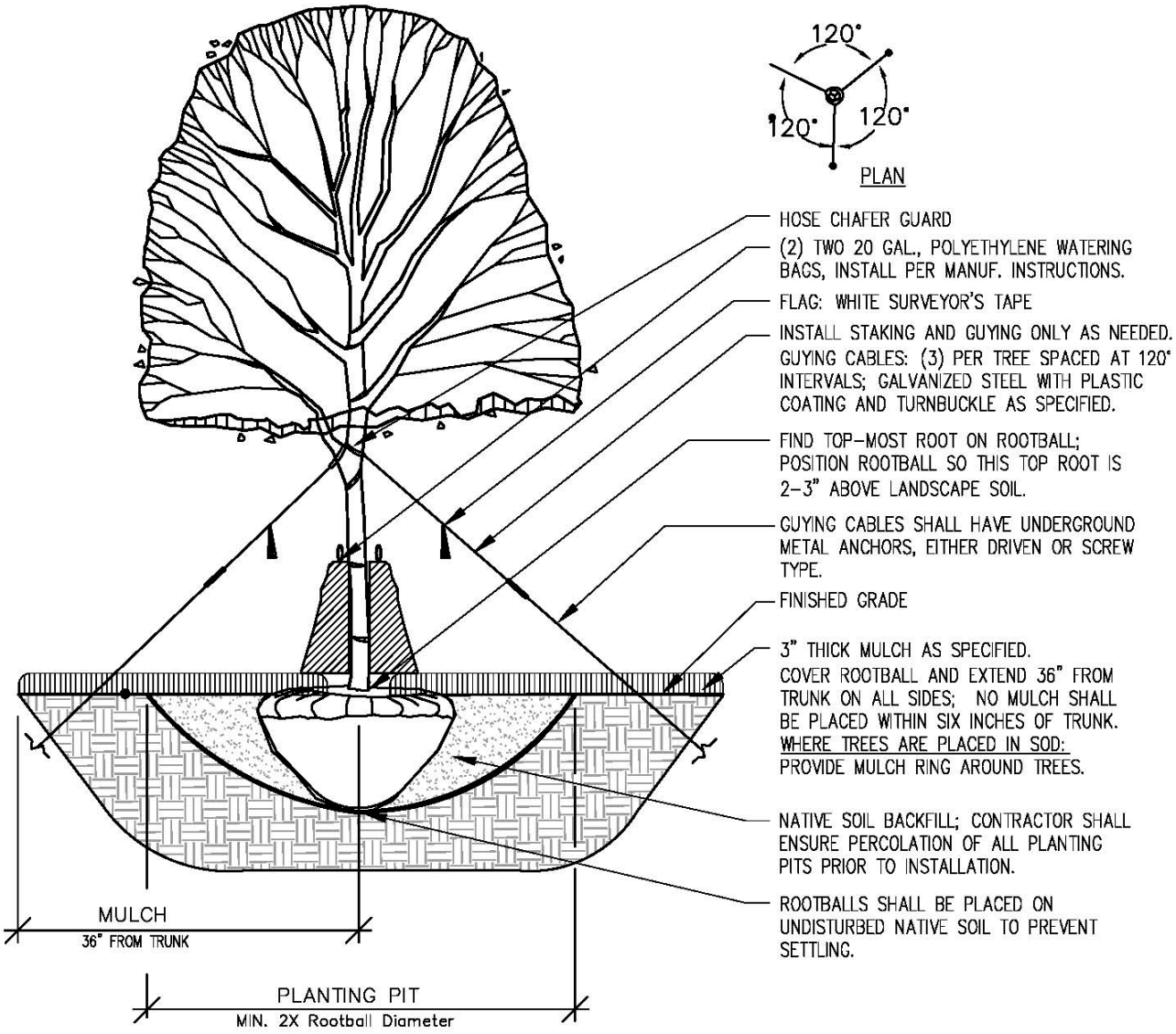
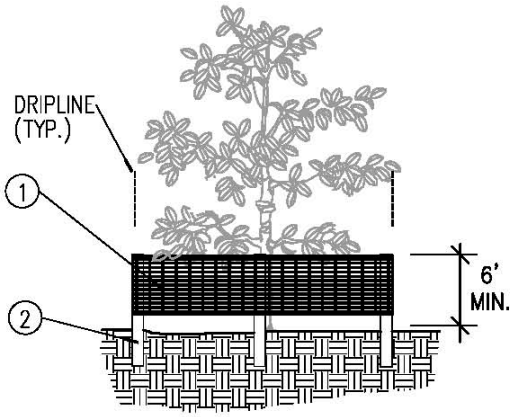
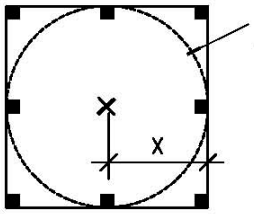


Figure 1, Detail A

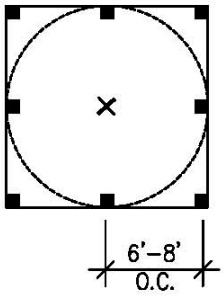


ELEVATION



X = 1 FOOT RADIUS FOR EACH INCH OF TRUNK DBH OR DRIPLINE, WHICHEVER IS GREATER.

