Integrated Natural Resources Management Plan for the Marine Corps Air Station Beaufort, Beaufort, South Carolina

2013

MARINE CORPS AIR STATION, BEAUFORT, SOUTH CAROLINA
INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN
2013

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 Marine Corps, U.S. Fish & Wildlife Service and South Carolina Department of Natural Resources participate annually in the MCAS Beaufort INRMP and Natural Resources Metric review. The last operation and effect review of this INRMP was completed in 2006. 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 partner's concur that the management actions prescribed in the INRMP and implemented, will contribute to the conservation and rehabilitation of installation natural resources.

Commanding Officer, MCAS Beaufort	**(Date)**
Natural Resources Manager, MCAS Beaufort	**(Date)**
U.S. Fish and Wildlife Service	**(Date)**
South Carolina Department of Natural Resources	**(Date)**

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Executive Summary

ES.1 Type of Document

This document is an Integrated Natural Resources Management Plan (INRMP).

ES.2 Purpose of Document

The purpose of this document is to meet statutory requirements under the Sikes Act Improvement Act (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 United States Code (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 INRMPs for each military installation in the United States unless the absence of significant natural resources on a particular installation makes preparation of a plan for the installation inappropriate.

The INRMP is to provide for integrated land management, fish and wildlife management, forest management, and outdoor recreation management by implementing an ecosystem approach to natural resources management without interfering with the military readiness or mission of the Installation. This INRMP covers a 5-year period, but has the flexibility to accommodate changes in the ecosystem and military mission. Annual reviews and updates to the management program will ensure that the INRMP integrates the latest scientific knowledge and evolves to meet the future requirements of the military mission and natural resources.

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. Eight Installation-wide ecosystem management goals and 38 objectives have been identified for MCAS Beaufort.

Goals:

1) Maintain required visibilities and clear zones around the airfield.
2) Maintain the airfield to reduce or eliminate bird and animal strikes.
3) Maintain extremely low fuel loads in and around the weapons storage area by keeping pine straw and brush to a minimum.
4) Maintain a forest buffer around the explosive ordnance disposal area to reduce noise and catch errant shrapnel.
5) Maintain low fuel loads, reduced brush (to reduce biting arthropods), and scenic woods adjacent to housing areas.
6) Remaining woods will be managed for fish & wildlife oriented recreation, commodity extraction, and low pest and fuel loads.
7) Maintain military readiness by protecting and managing endangered and threatened species and other trust natural resources. (This maintains readiness by insuring public confidence in the Marine Corps' ability to protect important natural resources while preparing for defenses of the county.)
8) Manage the installation to maintain biodiversity using the principles of ecosystem management.

The objectives necessary for achieving the natural resources program goals are provided in Appendix B. Section 4 of this document provides the details about how these objectives and goals will be obtained.

ES.4 Projects of the INRMP

Projects are discrete actions for fulfilling a particular strategy (strategies implement objectives). Projects may be required in order for MCAS Beaufort to fulfill regulatory requirements regarding natural resources management, or to enhance existing measures for ensuring compliance. Projects of the INRMP are shown in Appendix A including Table A-1.

Funding for implementation of the INRMP will come from Headquarters Marine Corps and local 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 Marine Corps Operations and Maintenance (O&M [MC]) Environmental, or other funding to implement Department of Defense (DoD) mandatory projects in the timeliest manner possible. Stewardship-type projects will be funded through forestry, agriculture outlease, fish and wildlife, Legacy, or other fund sources as funding and personnel resources become available.

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List of Acronyms

AICUZ	Air Installation Compatible Use Zone
APHIS	Animal and Plant Health Inspection Service
AQCR	Air Quality Control Region
ATV	All-Terrain Vehicle
BA	Biological Assessment
BASH	Bird/Animal Strike Hazard
BCC	Bird Species of Conservation Concern
BCP	Bird Conservation Plan
BMP	Best Management Practice
CA	Conservation Associate
CFR	Code of Federal Regulations
CNO	Chief of Naval Operations
CO	Commanding Officer
CWCS	Comprehensive Wildlife Conservation Strategy
CWA	Clean Water Act
CWAP	Clean Water Action Plan
CZMA	Coastal Zone Management Act
DoD	Department of Defense
DoDINST	Department of Defense Instruction
DoN	Department of the Navy
EFD	Engineering Field Division
EFH	Essential Fish Habitat
EPA	United States Environmental Protection Agency
ESA	Endangered Species Act of 1973
° F	Degrees Fahrenheit
FEMA	Federal Emergency Management Agency
FIFRA	Federal Insecticide, Fungicide and Rodenticide Act
FMIS	Forest Management Information System
GIS	Geographic Information System
GPM	Gallons Per Minute
HM	Hazardous Materials
HMU	Habitat Management Unit
HW	Hazardous Waste
HWMP	Hazardous Waste Management Plan
INRMP	Integrated Natural Resources Management Plan
MBTA	Migratory Bird Treaty Act
MCAS Beaufort	Marine Corps Air Station, Beaufort, SC
MSL	Mean Sea Level
MWR	Morale, Welfare, and Recreation Division
NAAQS	National Ambient Air Quality Standards
NAVFACENGCOM	Naval Facilities Engineering Command
NAVFAC SE	Naval Facilities Engineering Command Southeast

List of Acronyms (continued)

NCTC	Naval Communications Training Station
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NAGPRA	Native American Graves Protection and Repatriation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollution Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resource Conservation Service
NREAO	Natural Resources and Environmental Affairs Officer
NRM	Natural Resources Manager
NABPR	Native American Graves Protection and Repatriation Act
O & M(MC)	Marine Corps Operations and Maintenance
OPNAVINST	Chief of Naval Operations Instruction
P2	Pollution Prevention
PIF	Partners In Flight
PL	Public Law
PMP	Pest Management Plan
RA	Resource Assistant
RCRA	Resource Conservation and Recovery Act
ROICC	Resident Officer in Charge of Construction and Contracts
SAIA	Sikes Act Improvement Act of 1997
SCDHEC	South Carolina Department of Health and Environmental Control
SCDNR	South Carolina Department of Natural Resources
SCS	Soil Conservation Service
SPP	Species
SSURGO	Soil Survey Geographic
SHPO	State Historic Preservation Office
SWPPP	Stormwater Pollution Prevention Plan
TNC	The Nature Conservancy
TSI	Timber Stand Improvement
USACE	United States Army Corps of Engineers
USC	United States Code
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
UWA	Unified Watershed Assessment
WPNSTA	Weapons Station
WRAP	Wetland Rapid Assessment Procedure

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1 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 Stations. To facilitate this program, the amendments require the Secretaries of the military departments to prepare and implement integrated natural resources management plans for each military Installation in the United States unless the absence of significant natural resources on a particular Installation makes preparation of a plan for the Installation inappropriate.

The Marine Corps Air Station, Beaufort, South Carolina (hereinafter identified as MCAS Beaufort) has prepared this plan to comply with the SAIA, DoD Instruction (DoDINST 4715.3), ASN (I&E) Memorandum of 12 August 1998, OUSD Memorandum of 21 September 1998, Marine Corps Order 5090, and the Marine Corps' Handbook for Preparing, Revising, and Implementing Integrated Natural Resources Management Plans of May, 2004.

Other than the mandated requirement, the primary purpose of the INRMP is to provide MCAS Beaufort with a foundation from which to manage the Station's natural resources. The INRMP will guide the management of the Station's natural resources for the next 5 years. The INRMP will account for the goals of the natural resources program within those 10 years, while not interfering with the military mission of the Station. The INRMP will also consider the surrounding natural resources through implementation of an integrated approach to management.

The first three sections of this INRMP establish the existing conditions at MCAS Beaufort. 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 MCAS Beaufort, provides a brief overview of the natural resources program, identifies Station partnerships and stakeholders, and briefly describes Station plans, studies, and programs relevant to the natural resources program. Section 3 discusses the existing physical and biological characteristics of the local and regional environment.

Section 4 discusses ecosystem management at the Station by dividing management into four components: land management, forest management, fish and wildlife, and outdoor recreation. These components are further divided into subcomponents; for example, the land management discussion addresses wetlands, floodplain management, soil conservation and erosion control, stormwater/water quality control, landscaping and grounds maintenance, urban forestry and invasive, exotic and noxious species. Objectives, long-term management, project summaries, legal requirements, and sources for additional management information are addressed under each subcomponent.

Appendix A describes the projects that will be implemented by MCAS Beaufort. For each project, Appendix A discusses the purpose, location, description, cost, baselines, monitoring requirements, and legal requirements. It is the intent of MCAS Beaufort to implement the projects, as described in Appendix A, 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 the military mission and its civilian and military staffing, the implementation of projects will proceed as directly and completely as possible.

Appendix B provides a complete list of objectives for the INMRP. The Installations Bird / Aircraft Strike Hazard plan is provided as Appendix C. Appendix D includes a forest stand information table and the 10-year forest management prescriptions for each forest stand within MCAS Beaufort. Appendix E provides supporting biological information such as species lists for the Installation, surveys, and studies. Appendix F provides standards and guidelines that will be adhered to during management. Appendix G provides basic practices for natural resources management. Appendix H provides a prescribed fire standard operating procedure. Appendix I provides a biological assessment (BA) completed for the initial implementation of this plan and the 2006 updates to the BA for completion of the 2006 INRMP update. Appendix J provides the Installation's hunting and fishing order.

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 Stations. The Marine Corps's approach for management of natural resources is holistic in that it incorporates an awareness of the broad regional setting in which the Station is located. Appropriate and effective management of natural resources on Marine Corps lands will be achieved in accordance with the principles and practices of ecosystem management.

1.3 Goals of the INRMP

The SAIA directs the DoD to manage its lands in support of the military mission. In light of this requirement, three overall drivers have been used to filter the chosen management schemes. First, the reduction or elimination of collisions between aircraft and animals and support of the flying mission are paramount at the Air Station. Second, support of an improved quality of life for Marines (and their dependents) is the secondary driver at the Air Station and the primary driver at the Laurel Bay Housing Area. Third, Marine Corps and DoD guidance requires the use of ecosystem management to the extent it is compatible with the military mission and mission derived goals. For MCAS Beaufort and the Laurel Bay Housing Area, ecosystem management derived goals will include the maintenance and restoration of natural longleaf pine communities to include the conversion of altered communities to longleaf pine and the eradication or control of invasive exotic plants where practical. This all comes under the heading of providing "natural" forest areas with diverse wildlife and plants, especially those rare and uncommon species usually found only in relatively undisturbed or restored habitats.

Given these drivers, the following goals for specific areas have been derived:

1) Maintain required visibilities and clear zones around the airfield.
2) Maintain the airfield to reduce or eliminate bird and animal strikes.
3) Maintain extremely low fuel loads in and around the weapons storage area by keeping pine straw and brush to a minimum.
4) Maintain a forest buffer around the explosive ordnance disposal area to reduce noise and catch errant shrapnel.
5) Maintain low fuel loads, reduced brush (to reduce biting arthropods), and scenic woods adjacent to housing areas.
6) Remaining woods will be managed for fish & wildlife oriented recreation, commodity extraction, and low pest and fuel loads.
7) Maintain military readiness by protecting and managing endangered and threatened species and other trust natural resources. (This maintains readiness by insuring public confidence in the Marine Corps' ability to protect important natural resources while preparing for defense of the county.)
8) Manage the installation to maintain biodiversity using the principles of ecosystem management.

Under these goals, thirty-six objectives have been developed (Appendix B).

1.4 Implementation of the INRMP

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

Legal Requirements

Legal requirements are laws, executive orders, regulations, directives, and memoranda regarding the protection and management of natural resources (Table 1-1). The INRMP will be updated as legal requirements change. Relevant legal requirements for natural resources management are presented throughout Section 4.

Table 1-1
LEGAL DRIVERS FOR NATURAL RESOURCES MANAGEMENT

Name/Description	Citation
Off-road Vehicle Use	Executive Order 12608
Bald and Golden Eagle Protection Act of 1940	16 USC 668
Clean Air Act	42 USC 7401
Clean Water Act	33 USC 1251, 33 USC 1341
Coastal Zone Management Act	16 USC 1456
Coral Reef Protection	Executive Order 13089
Endangered Species Act	16 USC 1531 & 1536
Environmental Conservation Program	DoD Instruction 4715.3
Erosion Protection Act	33 USC 426
Estuary Protection Act of 1968	16 USC 1221
Farm Land Protection Policy	7 CFR 658
Farmland Protection Policy Act of 1981	7 USC 4201
Federal Insecticide, Fungicide, and Rodenticide Act	7 USC 136
Federal Land Policy and Management Act of 1976	43 USC 1701
Federal Noxious Weed Act of 1974	7 USC 2801
Federal Pest Plant Act	7 USC 150
Fish and Wildlife Conservation Act of 1980	16 USC 2901-2912
Fish and Wildlife Coordination Act, as amended	16 USC 661-666c
Floodplain Management	Executive Order 11988
Greening the Government through Environmental Management	Executive Order 13148
Invasive Species	Executive Order 13112
Magnuson-Stevens Fisheries Conservation and Management Act, as amended	Public Law 94-265
Management of Undesirable Plants of Federal Lands	7 USC 2814
Marine Mammal Protection Act of 1972	16 USC 1361
Migratory Bird Treaty Act	16 USC 703
Military Construction and Authorization Act – Leases, Non-excess Property	10 USC 2667
Military Reservations and Facilities – Hunting, Fishing, and Trapping	10 USC 2671
Multiple-Use Sustained Yield Act of 1960	16 USC 528

Table 1-1
LEGAL DRIVERS FOR NATURAL RESOURCES MANAGEMENT

Name/Description	Citation
National Environmental Policy Act of 1969	42 USC 4321
Natural Resources Management Program	32 CFR 190
North American Wetland Conservation Act	16 USC 4408
Outdoor Recreation – Federal/State Program Act	16 USC 460 P-3
Protection and Enhancement of Environmental Quality	Executive Order 11514
Protection of Wetlands	Executive Order 11990
Recreational Fisheries	Executive Order 12962
Responsibilities of Federal Agencies to Protect Migratory Birds	Executive Order 13186
Rivers and Harbors Act of 1899	33 USC 401
Sikes Act Improvement Act of 1997	16 USC 670
Soil and Water Conservation Act of 1977	16 USC 2001
Soil Conservation Act	16 USC 590
Timber Sales on Military Lands	10 USC 2665
Use of Off-Road Vehicles on DoD Lands	Executive Order 11989
Water Resources Planning Act	42 USC 1962
Watershed Protection and Flood Prevention Act	16 USC 1001, 33 USC 701

Funding

Funding for implementation of the INRMP will come from the Station or Headquarters Marine Corps 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 (MC) Environmental, or other funding to implement DoD mandatory projects, in the timeliest manner possible. Stewardship-type projects will be funded through HQMC, forestry, agricultural outlease, fish and wildlife, Morale, Welfare, and Recreation (MWR), or other fund sources as funding and personnel resources become available.

Implementation Responsibilities

The Commander Officer is directly responsible for operating and maintaining MCAS Beaufort, including the implementation and enforcement of this INRMP. The Commanding Officer is legally liable for complying with the laws involved with implementing this plan.

Management of Natural Resources at the Installation has been assigned to the Logistics Officer. Under the supervision and management of the Logistics Officer, the Natural Resources and Environmental Affairs Officer (NREAO) directs and coordinates the management and maintenance of natural resources at MCAS Beaufort. The NREAO directs a natural resources manager and a conservation officer who work on the natural resources program. Additional staff work on other environmental

programs. Work on the BASH program is carried out in cooperation with members of the Bird Hazard Working Group (BHWG) including the various safety officers, the Air Operations Officer, and the Public Works Officer. (See Appendix C for a detailed BASH plan.)

The Air Operations Department is responsible for coordinating airfield safety to include the control of birds around the airfield in coordination with the NREAO. Two employees of the Department of Agriculture assists both the Air Operations Department and the NREAO with implementing parts of this plan directed at reducing bird strike hazards and deer/aircraft collisions.

The Public Works Department works with the above departments in management of the resources.

Technical Assistance

Technical assistance to MCAS Beaufort 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 ten-year management period of this INRMP, additional cooperative agreements may be implemented.

Technical assistance from organizations outside the DoN will include:

- The United States Fish and Wildlife Service (USFWS) the South Carolina Department of Natural Resources (SCDNR), and The Nature Conservancy (TNC).
- Other government agencies, such as the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), Animal and Plant Health Inspection Service (APHIS) Wildlife Services, USDA Forest Service (USFS); National Park Service, and the U. S. Army Corps of Engineers.
- South Carolina Forestry Commission
- South Carolina Department of Health & Environmental Control's Division of Ocean & Coastal Resource Management

Technical assistance from within DoN will be provided by:

- The Marine Corps Air Station Beaufort's natural resources personnel;
- Foresters, fish and wildlife biologists, and soil conservationists at NAVFAC SE; and
- Additional staff, as needed and subject to funding, to be hired by MCAS Beaufort in order to complete the continuous work for successful implementation of the INRMP.

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;
- Retired military; and
- General Public

Options for supplemental labor resources from within the Station include volunteer civilian and military personnel, and their dependents.

1.5 Approval, Function, Use, and Revision Process of the INRMP

Approval of the INRMP

The INRMP is required to be signature-endorsed by the subject Station's Commanding Officer. According to the SAIA, the INRMP must reflect mutual agreement with the USFWS and the SCDNR. Mutual agreement will concern conservation, protection, and management of fish and wildlife resources, and will be represented by the signing of the appropriate agency representatives or by letter of endorsement.

Function and Use of the INRMP

The INRMP will outline the management of the Station's natural resources for the next ten years. To accomplish this, the INRMP presents long-term management concepts that are consistent with the management of natural resources and fulfillment of the Station's 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 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 existing management plans and programs developed for the Station, including, but not limited to, grounds maintenance and stormwater pollution and prevention**.**

Revision Process

In accordance with the Headquarters Marine Corps Handbook for Preparing, Revising and Implementing Integrated Natural Resources Management Plans, this INRMP will be reviewed on a yearly basis and re-approved every five years. The review process will take into account changes in military mission requirements and 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.

The revision process will be conducted under the direction of the Station Commanding Officer. Revisions will require consultation with and approval by the Commanding Officer, the USFWS, and the SCDNR.

1.6 Necessary Elements of the INRMP Addressed

Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act of 1996 (MSFCMA) requires the National Marine Fisheries Service (NMFS), the regional fishery management councils, and the Secretary of Commerce to 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.

MCAS Beaufort has freshwater wetlands, estuarine emergent wetlands, subtidal and intertidal flats, and oyster reefs, all of which are EFH for a variety of animals during at least one stage of their life cycle. These include brown shrimp, pink shrimp, white shrimp, black sea bass, cobia, gag grouper, and red drum (Orzetti et al. 2011).

The MSFCMA requires federal agencies to consult with NMFS when any activity proposed to be permitted, funded, or undertaken by a federal agency may have adverse impacts on designated EFH's. Impacts on EFH's were considered when preparing this document, and implementation of the plan would not be expected to adversely affect EFH's. Moreover, implementation of the INRMP would be expected to improve water quality and estuarine and marine habitats.

Coral Reefs

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 USMC 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.

Clean Water Action Plan

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 (UWA's) provide the foundation for this approach to restoring and protecting water quality and are vehicles to identify:

- Watersheds that will be targeted to receive significant new resources from the President's fiscal year (FY) 1999 budget and beyond 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 MCAS is located entirely within the Broad St. Helena watershed. According to the EPA's Index of Watershed Indicators, which determines the health of aquatic resources in the United States; in the 2008 report, this watershed has some areas with impaired water quality. This includes the Beaufort River near MCAS Beaufort. Implementation of this INRMP will not adversely affect water quality, but will be expected to protect and enhance water quality on and in areas surrounding the MCAS property.

Bird Air Strike Hazard Reduction

MCAS Beaufort has an active Bird Air Strike Hazard (BASH) program. The Installation uses the resources of Animal and Plant Health Inspection Service's Wildlife Services program to help control birds and other wildlife that are potentially hazardous to aircraft. The Installation's BASH plan is provided as Appendix C.

Critical Habitat

Section 1532 (5) (A) of the Endangered Species Act defines critical habitat for threatened or endangered species. Critical habitat is defined as a specific geographic area that is essential for the conservation of a threatened or endangered species and that may require special management and

protection. On MCAS Beaufort there are no areas designated as critical habitat for threatened or endangered species.

Public Access

In general, public access is restricted for security and safety. Limited access for hunting and special events is authorized by Station instructions when appropriate.

Cultural Resources

This plan is written to comply with the National Historic Preservation Act (NHPA) and the Native American Graves Protection and Repatriation Act (NAGPRA) primarily by compliance with the Installation's Integrated Cultural Resources Management Plan and its guiding laws. Elements of that plan which bear mention here include cultural resources training for Natural Resources personnel, an inadvertent discovery plan, and consultations with Native American Tribes regarding sacred sites, traditional cultural sites, and other items of mutual interest to the Tribes and the Marine Corps.

2 History and Organization

2.1 Location, Setting, History, and Military Mission

The Marine Corps Air Station (MCAS) Beaufort is located in Beaufort County, South Carolina, approximately 50 miles south-southwest of Charleston, South Carolina and approximately 40 miles northeast of Savannah, Georgia (Figure 1).

Beaufort County's population was estimated at 162,233 in 2010. This was a 34% increase since the 2000 census population of 120,937. Beaufort County's population had increased by 40% during the 1990s. Residential and commercial development in Beaufort County is beginning to impair training at the Station.

The MCAS Beaufort operates the facilities that provide a home and a base of operations for Fleet Marine Force units. The installation covers approximately 7,200 acres. As shown in Figure 2, about 5,600 acres are located generally east of U.S. Highway 21 and include the main airfield complex, associated operational facilities and installation housing areas. This area is hereinafter referred to as the Main Station. An additional 400+ acres of the Air Installation Compatible Use Zone (AICUZ) land is located outside of the perimeter fence of the Main Station. About 200 acres of this land is west of U. S. Highway 21 with the remaining 200 acres being northeast of the runways. The remaining 1,100 acres is comprised of the Laurel Bay family housing area, 3 miles west. Laurel Bay contains approximately 1,500 family quarters operated by a contractor under a public-private venture for the benefit of active duty officers and enlisted Beaufort Military complex personnel.

The MCAS Beaufort site was first used as a Naval Air Station during World War II. The field was deactivated in 1946, then reactivated and expanded in 1955, when it was designated as an auxiliary landing field for MCAS Cherry Point, North Carolina. In 1961, the activity was designated a Marine Corps Air Station. Marine Air Group (MAG) 31 was activated at the installation and is still the principal tenant. MAG 31 has six squadrons, of which one is always deployed. With the largest contingent of F/A-18 aircraft on the East Coast, the addition of MAG 31's seventh squadron will result in half of the entire Marine Corps F/A-18 inventory being stationed at MCAS Beaufort.

Currently, the mission of MCAS Beaufort is to administer assigned personnel, to maintain and operate facilities, and to provide services and materials to support operations of a Marine Air Group and

Figure 1. Vicinity Map of MCAS Beaufort.

other activities and units as designated by the Commandant of the Marine Corps, in coordination with the Chief of Naval Operations.