PLAN VIEW



POST SPACING

1. 6' HT CONSTRUCTION FENCE. SUBMIT PRODUCT INFORMATION FOR APPROVAL PRIOR TO INSTALLATION.

2. 8' TALL METAL "T" POSTS OR 2" x 2" X 8' PRESSURE TREATED WOOD POSTS WITH 24" BURIAL BELOW GRADE.

INSTALLATION NOTES:

A. BARRIERS SHALL BE LOCATED AWAY FROM THE TRUNK AT THE DRIPLINE OR AT 1 FOOT FOR EACH INCH OF TREE DBH, WHICHEVER IS GREATER.

B. POSTS SHOULD BE DRIVEN INTO THE GROUND TO A DEPTH OF 1/4 OF THE HEIGHT OF THE POST. FOR EXAMPLE, A 8' POST SHOULD BE SET AT LEAST 2' INTO THE GROUND.

C. SPACE POSTS EVERY 6' (MIN.) TO 8' (MAX.).

D. SECURE FENCING TO POST WITH NYLON CABLE TIES. WOOD STRIPS MAY BE ALSO BE USED TO PROVIDE ADDITIONAL SUPPORT AND PROTECTION BETWEEN TIES AND POSTS.

E. PROVIDE A TREE PROTECTION ZONE (TPZ) AS SHOWN ON THE PLANS. WITHIN THE TPZ THERE SHALL BE NO PARKING, WASHOUTS, BLDG MATERIAL STORAGE, WASTE, EXCESS SOIL, CONSTRUCTION EQUIPMENT, TRENCHING, REMOVING SOIL, OR ANY OTHER DISTURBANCE.

NOTE: IF WIRE TIES ARE USED, AVOID DIRECT CONTACT WITH FENCE. WIRE MAY DAMAGE FENCE OVER TIME.

B **Tree Protection Zone**
Barrier Detail

NTS

Figure 2, Detail B

B Laws, Executive Orders, Regulations

Laws, Executive Orders, Regulations, Directives, and Memoranda Relevant and Additional Sources of Information

Wetland Areas

Federal Water Pollution Control Act, as amended by the CWA of 1977, 33 U.S.C. 1251, prohibits the discharge of dredged or filled materials into waters of the U.S., including wetlands, without first obtaining a permit from the USACE (Section 404 of the CWA).

EO 11990, 24 May 1977, as amended, requires government agencies, in carrying out agency actions and programs affecting land use, to provide leadership and take action to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands.

CWA, Section 401 Water Quality Certification, 1986, 33 U.S.C. 1341, requires that states certify compliance with Federal permits or licenses and with state water quality requirements and other applicable state laws. Under Section 401, states have the authority to review any Federal permit or license that may result in a discharge to wetlands or other waters under the state's jurisdiction to ensure that the actions would be consistent with the state's water quality requirements.

EO 13112, 3 February 1999, requires executive agencies to restrict the introduction of exotic organisms into natural ecosystems.

OPNAVINST 5090.1D, 12-3.8(b), discusses natural resources management relating to wetland management.

Sources of Information

Technical Reports, Plans and Publications:

Wetland Creation and Restoration: The Status of the Science by Jon A. Kusler and Mary E. Kentula.

Clean Water Action Plan: Restoring and Protecting America's Waters, U.S. Environmental Protection Agency and the U.S. Department of Agriculture, October 1998.

Naval Station Mayport Preliminary Jurisdictional Wetland Determination, Prepared for the Department of the Navy by CZR, Inc., 1997.

Telephone Contacts:

USFWS, Regional Wetland Coordinator: (404) 679-7128

The Center for Wetlands (University of Florida): (352) 392-2424

The Wildlife Society: (301) 897-9770

Internet Addresses:

Weed Management – http://tncweeds.ucdavis.edu

Florida Exotic Pest Plant Council – www.fleppc.org

Weed Issues – www.ces.uga.edu/pubs/pubsubj.html#weeds
Invasive Plant Management –
http://refuges.fws.gov/FICMNEWFiles/NatlWeedStrategyTOC.html

FDEP Division of Water Facilities – www.dep.state.fl.us/water/

FDEP Bureau of Invasive Plant Management – www.dep.state.fl.us/stland/bapm

Wetland restoration, mitigation, construction, enhancement, and wildlife –
www.pwrc.usgs.gov/wli/constds/wlicps.htm

University of Florida, Center for Aquatic and Invasive Plants–
http://aquat1.ifas.ufl.edu/welcome.html

Environmental Law Institute – www.igc.apc.org/eli/

Center for Marine Conservation – http://www.cmc-ocean.org/

Society of Wetland Scientists – www.sws.org

Society for Ecological Restoration www.ser.org

Soil Conservation and Erosion Control

Soil Conservation Act, 16 U.S.C. 590a et seq., provides for soil conservation practices on Federal lands.

Federal Water Pollution Control Act, as amended by the CWA of 1977, 33 U.S.C. 1251, regulates the dredging and filling of wetlands and establishes procedures for identifying and regulating nonpoint sources of polluted discharge, including turbidity, into waterways.

EO 11989 and 12608 close areas to off-road vehicles where soil, wildlife, or other natural resources may be adversely affected.

EO 13112, 3 February 1999, requires executive agencies to restrict the introduction of exotic organisms into natural ecosystems. Vegetative buffers and landscaping to control soil erosion must comply with this executive order.

OPNAVINST 5090.1D, 12-3.8(d) discusses natural resources management relating to soil conservation management.

F.S., Chapter 582.05, provides for control and prevention of soil erosion and damage from floodwater and sediments, and for the conservation of soil and water resources.

Sources of Information

Technical Reports, Plans and Publications:

Soil Survey of City of Jacksonville, Duval County, Florida, U.S. Department of Agriculture, Soil Conservation Service, 1978.

Stormwater Pollution Prevention Plan, NS Mayport, 1997.

Telephone Contacts:

USDA NRCS: (706) 546-2278

Duval County Extension Office: (904) 266-0088

FDEP, Environmental Resource Permitting: (850) 595-8320

Internet Addresses:

University of Tennessee, Knoxville, Water Resources, Civil and Environmental Engineering – http://www.engr.utk.edu/research/water/erosion/index.html

USDA NRCS – http://www.nrcs.usda.gov/

The National Erosion Research Laboratory – http://topsoil.nserl.purdue.edu/nserlweb

Stormwater and Water Quality Control

Federal Water Pollution Control Act, as amended by the CWA of 1977, 33 U.S.C. 1251, describes guidelines for the control of nonpoint source pollution.

CZMA of 1972, 16 U.S.C. 1451 et seq., establishes authority (Section 6217) for states to administer coastal nonpoint pollution programs when approved by the NOAA and EPA.

EO 11990, 24 May 1977, as amended, directs the preservation and enhancement of wetlands.

Oil Pollution Act of 1990 (OPA 90), 33 U.S.C. 2701, requires planning for, rescue of, minimization of injury to, and assessment of damages or injury to fish and wildlife resources from the discharge of oil.

Comprehensive, Environmental Response, Compensation and Liability Act, (CERCLA) 42 U.S.C. 9601, et seq., authorizes Natural Resource Trustees to recover damages for injury to, destruction of, or loss of natural resources resulting from the release of a hazardous substance.

OPNAVINST 5090.1D, 12-3.8(f), discusses natural resources management relating to nonpoint source pollution.

OPNAVINST 5090.1D, Ch 23, establishes requirements, guidelines, and standards for the assessment of damages arising from the release of oil or hazardous substances.

F.S., Chapter 373.403, regulates the management and storage of surface water and is implemented by the SJRWMD through the environmental resources permitting process.

F.S., Chapter 376, Pollutant Discharge Prevention and Removal, prohibits the discharge of pollutants into coastal waters, estuaries, tidal flats, or beaches.

F.S., Chapter 380.012, The Florida Environmental Land and Water Management Act of 1972, is intended to: (1) ensure a water management system that reverses the deterioration of water quality and that provides optimum utilization of limited water resources; (2) facilitate orderly, well planned development; and (3) protect public health, welfare, safety, and quality of life for Florida residents.

Sources of Information

Technical Reports, Plans and Publications

Naval Station Mayport Stornwater Pollution Prevention Plan, 1997.

Telephone Contacts:

EPA, Nonpoint Source: (404) 346-2126

SJRWMD: (904) 329-4500

FDEP Stormwater Treatment: (850) 595-8320

Internet Addresses:

Nonpoint Source Pollution of Surface Waters – http://esa.sdsc.edu/carpenter.htm

Water Runoff Control Programs – http://webcentral.bts.gov/ntl/DOCS/RUNOFF.html

Controlling Nonpoint Source Pollution – http://waterknowledge.colostate.edu/roads.htm

SJRWMD – http://sjr.gov

USGS Water Resource Home Page – http://h2o.usgs.gov/

EPA Office of Water – www.epa.gov/owow/

Grounds Maintenance and Landscaping

The President's April 16, 1994, Memorandum on Environmentally Beneficial Landscaping, requires implementing landscaping practices that are intended to benefit the environment and generate long-term cost savings.

EO 13112, 3 February 1999, requires executive agencies to restrict the introduction of exotic organisms into natural ecosystems.

FIFRA, 7 U.S.C. 136, governs the use and application of pesticides in natural resources management programs.

Federal Water Pollution Control Act as amended by the CWA of 1977, 33 U.S.C. 1251, prohibits the discharge of dredged or filled materials into waters of the U. S., including wetlands, without first obtaining a permit from USACE (Section 404 of the CWA).