2.2 Overview of Natural Resources Management

MCAS Beaufort had a long-range fish & wildlife management plan as early as 1965. The deer herd was apparently well established by then. The state district biologists believed the deer population was lower in 1973 than at 8 or 10 years prior to that time; yet he still recommended a limited doe harvest that year at both the Main Station and Laurel Bay. The earliest planted pine stands on the Installation were also established in the 1960s. Since that time the Installation has been managed more or less continuously under various long-range management plans. The most recent INRMP was produced in 2001 in response to the SAIA of 1997. It was updated and resigned in 2006 and is currently being revised based upon the 2010 annual review. Typical management actions have included agricultural outleases that included planting, harvesting, and growth of agricultural crops; forest management that includes forest harvest, site preparation, planting, thinning, insect control, etc.; wildlife management that included

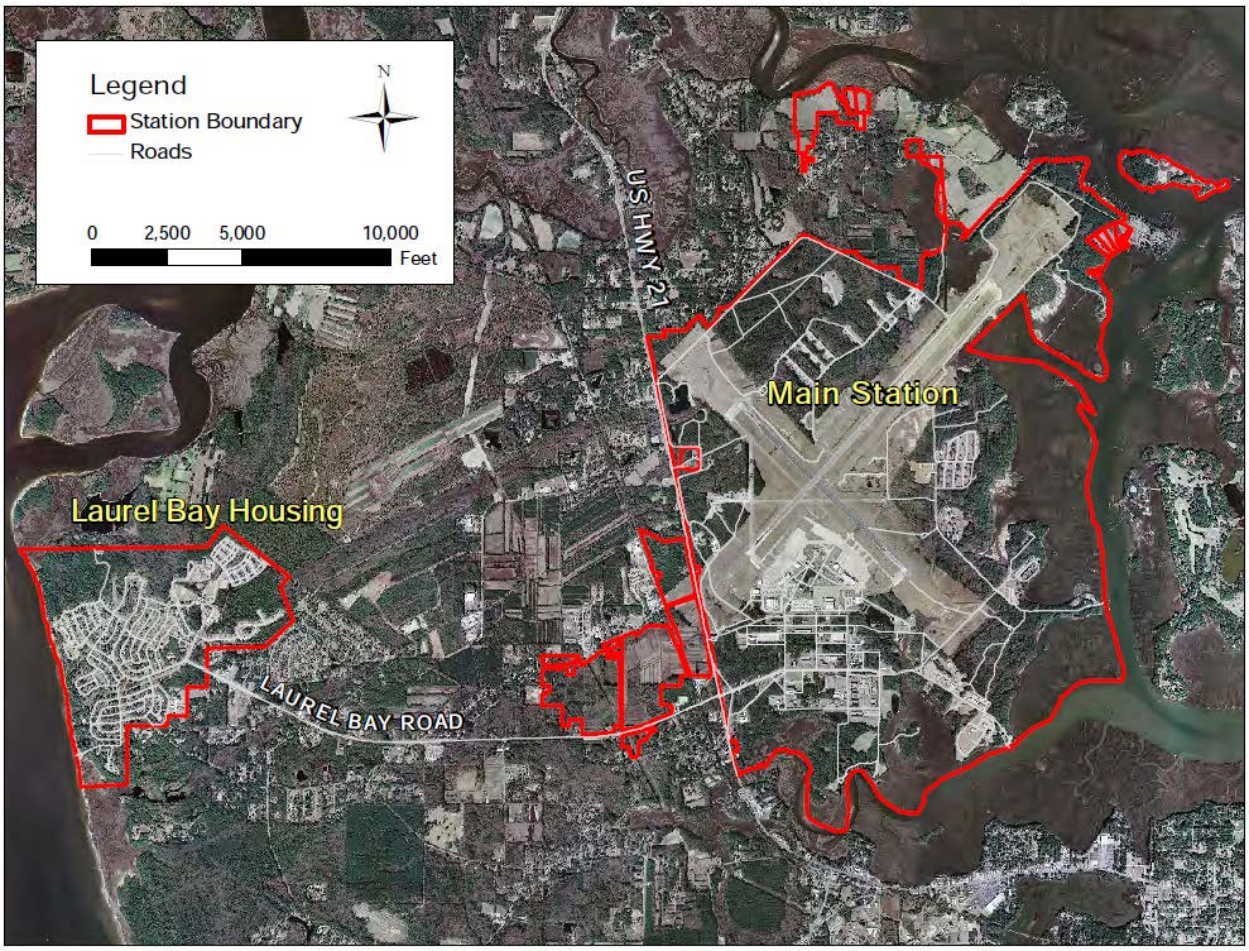

Figure 2. Aerial View of MCAS Beaufort and Surrounding Area.

hunting, habitat enhancement, and baseline species surveys; fish management that included fishing, stocking fish, fertilizing ponds, pond construction, and manipulation; and outdoor recreation management that included construction of observation platforms, boat ramps, nature trails, etc. The existing conditions of various resources are further described in Section 3 below.

2.3 Stakeholders and Partnerships

Stakeholders are those organizations or individuals who have a vested interest in land management on the Station. MCAS Beaufort recognizes that it is important to participate with the surrounding community and to maintain communication between the Station and the community. In addition, these efforts complement the overall philosophy of actively partnering with and sharing information and resources with other resource management agencies and organizations, including federal, state, or local government agencies, and non-governmental organizations.

Management of natural resources on MCAS Beaufort will be conducted in cooperation with the USFWS, the SCDNR, the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), United States Forest Service (USFS), and Animal and Plant Health Inspection Service (APHIS), the United States Army Corps of Engineers (USACE), The Environmental Protection Agency (EPA), Native American Tribes (Nations) and private individuals and groups interested in the Station's natural resources. In accordance with the SAIA, the SCDNR and USFWS will approve portions of the plan for which they have statutory authority. The Station already has a long history of cooperation with these two agencies including a Cooperative Agreement for Conservation and Development of Fish and Wildlife Resources on the Station, which was initiated in 1982. During the next five years, cooperation will continue and new partnerships may be forged as opportunities permit.

A number of defense organizations, federal agencies, and state agencies have an interest or a role in the management of the natural resources at MCAS Beaufort. The involvement of these agencies is based on signatory responsibilities, cooperative agreements, regulatory authority, and technical assistance as required by federal and state laws and regulations. The agencies and their roles are as follows:

- **Naval Facilities Engineering Command, Southeast (NAVFAC SE).** NAVFAC SE is the major Navy command assisting MCAS Beaufort in developing and implementing conservation programs.
- **United States Department of the Interior (DoI) USFWS.** USFWS provides signatory agreement concerning the conservation, protection, and management of the fish and wildlife resources presented in the INRMP. USFWS is the principal federal agency for issues regarding fish and wildlife management, as well as the regulatory authority for the Endangered Species Act (ESA) of 1973 and the Migratory Bird Treaty Act (I 6 U.S.C. 703-711).
- **South Carolina Department of Natural Resources (SCDNR).** SCDNR provides signatory agreement concerning the conservation, protection, and management of the fish and wildlife resources presented in the INRMP. SCDNR is the primary state agency in South Carolina for issues regarding fish and wildlife management and state-listed threatened and endangered species, as well as the regulatory and enforcement authority for hunting, fishing, and trapping. SCDNR is also a consulting agency under the Fish and Wildlife Coordination Act (16 U.S.C. 662).
- **United States Department of Agriculture Natural Resources Conservation Services (NRCS).** The NRCS works in cooperation with MCAS Beaufort to protect and enhance Station lands by preventing soil erosion, restoring eroded areas, maintaining vegetative cover, protecting watersheds, providing pest management and wildlife habitat management, and reducing downstream impacts both on and off military lands.
- **United States Department of Agriculture United States Forest Service (USFS).** The USFS provides technical assistance for control and prevention of forest insect and disease outbreaks.

- **United States Department of Agriculture Animal and Plant Health Inspection Service (APHIS).** The APHIS is responsible for protecting animal health, animal welfare, and plant health. APHIS is the lead agency for collaboration with other agencies to protect U.S. agriculture from invasive pests and diseases provides technical assistance for control and prevention of forest insect and disease outbreaks.
- **Environmental Protection Agency (EPA).** The EPA provides limited assistance on wetland delineations and regarding federally listed threatened and endangered species.
- **United States Army Corps of Engineers (USACE).** The USACE provides technical assistance and permitting for flood control, water management, navigation, wetlands, shoreline protection, and cultural resources issues, as well as regulatory authority for jurisdictional wetlands and waters of the United States.
- **South Carolina Department of Health and Environmental Control (SCDHEC).** Provides regulation and protection by the State for South Carolina's waters and other environmental concerns.

2.4 Plans, Programs, and Studies

This section addresses existing plans and programs developed for MCAS Beaufort outside the natural resources program. These plans 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.

Storm Water Plan

The 1987 CWA amendments establish greater regulation of stormwater discharges. Stormwater discharges from a point source are subject to NPDES permitting if the discharges are associated with industrial activity or are specifically identified as contributing to a violation of water quality standards. EPA and state stormwater discharge permit regulations require a NPDES permittee to prepare and implement a Stormwater Pollution and Prevention Plan (SWPPP).

This INRMP is consistent with MCAS Beaufort's SWPPP.

Pollution Prevention Plan

MCAS Beaufort has developed a pollution prevention (P2) program to eliminate or reduce the use of unnecessary or environmentally unsound materials or processes in facility operations. The P2 Plan has been prepared to help the Station manage its pollution prevention program, particularly in the area of hazardous materials. The P2 Plan presents the Station's pollution prevention goals, describes current work Station activities or shop processes, summarizes information on hazardous materials usage and hazardous waste generation, incorporates guidance on plan management and administration, and outlines a P2 participation program for all base personnel. The P2 Plan is reviewed and updated every 3 years.

Hazardous Waste (HW)

MCAS Beaufort has a Hazardous Waste Management Plan and is a conditionally exempt small quantities generator of hazardous waste. The Hazardous Waste Management Plan for MCAS Beaufort identifies responsibilities, requirements and procedures for proper identification, labeling, storage, and management of hazardous waste in compliance with State of South Carolina and EPA laws and regulations. The requirements of the plan apply to all departments, tenants, and contractors performing operations on the Station that generate hazardous waste. The natural resources program is not involved in programs pertaining to hazardous waste management.

Land Use and Development Plan

The Land Use and Development Plan for MCAS Beaufort provides a framework for orderly development of the Installation. This plan essentially consists of a four-phased analysis. First, existing land use conditions and environmental and man-made constraints to development are identified, described, and mapped. Second, each constraint is weighed based on the type of limitation it may pose on potential development, then like categories are compiled. The results are then compared against existing development to identify areas of preferred, high, limited, and restricted development potential. Third, proposed projects affecting future land use are identified, described, and mapped. Fourth, an ultimate development vision for the planning horizon of the plan (seven years) is provided. Incompatible land uses are identified and recommendations are made for the resolution of those incompatibilities.

Pest Management

The Public Works Department provides pest control support for MCAS Beaufort through implementation of its Pest Management Plan (PMP). The PMP outlines the following pest control support:

- Prolonging the life of the all structures through subterranean termite control;
- Maintaining the safety/security of industrial/storage areas, ammunition storage areas and railroads through weed control;
- Providing nuisance pest control to all buildings and housing areas to insure a good working and living environment;
- Controlling weed and insect pests in all recreational and lawn areas to maintain aesthetics and provide recreational facilities to personnel;

- Providing control of mosquitoes, Culicoides, flies and other potential disease vectors to insure the comfort and well being of all personnel;
- Providing vertebrate pest control, including rodent control, to all areas of the base. This includes controlling birds in and around Operations buildings and warehouses, where they interfere with mission essential work.

Pest management typically is not a natural resources program; however natural resources management is linked to pest management. Pesticides used in the Pest Management Program may have an impact on natural resources -- specifically on wetlands and water quality. The improper use of pesticides can lead to serious damage to both plant and animal life; therefore, type and quantity of pesticides used in the Pest Management Program are limited to ensure minimal negative impacts to natural resources. To avoid damage to natural resources, pesticide applications in the vicinity of natural resources areas (e.g. urban forest areas, wetlands) will be consistent with this INRMP and approved by the NRM. Pesticide use is controlled by DoD Instruction 4150.7. Common pesticides used include glyphosate for brush control along roads or in right-of-ways and acephate and hydromethylnon for control of fire ants and other arthropod pest. Herbicides, especially glyphosate will also be used to control invasive plants under this plan and the Station Pest Management Plan.

Use of pesticides is restricted based on a Biological Assessment made for implementation of this plan in 2001. The BA is provided in Appendix I.

Grounds Maintenance Program

Grounds maintenance is provided by the Public Works Department via contracts to private companies.

Integrated Cultural Resources Management Plan

MCAS Beaufort's Integrated Cultural Resources Management Plan (ICRMP) was completed in 2001 and updated in 2006. The State Historic Preservation Office (SHPO) has approved the plan. The ICRMP addresses a variety of cultural resources issues, but it interfaces with this INRMP primarily in how the natural resources management addresses ground disturbing activities that may impact cultural resources and in how the natural resources manager consults with Native Americans when issues of mutual concern and interest occur. Work completed under this INRMP will comply with commitments and methods prescribed in the ICRMP, with a programmatic agreement between the Installation, the SHPO and the Advisory Council on Historic Preservation. Work completed under this INRMP will also comply with several existing and planned Memoranda of Agreement between the Installation and specific Native American Tribes. These memoranda, agreements, and plans are all designed to ensure the

Installation complies with the National Historic Preservation Act and the Native American Graves Protection and Repatriation Act while complying with the natural resources laws that require this plan.

3 Existing Environment

3.1 Climate and Air Quality

Climate

Climatic conditions at MCAS are influenced by several different weather patterns during the year. Generally, weather conditions are mild, average temperatures are around 70 degrees Fahrenheit (^{o}F), and humidity ranges between 70 and 80 percent. The coldest month of the year is typically January, while the warmest months are July and August. Table 3-1 summarizes the average temperatures and rainfall in the Beaufort Area. Hurricane season runs from June through November; while rare, major hurricanes do occasionally strike the southern South Carolina Coast.

Table 3-1
MONTHLY CLIMATE LOWS, HIGHS AND AVERAGES FOR BEAUFORT, SOUTH CAROLINA

	Avg. High	Avg. Low	Mean	Avg. Precipitation
January	58°F	39°F	49°F	4.00 in
February	62°F	42°F	52°F	3.12 in
March	69°F	48°F	59°F	3.58 in
April	76°F	55°F	65°F	3.07 in
May	83°F	63°F	73°F	3.01 in
June	88°F	70°F	79°F	5.64 in
July	91°F	74°F	83°F	5.67 in
August	89°F	73°F	81°F	6.57 in
September	85°F	69°F	77°F	5.06 in
October	77°F	57°F	67°F	3.12 in
November	69°F	49°F	59°F	2.47 in
December	61°F	42°F	51°F	3.26 in

Source: http//.www.weather.com

Air Quality

The MCAS Beaufort is located in South Carolina air quality control region 058, which is classified as an attainment area (meets all National Ambient Air Quality Standards). Because the region is an attainment area, an air quality conformity determination under 40 CFR Part 93 is not required for the implementation of this plan.

The only emissions sources resulting from the natural resources management program are prescribed fire, wild fires, and motor vehicles. The vehicles operated by the natural resources program and the vehicles operated by resource users are minor mobile sources. The major potential for air quality impacts comes from woods fires, both prescribed and wild. The greatest air quality concerns from woods fires are particulate matter and carbon monoxide. Since prescribed fires are only set under predetermined conditions that have been chosen to reduce the drift of smoke across occupied land, prescribed fires generally produce less air quality problems than wild fires. These same conditions also reduce safety concerns associated with smoke drifting across roads and obstructing visibility.

All prescribed fires at MCAS Beaufort have been set in accordance with guidance established by the state forestry commission to alleviate both air quality and safety concerns.

Prescribed fires at MCAS Beaufort have burned about 300 acres annually over the last several years. Only 1 wildfire has occurred since 1988; about 35 acres of underbrush burned with an insignificant loss of marketable timber.

3.2 Coastal Resources

The Coastal Zone Management Act (CZMA) of 1972 (16 U.S. Code [USC] 1451 et seq.), as amended, encourages states to preserve, protect, develop, and, where possible, restore or enhance valuable natural coastal resources such as wetlands, floodplains, estuaries, beaches, dunes, barrier islands, and coral reefs, as well as the fish and wildlife using those habitats. Under the CZMA, the Marine Corps is obligated to ensure that any of its activities that would directly affect or that would be conducted in the coastal zone are carried out in a manner that is, to the maximum extent practicable, consistent with approved coastal zone management programs.

South Carolina has adopted a Coastal Zone Management Plan (CZMP). The Secretary of the United States Department of Commerce approved South Carolina's CZMP under the CZMA. This INRMP is consistent with South Carolina's CZMP.

3.3 Physiography, Geology, and Topography

Beaufort County is generally low and gentle to flat with a series of ancient marine terraces. Elevations within the county range from sea level to approximately 100 feet above mean sea level (msl) in the northwestern corner of the county. Over 50 percent of the area has elevations of less than 42 feet. About 19.5 percent of the county is flooded daily or occasionally by salt water (USDA 1980).

Geology

The MCAS and the surrounding vicinity fall within the outer coastal plain of southeast South Carolina. In general, the surface and near surface deposits in this division consist of limestone, shell,

sand, and clay. Most of the dry land is part of either the Pamlico terrace (from 0 to 25 feet above msl) or Talbot terrace (25 to 42 feet above msl).

Topography

The MCAS Beaufort is located between the Broad and Beaufort Rivers in Beaufort County, which lies in southeast South Carolina. Land elevations on MCAS Beaufort range from msl to 37 feet above msl The area is generally flat with broad ridges and shallow valleys.

3.4 Soils, Cropland, and Developed Areas

Soils

The USGS has mapped 24 soil types at MCAS Beaufort (Figures 3 & 4). These soils can be categorized into three general soil classifications. The Bohicket-Capers-Handsboro soils, covering 40 percent of the installation, are poorly drained with a high organic content, and have periodic flooding. This soil group has severe limitations that make certain uses not recommended. The Coosaw-Williman-Ridgeland soils and the Wando-Seabrook-Seewee soils, covering 60 percent of the installation, are loamy soils and somewhat poorly drained. Because of the seasonal high water table associated with these soils, there is moderate limitation for certain other uses. Although construction and use of the land are feasible, special designs and land use plans may be needed. A large portion of the installation has cohesively undrained soils. The presence of soils with seasonal high water table affects the types of wildlife as well as the quality of habitat for wildlife present. Wetland areas provide needed sources of water for wildlife. The seasonal high water table affects the type of trees that will grow, as well as the productivity of selected types of trees. Poorly drained soils are suitable for agriculture only through artificial drainage. Poorly drained soils affect the type and intensity of recreational activities possible. The seasonal high water table associated with all the soils on the installation presents a constraint for agricultural use, building construction, and most land uses requiring heavy equipment. Over the years, significant portions of these soils have been drained by ditches and underground pipes. Drainage for one use, such as agriculture or urban use, alters the physical characteristics of a soil and impacts its capabilities for other uses, such as wildlife.

Agricultural Outlease

Approximately 116 acres of the installation was in an agricultural outleasing program until 2006. The lands were acquired from 1989 to 1992 for safety and were in vegetable crops at that time. The outlease program was started immediately upon acquisition of the land.

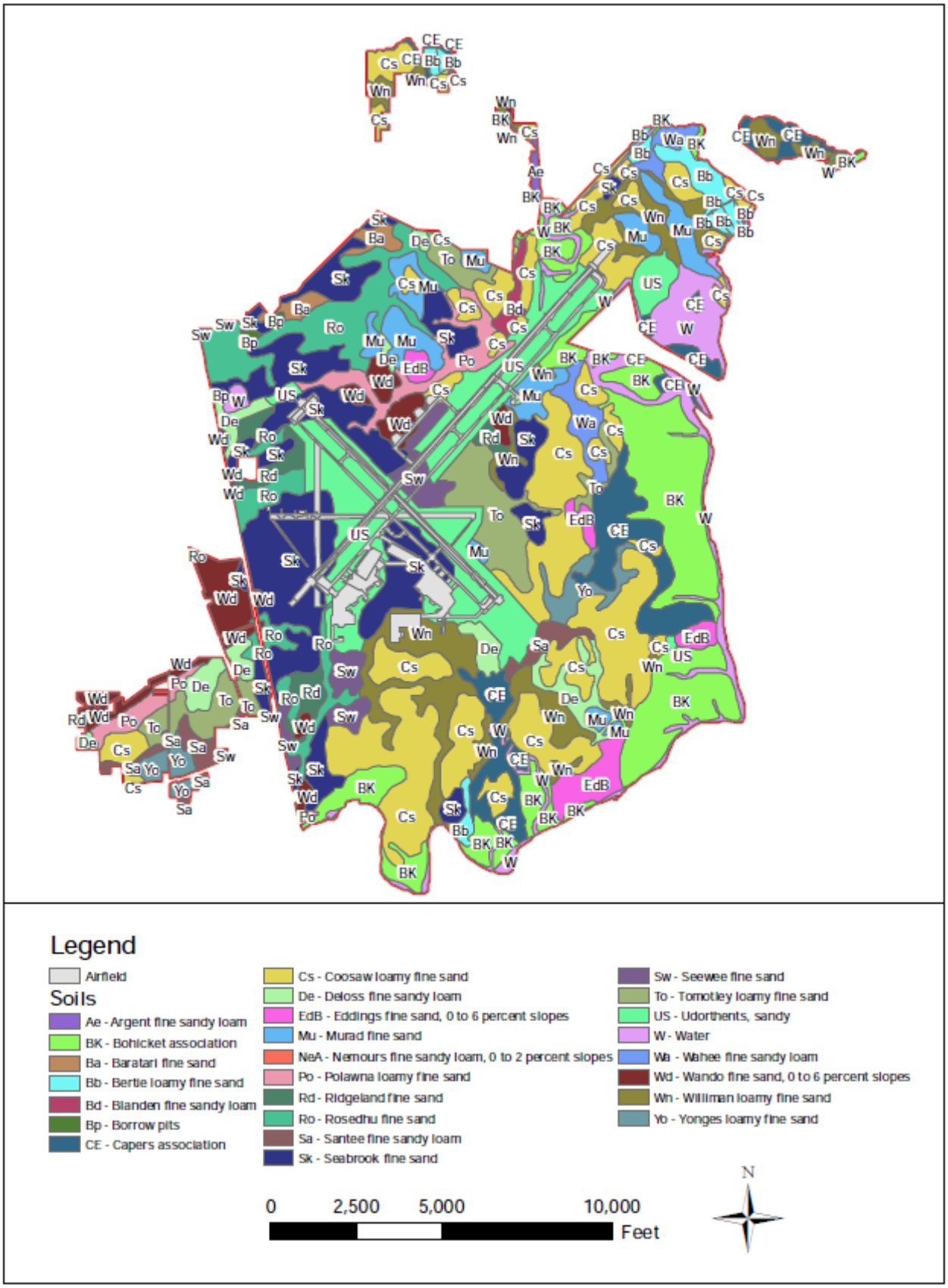

Figure 3. Main Station Soil Types.