OPNAVINST 5090.1D, 12-3.8(e), discusses natural resources management relating to environmentally and economically beneficial landscaping.

Sources of Information

Telephone Contacts:

SJRWMD – Xeriscaping: (800)725-5922

Duval County Extension Office: (904)266-0088

Internet Addresses:

Where to find native nurseries – www.fnps.org/wheretofind.html

Creating Vegetative Designs – http://www2.nrcs.usda.gov/Netdynamics/VegSpec/pages/HomeVegspec.htm

Xeriscaping – http://www.xeriscape.org

Association of Native Nurseries – http://www.afnn.org/

Low energy landscapes in Florida – http://edis.ifas.ufl.edu/scripts/htmlgen.exe?DOCUMENT_MG013

FNAI – http://www.fnai.org

Florida Native Plant Society – http://www.fnps.org

TNC – http://www.tnc.org/infield/State/Florida/

SJRWMD – http://sjr.state.fl.us

WaterWiser is a program of the American Water Works Association, which is operated in cooperation with the EPA and the U.S. Bureau of Reclamation – http://www.waterwiser.org

Floodplain Management

EO 11988, Floodplain Management, May 24, 1977, requires Federal service agencies to avoid construction or management practices that can adversely affect floodplains, unless it is found that: there is no practical alternative and the proposed action has been designed to minimize harm to the floodplain.

OPNAVINST 5090.1D, 12-3.8(c), discusses natural resources management relating to floodplain management.

Sources of Information

Telephone Contacts:

Jacksonville Building Department: (904) 693-5067

Internet Addresses:

FEMA's Floodplain Management Summary – http://www.fema.gov/mit/fldmit.htm

Floodplain Management – http://www.fws.gov/directives/613fw1.html

Strategies for floodplain management – http://floodplain.org/c-overvi.htm

Northwest Florida Water Management District – http://www.state.fl.us/nwfwmd/

Invasive and Exotic Species

Federal Noxious Weed Act of 1974, 7 U.S.C. 2801 et. seq., provides for the control and eradication of noxious weeds and their regulation in interstate and foreign commerce.

ESA, 16 U.S.C. 35, 32 Code of Federal Regulations (CFR) 190, provides for the identification and protection of threatened and endangered species of fish, wildlife, and plants and their critical habitats. Requires Federal agencies to ensure that no agency action is likely to jeopardize the continued existence of a threatened or endangered species.

EO 13112, 3 February 1999, requires executive agencies to restrict the introduction of exotic organisms into natural ecosystems.

FIFRA 7 U.S.C. 136, requires that all pesticides, whether for commercial or private use, be applied in accordance with product labeling and that containers are properly disposed of. EPA is responsible under FIFRA for the registration of all pesticide active ingredients used in the U.S.

OPNAVINST 6240.4B, 27 August 1998, DoD Pest Management Program, provides the Navy with policies for implementing pest management programs directed against pests that conflict with or adversely affect the mission of the DoD; affect the health and well-being of Navy personnel and their dependents; attack or damage real property, supplies, or equipment; adversely affect the environment; or are otherwise undesirable.

Federal Plant Pest Act, 7 U.S.C. 150aa et seq., regulates the importation and interstate movement of plant pests and authorizes the Secretary of Agriculture to take emergency measures to destroy infected plants or materials.

OPNAVINST 5090.1D, 12-3.10, discusses natural resources management relating to the control of noxious weeds.

Florida Statutes (F.S.), Chapter 370.072, Florida Endangered and Threatened Species Act, is to conserve, protect, and manage the threatened and endangered species and their habitats.

F.S., Chapter 487, the Florida Pesticide Law, regulates the distribution and use of pesticides.

F.S., Chapter 482, Structural Pest Control Act, requires using pesticides for their intended purpose in accordance with the registered labels or as directed by the EPA.

F.S., Chapter 369.2, Florida Aquatic Weed Control Act, regulates noxious aquatic weeds on public lands.

Florida Statutes, Chapter 369.252, Invasive Exotic Plant Control, requires a program be established to eradicate or maintain control of the species detrimental to the state's natural environment.

Sources of Information

Technical Reports, Plans and Publications

Naval Air Station Jacksonville Pest Management Plan, Naval Facilities Engineering Command, June 1993.

Telephone Contacts:

Duval Soil and Water Conservation District: (904) 266-0088

TNC Florida Office: (407) 682-3664

Applied Biology Department of Southern Division: (843)820-7140 - Pesticide use

FDACS, Pesticide Division: (850) 487-2130 - Pesticide use

Internet Addresses:

Weed Management – http://tncweeds.ucdavis.edu

Florida Exotic Pest Plant Council – www.fleppc.org

Weed issues – www.ces.uga.edu/pubs/pubsubj.html#weeds

Invasive Plant Management – http://refuges.fws.gov/FICMNEWFiles/NatlWeedStrategyTOC.html

University of Florida, Center for Aquatic and Invasive Plants – http://aquat1.ifas.ufl.edu/welcome.html

TNC, Wildland Invasive Species Inventory – http://tncweeds.ucdavis.edu/

Urban Forestry and Tree Mitigation

Federal Noxious Weed Act of 1974, 7 U.S.C. 2801, establishes control and eradication of noxious weeds and regulates them in interstate and foreign commerce.