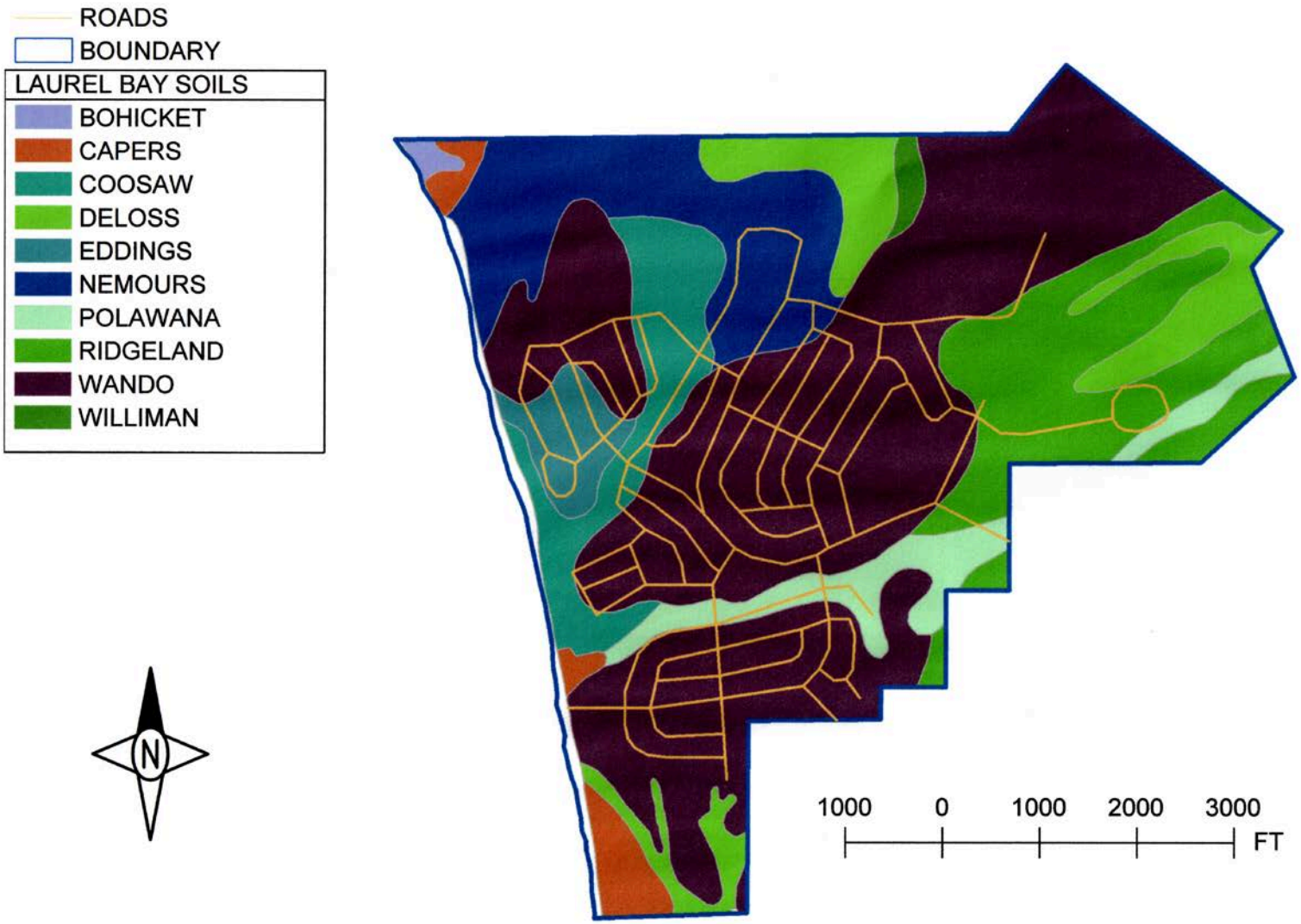

Figure 4. Laurel Bay Soil Types.

Vegetable farming was the only agricultural outlease use, and a five-year lease was established with a local agricultural producer in January 1999. The outlease was put out for new bids and reissued in 2005, but the area was not farmed after that. Agricultural outleasing of the land helped reduce maintenance cost to the installation, and earned revenues for the installation that were used to support other natural resources programs and benefit the local economy. The primary constraints for agricultural use of the land are drainage associated with high seasonal water tables, and wind erosion associated with strong winds after the soil has dried. Conservation practices for agricultural use of the land include drainage systems (maintenance of existing ditches), conservation cover crops, mulching, and wind breaks.

In spite of these benefits and past successes, the lessee stopped planting the fields and a new lessee has not been found. Given that the outlease is formerly drained wetlands and that leaving these fields and associated drainage structures unmaintained will ultimately allow the area to become a wetland again, the Station has moved ahead with a plan to control this process in order to create a flow-through forested wetland. This will provide a high quality wetland while minimizing the potential for attracting birds that would be hazardous to aircraft.

Maintained Areas

The maintained areas consist primarily of the airfield and the urban/production area. The airfield contains the aircraft landing strips and surrounding grassed clear zone areas. The urban/production area contains administrative buildings, facility maintenance structures, aircraft hangers, other operational structures, and personnel housing. These areas primarily are located where soils with the least natural limitations to construction are located. Though most of the land in the urban area is developed, there are still small parcels that remain as open land, small wetland areas, or urban forest patches. Other than the buildings and transportation infrastructure, the urban area is covered with manicured lawn grasses and landscaping materials such as shrubbery and trees. Other than the paved runways, taxiways, and aprons, the airfield consists almost totally of grassed areas containing Bahia grass, Bermuda grass, native grasses, and a few small wetland areas. A grounds maintenance program for the airfield and urban area provides for regular mowing of the grass and pruning of shrubbery. The primary natural resources management issues for the developed area are BASH reduction, wildlife habitat conservation, and wetlands/water quality protection, urban forestry, grounds maintenance, and integrated pest management. Approximately 2,423 acres of the installation are maintained, about 1,063 of which comprise the airfield.

Pesticide use is covered under a separate pest management plan not covered in this document and is controlled by DoD Instruction 4150.07 as well as cognizant federal laws and regulations. The most common pesticide used outside of developed areas is glyphosate for brush control along roads or in right-of-ways and elimination of invasive plants. Because of DoD initiatives to reduce pesticide use, overall pesticide use is low.

3.5 Hydrology

Both the Main Station and Laurel Bay abut substantial tidal marsh and rivers. Brickyard, Albergottie, Salt, Mulligan, and McCauley Creeks drain the Main Station into the Beaufort River and Port Royal Sound or (less commonly) into Whale Branch, the Coosaw River, and St. Helena Sound. Laurel Bay drains into the Broad River, which also drains into Port Royal Sound and into Whale Branch which discharges into both St. Helena Sound via the Coosaw River and into the Broad River. All of these lands and waters are in the Broad-St. Helena Watershed (USGS Cataloging Unit 03050208).

The only permanent freshwater on the Installation consists of the two managed ponds and two stormwater retention basins. With the exception of these small manmade ponds, all surface freshwater on the Installation is intermittent in nature even though some streams and ponds only go dry during extreme drought. The ponds are described below under fisheries resources and fish and wildlife oriented recreation.

The Installation has been ditched which has altered surface hydrology generally by drying out the soils of wetland areas. There are also many roads that impede surface flow and make areas wetter. Consequently, as with much of the county, the hydrology has been complicated by human activities.

Wetlands

Wetlands are considered transitional zones between the terrestrial and aquatic environments. Physical, chemical, and biological features indicative of hydrological conditions characterize these areas. Wetlands serve as a valuable resource for groundwater recharge within the region and are currently regulated by USACE under Section 404 of the Clean Water Act (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."

The MCAS Beaufort contains both freshwater and estuarine wetlands. A jurisdictional wetland survey was completed and was approved by the Army Corps of Engineers in 2008. Most of the large wetlands are estuarine and occur along Brickyard and Albergottie Creeks. The smaller freshwater wetlands consist of both the forested and non-forested types and are harder to identify. Current, approximate wetland acreages for Laurel Bay are 44 acres of non-alluvial swamp forest, 1 acre of small stream forest, and 1 acre of salt marsh. The Main Station has approximately 80 acres of non-alluvial swamp forest, 53 acres of pocosin, 26 acres of small stream forest, 21 acres of salt marsh, 12 acres of upland borrow pit, 11 acres of jurisdictional pond, 9 acres of maritime wetland forest, and 7 acres of depression meadow. The agricultural outlease has 33 acres of non-alluvial swamp forest and less than a quarter-acre of small stream forest. The exact amount of estuarine wetlands controlled by the Installation

is uncertain since the title to estuarine wetlands must be researched to be sure the land is actually owned by the titleholder rather than the state.

The estuarine wetlands are composed predominately of smooth cordgrass. At higher elevations near the islands, the smooth cordgrass becomes progressively less vigorous and small sandy flats and saltmeadow areas exist. The predominant vegetation in these areas includes black needlerush, wiregrass, sea oxeye, and other species. Other species include various bulrushes and sedges. In addition to providing primary productivity and serving as an erosion buffer, these marsh areas also provide habitat for several species of rails, blackbirds, wading birds, raccoons, otter, alligators, osprey and bald eagles. The creeks and rivers within the marsh and the waters adjacent to the property support a wide diversity of marine and estuarine fishes; including flounder, sheepshead, black drum, black sea bass, pinfish, croaker, spotted seatrout, red drum, whiting, rock bass, mullet, ladyfish, and immature stages of many other species. The adjacent waters also contain oysters, hard clams, shrimp, and blue crabs.

The freshwater wetlands on the Installation include wet flatwoods with deeper ponds and hardwood forest along intermittent streams and in basins (areas with only intermittent outlets). The flatwoods and associated ponds have an overstory of slash, longleaf, or loblolly pine; pond cypress; blackgum; and red maple. The midstory, when present, consist primarily of smaller individuals of the overstory species. The shrub layer is dominated by bitter gallberry, fetterbush, and leucothoe with an occasional pondspice and even less frequent pond berry. The usually dense herbaceous layer varies between wetlands, but grasses and sedges dominant with other herbaceous species intermixed. These areas provide numerous breeding grounds for amphibians, especially tree frogs and salamanders. Due to the long history of human occupation, most of the wetlands on the Installation have an altered hydrology brought about by drainage and damming (from roads and forest wind rows).

Groundwater

Two groundwater aquifers are present in the region; a shallow unconfined aquifer and a deep confined aquifer (Floridan Aquifer). The shallow unconfined aquifer consists of approximately 40 to 60 feet of Pleistocene-age sands above the limestone bedrock aquifer and is generally permeable. The rate of groundwater flow in the shallow aquifer generally ranges from 0.2 to 1.2 feet per day.

The Floridan Aquifer extends continuously from South Carolina into Florida. This aquifer is the most important source of groundwater in the lowcountry of South Carolina. The area around MCAS Beaufort has been identified as a recharge zone for the Floridan Aquifer since there is often no confining layer between the surficial aquifer and the Floridan Aquifer at MCAS Beaufort.

Floodplains

The Federal Emergency Management Agency (FEMA) defines floodplains as areas subject to a one (1) percent or greater chance of flooding in any given year. Floodplains are low, relatively flat areas adjoining inland and coastal waters. Extensive floodplain areas exist in the Beaufort area because of its slight elevation above sea level and the relatively flat topographic relief of the land surface. Areas predicted to be subject to a 100-year flood event on MCAS Beaufort include much of the eastern portion of the Installation (Figures 5 & 6).

3.6 Vegetation

Managed pine forest is the dominant habitat found on the Installation. Nelson (1986) would refer to these habitats as either pine flatwoods or pine savannah. Pine forests compose approximately 58% (1,152 acres) of the forested acreage. Slash and loblolly pines are the major species present but longleaf pine occurs in some areas. When the existing slash and loblolly pine stands were established on the Main Station, the woody debris in the planted areas was pushed into windrows. This resulted in rows of hardwood trees -- mostly sweet gum, red maple, and black cherry -- being established in the planted pine stands. These areas reduce pine production, provide mast for wildlife, and provide refugia for amphibians and reptiles. They also harbor many invasive plants such as Chinese privet, Chinese tallowtree, and Chinaberry.

The pure hardwood habitat comprises about 330 acres of the forested acres. Nelson would refer to these habitats as mixed-mesophytic hardwoods. The dominant hardwood species present are oak, (water, live, and willow), sweetgum, and pecan trees. Several stands, while by no means pristine, are relatively old having originated in the 1910's, 1920's, and 1930's. One small area at Laurel Bay has a remnant beech woods.

About 25% (493 acres) are mixed pine-hardwood types, which have neither hardwoods nor pines dominating the crown. Many of these stands have discrete inclusions of hardwoods that are relatively old, also having originated in the 1910's, 1920's, and 1930's. The mixed pine/hardwood forest can be very productive for timber and wildlife, especially deer. The large, old hardwoods are also excellent habitat for several uncommon or rare bat species and cavity nesting birds. These areas further add to the Installation's biological diversity by having plants not found in other habitats.

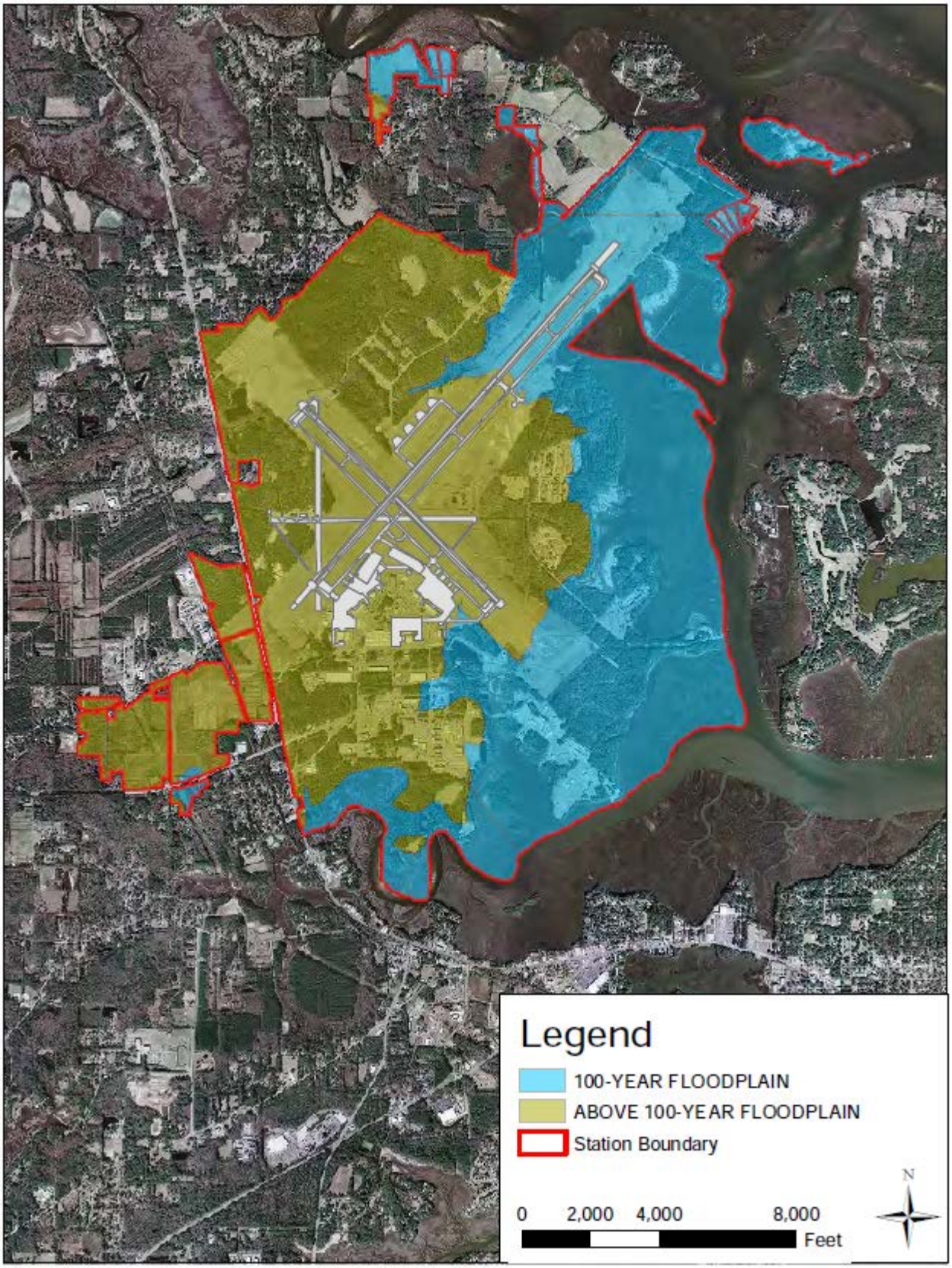

Figure 5. Main Station Flood Plain.

Figure 6. Laurel Bay Flood Plain.

The old longleaf stand, hardwood stands and mixed pine/hardwood stands are remnants of forest communities that show much less evidence of human disturbance than the remainder of the Installation. These areas presumably exhibit more characteristics of natural communities than the more intensively altered pine stands and developed areas. The areas also have a few species of plants and animals not located elsewhere on the Installation. Examples include Crane Fly Orchid (*Tipularia discolor*) at the beech forest site and Southeastern myotis in the old hardwood areas. Another area of uncommon vegetation is on the AICUZ lands adjacent to U. S. Highway 21. This area has a small area of sandy, dry open woods with xeric sandhill species with some small wetlands that have the uncommon pond spice (*Litsea aestivalis*).

Plant species identified at MCAS Beaufort are listed in Appendix E.

Invasive Species

Species can be categorized as invasive, exotic, and native, and/or native and invasive. Invasive species are alien species whose introduction does, or is likely to, cause economic or environmental harm or harm to human health. In natural areas, the definition of invasive species is expanded to include aggressive plants that produce a significant change in terms of composition, structure, or ecosystem functions (Cronk and Fuller 1995). Executive Order 13112, Invasive Species, of February 3, 1999 requires executive agents to restrict the introduction of exotic organisms into natural ecosystems. 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.

The Federal Noxious Weed Act of 1974 (7 U.S.C. 2801-2814) provides for the control and eradication of noxious weeds and their regulation in 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 (*Pueraria lobata Dc*)" (7 U.S.C. 2802 (c)).

The following species occur on or near MCAS BEAUFORT and are considered exotic and invasive:

- Mimosa (*Albizia julibrissin*), a native of Asia, is an ornamental that has escaped and become naturalized in the southeastern United States. It is found mainly along roadsides, disturbed areas, and edges of forests.
- Giant Cane (*Arundo donax*) is a tall, perennial grass that can grow to over 20 feet in height. It becomes established in moist places such as ditches, streams, and riverbanks, growing best in well drained soils where abundant moisture is available.

- Chinese tallow or popcorn tree (*Sapium sebiferum*) tends to take over large areas, mainly areas with wet soils, but can thrive in upland areas as well. It can survive in both poorly drained freshwater and saline soils. It has the capacity to dominate wetland areas.

- Chinese privet (*Ligustrum sinese*) generally occurs on open disturbed sites and is difficult to control in wetland areas.

- Rattlebox (*Sesbania punicea*) is a deciduous shrub or small tree, up to 4 meters tall generally found in moist soil areas.

- Common reed (*Phragmites australis*) thrives in shallow water and wet soils. It has spread throughout Gulf and Atlantic coast marshes in the United States in the past 30 years.

- Saltcedar (*Tamarisk sp.)* is a large shrub or small tree that was introduced to North America from the Middle East in the early 1800s. It continues to spread rapidly and currently infests water drainages and wet areas.

- Misc. aquatic weeds (*Eichhornia spp*. and *Alternanthera spp*.) can degrade water quality and dramatically alter native plant and animal communities.

- Mole crickets (*Scapteriscus borellii*) damage turf and pasture grasses mainly by tunneling (because it is largely carnivorous and feeds on soil-inhabiting insects).

- Fire ants (*Solenopsis* spp.) include many opportunistic ant species, both exotic and native. Fire ants are present throughout MCAS Beaufort..

An invasive plant survey and management plan was completed in 2005 and is provided in Appendix E. Given that one goal of this INRMP is to maintain native biodiversity, MCAS Beaufort has a serious invasive plant problem. Chinese privet (also called Ligustrum) and Chinese tallowtree (also called popcorn tree) were the worst invaders. In many areas Chinese privet is the dominant woody shrub, and Chinese tallowtree is the dominant tree. Control has been initiated using herbicides and limited pulling of seedlings, but the problem is severe and will take years to get under control.

3.7 Wildlife

General

The Installation's wildlife is typical of South Carolina's outer coastal plain. (Lists of vertebrate species encountered at the Main Station and Laurel Bay over the years are provided in Appendix E). Rare, threatened, and endangered species are discussed below. The most common large mammal on the Installation is the white-tailed deer. Deer and other game species are hunted in accordance with state regulations. Comprehensive surveys to develop complete species list of the Installation have not been completed so the lists do not represent the entire suite of vertebrate species using the Installation.

Common amphibians found at MCAS Beaufort include slimy, dwarf, and mole salamanders; green, pinewoods, and squirrel, treefrogs; spring peeper; ornate chorus frog; Southern, Eastern spadefoot, and Eastern narrowmouth toads, and Southern leopard frog. Common reptiles found at MCAS Beaufort include turtles; green anole; Southeastern five-lined, broad head, and ground skink; Eastern glass lizard; black racer, and banded water snake. Common birds found at MCAS Beaufort include pied-billed grebe, double-crested cormorant, herons, egrets, wood duck, osprey, red-tailed hawk, American kestrel, clapper rail, killdeer, laughing gull, ring-billed gull, mourning dove, chimney swift, belted kingfisher, red-bellied woodpecker, downy woodpecker, Northern flicker, Eastern wood-peewee, great-crested flycatcher, Eastern kingbird, white-eyed vireo, red-eyed vireo, blue jay, American crow, fish crow, purple martin, tree swallow, barn swallow, Carolina chickadee, tufted titmouse, brown-headed nuthatch, Carolina wren, wood thrush, hermit thrush, brown thrasher, Northern mockingbird, European starling, American pipit, yellow-rumped warbler, yellow-throated warbler, pine warbler, summer tanager, Eastern towhee, white-throated sparrow, northern cardinal, red-winged blackbird, and common grackle. Common mammals found at MCAS Beaufort include shrews, moles, red bat, evening bat, gray squirrel, mice, rats, gray fox, river otter, bobcat, and white-tailed deer.

Game Species

The MCAS Beaufort allows harvest of game species in accordance with state and federal regulations except where hunting is restricted by Installation instructions. Bear, duck, and turkey hunting are not permitted on the Installation. Deer, rabbits, and squirrels are common on the Installation. Fields for hunting dove are not available at Laurel Bay or within the fenced portion of the Main Station. Unfenced fields west of U. S. Highway 21 are leased to the public for growing crops and are not available for hunting. While furbearers (fox, bobcat, mustelids, etc.) are present on the Installation, trapping is not authorized on the Installation.

White-tailed deer are the most sought after game on the Installation. They occupy both forest and non-forest habitats. Habitat on the installation has been enhanced by thinning forest stands and prescribed burns. In addition, food plots and power line clearings provide additional forage for resident deer and other wildlife. The varied habitat types available on MCAS Beaufort provide cover and a diverse food supply during all seasons of the year. The sex, weight, and age of harvested deer are recorded for all deer harvested on the installation. In addition, the circumference of the antlers and the number of points on all harvested bucks are recorded to measure hunter satisfaction. This information is provided to the SCDNR, which then issues doe tags allowing the harvest of female deer to maintain a low deer population. This maintains deer herd health and reduces the potential for deer/aircraft collisions on runways. If deer become a problem along runways, the Installation obtains a permit to kill enough deer to resume safe operating conditions for the airfield.

Harvest numbers and weights have been low in recent years. The latest recommendations from state biologists have been to increase the harvest to improve herd health and decrease the possibility of deer/aircraft collisions.

3.8 Threatened and Endangered Species

The Station funded a rare species survey in 1991 and 1992 and updated that survey in 1998 and 1999 as part of completing the last IMRMP. Table 3-4 provides a list of rare, threatened, and endangered species that occur or may occur on MCAS Beaufort. Only five of these species have been confirmed on the Station. The American alligator, which is only listed due to its similarity of appearance to other crocodilians, is fairly common in the permanent and semi-permanent freshwater wetlands on the Installation. The bald eagle, protected by the Bald and Golden Eagle Protection Act, has been observed nesting at Jack Island (part of the MCAS complex) and just north of Laurel Bay (Figure 7) while the federally-endangered wood stork has been observed flying over Laurel Bay. The southeastern myotis has been captured at Laurel Bay by state biologist. Finally, one federally-listed plant species, Pondberry, has been located at four distinct locations, all in the northern portion of the Station, near the unexploded ordnance disposal area (Figure 8). The plants grow in colonies at the upper edge of frequently flooded areas of pine flatwoods. The four sites have 6 distinct colonies.

Critical Habitat

Section 1532 (5) (A) of the ESA defines critical habitat for threatened or endangered species. There are no areas designated as critical habitat for threatened or endangered species on MCAS Beaufort.

3.9 Bird Aircraft Strike Hazards

MCAS Beaufort has the potential for serious safety problems caused by aircraft and birds utilizing the same airspace. To ameliorate this problem, MCAS Beaufort employs a full time biologist and wildlife specialist to assess and reduce bird hazards and is implementing a Bird/Aircraft Strike Hazard Plan (Appendix C). As part of the hazard assessment, the biologist makes regular observations at the points shown on Figure 9.

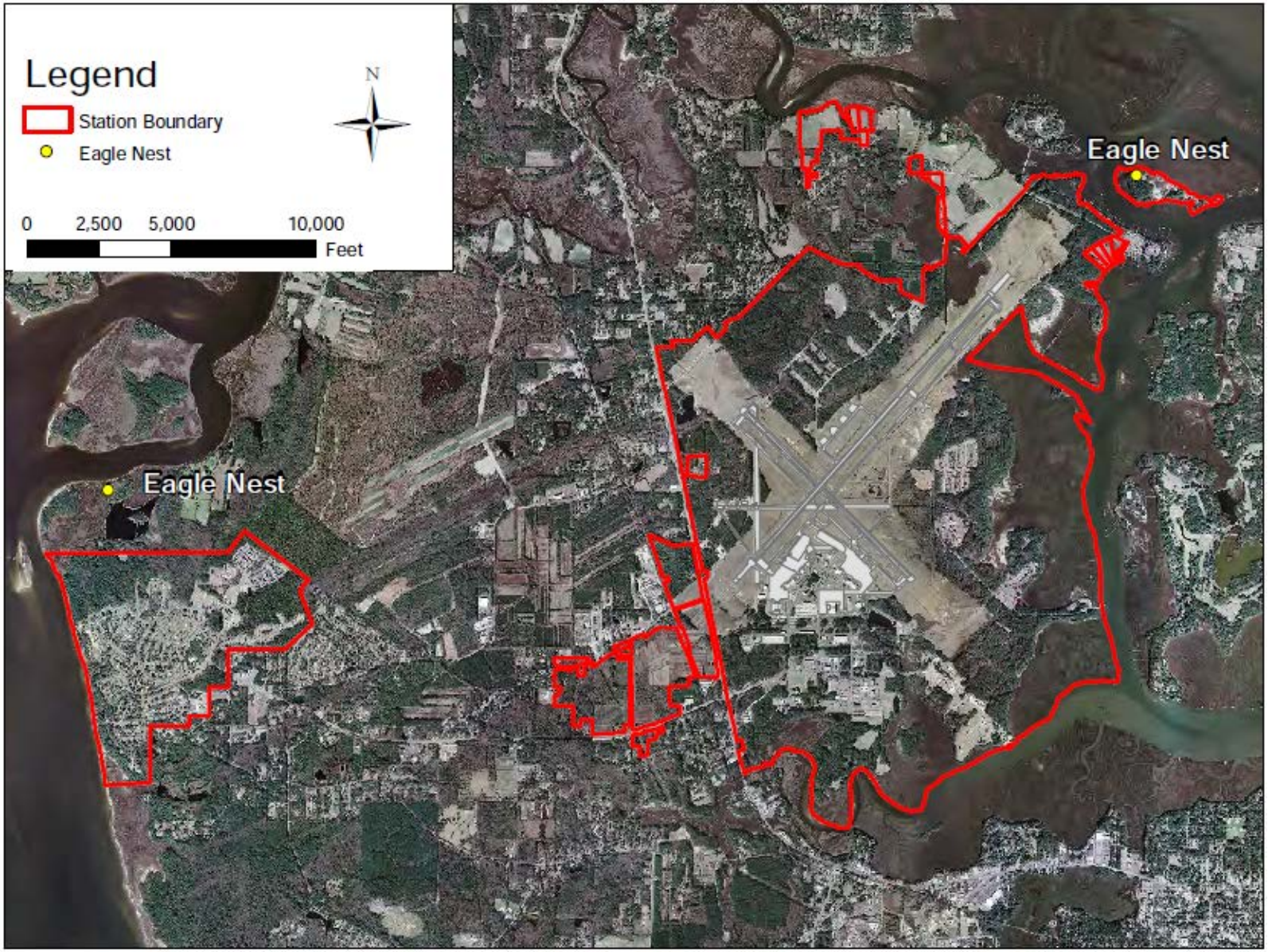

Figure 7. Bald Eagle Nests at MCAS Beaufort.

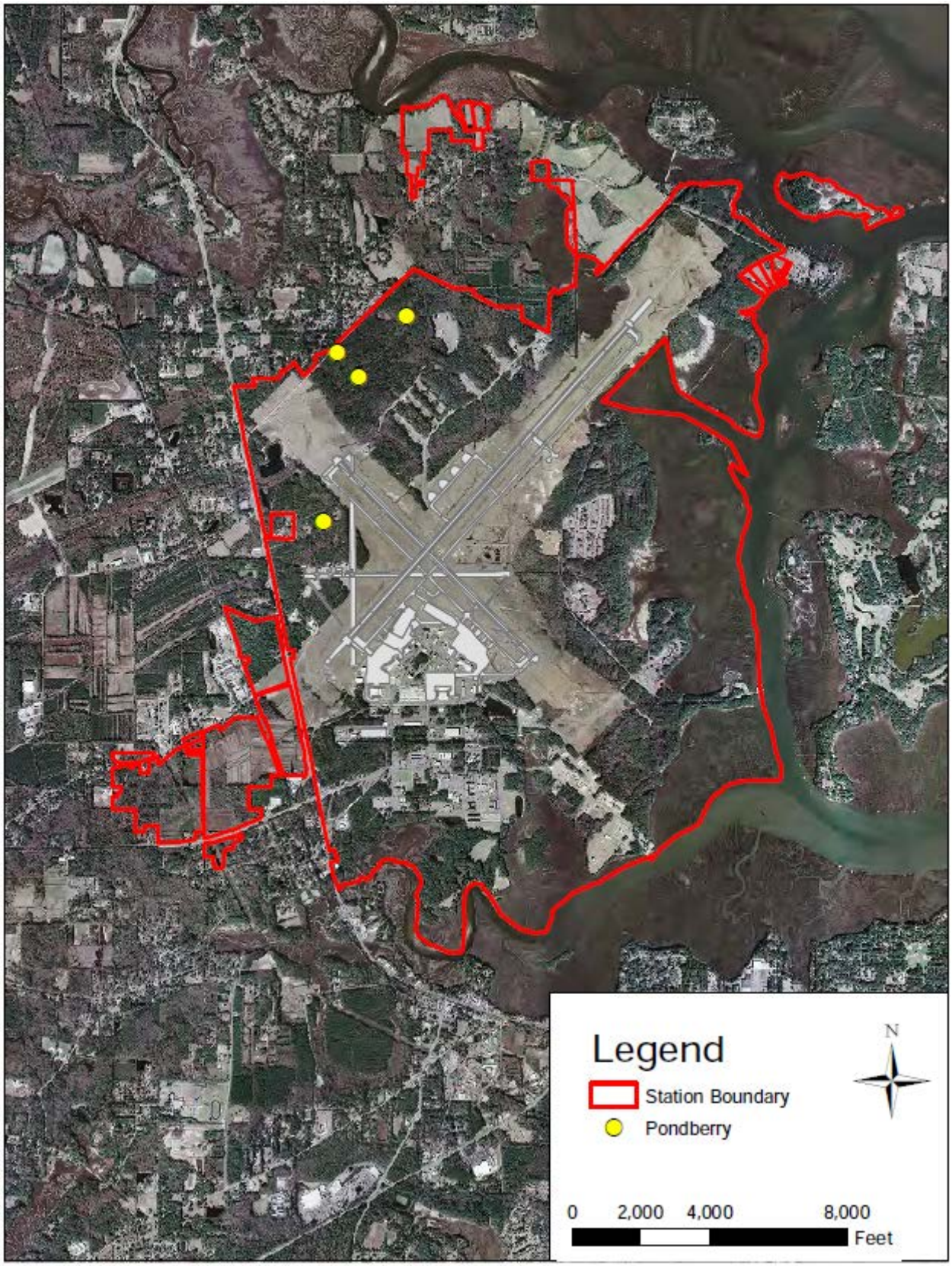

Figure 8. Pondberry Locations at MCAS Beaufort.

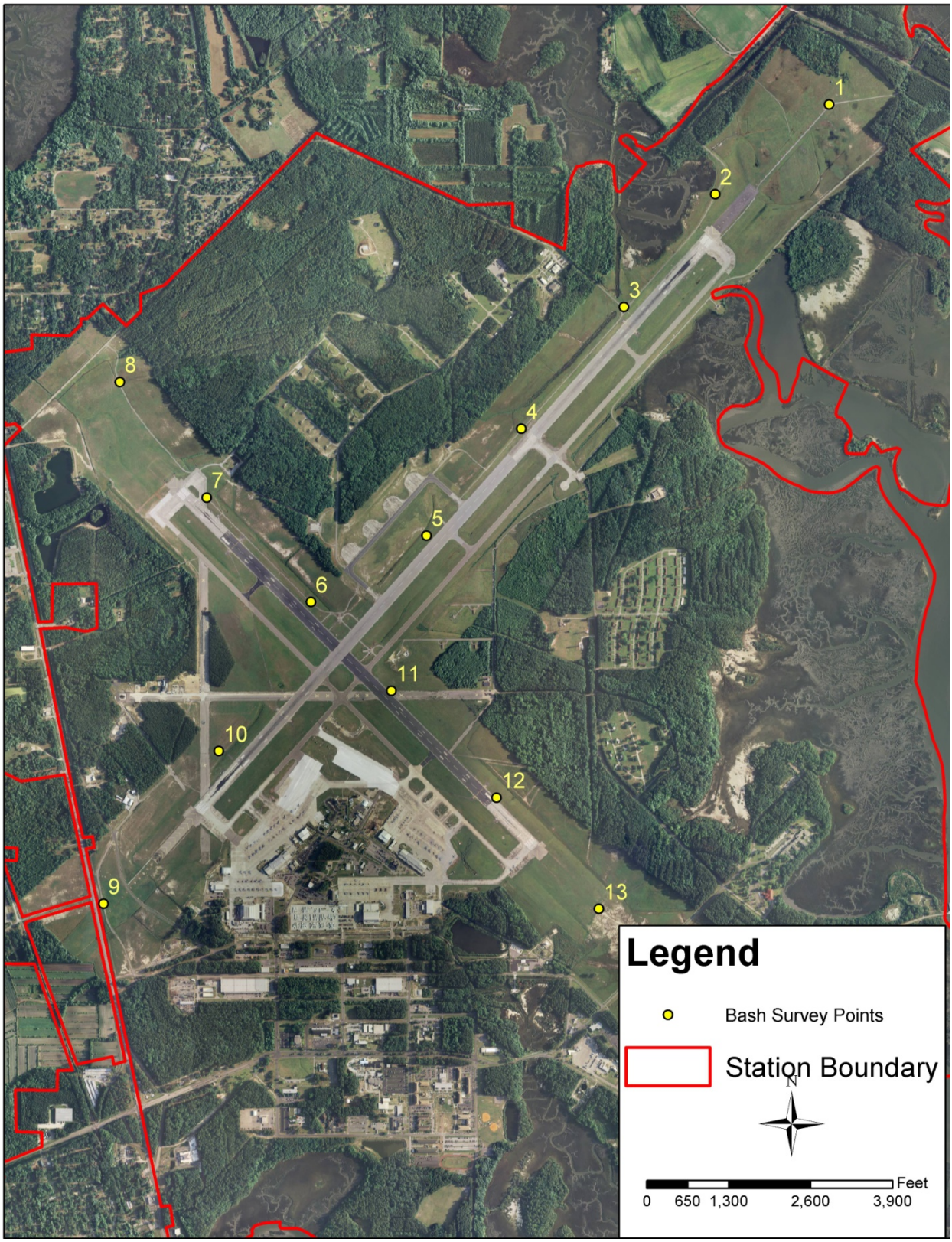

Figure 9. BASH Survey Points at MCAS Beaufort.

TABLE 3-2
FEDERAL & STATE LISTED THREATENED & ENDANGERED SPECIES THAT OCCUR OR POTENTIALLY OCCUR ON MCAS BEAUFORT, SOUTH CAROLINA

Common Name	Scientific Name	Residence Status(1)	Listing Status(2) USF&WS(3)	Listing Status(2) SCDNR (3)
REPTILES & AMPHIBIANS				
American Alligator	*Alligator mississippiensis*	CR	T/SA	-
Flatwoods Salamander	*Ambystoma cingulatum*	UR	T	E
Dwarf Siren	*Pseudobranchus striatus*	PR	-	T
Spotted Turtle	*Clemmys guttata*	PR	-	T
Eastern Diamondback	*Crotalus adamanteus*	LR	C	-
BIRDS				
Piping Plover	*Charadrius melodus*	UM	T	T
Wilson's Plover	*Charadrius wilsonia*	PM/PR	-	T
Swallow-tailed Kite	*Elanoides forficatus*	LM	-	E
Arctic Peregrine Falcon	*Falco peregrinus tundrius*	PM	T	T
Bald Eagle	*Haliaeetus leucocephalus*	CM	-	E
Wood Stork	*Mycteria americana*	CM	E	E
Red-Cockaded Woodpecker	*Picoides borealis*	PR	E	E
Glossy Ibis	*Plegadis falcinellus*	PR	-	SC
Least Tern	*Sterna antilarum*	LM/PR	-	T
Bachman's Warbler	*Vermivora bachmanii*	UM	E	E
Bachman's Sparrow	*Aimophiola aestivalis*	PR	-	SC
MAMMALS				
West Indian Manatee	*Trichechus manatus*	PM	E	E
Southeastern Myotis	*Myotis austroriparius*	CR	-	T
Rafinesque's Big-eared Bat	*Corynorhinus rafinesquii*	PM/PR	-	E
Northern Yellow Bat	*Lasiurus intermedius*	PR	-	SC
FISH				
Atlantic Sturgeon	*Acipenser oxyrinchus*	PM	E	E
Shortnose Sturgeon	*Acipenser brevirostrum*	PM	E	E
PLANTS				
Pondberry	*Lindera melissifolia*	CR	E	E
Canby's Dropwort	*Oxypolis canbyi*	PR	E	E
Chaff-seed	*Schwalbea americana*	PR	E	E
Flat-leaved False-foxglove	*Agalinis linifolia*	PR	-	SNR
Carolina Doghobble	*Agarista populifolia*	UR	-	S1
Incised Groovebur	*Agrimonia incisa*	PR	-	S2
White colicroot	*Aletris obovata*	UR	-	S1
Short-spike Bluestem	*Andropogon brachystachyus*	UR	-	S1
Elliot's Bluestem	*Andropogon gyrans*	PR	-	S1

TABLE 3-2 (Continued)
FEDERAL & STATE LISTED THREATENED & ENDANGERED SPECIES THAT OCCUR OR POTENTIALLY OCCUR ON MCAS BEAUFORT, SOUTH CAROLINA

Common Name	Scientific Name	Residence Status(1)	Listing Status(2) USF&WS(3)	Listing Status(2) SCDNR (3)
PLANTS (Cont'd)				
Purple silkyscale	*Anthaenantia rufa*	PR	_	S2
Piedmont Three-awned Grass	*Aristida condensate*	UR	-	S2
Large-flowered Mildwort	*Asclepias connivens*	UR	-	S1
SavaUnna Milkweed	*Asclepias pedicellata*	PR	-	S2
Water-hyssop	*Bacopa cyclophylla*	PR	-	S1
Cana Lily	*Canna flaccid*	PR	-	S2
Widow Sedge	*Carex basiantha*	PR	-	S2
Narrowleaf Sedge	*Carex amphibola*	PR	-	SNR
Shore-line Sedge	*Carex hyalinolepis*	PR	-	S2
Nutmeg Hickory	*Carya myristiciformis*	PR	-	S2
Cayaponia	*Cayaponia quinqueloba*	PR	-	S1?
Southeastern Tickseed	*Coreopsis gladiate*	PR	-	SNR
Narroleaf Rushfoil	*Crotonopsis linearis*	PR	-	SNR
Leafless Swallow-wort	*Cynanchum scoparium*	UR	-	S1
Marshland flatsedge	*Cyperus distinctus*	PR	-	S1
Flatsedge	*Cyperus tetragonus*	PR	-	S2
Rose Dicerandra	*Dicerandra odoratissima*	UR	-	S1
Green-fly Orchid	*Epidendrum conopseum*	UR	-	S3
Cupgrass	*Eriochola michauxii*	UR	-	S1
Florida Through-wort	*Eupatorium anomalum*	UR	-	S1?
Rough Thoroughwort	*Eupatorium scabridum*	PR	-	S1
Godfrey's Privet	*Forestiera godfreyi*	UR	-	S1
Privet	*Forestiera segregata*	UR	-	S1
Two-winged Silverbell	*Halesia diptera*	UR	-	S1
Georgia Frostweed	*Helianthemum georgianum*	PR	-	S2
Creeping St John's Wort	*Hypericum adpressum*	PR	-	S2
Large-stem Morning Glory	*Ipomoea macrorhiza*	UR	-	S1
Southern Lepuropetalon	*Lepuropetalon spahtulatum*	PR	-	S2
Gopher Apples	*Licania michauxii*	UR	-	S1
Dwarf Bullrush	*Lipocarpha micrantha*	PR	-	S2
Southern Twayblade	*Listera australis*	CR	-	S3
Pond-spice	*Litsea aestivalis*	CR	-	S3
Lance-leafe Loosestrife	*Lysimachia hybrid*	UR	-	S1
Climbing Fern	*Lygodium palmatum*	UR	-	S3
Stagger-Bush	*Lyonia ferruginea*	PR	-	S1
Carolina Bird-in-a-nest	*Macbridea caroliniana*	PR	-	S3
Bentgrass	*Muhlenbergia filipes*	CR	-	SNR
Ogeechee Tupelo	*Nyssa ogeche*	UR	-	S1
Sampson Snakeroot	*Orbexilum lupinellum*	UR	-	S1
A Panicgrass	*Panicum neuranthum*	UR	-	SNR

TABLE 3-2 (Continued)
FEDERAL & STATE LISTED THREATENED & ENDANGERED SPECIES THAT OCCUR OR POTENTIALLY OCCUR ON MCAS BEAUFORT, SOUTH CAROLINA

Common Name	Scientific Name	Residence Status(1)	Listing Status(2) USF&WS(3)	Listing Status(2) SCDNR (3)
PLANTS (Cont'd)				
A Panicgrass	*Panicum webberianum*	UR	-	SNR
Slender-leaved Dragon-head	*Physostegia leptophylla*	UR	-	SNR
Climbing Fetterbush	*Pieris phillyreifolia*	UR	-	S1
Georgia Fever-bark	*Pinckneya pubens*	UR	-	S1
Pineland Plantain	*Plantago sparsiflora*	PR	-	S2
Hooker's Milkwort	*Polygaly hookeri*	PR	-	S1
Bachelor's button	*Polygala nana*	UR	-	S1
Leafy Pondweed	*Potomogeton foliosus*	PR	-	SNR
Whiskfern	*Psilotum nudum*	PR	-	S1
Crested Plume Orchid	*Pteroglossaspis ecristata*	PR	-	S2
Pinelands Mountain Mint	*Pycanthemumnudum*	PR	-	S1
Bluff Oak	*Quercus austrina*	PR	-	S1
Myrtle-leaf Oak	*Quercus myrtifolia*	PR	-	S1
Needle Palm	*Rhapidophyllum hystrix*	UR	-	S1
Soft-haired Coneflower	*Rudbeckia mollis*	UR	-	S1
A Petunia	*Ruellia caroliniensis* ssp *cilosa*	PR	-	S1
Tiny-leaved Buckthorn	*Sageretia minutiflora*	UR	-	S3
Grassleaf Arrowhead	*Sagittaria graminea* var. *weatherbiana*	PR	-	S1
Baldwin's Nutrush	*Scleria baldwinii*	PR	-	S2
Florida Dropseed	*Sporobolus floridanus*	PR	-	S1
Powdery Thalia	*Thalia dealbata*	UR	-	S2
Florida Yellow-eyed Grass	*Xyris difformis* var. *floridana*	PR	-	S2
Acid-swamp Yellow-eyed Grass	*Xyris serotina*	PR	-	S1

RESIDENT STATUS (1)

CR = Confirmed Resident
LR = Likely Resident
PR = Possible Resident
UR = Unlikely Resident
CM = Confirmed Migrant or Occasional Visitor
LM = Likely Migrant or Occasional Visitor
PM = Possible Migrant or Occasional Visitor
UM = Unlikely Migrant or Occasional Visitor

STATUS (2)

S1 = Critically imperiled statewide
C = Candidate
E = Endangered
T = Threatened
S2 = Imperiled statewide
SNR = Status not resolved
SX = State Extirpated
T/SA = Threatened due to Similarity of Appearance
S3 = Rare or uncommon statewide
SH = Historical Records

AGENCY (2)

USF&WS = U. S. Fish & Wildlife Service
SCDNR = South Carolina Department of Natural Resources

3.10 Forest Resources

MCAS Beaufort manages approximately 2,000 acres of forestland. The predominant species at the Installation is loblolly pine, with lesser amounts of slash pine, pine/hardwood, longleaf pine, and hardwood.

Basic stand data, prescriptions, and records of completed actions are stored in a Forest Management Information System (FMIS) database. MCAS Beaufort uses this database in its Forest Management program. FMIS provides a means of recording and retrieving forest management data required for inventory control, analysis of stand information, and forest practices. More information on forest management, including stand maps and tables, is provided in Appendix D.

3.11 Outdoor Recreation

Outdoor recreation is the public or military use of natural resources, including indoor interpretative centers, where the focus is on the understanding of the natural environment. Outdoor recreation includes facilities such as nature trails, picnic and camping areas, scenic rivers, equestrian areas and other consumptive and non-consumptive uses of natural resources. The use of off-road vehicles, as well as highly developed outdoor uses such as golf courses and tennis courts is not considered outdoor recreation in the context of this natural resources plan. The Installation is an important occupier of federal lands and has adequate resources to support various programs for outdoor recreation. Outdoor recreation opportunities include camping, picnicking, fitness trails, boating, canoeing, recreational gardening, archery, fresh water and saltwater fishing, crabbing, shrimping, hiking, bird watching, nature study, bicycling, horseback riding, and outdoor education/interpretation.

The section on outdoor recreation inventories special interests areas, as well as identifies areas suitable for dispersed and concentrated outdoor recreation opportunities. These are for military and civilian personnel who live and/or work on the Installation, for military retirees, and for the general public, to the extent access to these opportunities fits within the security needs and mission of the Installation. The program develops strategies for managing the natural resources that meet outdoor recreation needs as an overall, compatible program as a part of the integrated plan. Approximately 5,800 military and 4,500 civilian personnel are assigned to MCAS Beaufort, and are potential users of the outdoor recreation facilities.