EO 13112, Invasive Species, as previously described.

OPNAVINST 5090.1D, 12-3.8(j), discusses laws that govern natural resources management relating to the protection and management of forest resources.

Sources of Information

Telephone Contacts:

Duval County Forester: (904) 630-1620

Alliance for Community Trees: (800) ACT-8886. ACT provides support for nonprofit organizations involved in planting trees and educating the public about the benefits of trees in urban areas.

National Tree Trust Foundation: (202) 846-TREE. A nonprofit organization that has distributed trees to over 500 community groups across the nation.

National Association of State Foresters: (202) 624-5415. The association represents the directors of the state forestry agencies from all 50 states.

Society of American Foresters: (301) 897-8720. An organization of 18,000 members involved in allied areas of professional forestry.

Society of Municipal Arborists: (314) 862-1711. The organization's approximately 500 members promote interest in the planting and maintenance of public trees and the preservation of public open space.

Internet Addresses:

Tree City USA – http://www.arborday.org/programs/treecityusa.html

Vegetation Management – www.sfrc.ufl.edu/Extension/vegman.htm

Florida's Forestry information – www.sfrc.ufl.edu/Extension/ffws/ffwshome.htm

Serving the Wholesale Nursery Industry – http://www.growit.com

Your Florida Backyard – http://www.nsis.org

American Forests (202) 955-4500 – http://www.americanforests.org. American Forests is one of the nation's oldest citizen conservation organizations and a leading force in the protection and management of forest resources in America.

National Arbor Day Foundation (402) 474-5655 – http://www.arborday.org. A major program of the foundation is the Tree City USA program. Other programs include Tree Line USA, Conservation Trees, Trees for America, Arbor Day Farms, and Rain Forest Rescue.

International Society of Arboriculture (217) 328-2032 – http://www2.champaign.isa-arbor.com. A nonprofit organization for municipal foresters and professionals in arboriculture and urban forestry.

USFS (202) 205-9694 – http://www.fs.fed.us. The lead Federal agency for providing technical and financial assistance and research on urban and community forestry for the nation.

Treelink – http://www.treelink.org. Information, research, and networking for people working in urban and community forestry.

Forest Management

Federal Property and Administration Act of 1949, 63 Stat. 377, as amended 41 CFR, Chapter 101, Federal Property Management Regulations, Title 10 U.S.C., Sections 2665, sale in certain interest in land; logs.

Federal Noxious Weed Act of 1974, 7. U.S.C. 2801, establishes control and eradication of noxious weeds and regulates them in interstate and foreign commerce.

Forest Pest Suppression Memorandum of Agreement between the Department of Agriculture and DoD, 11 December 1990, is the planning, coordination, and execution of field operations to prevent and suppress damaging forest insects and disease outbreaks.

EO 13112, Invasive Species, as previously described.

DoDINST 7310.5, administers the reimbursement of costs of managing forest resources for timber production. Under this regulation, only expenses related to the maintenance of timber for commercial sale are reimbursed.

OPNAVINST 5090.1D, 12-3.8(j), discusses laws that govern natural resources management relating to the protection and management of forest resources.

10 U.S.C. 2665, Forestry Reimbursable Funding.

32 CFR 190, Natural Resources Management Program.

DoDINST 4715.3, DoD Environmental Conservation Program.

DoDINST 7000.14, DoD Financial Management Policy.

NAVFAC P-73, Volume II, Chapter 3, Real Estate Operations and Natural Resources Procedure Manual.

Sources of Information

Technical Reports/Publications:

Forest Management

Myers, R., and J. Ewel. 1990. *Ecosystems of Florida.* The University Press of Central Florida, Orlando. Florida.

Drew, M.B., L.K. Kirkman, and A.K. Gholson. 1998. The Vascular Flora of Ichauway, Baker County, Georgia: A Remnant Longleaf Pine/Wiregrass Ecosystem. *Castanea*. 63:1-24.

Kirkman, L.K., M.B. Drew, L.T. West, and E.R. Blood. 1998. Ecotone Characterization between Upland Longleaf Pine/Wiregrass Stands and Seasonally-Ponded Isolated Wetlands. *Wetlands* 18:346-364.

Kirkman, L.K., R.M. Mitchell, R.C. Helton and M.B. Drew. (In review). Productivity Controls on Plant Diversity Across an Environmental Gradient in a Fire-Dependent Ecosystem (Submitted to *Ecology*).

Forest Protection

Managing Wildlife, Alabama Wildlife Federation, 1999.

Pitch Canker Video – www.r5.pswfs.gov/video

Telephone Contacts:

Glenn Gaines, USFS: (404) 347-4084

Certified Prescribed Burn Manager training, Jim Brenner: (850) 488-6480

Tall Timbers Research Station: (850) 893-4153

TNC Fire Management Office: (850) 668-0827
Duval County Forester: (904) 630-1620

National Association of State Foresters: (202) 624-5415; The association represents the directors of the state forestry agencies from all 50 states.

Society of American Foresters: (301) 897-8720; An organization of 18,000 members involved in allied areas of professional forestry.

Internet Addresses:

Forest Management

FDOF – http://flame.doacs.state.fl.us/

FDOF Forest Protection Bureau – http://flame.fl-dof.com/Train/rxtrain.html

FDACS – http://doacs.state.fl.us/

Tall Timbers Research Station:

Plant Ecology – Effectiveness of Prescribed Burns – www.talltimbers.org/research/peco.html

Effects of Fires on Forest Birds, Red-Cockaded Woodpeckers, Gopher Tortoises – www.talltimbers.org/research/ve.html

A Guide for Prescribed Fire in Southern Forests – www.pfmt.org/standman/prescrib.htm

Prescribed Burning Regulations – www.sfrc.ufl.edu/Extension/ffws/pb.htm

Prescribed burning and air quality – http://edis.ifas.ufl.edu/BODY_FR058

Southern Research Station (Publication-Scientific) – www.srs.fs.fed.us./pubs/1999-12_publications.htm

Vegetation Management – www.sfrc.ufl.edu/Extension/vegman.htm

Forested Wetlands – http://edis.ifas.ufl.edu/scripts/htmlgen.exe?DOCUMENT_FR006

Florida's Forestry information – www.sfrc.ufl.edu/Extension/ffws/ffwshome.htm

Effects of Fire on Threatened and Endangered Plants – http://fire.r9.fws.gov/ifcc/T&EPlants/T&EPlants.htm#Abstract

Firing Techniques – www.pfmt.org/standman/firingtech.htm

Fire Effects on Plants and Wildlife – http://www.fs.fed.us/database/feis/

American Forests – (202) 955-4500 – http://www.americanforests.org/

USFS – (202) 205-9694 – http://www.fs.fed.us/

National Wildfire Coordinating Group – http://www.nwcg.gov/

Wildland Fire and Aviation Management Training – http://fire.nifc.nps.gov/mats/matsframe.asp

Forest Protection

Fusiform rust information provided by the University of Florida, School of Forest Resources and Conservation – http://www.sfrc.ufl.edu/Extension/bul903.htm

Information on diseases and management measures – http://www.bugwood.caes.uga.edu/-southern/Diseases/pitchcanker.htm

Freshwater Fisheries Management

EO 12962 directs Federal agencies to cooperate in conservation of aquatic resources and enhancement of opportunities for recreational fishing.

ESA, 16 U.S.C. 35, 32 CFR 190, provides for the identification and protection of threatened and endangered species of fish, wildlife, and plants and their critical habitats. Requires Federal agencies to ensure that no agency action is likely to jeopardize the continued existence of a threatened or endangered species.

Sikes Act, as amended 16 U.S.C. 670 a-o, requires each military department to manage fish and wildlife resources in accordance with a tripartite cooperative plan agreed to by the USFWS and state wildlife agency.

Fish and Wildlife Conservation Act, 16 U.S.C. 2901, encourages all Federal departments and agencies to utilize their statutory and administrative authority, to the maximum extent practicable and consistent with each agency's statutory responsibilities, to conserve and promote conservation of non-game fish and wildlife and their habitats.

EO 13112, 3 February 1999, requires executive agencies to restrict the introduction of exotic organisms into natural ecosystems.

OPNAVINST 5090.1D, 12-3.5, discusses laws that govern natural resources management relating to the protection and management of fish and wildlife resources.

F.S., Chapter 370.072, Florida Endangered and Threatened Species Act, is to conserve, protect, and manage the threatened and endangered species and their habitats.

Fish and Wildlife Conservation on Military Reservations, as amended, 16 U.S.C. 670 a-o, requires each military department to manage natural resources, to ensure professional services necessary for the management of fish and wildlife resources on each Installation are provided, to provide their personnel with professional training in fish and wildlife management, and to give priority to contracting fish and wildlife work with Federal and state agencies having responsibility for conservation or management of fish and wildlife resources, in accordance with the tripartite cooperative plan agreed to by the Installation, the USFWS, and the state fish and wildlife agency.

Military Reservations and Facilities – Hunting, Fishing, and Trapping, 10 U.S.C.2671, provides that hunting, fishing, and trapping on military lands can be in accordance with state laws.

Fish and Wildlife Coordination Act, as amended, 16 U.S.C. 661 – 666c, provides for effective integration of fish and wildlife conservation programs with Federal water resource development and construction projects affecting water resources.