The degree of access to specific recreation areas (i.e., Main Station, Laurel Bay, and AICUZ areas) is dependent upon the activity and the access classification of the individual. Access should also be considered in terms of accessibility of facilities and programs for the physically challenged. Federal or

federally assisted facilities and programs are required, by law, to be accessible to the disabled. The Architectural Barriers Act of 1968 (Public Law 90480) requires facilities to be accessible to the physically handicapped. Section 504 of the Rehabilitation Act of 1973, as amended (Public Law 93-112), prohibits discrimination on the basis of handicap in program participation. The Americans with Disabilities Act of 1990 (Public Law 101-336) provides standards for addressing discrimination against individuals with disabilities in employment, transportation, telecommunications, public accommodations, and services operated by private entities. Military installations, including dependents and civilian employees, are not exempt from these laws.

The limited size of the Station and current security issues limit access to outdoor recreation on MCAS Beaufort to military personnel.

Currently constructed facilities include the fish ponds (Figure 10) boat ramps (Figures 11 & 12) on Scout and Round Island Ponds, the Broad River, and Albergottie Creek; piers or platforms (for fishing and nature observation) on Scout and Round Island Ponds, the Broad River, and Albergottie Creek; picnic pavilions at Scout Pond, Sunset Place, and Shady Point (Figure 13); the nature/jogging trail (Figure 14); and horse stable on Laurel Bay (Figure 15). All of these facilities receive considerable use, but the use has not been measured. The facilities at Scout Pond comply with the Americans with Disabilities Act (ADA).

Hunting and Trapping

Recreational opportunities for hunting are present on the Installation. Thirteen areas on the Main Station have been designated as authorized hunting areas. Game species include deer, rabbit, squirrel, raccoon, quail, and dove. Bear, duck, and turkey are not authorized game species. Hunters must comply with all applicable State of South Carolina and Federal regulations. Hunters may use bow and arrow or shotguns and may hunt individually or in organized groups. Night hunting, except for raccoon hunting on the Air Station, is prohibited.

All persons, 16 years or older, must possess an MCAS Hunting Permit and a valid South Carolina Hunting License and have attended the hunter's safety brief given by NREAO or a Deputy Game Warden. There is no fee for the permits, which are valid until the 30th day of June each year. Prior to the issuance of an MCAS permit and upon proof of a valid State or County license, the applicant must sign both a Certificate of Release which releases the Federal Government from all responsibility in case of accident or injury while hunting and a Certificate of Understanding, which certifies the applicant's familiarity with current regulations. In addition, the applicant must present evidence of having attended a Hunter Safety Lecture sponsored by the Natural Resources and Environmental Affairs Office and register all firearms/weapons with the Installation. Harvest reports are required from hunters when checking in with

the Provost Marshall's Office or the duty game warden at the completion of the hunt. Trapping is not authorized on the Installation.

Fishing

Access to estuarine waters around MCAS Beaufort is provided by boat ramps and fishing piers. Anglers must abide by SCDNR fishing regulations. Aquatic habitat is protected by land-based best management practices such as those included in the Stormwater Pollution Prevention Plan and through compliance with the Clean Water Act.

Two small freshwater ponds and three retention ponds (Figure 10) are managed to provide freshwater fishing. The 8.95-acre Scout Pond was built in the early 1970's and stocked in 1972. The pond is largely fed by groundwater with some runoff and has low natural fertility. The pond was limed with 12 tons of agricultural lime in 1980, 1987, and 1994. Scout Pond is known to contain largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), Shellcracker (*Lepomis microlophus*), channel catfish (*Ictalurus punctatus*), and hybrid grass carp (*Cteno pharyngodon idella*). The 6.74-acre Round Island Pond was built during late 1984 to early 1985 and was stocked with bass and bream in 1985. It too contains channel catfish and sterile grass carp. The pond was limed in 1986 and has been fertilized periodically. Both ponds are managed for bass and bream using the "balance" concept whereby bass harvest is somewhat limited to insure that an overpopulation of bream does not occur. Catfish are targeted at both ponds on a catch and release basis only. The ponds are aerated to prevent fish kills during weather conditions conducive to low dissolved oxygen. On Scout and Round Island Ponds, boats with electric trolling motors may be used via two boat ramps. No live bait may be used except for worms or crickets. The 3.4 acre MCCS Pond, which is located near the enlisted barracks, is a retention pond created during new construction about 2000. It was stocked with bluegill in 2002 and largemouth bass in 2003. All fishing is catch and release only. The 9.2-acre Fuel Farm Pond was created in the 1990s for retention, but it was not considered suitable for freshwater retention because of occasional saltwater intrusion during extreme spring tides. However the continual growth of cattails in it indicates it is probably suitable for freshwater fish. It was stocked with bluegill in 2005 and largemouth bass in 2006. It is catch and release fishing only. The newest retention pond opening to fishing is the Ballfield Pond (4 acres, Figure 10). It was stocked in 2009 and will be opened in 2011.

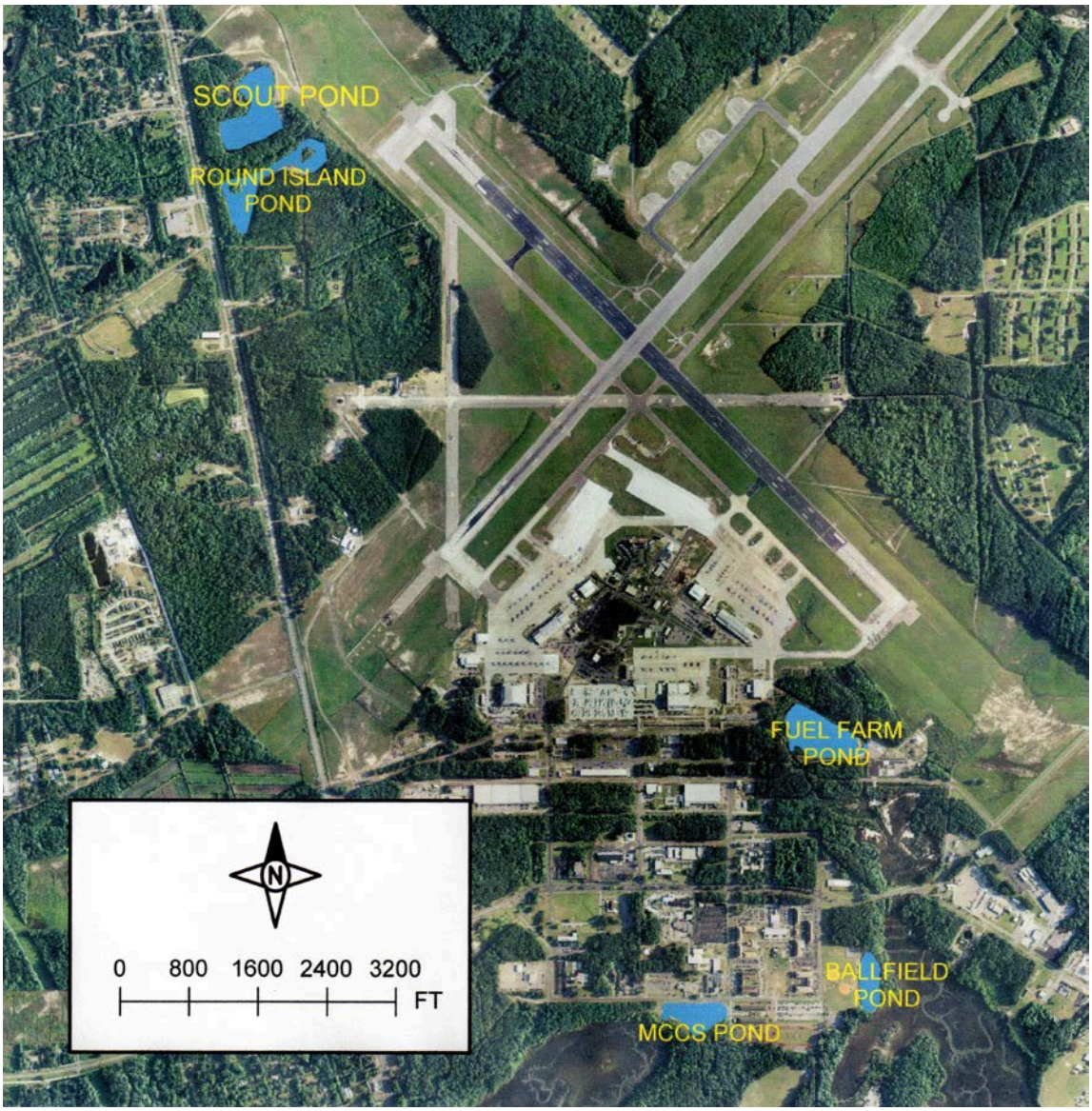

Figure 10. Fish Ponds at MCAS Beaufort.

Personnel authorized to fish on Installation property include active duty and retired military personnel and their dependents; and house guests of the aforementioned persons. All persons 16 years or older, must possess an MCAS fishing permit and applicable South Carolina licenses. There is no fee for a MCAS fishing permit. Prior to the issuance of the combination permit, and upon proof of a valid State license, the applicant must sign both a Certificate of Release and a Certificate of Understanding. Permits may be obtained at the NREAO office.

Saltwater fishing, crabbing, and shrimping are authorized on the Installation and South Carolina regulations apply. The pier on Albergottie Creek is ideal for saltwater use.

Boating

Several water resources on and adjacent to the Installation are available for non-motorized, (such as canoeing), and motorized boating. Non-motorized boating (electric trolling motors allowed) is required when fishing on the Installation ponds. Besides the ramps and piers on Scout and Round Island Ponds, one boat ramp is present at the Main Station and another is present at Laurel Bay (Figures 11 & 12).

Picnic and Camping Areas

Picnicking is a universally popular outdoor recreation activity. Covered picnic areas with tables are available at Scout Pond and Sunset Place, and a larger picnic area is available at Shady Point near the barracks (Figure 13). The areas have grills and restroom facilities. Currently, no area has been developed for unsupervised camping; however, an area adjacent and south of Scout Pond is used for primitive camping by Scouts.

Nature Trails and Study

Long distance walking trails are not currently provided at the Installation due to a lack of contiguous undeveloped lands. Although not large, the wooded areas at the Main Station, and at Laurel Bay, provide potential for hiking. The areas near existing housing at Laurel Bay currently receive considerable foot traffic along forest access roads and fire lanes. A paved jogging/walking trail overlooks the marsh on the east side of the developed areas near headquarters and bachelor enlisted quarters on the Main Station. (Figure 14).Another paved jogging trail, which runs along the interior of the main station, is also used by walkers and provides limited opportunity for nature observation and study.

Horseback Riding

Horseback riding is authorized on Laurel Bay Housing Area. A stable (Figure 15) is provided on Laurel Bay and riders from there utilize the existing trails and firebreaks for horseback riding.

Scenic Areas

Albergottie Creek, Broad River and adjoining tidal marshes provide scenic vistas. There is currently a walking/jogging trail along Albergottie Creek with piers for viewing (Figure 14). The boat ramp at Laurel Bay provides additional opportunities for scenic viewing of the Broad River (Figure 12). There are other marshland and creek front areas that offer vistas, but lack access. These areas could be developed for nature observation.

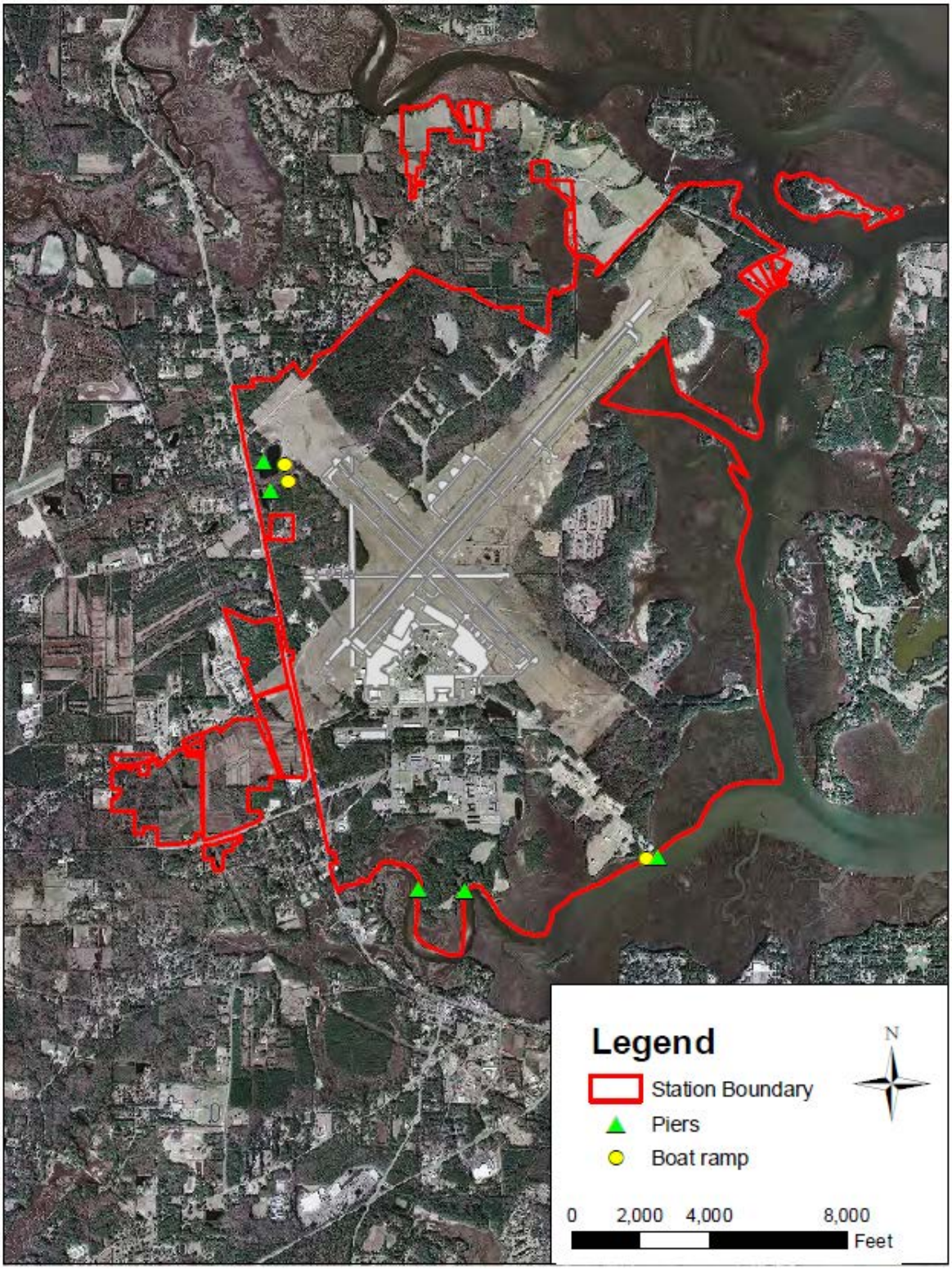

Figure 11. Boatramps, Piers, and Observation Platforms at the Main Station.

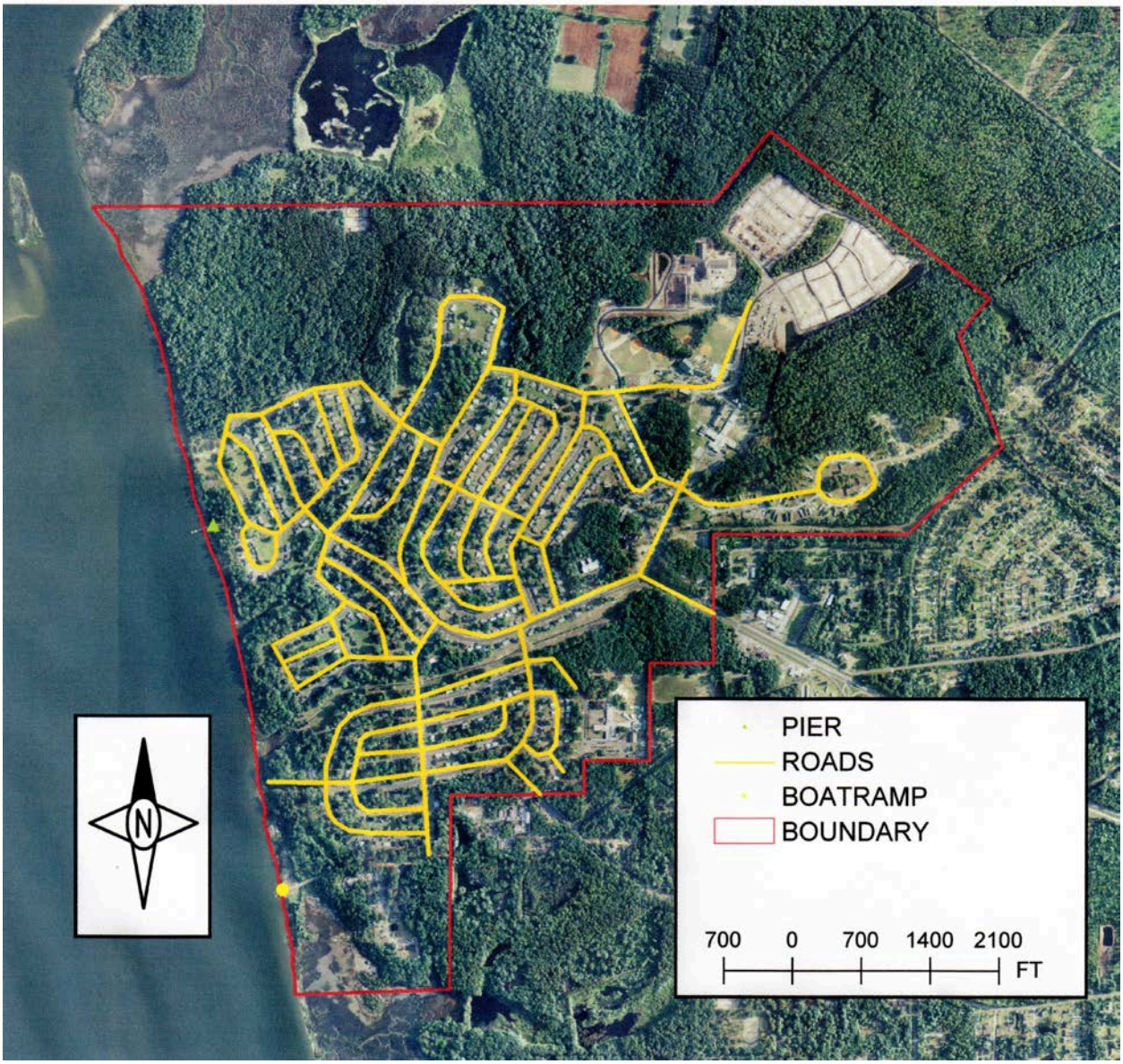

Figure 12. Boatramps, Piers, and Observation Platforms at Laurel Bay.

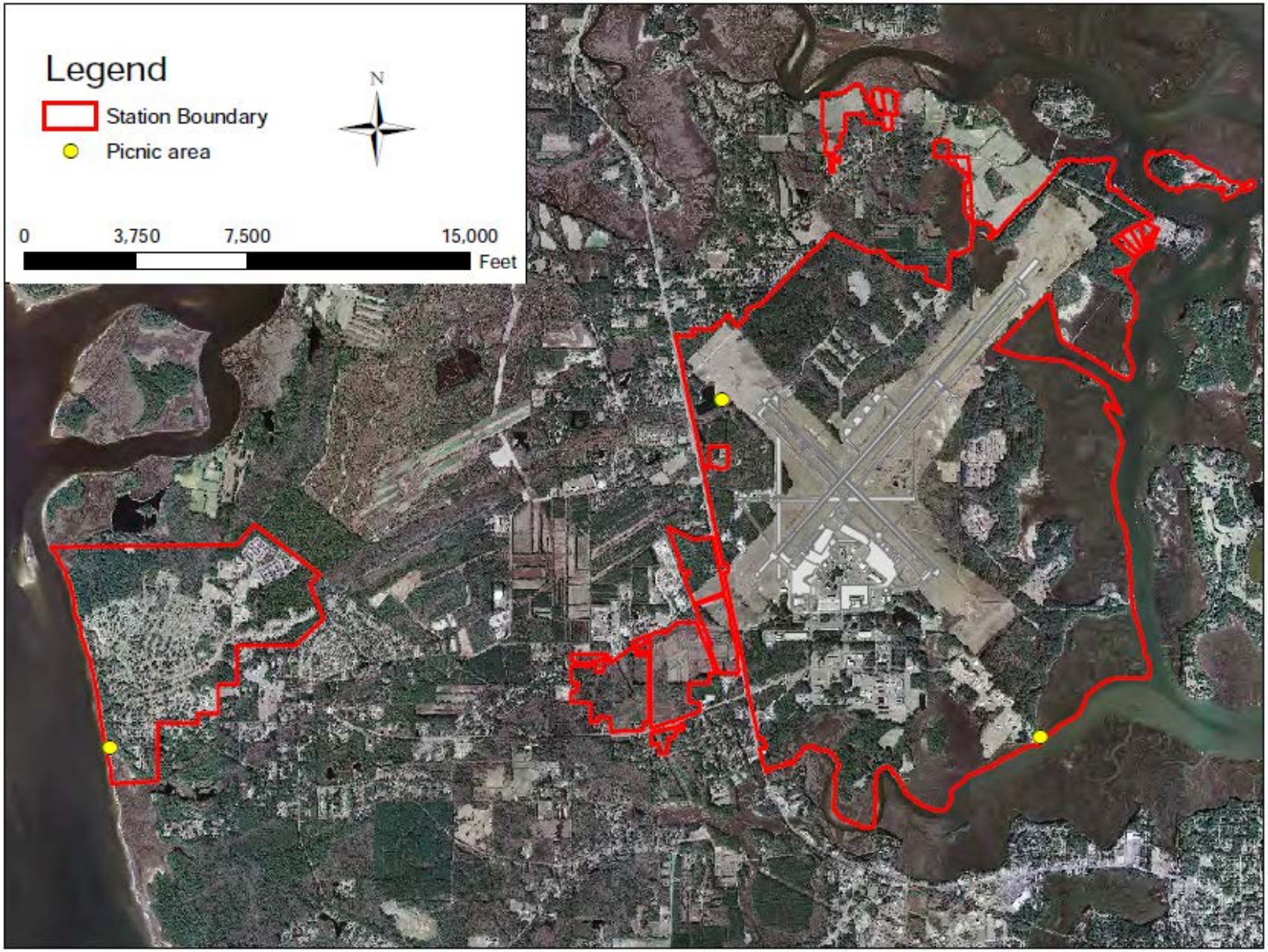

Figure 13. Picnic Areas at MCAS Beaufort.