Sources of Information

Telephone Contacts:

FFWCC, Division of Freshwater Fisheries, Tallahassee: (850) 488 0520

TNC Florida Office: (407) 682-3664

Internet Addresses:

Habitat Conservation Planning Handbook – http://endangered.fws.gov/hcp/hcpbook.htm

FFWCC – http://fcn.state.fl.us/gfc/

North Carolina State University – NCSU Aquatic Weed Management. Extension Information – www.cropsci.ncsu.edu/aquaticweeds

USACE, Waterways Experiment Station – www.wes.army.mil

Books:

Alabama Wildlife Federation, 1999, *Managing Wildlife*.

Biotic Communities Management

EO 12962 directs Federal agencies to cooperate in conservation of aquatic resources and enhancement of opportunities for recreational fishing.

ESA, 16 U.S.C. 35, 32 CFR 190, provides for the identification and protection of threatened and endangered species of fish, wildlife, and plants and their critical habitats. Requires Federal agencies to ensure that no agency action is likely to jeopardize the continued existence of a threatened or endangered species.

Sikes Act, as amended 16 U.S.C. 670 a-o, requires each military department to manage fish and wildlife resources in accordance with a tripartite cooperative plan agreed to by the USFWS and state wildlife agency.

Fish and Wildlife Conservation Act, 16 U.S.C. 2901, encourages all Federal departments and agencies to utilize their statutory and administrative authority, to the maximum extent practicable and consistent with each agency's statutory responsibilities, to conserve and promote conservation of nongame fish and wildlife and their habitats.

EO 13112, 3 February 1999, requires executive agencies to restrict the introduction of exotic organisms into natural ecosystems.

OPNAVINST 5090.1D, 12-3.5, discusses laws that govern natural resources management relating to the protection and management of fish and wildlife resources.

F.S., Chapter 370.072, Florida Endangered and Threatened Species Act, is to conserve, protect, and manage the threatened and endangered species and their habitats.

Fish and Wildlife Conservation on Military Reservations, as amended, 16 U.S.C. 670 a-o, requires each military department to manage natural resources, to ensure professional services necessary for the management of fish and wildlife resources on each installation are provided, to provide their personnel with professional training in fish and wildlife management, and to give priority to contracting fish and wildlife work with Federal and state agencies having responsibility for conservation or management of fish and wildlife resources, in accordance with the tripartite cooperative plan agreed to by the Installation, the USFWS, and the state fish and wildlife agency.

Military Reservations and Facilities – Hunting, Fishing, and Trapping, 10 U.S.C.2671, provides that hunting, fishing, and trapping on military lands can be in accordance with state laws.

Fish and Wildlife Coordination Act, as amended, 16 U.S.C. 661 – 666c, provides for effective integration of fish and wildlife conservation programs with Federal water resource development and construction projects affecting water resources.

Sources of Information

Telephone Contacts:

FFWCC, Division of Freshwater Fisheries, Tallahassee: (850) 488 0520

TNC Florida Office: (407) 682-3664

USFWS, Jacksonville Ecological Services Field Office: (904) 232-2580

Internet Addresses:

Habitat Conservation Planning Handbook – http://endangered.fws.gov/hcp/hcpbook.htm

FFWCC – http://fcn.state.fl.us/gfc/

North Carolina State University – NCSU Aquatic Weed Management. Extension Information – http://www.cropsci.ncsu.edu/aquaticweeds/

USACE, Waterways Experiment Station – www.wes.army.mil/

Books:

Alabama Wildlife Federation, 1999, *Managing Wildlife*.

Wildlife Damage and Diseases

ESA, 16 U.S.C. 35, 32 CFR 190, provides for the identification and protection of threatened and endangered species of fish, wildlife, and plants and their critical habitats. Requires Federal agencies to ensure that no agency action is likely to jeopardize the continued existence of a threatened or endangered species.

Migratory Bird Treaty Act, as amended 16 U.S.C. 703-712, prohibits the taking or harming of a migratory bird, its eggs, nests, or young without the appropriate permit.

F.S., Chapter 370.072, Florida Endangered and Threatened Species Act, is to conserve, protect, and manage threatened and endangered species and their habitats.

Sources of Information

Telephone Contacts:

USDA, Animal and Plant Health Inspection Service (APHIS): (904) 375-2229

Brian Millsaps, FFWCC: (850) 488-3831

Jeff Gore, FFWCC: (850) 265-3677

Frank Finchum, USFWS: (404) 221-3588

Internet Addresses:

Wildlife damage and diseases information provided by the University of Nebraska Cooperative Extension Service, Great Plains Agricultural Council, and the USDA – http://www.ces.ncsu.edu/nreos/wild/wildlife/prevent.html

Prevention and Control of Wildlife Damage and Wildlife Diseases and Humans – http://ces.ncsu.edi/nreos/wild/wildlife/prevent.html

NuisanceWildlife Control Information – http://www.aphis.usda.gov/ws.

USGS National Wildlife Health Center Web – http://www.emtc.usgs.gov/nwhchome.html

Wildlife Disease/Health Related Links – http://www.emtc.nbs.gov/http_data/whip/links.html

Outdoor Recreation

SAIA of 1997, 16 U.S.C. 670a(b)(1)(G), requires public access to a military installation for the necessary, appropriate, and sustainable use of natural resources by the public to the extent that the use is not inconsistent with the needs of the fish and wildlife resources or with safety and military security.

Outdoor Recreation – Federal/State Program Act, 16 U.S.C. 460 P-3, defines a program for managing lands for outdoor recreation.

OPNAVINST 5090.1D, 12-3.11, discusses natural resources management relating to the protection and management of outdoor recreational resources.

Military Reservations and Facilities – Hunting, Fishing, and Trapping, 10 U.S.C.2671, provides that hunting, fishing, and trapping on military lands can be in accordance with state laws.

Memorandum of Understanding between the Department of the Interior and the Department of Defense for the Development of Public Outdoor Recreation Resources on Military Installation, 7 April 1978.

DoDDIR 4715.3 of May 1996, Environmental Conservation Program.

Secretary of the Navy Instruction (SECNAVINST) 6240.6E, Environmental Protection and Natural Resources.

NAVFAC P-73, Volume II, Natural Resources Management Procedural Manual.

OPNAVINST 5090.1D, 12-3.11, discusses natural resources management relating to the protection and management of outdoor recreational resources.

32 CFR 190, Natural Resources Management Program.

Sources of Information

Publications:

FDEP, 1994, Florida's Statewide, Comprehensive Outdoor Recreation Plan, , Division of Recreation and Parks, Tallahassee, Florida.

Telephone Contacts:

FDEP, Division of Recreation and Parks: (850) 488-6321

NPS, Southeast Region, Recreation and Conservation Division: (404) 562-3175

Internet addresses:

NPS – http://www.nps.gov/

Land Impact Guidelines

Federal Water Pollution Control Act, as amended by the CWA of 1977, 33 U.S.C. 1251, prohibits the discharge of dredged or filled materials into waters of the United States, including wetlands, without first obtaining a permit from USACE (Section 404 of the CWA).

EO 11990, 24 May 1977, as amended, requires government agencies, in carrying out agency actions and programs affecting land use, provide leadership and take action to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.

CWA, Section 401 Water Quality Certification, 1986, 33 U.S.C. 1341, requires that states certify compliance of Federal permits or licenses with state water quality requirements and other applicable state laws. Under Section 401, states have authority to review any Federal permit or license that may result in a discharge to wetlands or other waters under state jurisdiction to ensure that the actions would be consistent with the state's water quality requirements.

Federal Noxious Weed Act of 1974, 7 U.S.C. 2801 et. seq., provides for the control and eradication of noxious weeds and their regulation in interstate and foreign commerce.

EO 13112, 3 February 1999, requires executive agencies to restrict the introduction of exotic organisms into natural ecosystems.

FIFRA, 7 U.S.C. 136, requires that all pesticides, whether for commercial or private use, be applied in accordance with product labeling and that containers are properly disposed of. EPA is responsible under FIFRA for the registration of all pesticide active ingredients used in the United States.

Federal Plant Pest Act, 7 U.S.C. 150aa et seq., regulates the importation and interstate movement of plant pests and authorizes the Secretary of Agriculture to take emergency measures to destroy infected plants or materials.

F.S., Chapter 487, the Florida Pesticide Law, regulates the distribution and use of pesticides.

F.S., Chapter 482, Structural Pest Control Act, requires using pesticides for their intended purpose in accordance with the registered labels or as directed by the EPA.

F.S., Chapter 369.2, Florida Aquatic Weed Control Act, regulates noxious aquatic weeds on public lands.

F.S., Chapter 369.252, Invasive Exotic Plant Control, requires a program to be established to eradicate or maintain control of the species detrimental to the state’s natural environment.

EO 11988, Floodplain Management, May 24, 1977, requires Federal service agencies to avoid construction or management practices that can adversely affect floodplains, unless it is found that: (1)

there is no practical alternative and (2) the proposed action has been designed to minimize harm to or within the floodplain.

The President's April 16, 1994, Memorandum on Environmentally Beneficial Landscaping, requires implementing landscaping practices that are intended to benefit the environment and generate long-term cost savings.

EO 13112, 3 February 1999, requires executive agencies to restrict the introduction of exotic organisms into natural ecosystems.

ESA, 16 U.S.C. 35, 32 CFR 190, provides for the identification and protection of threatened and endangered species of fish, wildlife, and plants and their critical habitats. Requires Federal agencies ensure that no agency action is likely to jeopardize the continued existence of a threatened or endangered species.

F.S., Chapter 370.12, Florida Endangered and Threatened Species Act, intends to conserve, protect, and manage the threatened and endangered species and their habitat.

Sources of Information

There are no additional sources.