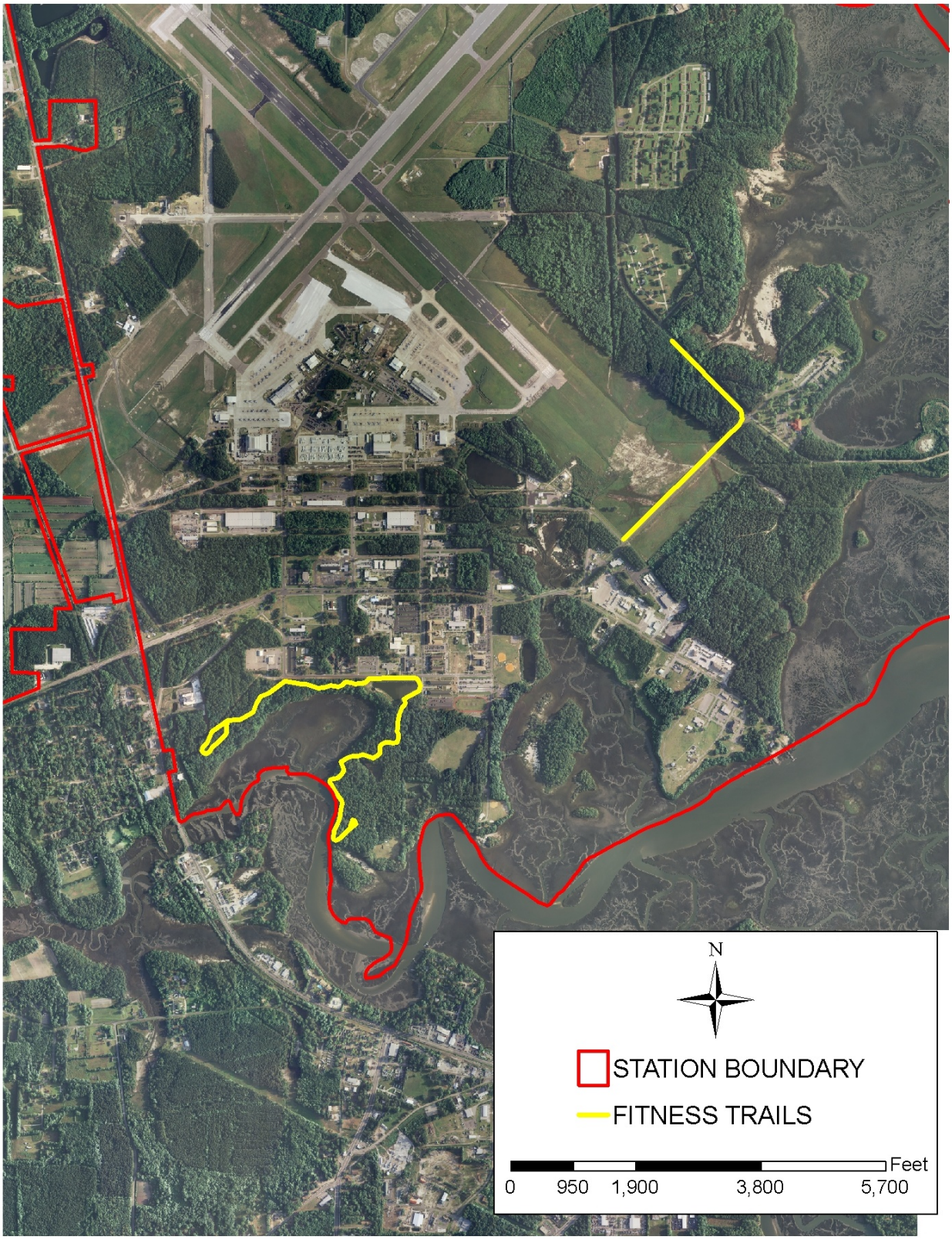

Figure 14. Nature and Jogging Trails at MCAS Beaufort.

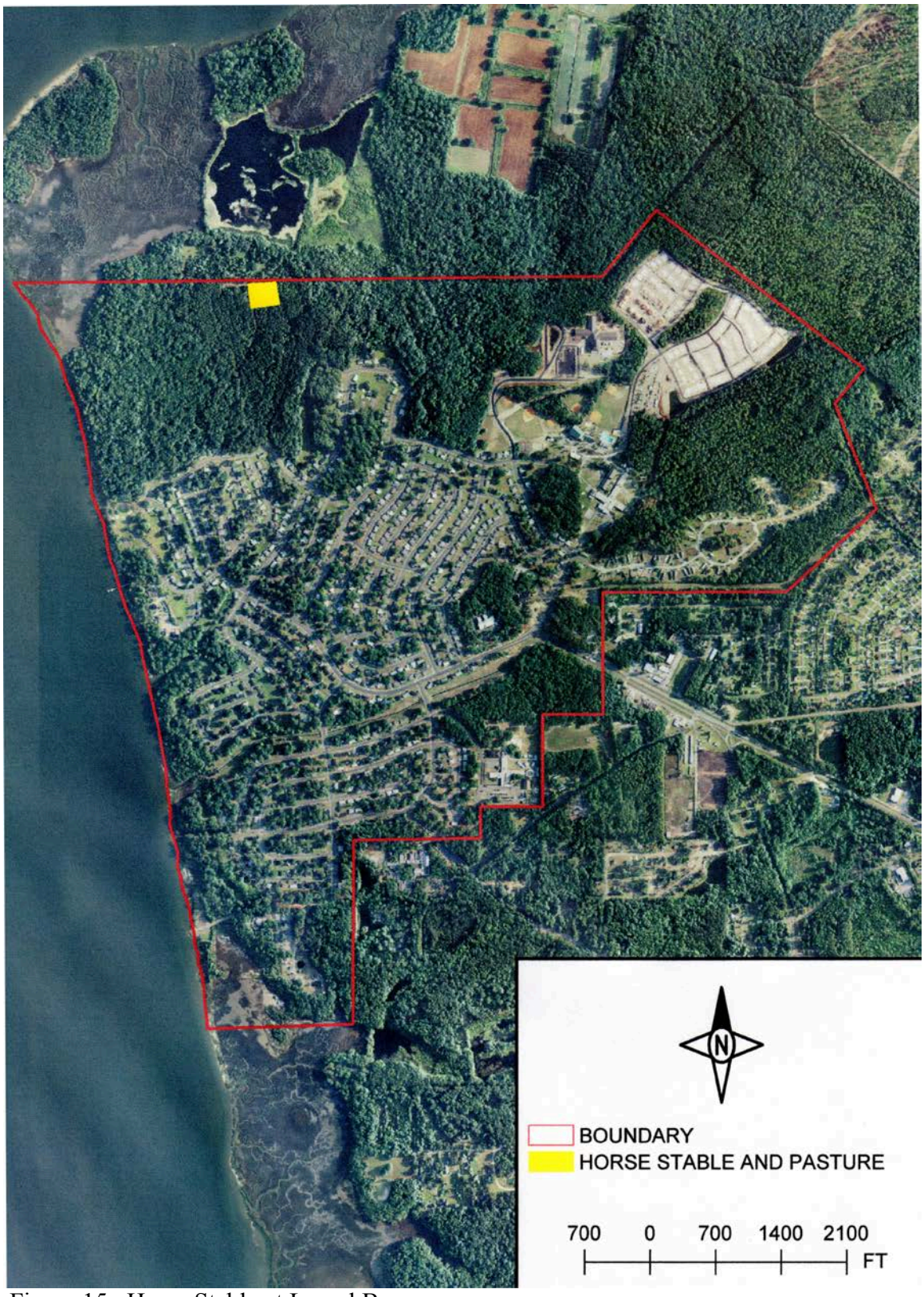

Figure 15. Horse Stable at Laurel Bay.

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4 Natural Resource Management

This section discusses natural resources management at MCAS Beaufort by dividing natural resources into focus units: land management, forest management, fish and wildlife, and outdoor recreation. These focus units are further divided into subunits; for example, the land management discussion addresses wetlands, soil conservation and erosion control, and invasive and exotic species.

For each subunit, Section 4 discusses the objectives, long-term management, and identifies strategies, tasks and projects. Each subunit also identifies legal requirements, and sources for additional management information.

4.1 Land Management

This section addresses the land resources on the Station that are managed as individual components and have independent management programs and techniques. The land management issues contained within this plan are not intended for directing land use activity (i.e. what buildings or activities should go where), but rather to provide managers with directions and general techniques to protect and enhance the natural environment, while continuing to provide the resources to support the military mission of MCAS Beaufort.

Croplands

Part of the AICUZ lands west of U. S. Highway 21 was in cropland prior to the Marine Corps purchasing the land. This property, which is highly productive and had been drained to facilitate crop production, is being restored to a flow-through wetland that could be used as a mitigation bank.

Objectives

25. Convert the current leased land into a flow- through wetland by reducing ditching and planting native trees.
26. Utilize this wetland as a mitigation bank with the approved Mitigation Banking Instrument (MBI) that will guide future management of the bank as incorporated into this INRMP and the Station Master Plan.

27. Reduce the probability of the wetland creating a BASH problem.

Long-Term Management

MCAS Beaufort is converting the cropland to wetlands and other high quality habitat by reducing the ditching, planting native species, and manipulating water levels to improve wildlife habitat and obtain mitigation credit for the land. As part of obtaining the mitigation credit, the Marine Corps has committed to maintaining the bank as a conservation area managed in accordance with the MBI and, in the event that the lands are ever disposed of, will use all legal means to insure that the proper conveyance easements are placed on the land to provide perpetual protection for the lands. The following restrictions are specified in the MBI, except as authorized as reserved rights therein:

- There shall be no filling, flooding, excavating, mining, drilling, removal of natural materials, dumping, or alteration of the topography in any manner.
- There shall be no draining, dredging, damming, impounding, changing the grade or elevation, impairing the flow or circulation of waters, reducing the reach of waters, and no other discharge or activity requiring a permit under applicable clean water or water pollution control laws and regulations, as amended.
- There shall be no clearing, burning, cutting or destroying of trees and other vegetation, except as expressly authorized, and no planting or introducing non-native or exotic species of trees or other vegetation.
- There shall be no destruction of animal life (including birds, insects and fish) or their habitats, except as expressly authorized, and as necessary for compliance with MCAS Beaufort's Bird Aircraft Strike Hazard (BASH) Plan.
- There shall be no agricultural, industrial, or commercial activity allowed.
- There shall be no construction, erection, or placement of buildings, billboards, or any other structures, except for wildlife observation structures authorized, nor any additions to existing structures.
- There shall be no construction of new roads, trails or walkways without the prior written approval of USACE, including of the manner in which they are constructed.
- There shall be no construction or placement of utilities or related facilities without the prior written approval of USACE.
- There shall be no application of pesticides and biological controls without prior written approval from USACE, except that application of pesticides or biological controls for problem vegetation, such as non-native or exotic species.

Project Summaries (see Appendix A for additional information)

Project: Wetland Mitigation Bank

Strategy: Convert wet outlease areas to forested wetlands and maintain remaining areas as early successional habitat.

Tasks:

1) Initiate actions in the MBI. This includes the land clearing, construction, tree planting, and other on-the-ground work.
2) Monitor the success of habitat creation and use by birds (for BASH). Monitoring will be a minimum of 7 years post construction.

Wetlands

The USACE (Federal Register, Section 328.3[b], 1991) and the Environmental Protection Agency (EPA) (Federal Register, Section 230.4[t], 1991) jointly define wetlands as "…those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that 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" (USACE 1982). The USACE definition relies on three key parameters – hydrology, soil, and vegetation – which must all occur and meet the defined characteristics in order for a location to be classified as a wetland.

MCAS Beaufort has extensive areas of salt marsh, brackish marsh, and forested swamps.

Objectives

14. Protect soils and wetlands through the use of state best management practices during forestry operations.
15. Protect wetland and water quality using a variety of techniques such as storm water retention/detention, buffer strips, and best management practices.

Long-Term Management

MCAS Beaufort will continue to incorporate the Department of the Navy's policy of no net loss of wetlands. This will include the conversion of the agricultural outlease to a flow-through forested wetland. Protective buffer strips or corridors of designated widths will be maintained and/or developed around wetlands and along streams. Vegetative buffers between wetland and upland vegetative communities will help maintain and improve water quality by filtering sediments and other pollutants from runoff prior to discharge into the wetland. Vegetative buffers also will provide habitat for a diversity of wetland and upland species. Width of the buffers will be determined by the following: Best Management Practices, edaphic characteristics (topography and erodibility, sensitivity and uniqueness of wetland fauna and flora, and degree of disturbance. As a general guideline, a minimum 50ft. buffer will be left undisturbed adjacent to permanent streams, natural forested wetlands, and ephemeral wetlands. Restrictions within these buffers include activities such as heavy equipment operation, application of pesticides with acute toxicity to fauna, soil horizon disturbance, and intensive timber harvest. Other management may include the creation and

expansion of wetlands, wetland quality monitoring, and more extensive inventory of existing wetlands.

MCAS Beaufort may have to develop wetlands when necessary to meet the military mission of the Installation; any wetland development will be in full compliance with cognizant laws and in cooperation with cognizant agencies after utilizing an avoid, reduce, mitigate approach to the development of the wetlands.

Project Summaries (see Appendix A for additional information)

Project 2: Wetland Delineation

Strategy: Keep the installation's wetland maps up to date; this includes getting newly acquired property delineated in a timely manner.

Tasks:

1) Prior to 2013, have the USACE evaluate the current wetland map and re-approve if feasible; otherwise, redo wetlands map. Repeat this procedure in 2018.
2) Obtain delineations for recently acquired properties as soon as practicable following acquisition of the land. Funding for these delineations will be added to Table I-1 when requested.
3) Wetland maps will be made available to the planning department when conducting site approvals for new construction projects.
4) Update GIS layer of wetland boundaries when maps are revised.

Project 3: Wetland Enhancement

Strategy: MCAS Beaufort will enhance the existing wetlands by prescribed fire, removing trash and eliminating invasive exotic plants.

Tasks:

1) Use herbicides and other methods to remove invasive plants for the wetlands on the Installation. (See Invasive Plants Section below.)
2) For wetlands in pine stands, continue to prescribe burn when burning the pine stands. (See Forest Management section below.)
3) Study wetlands to determine if any need replanting with native species.

Project 4: Wetland Monitoring

Strategy: MCAS Beaufort will assess wetland function periodically as follows (items 1 and 2 are mandatory; items 3 and 4 are stewardship):

Tasks:

1) Keep records of area of wetlands created, restored, enhanced, drained or filled each year.
2) Utilize data from migratory bird surveys, invasive species monitoring, and other studies in evaluating the wetlands.

Laws, Executive Orders, Regulations, Directives, and Memoranda Relevant to Wetlands

Federal Water Pollution Control Act, as amended by the Clean Water Act (CWA) of 1977, 33 United States Code (USC) 1251, prohibits the discharge of dredged or filled materials into waters of the United States, including wetlands, without first obtaining a permit from the USACE (Section 404 of the CWA).

Executive Order (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.

Clean Water Act: Section 401 Water Quality Certification, 1986, 33 USC 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 5090.1B, par 22-4.3(a), discusses natural resources management relating to wetland management.

South Carolina Code of Laws, Title 48, Chapter 39, Coastal Tidelands and Wetlands requires protection and responsible management of all areas defined as part of the coastal zone.

South Carolina Scenic Rivers Act of 1989, allows the harvest of timber in wetland areas provided that Forestry Commission approved Best Management Practices (BMPs) are followed.

South Carolina Pollution Control Act gives DHEC the authority to regulate the quality of surface and groundwaters in SC.

Additional Sources of Information

Technical Reports/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, United States Environmental Protection Agency and the United States Department of Agriculture, October 1998.

Telephone Contacts:

USACE Charleston Regulatory Office – (843) 329-8044

EPA Regional Wetlands Coordinator - (404) 562-9408

Internet Addresses:

NRCS Wetland Science site: http://www.wli.nrcs.usda.gov/

Environmental Law Institute: http://www2.eli.org/index.cfm

Station for Marine Conservation: http://www.cmc-ocean.org/

University of Florida: Center for Aquatic and Invasive Plants: Institute of Food and Agricultural Sciences: http://aquat1.ifas.ufl.edu/welcome.html

EPA: Office of Water, Wetlands, Oceans and Watersheds: www.epa.gov/owow/

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 the natural resources and functions of floodplains. 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 archaeological significance.

Objective

1. Maintain the attenuation capacity of the remaining undisturbed acreage within the 100-year floodplain.

Long-Term Management

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

Project Summaries

Project: None

Strategy: MCAS Beaufort will review all proposed activities for impact avoidance to the attenuation capacity of the 100-year floodplain. If development is necessary with the floodplain, locations in previously disturbed areas of the floodplain will first be evaluated for suitability.

Tasks:

1) Natural resources personnel will coordinate with facility and environmental personnel to ensure implementation of the floodplain management strategy.
2) When there is no practical alternative to development in the floodplain, construction methods that minimize impact to the attenuation capacity will be used when practicable.

Laws, Executive Orders, Regulations, Directives, and Memoranda Relevant to Floodplains

EO 11988, Floodplain Management, May 24, 1977, requires federal service agencies to avoid construction or management practices that will 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.

Marine Corps Order 5090.2A discusses natural resources management relating to floodplain management.

44 CFR Chapter 1 Subpart C Section 60.22, contains suggestions for improving floodplain management to reduce the possibility of flooding.

South Carolina Code of Laws, Title 48, Chapter 11 Watershed Conservation Districts, establishes watershed conservation districts and provides that SCDNR will assist with floodplain issues.

Additional Sources of Information

Internet Addresses:

FEMA's Floodplain Management Summary:
http://www.fema.gov/plan/prevent/floodplain/index.shtm

Soil Conservation and Erosion Control

Soil conservation involves the identification (e.g., type, location and amount) and appropriate use of soils in accordance within the limits of its physical characteristics while protecting it from uncontrolled stormwater runoff to prevent and control soil erosion. Information on soil properties

will be used to plan the use and management of soils for construction, forestry practices, recreation facilities, and wildlife habitat. More fragile soil types require modifications to the timing, intensity and frequency of forestry and wildlife management practices. Knowing where soil types are located on a particular tract, and understanding the capabilities and limitations of the soils are prerequisites to selecting the most appropriate wildlife habitat or forestry improvement practices. Many of MCAS Beaufort's Soils are very poorly or poorly drained; these soils present problems for construction.

Soil erosion contributes to water quality and conveyance problems, which may include: 1) elimination of habitat (terrestrial and aquatic); 2) reduction in reservoir capacity and stream flow; 3) increased flooding potential; 4) affected water quality; and 5) increased maintenance time and costs associated with stormwater facilities (e.g., culverts, ditches, and swales).

Water quality is affected by increased sedimentation. Sedimentation is particularly detrimental to benthic organisms and many fish species. Sedimentation can eliminate habitat by covering food sources and spawning sites and can smother bottom-dwelling organisms and periphyton. In addition, sedimentation increases turbidity, thereby limiting the depth to which light can penetrate and limiting aquatic vegetation photosynthesis. Reductions in photosynthesis can decrease dissolved oxygen levels below levels required to sustain aquatic vegetation, fish, and benthic invertebrates.

Actions contributing to soil erosion on the Station include:

- Human alterations to the natural 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.
- Forestry practices, including prescribed burns, thinning, and reforestation, exposing soils to rainfall and stormwater runoff.
- Wave and wake action along the shoreline area of the Station.
- Development in poor soil quality areas.
- Improper mowing and maintenance of grassed areas.

Objective

14. Protect soils through the use of state best management practices during forestry operations.

Long-Term Management

The long-term management concept for soil conservation is to identify and understand the suitability and sustainability of a soil unit for a proposed action. USDA NRCS soil surveys have been reviewed to determine constraints on soil management units, and may also be used to determine appropriate management practices. The USDA soil survey for Beaufort County also provides

information about potential erosion hazards; groundwater contamination; productivity of cultivated crops, trees, and grass; and the protection of water quality, wetlands, and wildlife habitat.

MCAS Beaufort will:

- Implement the six principles for soil conservation and erosion management (Smoot and Smith, 1999).
    1. Minimizing areas of disturbance by leaving intact stream buffers, forest conservation areas, wetlands, highly erodible soils, steep slopes, environmental features, and stormwater filtration areas;
    2. Stabilizing and protecting disturbed areas that are highly susceptible to erosion 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; and
    6. Reducing exposure time.
- Continue to use BMP's during all natural resources operations.
- Continue to evaluate and map erosion control problem areas on the Station.
- Initiate projects to stop erosion at problem areas after consulting with the NRCS, USFWS and SCDNR.

Project Summaries

Projects: None.

Strategy: MCAS Beaufort will continue to implement soil conservation and erosion control practices.

Tasks:

1) Determine areas where soil type or past practices present threats of erosion.
2) Continue to implement BMPs to prevent soil erosion during all natural resources operations on the Station.
3) Utilize South Carolina Forestry Commission forestry best management practices to prevent erosion during forestry operations.

Laws, Executive Orders, Regulations, Directives, and Memoranda Relevant to Soil Conservation

Soil Conservation Act, 16 USC 590a et seq., provides for soil conservation practices on federal lands.

Federal Water Pollution Control Act, as amended by the CWA of 1977, 33 USC 1251, regulates the dredging and filling of wetlands and establishes procedures for identifying and regulating non-point sources of polluted discharge, including turbidity, into waterways.

EO's 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 5090.1B, par 22-4.3(d) discusses natural resources management relating to soil conservation management.

Soil and Water Conservation Districts Law [SC ST SEC 48-9-10] establishes conservation districts, and directs the FL Department of Natural Resources to create plans and guidelines to prevent erosion.

Erosion and Sediment Reduction Act of 1983 directs the South Carolina Department of Health and Environmental Control to implement a statewide erosion and sediment reduction and stormwater management program.

Additional Sources of Information

Telephone Contacts:

USDA NRCS, Beaufort County, South Carolina: (843) 522-8100

Internet Addresses:

USDA NRCS: http://www.nrcs.usda.gov/

Stormwater and Water Quality Control

Stormwater runoff is precipitation that falls onto surfaces, such as roofs, streets, the ground, etc., 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. Non-point source pollution is pollution of surface-water and groundwater resources by diffuse sources. Point source pollution is pollution identified by a single, identifiable point source (such as an outlet pipe)

Objective

15. Protect wetland and water quality using a variety of techniques such as storm water retention/detention, buffer strips, and best management practices.

Long-Term Management

MCAS Beaufort natural resources program will be guided by the following management concepts for stormwater runoff and water quality control:

1. Continue to manage stormwater in natural areas consistent with BMP's described in the SWPPP, to the extent practicable,
2. Update SWPPP to include stormwater management practices for non-industrial areas such as forested and shoreline areas, and for non-industrial activities such as forest clearing and reforestation, and timber stand improvement,
3. Protective buffer strips or corridors of designated widths will be maintained and/or developed around wetlands and along shorelines. Allowances will be made for essential military mission requirements,
4. As part of the Oil and Hazardous Substance Spill Contingency Plan, implement the natural resource damage assessment 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. The program consists of criteria and procedures for collecting and evaluating the extent of damage to natural resources resulting from an incident and for determining restoration measures,
5. Manage stormwater runoff from new development in order to protect adjacent natural areas, and
6. Continuously assess and improve existing pesticide, herbicide, and fertilizer use with the intent of protecting water quality.

Project Summaries

Projects: None.

Strategy: Evaluate the stormwater management program and activities contributing to stormwater runoff and/or pollutant loading in stormwater runoff as it relates to the natural resources program.

Tasks:

1) Continue to implement BMPs to minimize stormwater runoff during forestry operations.
2) Natural resources personnel should review construction projects to evaluate stormwater discharge into wetlands and waterbodies and ensure that:
   - Stormwater runoff is subjected to BMP's prior to discharging into wetlands and waterbodies. BMP's shall prevent or reduce the amount of pollution in water to a level compatible with South Carolina Surface Water Quality Standards;
   - No site activities result in violation of state water quality standards associated with the siltation of wetlands, or reduction in the natural retention or filtering capability of wetlands;
   - Adequate soil erosion measures are implemented.

Laws, Executive Orders, Regulations, Directives, and Memoranda Relevant to Stormwater

Federal Water Pollution Control Act, as amended by the CWA of 1977, 33 USC 1251, describes guidelines for the control of non-point source pollution.

Coastal Zone Management Act of 1972 (CZMA), 16 USC 1451 et seq., establishes authority (Section 6217) for states to administer coastal non-point pollution programs when approved by the National Oceanic and Atmospheric Administration (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 USC 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, 42 USC 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 5090.1B, par 22-4.3(b), discusses natural resources management relating to non-point source pollution.

OPNAVINST 5090.1B, par 27, establishes requirements, guidelines, and standards for the assessment of damages arising from the release of oil or hazardous substances.

Stormwater Management and Sediment Reduction Act directs that no person may engage in a land-disturbing activity without first submitting a stormwater management and sediment control plan to the appropriate implementing agency and obtaining a permit to proceed and mandates that the South Carolina Department of Health and Environmental Control provide technical and other assistance to local governments in the control of stormwater runoff and sediment.

Additional Sources of Information

Telephone Contacts:

SCDHEC, OCRM Beaufort Office – (843) 846-9400

Internet Addresses:

Environmental Law Institute: http://www.eli.org/

USGS Water Resources Home Page: http://h2o.usgs.gov/

EPA: Office of Water: www.epa.gov/owow/

South Carolina Office of Coastal and Marine Resources:
http://www.scdhec.gov/environment/ocrm/

Grounds Maintenance and Landscaping

Grounds maintenance is provided by contract and is managed by MCAS Beaufort's Facilities Department and by the Housing Area Contractor. Grounds maintenance under these contracts, which include such services as grass cutting, edging, pruning, mulching, fertilization, irrigation, and sodding, impacts natural resources. Natural Resources program personnel will review and observe these practices to ensure implementation, to the maximum extent practical, of the objectives and management below

Objective

19. Implement beneficial landscaping and grounds maintenance practices to reduce erosion, prevent invasive species introductions into unimproved areas, and improve wildlife habitat.

Long-Term Management

Grounds Maintenance

Natural resources personnel will review grounds maintenance contracts prior to renewal and provide input that improves the natural values extracted from the maintained lands while minimizing grounds maintenance costs.

Landscaping

MCAS Beaufort's natural resources personnel will recommend and/or incorporate the principles of xeriscaping into grounds maintenance and landscaping activities. Xeriscaping uses drought tolerant 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 and thus costs. Xeriscaping will be utilized in new construction activities and will be phased into existing landscape areas as appropriate. . Xeriscaping offers a viable alternative to the typically high-volume water requirements of other landscaping approaches by conserving water through creative landscaping.

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

- Planning and design for water conservation and aesthetics;
- Creating practical turf areas using manageable sizes, shapes, and appropriate grass species;

- 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;
- Using soil amenities, such as compost or manure, appropriate to site and plant needs;
- Using mulches such as wood chips to reduce evaporation and keep the soil cool;
- Irrigating efficiently with properly designed systems (including hose-end equipment) and by applying the right amount of water at the right time; and
- Maintaining the landscape by mowing, weeding, pruning, and fertilizing properly. .

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To integrate the principles of xeriscaping into existing landscaped areas, the Installation should evaluate regional initiatives and current landscaping practices and sites and to predict the effectiveness of xeriscaping toward improving existing conditions. MCAS Beaufort should 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. The success of integrating the xeriscaping principles into existing landscaped areas should be monitored and adjustments to management practices will be made, as necessary. Urban areas will utilize native plantings and mowing schedules that improve wildlife habitat and reduce erosion and stream pollution as feasible with existing funding.

Project Summaries

Projects: None.

Strategy: MCAS Beaufort natural resources program will recommend grounds maintenance and landscaping practices consistent with the concepts presented in this INRMP.

Tasks:

1) Educate Installation and contractor personnel on the principles of grounds maintenance and landscaping discussed in this INRMP.
2) Natural resources personnel will review all new landscaping projects and grounds maintenance contracts to ensure the management outlined above is included in the projects or contracts to the maximum extent practicable.

Laws, Executive Orders, Regulations, Directives, and Memoranda Relevant to 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.

Executive Order 13112, 3 February 1999, requires executive agencies to restrict the introduction of exotic organisms into natural ecosystems.

Federal Insecticide, Fungicide and Rodenticide Act, 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 Clean Water Act 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).

OPNAVINST 5090.1B, par 22-4.3(h), discusses natural resources management relating to environmentally and economically beneficial landscaping.

Additional Sources of Information

Telephone Contacts:

Beaufort County Extension Office: (843) 470-3665

Internet Addresses:

Where to find native nurseries: http://www.wildflower2.org/

South Carolina Native Plant Society: http://www.scnps.org/

Beaufort Count Extension Service: http://www.clemson.edu/beaufort/

Invasive, Exotic, and Noxious Species

Objective

2. Control invasive species throughout the Installation.

Long-Term Management

Invasive and exotic species will be managed through treatment, removal, and restrictions on the introduction of invasive and exotic species at the Installation in accordance with Executive Order 13112. MCAS Beaufort will survey the extent of invasive and exotic species on all properties, develop an invasive and exotic species control plan that will identify and describe invasive and exotic species, and schedule removal. This plan will be implemented to control invasive and exotic species to acceptable levels. In addition, the NRM will screen all lists of landscaping plants proposed for planting to ensure invasive and exotic species are not used.

Prior to the use of a Federal Insecticide, Fungicide, and Rodenticide Act- (FIFRA-) regulated pesticides at MCAS Beaufort, the Installation's NRM will contact the Applied Biology Department of NAVFAC Atlantic for information regarding approved pesticides, including the location of use, amount, and concentrations, as well as treatment methods (e.g. basal-bark, cut-stump, cut-surface, foliar). The applicability of burning or hand clearing in combination with pesticides will also be considered, as well as other non-pesticide removal methods.

The use of pesticides for removal of invasive and exotic species and pests will be conducted in accordance with federal and state laws regulating the use of pesticides. According to the EPA, a "pesticide is any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest. Pests can be insects, mice and other animals, unwanted plants (weeds), fungi, or microorganisms like bacteria and viruses; the term pesticide also applies to herbicides, fungicides, and various other substances used to control pests" (http://www.epa.gov/pesticides/about/). Under the 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, but not less so.

To ensure that the application of pesticides does not contaminate surface waters and/or inadvertently affect flora or fauna, pesticides will 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 buffer areas around surface waters will also help prevent misdirected application or deposition. Pesticides with lower toxicity will be used and applied at rates below those specified on the label, when it is believed that such modifications can adequately address the problem. The Installation will evaluate the effectiveness of the lower rates and toxicity, and will apply pesticides in accordance with label instructions if the lower rate applications are not adequately controlling the problem. The Installation will also consider the applicability of non-pesticide removal methods.

Project Summaries

Project 5: Control of Invasive and Exotic Species.

Strategy: MCAS Beaufort will implement its invasive and exotic plant control plan.

Tasks:

1) Control invasive plants on MCAS Beaufort by implementing the invasive plant management report (Appendix E). This will involve combinations of pesticide applications, cutting, pulling, and prescribed fire.
2) Monitor the efficacy of treatment with observations and field notes: use more quantitative methods when necessary. Monitor both the reduction in invasive plants and the return of desired native plants.
3) Retreat where necessary to improve and maintain control. Use the monitoring to change techniques and methods as needed to effect control.
4) Prohibit the planting of Cogon Grass (*Imperata cylindrical*), *Tamarix* sp., Chinese Tallow (*Triadica sebifera*), Mimosa (*Albiza julibrissin*), Chinese//European Privet (*Ligustrum sinense/L. vulgare*), Kudzu (*Pueraria Montana*), Chinese Wisteria (*Wisteria sinensis*), Japanese Wisteria (*Wisteria*

floribunda), and Tropical Soda Apple (*Solanum viarum*) anywhere on the installation. Revise any existing contracts to reflect this and review any new contracts and site plans to preclude planting of these species.

5) In developed areas of the Installation search for and remove any current Cogon Grass or Tropical Soda Apple. Also, gradually remove any ornamental plantings of the other species listed in task 4 as they die out or grow too large for their location. Replace all removed plants with appropriate native plants.

6) Control fire ants through approved methods and partner with state and federal agencies to use biological control when feasible.

Laws, Executive Orders, Regulations, Directives, and Memoranda Relevant to Invasive 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.

Executive Order 13112, 3 February 1999, requires executive agencies to restrict the introduction of exotic organisms into natural ecosystems.

Federal Insecticide, Fungicide, and Rodenticide Act, 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.

OPNAVINST 6240.4B, 27 August 1998, DoD Pest Management Program, provides the DoN 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 the DoN personnel and their dependants; attach or damage real property, supplies, or equipment; adversely affect the environment; or are otherwise undesirable.

Federal Plant Pest Act, 7 U.S.C. 150a 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 5090.1B, par 22-4.3(f), discusses natural resources management relating to the control of noxious weeds.

South Carolina Code of Laws, Title 46, Chapter 23 Noxious Weeds, establishes control and eradication of noxious weeds and regulates them in interstate and foreign commerce.

South Carolina Code of Laws, Title 49, Chapter 6 Aquatic Plant Management, creates a program for the purpose of preventing, identifying, investigating, managing, and monitoring aquatic plant problems in public waters of South Carolina.

Additional Sources of Information

Telephone Contacts:

TNC, South Carolina Office - (803) 254-9049

Internet Addresses:

South Carolina Exotic Pest Plant Council: http://www.se-eppc.org/southcarolina/

University of Florida, Center for Aquatic and Invasive Plants: http://aquat1.ifas.ufl.edu/welcome.html

USFWS Invasive Species Program: http://invasives.fws.gov/

National Invasive Species Council: http://www.invasivespecies.gov/

USDA Plants Database: http://plants.usda.gov/

Southeastern Invasive Plant Information: http://www.invasive.org/eastern/

Southeast Exotic Pest Plant Council: http://www.se-eppc.org/

4.2 Forest Management

MCAS Beaufort will manage its limited forest to support mission training, provide forest products, enhance wildlife habitat, and maintain aesthetics using ecosystem management concepts to guide management decisions. The limited acreage, restricted access, extensive wetlands, and smoke concerns limit management both from a harvest and management standpoint.

Approximately 2,000 acres of land are being managed as forestland at MCAS Beaufort. The program has a 10-year management window with continual review and updating as required.

Objectives

1. Prescribe burn pine and pine/hardwood stands tri-annually while trying to mimic natural fire regimes.
3. Evaluate pine stands for conversion to longleaf pine; initiate conversion on 10-20% of identified areas by end of planning period while balancing age class distributions.
17. On most available land, produce a sustained yield of commercial timber products from native species in a manner consistent with ecosystem management.

Long-Term Management

The 10-year Forest Management Plan for MCAS Beaufort is included in Appendix D.

The forester at MCAS Beaufort provides on-the-ground professional forest management services for the Station. NAVFAC Real Estate awards and maintains records on forestry contracts.

Forest stands at MCAS Beaufort are managed with an ecosystem approach for sustained yield and health. Planned silvicultural activities for this 10-year period include thinning and prescribed burning; however, other activities may also occur. For example, if new development is required for training, areas may need to be clearcut. Other forest management activities such as fire suppression and control of insects may be required.

Firebreaks are a necessary part of a fire management program. Existing features such as roads and streams may be used as firebreaks, but oftentimes such features are not present. Where existing features do not occur, man-made firebreaks must be established and maintained. Firebreaks are established prior to prescribed burning; or, in areas that will not be burned during a given year, firebreaks may be necessary to establish and maintain as a protection against spread of wildfires. Plowed firebreaks will be disked and leveled to prevent soil erosion and interruption of boundaries and hydrology. Permanent firebreaks may later be used for forest access.

Unplanned activities that will require a change to the plan of work in forest areas may result due to natural causes or mission related requirements. Natural causes include the effects of wildfire, insect and disease outbreaks, nuisance animal damage, and weather related events such as tornadoes, tropical storms, or hurricanes. Mission related requirements may include such actions as clearcutting of forest areas and subsequent deletion of areas from the forest management program for new facilities. Mission related changes may also require increased thinnings or other forest cuttings that allow the area to remain in forestry but will necessitate an interruption in the rotation requiring site preparation and reforestation.

Project Summaries

Projects 6, 7, 8, 9, and 10: Forest Product Sales, Fire Management, Forest Protection, Forest Inventory, and Timber Stand Improvement

Strategies: Leave the forest stands alone to promote training, wildlife habitat, and an aesthetically pleasing appearance. Utilize timber management techniques on a minimal basis primarily to support other programs.

Tasks:

1) Sell timber when areas are being cleared for training or development reasons.
2) Protect forest from wildfires by maintaining firebreaks.
3) Conduct prescribed burns in the pine forests to reduce undergrowth to facilitate training and reduce the probability of wildfires.
4) Monitor forest periodically for disease or pest outbreaks and protect remaining healthy trees when desirable from both a forest and wildlife management perspective.

5) Inventory the forest stands at the end of the planning period to make informed choices for the next plan.

Laws, Executive Orders, Regulations, Directives, and Memoranda Relevant to Forest Management Activities

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.

Executive Order 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 5090.1B, par 22-4.4, discusses laws that govern natural resources management relating to the protection and management of forest resources.

Sikes Act, 16 U.S.C. 670 (a)-(o), authorizes conservation programs on military reservations.

DoD Directive 4715.1 establishes the Defense Environmental Security Council; the Environment, Safety, and Occupational Health Policy Board and the Defense Environmental Security Council Committee structure; and the Armed Forces Pest Management Board.

Additional Sources of Information

Technical Reports/Publications:

Farrar, R.M. Jr. 1996. *Fundamentals of Uneven-Aged Management in Southern Pine.* Tall Timbers Research Station Miscellaneous Publication No. 9, Tallahassee, South Carolina.

A Guide for Prescribed Fire in Southern Forests. 1998 USDA Forest Service, Southern Region. Technical Pub. R8-TP 11.

Telephone Contacts:

Tall Timbers Research Station: (850) 893-4153

TNC Fire Management Office: (850) 668-0827

Internet Addresses:

South Carolina Division of Forestry: http://www.state.sc.us/forest/

South Carolina Forestry Best Management Practices: http://www.state.sc.us/forest/refbmp.htm

South Carolina Department of Natural Resources: http://www.dnr.sc.gov/

Tall Timbers Research Station: http://www.ttrs.org/

Southern Research Station (Publication-Scientific): http://www.srs.fs.usda.gov/pubs/

Fire Effects on Plants and Wildlife: http://www.fs.fed.us/database/feis/

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 Association of State Foresters: http://www.stateforesters.org/The association represents the directors of the state forestry agencies from all 50 states.

Society of American Foresters – (301) 897-8720. http://www.safnet.org/An organization of 18,000 members involved in allied areas of professional forestry.

USDA Forest Service – (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.

4.3 Fish and Wildlife

Fish and wildlife management actions are designed to conserve, enhance, and regulate habitat for game and non-game indigenous wildlife species. This section addresses the following: 1) wildlife management, 2) threatened and endangered species and natural communities, 3) game management, 4) prevention and control of wildlife damage and disease, and 5) fisheries management.

Wildlife Management

Wildlife management involves the implementation of general management practices to manipulate wildlife habitat to diversify existing wildlife populations.

Growth and development on and surrounding the Installation will require the implementation of many general management practices to conserve and enhance terrestrial, aquatic and avian wildlife populations on MCAS Beaufort and in the region.

Objectives

10. Maintain populations of all animals appropriate for the local area, habitats, and size of the Installation; maintain average or better populations for species determined to be declining in the region.
11. Monitor the deer herd through collection of information from harvested deer supplemented with other studies as recommended by the State.
13. Utilize bird and bat houses at Laurel Bay to increase populations of mosquito eating birds and bats; utilize bird and bat houses on the Main Station to increase populations of forest dwelling species.

24. Control the deer herd through hunting and other legal means to keep deer away from the runways and taxiways.

Long-Term Management

Wildlife habitats will be managed to sustain wildlife resources on the Station consistent with the military mission. In general, the Installation will manage wildlife to prevent bird/aircraft strikes, provide a resource for hunting and nature observation, maintain ecosystem components and processes, and complement ongoing programs at the federal, state, and local level.

Terrestrial Wildlife Management

- Preserve hardwoods during Timber Stand Improvement and Wildlife Stand Improvement activities on the installation to provide mast (e.g., acorns, hickory, nuts, pecans and various berries).
- Avoid habitat fragmentation. Arbitrarily locating human-made linear and non-linear structures within wildlife areas undermines ecological processes by separating wildlife populations and may render the fragmented parcel unsustainable for wildlife.
- Maintain forest stands with different sizes, ages, and densities.
- Utilize tree thinnings in coordination with prescribed burns in managed timber stands to remove dense overstory and understory, remove forest litter to decrease wildfire susceptibility, and increase foraging efficiency. The thinning and burning should be sufficient to allow production of a good mixed grass / forbe layer throughout pine stands over 30 years of age.
- Continue a nesting assistance program on the Installation. This effort involves retaining snags (dead trees) within managed forests for use by woodpeckers, owls, squirrels, bluebirds, and other cavity dwelling species.
- Coordinate maintenance (e.g., mowing, pruning, trimming) with seasonal wildlife needs within improved, semi-improved, and unimproved areas.
- Maintain native vegetation in various successional stages along wooded edges to provide food, cover, and access to adjacent wood lots.
- Create brush piles within clear cuts and other open areas to provide cover, nesting, and feeding areas for wildlife.
- Protect wetland areas that provide foraging, mating, and nesting resources for aquatic wildlife.

Migratory Bird Management

Migratory birds are protected under the Migratory Bird Treaty Act (MBTA) of 1918 (16 USC 703-711), which decreed that all migratory birds and their parts (e.g., eggs, nests and feathers) are fully protected by law; however, that protection does not extend to military training. Migratory birds face serious challenges, including habitat loss, collisions with artificial structures, and environmental

contaminants. Because migratory birds cross the boundaries of nations, watersheds, and ecosystems, protecting them requires a coordinated effort involving multiple jurisdictions and interests.

Partners In Flight (PIF) is an international organization of various federal, state, local, and independent agencies that was launched in 1990 in response to growing concerns about declines in the populations of many land bird species in order to emphasize the conservation of birds not covered by existing conservation initiatives. The Department of Defense is one of the many federal agencies that signed a Memorandum of Agreement supporting the conservation of birds through the PIF initiative.

PIF has developed Bird Conservation Plans (BCPs) for each physiographic area and/or state in the United States. The Bird Conservation Plan for the South Atlantic Coastal Plain applies to MCAS Beaufort (PIF 2001). MCAS Beaufort will implement long-term migratory bird management practices in support of PIF and the Bird Conservation Plan while ensuring the Station's military mission. In addition to the practices noted above, the following practices will be implemented for migratory bird management:

- Annual monitoring for migratory birds with emphasis on BCC and South Carolina Comprehensive Wildlife Conservation Strategy priority species to determine population trends in association with habitat management. The highest priority bird species are Bachman's Sparrow, Henslow's Sparrow, Loggerhead Shrike, Painted Bunting, and Rusty Blackbird. If funding is available, point counts for most bird species will be conducted to collect information on all priority species. This should be about 50 points each year in late May or early June plus searches for Henslow's sparrows and Rusty Blackbirds during the winter.
- Develop other management strategies for high priority species as management techniques are developed.

The 2003 National Defense Authorization Act directed the USFWS to exempt the Department of Defense from the MBTA takings provisions for the incidental take of migratory birds by defense personnel engaged in military readiness activities. The proposed exemption was published in the federal register as 50 CFR Part 21 on 28 February 2007. The rule directs and encourages the Department of Defense to manage migratory birds to reduce adverse impacts that any incidental take may have on bird species. The rule and Executive Order 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds) both direct the Department of Defense to emphasize BCC when managing migratory birds. The U. S. Fish and Wildlife Service (2002) has provided lists of BCC by region of the country. These regions correspond to the PIF conservation plan regions.

The management outlined in this plan, including preservation of mature hardwood forest, control of invasive species, and control of shoreline erosion will all have positive impacts on Chuck-

will's-widows, Northern Parulas, and Painted Buntings -- all of which are BCC that reside on the Station in small numbers.

For non-military readiness activities, migratory birds at MCAS Beaufort will be protected under the MBTA against "takings." Under the MBTA, takings could include habitat modifications, shooting, pesticide application, nest or egg removal, and occasionally, tree removal. Habitat modification as a result of timber sales does not constitute a taking; neither does nest removal outside nesting season. The Station's Natural Resources Manager will be informed before any action is taken that may affect any migratory bird species. The Natural Resources Manager will determine if the possible impacts associated with the action would impact migratory bird species and, if necessary, will initiate discussions or negotiate a permit with the USFWS.

South Carolina Comprehensive Wildlife Conservation Strategy

South Carolina recently completed its comprehensive wildlife management plan. It is designed to manage all nongame wildlife to stop ongoing declines in many species. While this plan is for the whole state, many of the species and habitats effected by the plan occur on MCAS Beaufort. Where management of these species and habitats as provided for in the Comprehensive Plan does not conflict with MCAS Beaufort's mission, this INRMP is designed to help South Carolina meet its goals under the Comprehensive Plan by targeting those species and habitats identified in the Comprehensive Plan for management on the Installation. Specifically, MCAS Beaufort plans on managing for such species as the Painted Bunting, Northern Bobwhite and Loggerhead Shrike and for habitats such as longleaf pine forest including the isolated ponds in those forests so vital to certain amphibians. MCAS Beaufort can help in four of the eight Conservation Action Areas identified in the plan. These are Habitat Protection, Control of Invasive and Nonnative Species, Public Land Management, and Survey and Research Needs.

Project Summaries

Project 11: Nongame Management

Strategy: Conduct habitat improvement actions for a variety of species, especially BCCs and species identified in South Carolina's CWCS.

Tasks:

1) Purchase or construct nest boxes. Many boxes and plans are available either locally or on the internet. (Use any search engine and search for "bird nest boxes"). More information on bird houses is available online at: http://library.fws.gov/Bird_Publications/house.html and specifically for purple martins at: http://www.purplemartin.org

2) Place purple martin boxes only at Laurel Bay and on lawns away from building. Place other nest boxes on the sides of trees in the forested areas. Purple martin boxes should be about 15 feet high and about 40 feet or more away from any buildings.
3) Maintain the nest boxes.
4) Construct brush piles from timber slash.
5) Plant food plots in areas that will not conflict with BASH management.
6) Plant hedgerows of native species.
7) Maintain forest stands in conditions conducive to BCCs and priority species from South Carolina's CWCS.
8) Monitor specific elements to evaluate the effectiveness of management.

Project 12: Migratory Bird Surveys

Strategy: MCAS Beaufort will continue to monitor migratory birds annually by completing surveys during the breeding season with an emphasis on painted buntings and winter surveys for grassland sparrows.

Tasks:

1) Utilize federal, state, or local biologist to conduct point counts directed specifically at painted buntings. Provide this data to the Eastern Painted Bunting Working Group.
2) Conduct searches for winter grassland sparrows the year following burns in open pine stands with a grass/forb ground cover.
3) Identify and count (to the extent practicable) any migratory birds that are unavoidably taken during military readiness activities. Report these takings up the chain of command. (Note that taking is defined as kill, harm, or harass.)

Laws, Executive Orders, Regulations, Directives, and Memoranda Relevant to Wildlife Management

Sikes Act, as amended 16 USC 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, to provide its personnel with professional training in fish and wildlife management.

Migratory Bird Treaty Act, as amended 16 USC 703-712, prohibits the taking or harming of a migratory bird, its eggs, nests, or young without the appropriate permit.

Fish and Wildlife Conservation Act, 16 USC 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.

Endangered Species Act, 16 USC 1531-1543, Title 50 Code of Federal Regulations (CFR) Part 17, 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.

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.

Federal Insecticide, Fungicide, and Rodenticide Act, 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.

Marine Mammal Protection Act of 1972, 16 USC 1361-1407, prohibits the taking or harming of marine mammals without the appropriate permit.

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

OPNAVINST 5090.1B, par 22-4.2 discusses laws that govern natural resources management relating to the protection and management of fish and wildlife resources.

South Carolina Statutes, Chapter 372, covers wildlife management.

Additional Sources of Information

Telephone Contacts:

SCDNR, Wildlife and Freshwater Fisheries Division – Jay Cantrel (803) 625-3569

PIF DoD Committee Rep., Joe Hautzenroder: (202) 685-9331

Internet Addresses:

South Carolina Comprehensive Wildlife Management Plan:
http://www.dnr.sc.gov/cwcs/index.html

North American Bird Conservation Initiative: http://www.nabci-us.org./main2.html

DOD Partners-in-flight Program: http://www.dodpif.org/

Atlantic Coast Joint Venture: http://www.acjv.org/

USFWS Division of Migratory Bird Management: http://www.fws.gov/birds/

Threatened and Endangered Species and Natural Communities

Species are listed as endangered or threatened if there is current or threatened habitat loss, disease, over-exploitation, or other factors affecting its existence, based upon scientific and commercial data. The ESA was passed in 1973 to provide a means to conserve endangered and threatened species and the habitats on which these species depend. The ESA also prohibits federal

agencies from authorizing, funding, or carrying out any actions that destroy or adversely modify "critical habitat." Critical habitat for a threatened or endangered species is defined as: (1) the specific areas within the geographical area occupied by the species at the time it is listed as threatened or endangered on which are found physical or biological features essential to the conservation of the species, and which may require special management considerations or protection; and (2) specific areas outside the geographical areas occupied by the species at the time it is listed, upon a determination by the Secretary of Interior that such areas are essential for the conservation of the species. Additionally, the South Carolina Endangered and Threatened Species Act provides protection to species not listed under the federal act.

Federally and state-listed animal species that occur or may occur on MCAS Beaufort (Section 3.6) have been identified as conservation priorities and require special protection efforts.

Objectives

10. Maintain populations of all animals appropriate for the local area, habitats, and size of the Installation; maintain average or better populations for species determined to be declining in the region.
12. Monitor, maintain, and provide a conservation benefit for listed species on MCAS Beaufort

Long-Term Management

MCAS Beaufort will actively manage areas for the species discussed below, but will also manage for other federally or state-listed threatened or endangered species as conditions warrant. Several listed threatened or endangered species have been identified as conservation priorities. Changes in management practices may result from: 1) the listing of a new species for protective status or the removal of a species; or 2) a change in the species found to occur on the Station. MCAS Beaufort will continue to conduct species surveys to identify new species and monitor changes in species populations and habitat. Species information provided by the surveys will be used to modify management practices. Management practices will be modified by the Natural Resources Manager in consultation with Southern Division foresters and biologists, as well as appropriate federal and state agencies.

Bald Eagle (*Haliaeetus leucocephalus*)

Status. Threatened - State

Habitat Use and Requirements. Bald eagles are primarily riparian, associated with coasts, rivers, and lakes, usually nesting near bodies of water. They are opportunistic feeders and taking a variety of vertebrate prey, both living and carrion, depending on locality and availability. When fish are abundant they are the major part of the eagle's diet. In South Carolina, the breeding season is in the winter. Nests are usually located in the tops of tall, living trees. Nest site prerequisites generally include:

- Proximity to water: usually within a half mile (0.8 km), with a clear, short flight path to it;
- The largest/tallest tree in the stand;
- An unobstructed view of the surrounding area;
- Proximity of good perching trees; and
- Acceptable levels of human activity.

Habitat Conditions. Suitable habitat (feeding, roosting, and nesting areas) for bald eagles exists on the Station.

Limiting Factors. Human disturbance during nesting, illegal shooting, loss of nest trees, and electrocution by power lines are the primary limiting factors.

Current Status – Current resident; there is a nest just north of the Laurel Bay Housing Area and an occupied nest on Jack's Island just a mile northeast of the main runway (Figure 7). The Bald Eagle has recently been delisted by the USFWS; however, it is still protected by the MBTA and the Bald and Golden Eagle Protection Act.

Management. Eagle nests will be protected as discussed in Appendix I.

Annual Survey. MCAS Beaufort personnel will search for nests each winter. The Installation will also cooperate with surveys conducted by SCDNR and the USFWS.

USFWS Guidelines. For additional information regarding bald eagle management see "Management Guidelines for the Bald Eagle in the Southeast Region". This INRMP protects habitat for bald eagles through active management of factors such as wetlands, floodplains, water quality, and forests.

American Alligator (*Alligator mississippiensis*)

Status. Threatened by similarity of appearance - Federal and State

Habitat Use and Requirements. The alligator inhabits river systems, canals, lakes, swamps, bayous, and coastal marshes eating anything of suitable size, including mammals, amphibians, birds, reptiles, fishes, and crustaceans. Nesting occurs in late spring or early summer.

Habitat Conditions. Habitat is limited on the Station. Alligators use the freshwater ponds and the retention ponds on the Installation.

Limiting Factors. In past years, illegal hunting and destruction of wetlands were major factors contributing to declining populations of this species. Protection from illegal hunting has resulted in a resurgence of the alligator populations throughout the Southeast. Currently, hunting alligators under the rules and regulations also controls the population.

Current Status. Known resident.

Management. Best management for the alligator will be preservation and maintenance of open water areas and adjacent wetlands. This INRMP protects habitat for alligators through active management of factors such as wetlands, floodplains, soil erosion, and stormwater. Nuisance alligators will be removed in accordance with state and federal laws. Feeding alligators on the Installation is prohibited.

Wood Stork (*Mycteria americana*)

Status. Endangered - State and Federal

Habitat Use and Requirements. Storks feed on small fish in freshwater and brackish wetlands, including freshwater marshes, flooded pastures, and ditches. Particularly attractive feeding sites are depressions in marshes or swamps, where fish become concentrated during periods of falling water levels. The storks will travel up to 80 miles (130 km) between rookeries and feeding areas. Nests are usually constructed in the upper branches of large cypress trees. Breeding occurs in February through April.

Habitat Conditions. The Station's shallow ponds and marshes provide potential feeding habitat for the wood stork.

Limiting Factors. Wood stork decline is the result of loss of suitable feeding habitat and rookery sites.

Current Status. Irregular visitor. Storks have been observed on the Installation and sightings are becoming more common.

Management. Maintain existing wetlands. Natural resources personnel will be aware of the potential for wood storks and contact the cooperating agencies if storks are regularly observed on the Installation to determine if additional management is necessary. This INRMP protects habitat for wood storks through active management of factors such as wetlands, floodplains, soil erosion, and stormwater. Wood storks will not be specifically managed for since they are a definite BASH problem.

Shortnose Sturgeon (*Acipenser brevirostrum*)

Status. Endangered - State and Federal

Habitat Use and Requirements. During the winter and early spring months, December through April, most shortnose sturgeon remain in lower estuaries of rivers, where salinities range from 18 to 30 parts per thousand. Both male and female spawners migrate upstream in January and February, spawning in February, March, and April. Spawning is believed to occur among the roots and trunks of trees in swamps or in oxbow lakes that swell following spring rains. During the warmer months, May through August, adult shortnose congregate in summer feeding areas. There they seek snails, amphipods and other bottom-dwelling animals, abundant in the low-salinity (1 to 3 parts per thousand) portions of the estuary.

Habitat Conditions. MCAS Beaufort is too far downstream in the watershed to have any spawning habitat for this species, but the species is expected to move through waters adjacent to the Station.

Limiting Factors. Many favored spawning rivers have been dammed, while others have been adversely affected by pollution (industrial, agricultural, sewage, siltation, etc.). It is believed shortnose sturgeons are highly selective in their food and habitat preferences and are unable to adjust if preferred habitat is destroyed or polluted.

Current Status. Likely migrant or occasional visitor in waters adjacent to the Installation.

Management. This INRMP protects habitat for shortnose sturgeon by managing water quality through factors such as wetlands, floodplains, soil erosion, and stormwater control.

Atlantic Sturgeon (*Acipenser oxyrinchus*)

Status. Endangered – State and Federal

Habitat Use and Requirements. Adult Atlantic sturgeon primarily 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.

Habitat Conditions. MCAS Beaufort does not provide spawning habitat for this species, but adults are expected to move through waters adjacent to the Installation and juvenile life stages may reside there.

Limiting Factors. Many favored spawning rivers have been dammed, while others have been adversely affected by pollution (industrial, agricultural, sewage, siltation, etc.). Atlantic sturgeon are highly selective in their food and habitat preferences and are unable to adjust if preferred habitat is destroyed or polluted.

Current Status. Likely migrant in waters adjacent to the Installation.

Management. This INRMP protects habitat for Atlantic sturgeon by managing water quality through factors such as wetlands, floodplains, soil erosion, and stormwater control.

Pondberry (*Lindera melissifolia*)

Status. Endangered - State and Federal

Habitat Use and Requirements. Restricted to the upper edges of intermittently wet ponds in pinewoods.

Habitat Conditions. Apparently suitable where found on the Installation; however, other apparently suitable areas are not occupied by the species.

Limiting Factors. Generally unknown at this time; however, habitat loss, including possible loss of pollinators, is a likely problem. A lack of burning may also be a problem.

Current Status. Occurs at four locations on the Installation. The species may be threatened by the laurel wilt disease which attacks other members of the laurel family and is transmitted

by an introduced, invasive beetle. The Station has funded ongoing studies of the impacts of this disease on the installation's populations of pondberry.

Management. Monitoring, prescribed fire, and other management will be conducted in accordance with the biological assessment (Appendix I). Studies of the laurel wilt disease have been added to the plan. This INRMP protects habitat for pondberry through active management of factors such as wetlands, floodplains, invasive species, and forests.

Flatwoods Salamander (*Ambystoma cingulatum*)

Status. Endangered- State; Threatened - Federal

Habitat Use and Requirements. Primary habitat is flatwoods dominated by pine and grass. Flatwoods salamanders are generally found beneath logs near cypress ponds, swamps, and pitcher plant bogs. Breeding occurs in November.

Habitat Conditions. Potential habitat occurs on the Installation around isolated wetlands and ponds in pine forests.

Limiting Factors. Destruction or degradation of isolated wetlands in pine forest habitat.

Current Status - Possible resident.
Flatwoods salamanders are unevenly distributed and uncommon in South Carolina. Past surveys of the Installation by Navy and SCDNR did not find any flatwoods salamanders

Management. Isolated wetlands in pine forest will be preserved. Prescribed fire will be allowed to burn through ephemeral ponds (when dry) in pine flatwoods that could harbor this species, since fire will help maintain these open, wetland areas. This INRMP protects habitat for flatwoods salamanders through active management of factors such as wetlands, soil erosion, invasive species, and forests.

Canby's Dropwort (*Oxypolis canbyi*)

Status. Endangered - Federal and State

Habitat Use and Requirements. This species is typically found in isolated, wetland depressions and always in association with pond cypress.

Habitat Conditions. The numerous wetlands on the Installation provide potential habitat, but pond cypress is uncommon on the Installation.

Limiting Factors. The most significant threat to the species is the direct loss or alteration of its wetland habitat. Ditching and draining of lowland areas, primarily for agricultural and silvicultural purposes, has altered the groundwater table and changed the vegetative composition in many areas of the mid-Atlantic coastal plain, where the species historically occurred. Roadside maintenance, or improvements, also threatens this plant in some locations. Predation by larvae of the black swallowtail butterfly occurs, but the degree of predation among populations and the overall impact is unknown. The small population size of Canby's dropwort makes it vulnerable to potentially harmful losses from collecting.

Current Status - Unlikely resident.

Historical range of the plant includes coastal South Carolina. However, past surveys for threatened and endangered plants on the Installation did not find Canby's dropwort.

Management. This INRMP protects habitat for Canby's dropwort through active management of factors such as wetlands, floodplains, soil erosion, and invasive species.

Chaff-Seed (*Schwalbea americana*)

Status. Endangered - Federal and State

Habitat Use and Requirements. The plant is found in grasslands containing scattered trees and drought resistant undergrowth, or in longleaf pine woodlands.

Habitat Conditions. Potential habitat is present on the Installation.

Limiting Factors. Clear-cutting and other intensive forestry treatments.

Current Status - Unlikely resident.
Past surveys found potential habitat, but no specimens were found.

Management. Management practices needed to encourage this species include prescribed burning on a two or three year interval and prohibition of intensive site preparation methods. If specimens are found, a buffer zone will be placed around each colony. Size of buffer zone will be determined based on extent of colony. Timber harvesting will be excluded from this buffer zone, unless deemed advantageous to this sensitive species. This INRMP protects habitat for chaff-seed through active management of factors such as grounds maintenance, invasive species, and forests.

Eastern Diamondback Rattlersnake (*Crotalus adamanteus*)

Status. Petitioned - Federal.

Habitat Use and Requirements. Eastern diamondbacks may be found in many habitats, including dry pine forest, coastal maritime hammocks, grass-sedge marshes, sandy mixed woodlands, and salt marshes.

Habitat Conditions. Potential habitat is present on the Installation

Limiting Factors. The greatest threat is habitat loss, especially forested wetlands, upland pine forests, and isolated wetlands in pine forest habitat. Fragmentation of forests may reduce the ability of eastern diamondbacks to move safely between different forested areas.

Current Status – Likely resident. Eastern diamondbacks have been identified throughout Beaufort County.

Management. Monitoring, prescribed fire, and wetlands preservation will be continued on the Installation. This INRMP protects habitat for eastern diamondback rattlesnakes through active management of factors such as wetlands, floodplains, grounds maintenance, and forests.

Rafinesque's Big-Eared Bat (*Corynorhinus rafinesquii*)

Status. Endangered – State.

Habitat Use and Requirements. Inhabits forested regions of pine flatwoods and hardwood hammocks. They will roost in hollow trees, crevices behind bark, under dry leaves, and buildings and other man-made structures, sometimes in rather lighted areas. Colony size could range from 2-100 individuals.

Habitat Conditions. Although no species were captured during recent surveys, potential habitat occurs in hardwoods sites with large trees.

Limiting Factors. The greatest threat is habitat loss, especially forested wetlands. Large, older trees that have cavities for roosting are now rare in the landscape. A recent study revealed that bats move between several tree cavities during the summer, indicating that a small colony needs lots of space. Forested corridors connecting to other forested wetlands are important because these bats generally avoid open spaces. Fragmentation of our forests may reduce their ability to move between different forested areas.

Current Status – Possible resident. No individuals have been located in past surveys.

Management. Identify and protect habitat for bats, especially colony sites (both maternity and winter sites). Mature bottomland hardwood forests should be protected and forested corridors, preferably along water, need to be maintained as well. Bats should be discouraged from using buildings occupied by humans. Erect bat boxes in suitable habitat where cavity trees are limited. This INRMP protects habitat for Rafinesque's big-eared bat through active management of factors such as wetlands, floodplains, grounds maintenance, and forests.

Southeastern Myotis (*Myotis austroriparius*)

Status. Threatened – State.

Habitat Use and Requirements. A variety of roost sites across its range, typically roosting in clusters of several to a few hundred or more individuals. On the installation, probably associated with bottomland habitats with large, hollow trees, often near water. Forage primarily over lakes, ponds and slow-moving streams, flying close to the water's surface.

Habitat Conditions. Hardwood sites with large hollow trees provide natural roosting habitat on the Installation.

Limiting Factors. Colonies are extremely sensitive to disturbances and are easily driven away from roost by humans. The major threat to this bat is destruction of roost by humans.

Current Status – Confirmed resident. An active roost was found during a 2004 – 2005 survey. Other apparent active roosts were found on the installation (by a trained dog); however, the species present at these roosts were not determined.

Management. Protect mature bottomland hardwood forests and riparian areas. Preserve large hollow trees suitable for roosting. Re-inspect suspected roost trees and determine if any rare bat species are present. Erect bat boxes in suitable habitat where cavity trees are limited. This

INRMP protects habitat for southeastern myotis through active management of factors such as wetlands, grounds maintenance, invasive species, and forests.

Project Summaries

Project 13: Monitor and Maintain Pondberry.

Strategy: MCAS Beaufort will monitor pondberry. The number of sites and stems for pondberry on MCAS Beaufort should remain within historical data or increase; the amount of flowering and fruiting should remain within historical data or increase.

Tasks:

1) Monitor pondberry at least twice yearly as described in the biological assessment.
2) Try different fire techniques or other possible management actions, after consulting with the USFWS to increase flowering and fruiting of the plants.
3) Review results of surveys and management yearly with cooperating agencies and improve management as necessary to maintain the species.

Project 14: Other Rare, Threatened and Endangered Species Surveys.

Strategy: MCAS Beaufort will survey and monitor wood storks, bald eagles, and other listed species on the Station.

Tasks:

1) Look for new bald eagle nest each year during December or January.
2) Look for nesting wood storks each summer.
3) Check out suspected bat roost trees for the presence of the two state listed bat species.
4) Conduct surveys for Schwalbea chaffseed and Canby's cowbane following prescribed burning in appropriate habitat.
5) Conduct other surveys as needed after consulting with cooperating federal and state biologist.
6) Review results of surveys yearly with cooperating agencies and improve management as necessary to maintain the species.

Project 5: Control Invasive Plant Species.

Strategy: Control invasive species as described in the invasive species section. Take extra precautions to prevent accidental damage to pondberry in areas near known pondberry sites after consulting with the USFWS.

Tasks:

1) Control invasive plants on MCAS Beaufort by implementing the invasive plant management report (Appendix E). This will involve combinations of pesticide applications, cutting, pulling, and prescribed fire.

2) Monitor the efficacy of treatment with observations and field notes: use more quantitative methods when necessary. Monitor both the reduction in invasive plants and the return of desired native plants.

3) Retreat where necessary to improve and maintain control. Use the monitoring to change techniques and methods as needed to effect control.

4) Prohibit the planting of Cogon Grass (*Imperata cylindrical*), *Tamarix* sp., Chinese Tallow (*Triadica sebifera*), Mimosa (*Albiza julibrissin*), Chinese//European Privet (*Ligustrum sinense/L. vulgare*), Kudzu (*Pueraria Montana*), Chinese Wisteria (*Wisteria sinensis*), Japanese Wisteria (*Wisteria floribunda*), and Tropical Soda Apple (*Solanum viarum*) anywhere on the installation. Revise any existing contracts to reflect this and review any new contracts and site plans to preclude planting of these species.

5) Control fire ants through approved methods and partner with state and federal agencies to use biological control when feasible.

Laws, Executive Orders, Regulations, Directives, and Memoranda Relevant to Threatened and Endangered Species Management

Endangered Species Act, 16 USC 1531-1543, Title 50 Code of Federal Regulations (CFR) Part 17, 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 USC 703-712, prohibits the taking or harming of a migratory bird, its eggs, nests, or young without the appropriate permit.

Sikes Act, as amended 16 USC 670 a-f, 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, to provide its personnel with professional training in fish and wildlife management.

Marine Mammal Protection Act of 1972, 16 USC 1361-1407, prohibits the taking or harming of marine mammals without the appropriate permit.

Fish and Wildlife Conservation Act, 16 USC 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 5090.1B, par 22-4.2 discusses laws that govern natural resources management relating to the protection and management of fish and wildlife resources.

South Carolina Statutes, Chapter 372, protects wildlife species listed as endangered, threatened, or species of concern by the state of South Carolina.

Additional Sources of Information

Telephone Contacts:

USFWS Charleston Ecological Services Office: (843) 727-4707

Internet Addresses:

USFWS Endangered Species http://endangered.fws.gov/

Habitat Conservation Planning Handbook*: Effects of Fire on Threatened and Endangered Plants*: http://fire.r9.fws.gov/ifcc/T&EPlants/T&EPlants.htm#Abstract

South Carolina Department of Natural Resources: http://www.dnr.sc.gov/
Nature Serve Rare Species List: http://www.natureserve.org/explorer/
Rare Species Lists for South Carolina: http://www.dnr.sc.gov/species/index.html

Game Management

Hunting is currently allowed on the Installation. MCAS Beaufort Air Station Order 1700.2E contains Installation hunting regulations (Appendix J). All hunting activities are conducted in accordance with federal and state laws and regulations. These laws are enforced on the Installation by the installation game warden.

Game management in the context of this plan includes established techniques, which benefit a variety of wildlife including both game and non-game species. MCAS Beaufort will utilize effective management and monitoring techniques to sustain essential habitat and populations of game (e.g., white-tailed deer, wild turkey, quail, and waterfowl) species in areas consistent with the military mission.

Objective

6. Provide fish & wildlife based outdoor recreation, including hunting, appropriate to the present resource base and compatible with military use of the Installation.
11. Monitor the deer herd through collection of information from harvested deer supplemented with other studies as recommended by the State.
22. Conduct deer surveys to evaluate deer hazards monthly or more frequently as determined on site by the NREAO.
23. Test various management schemes in the woods around the airfield for impacts on the number of deer using the airfield.
24. Control the deer herd through hunting and other legal means to keep deer away from the runways and taxiways.

Long-Term Management

White-Tailed Deer Management

MCAS Beaufort will continue to improve herd condition, maintain deer populations at acceptable levels, and increase the quality of individual deer (higher weights for both sexes and more antler points on bucks) SCDNR biologists recommend keeping the fawn (less than 1.5 years old) and young antlered buck harvest low while emphasizing the harvest of adult doe.

Deer herd management will consist primarily of habitat enhancement and harvest quotas. Deer harvest data is compiled at the game check station and will be kept to monitor the condition of the herd. SCDNR deer biologists will analyze the previous year's harvest data and make specific recommendations for the number of deer to be harvested during the next hunting season.

Habitat enhancement will be accomplished through timber management practices including thinnings, reforestation, and final harvests. Prescribed burning of selected areas, on a three to five year rotation, will be emphasized since this is the most effective and economical means of improving deer habitat. Forest openings, created by powerline right-of-ways, roads, magazine areas, and wildlife food plots will be maintained. Some openings will be planted while others will be maintained by burning, disking, or mowing. Fruit and mast producing trees and shrubs will be planted and protected when funding and manpower is available. Overall, the emphasis will be on maintaining a low, but healthy deer population that is concentrated away from the runways.

Wild Turkey Management

Turkeys respond favorably to many techniques employed for deer, songbirds, quail and a variety of other species. The most feasible management practices on the Installation for turkey are prescribed burning on a 3-5 year schedule and thinning operations. This will improve turkey habitat by keeping an open understory, while encouraging development of fruit and mast-bearing species. Maintenance of an open understory, with adequate grasses and legumes and preservation of hardwood mast-producing trees, is the long-term goal.

Bobwhite Quail Management

The primary long-term management factors for managing bobwhite quail are provisions for food and cover for nesting and brood rearing habitat. Quail management practices correspond closely to those identified above for deer and turkey. An open overstory is the most important component of quail habitat. Carrying capacity of forested areas are increased primarily through timber harvesting and prescribed burning. Pine forests managed for quail can usually support one covey to each 25-100 acres. Another component for effective quail management is the establishment of cover, because of

its significance during each life stage of the quail. Therefore, establishing hedgerows and brush piles with native vegetation, in close proximity to food, is a high management priority.

Waterfowl Management

Waterfowl are considered a BASH hazard at MCAS Beaufort. The Installation will be managed to keep waterfowl numbers as low as practical.

Project Summaries

Project 15: Manage Small Game.

Strategy: Allow harvest of small game in accordance with SCDNR regulations except that duck, and turkey will not be harvested. Hunting may be further restricted to maintain safety and security. Manage small game habitat by prescribed fire and timber management that provides habitat for small game in an ecosystem management setting. Utilize other small game practices (brush piles, food plots, nest boxes, etc.) as time, funding, and volunteer help permit.

Tasks:

1) Conduct small game hunts in accordance with SCDNR regulations in a manner compatible with Installation security and safety considerations.
2) Plant food plots in areas that will not conflict with BASH management.
3) Prescribed burn the pine stands on a 3-5 year basis, but burn some pine stands more frequently to promote Northern Bobwhite.
4) Construct brush piles from timber slash with volunteer labor. Also utilize the half-cut technique to create cover.
5) Maintain forest stands in conditions conducive to Northern Bobwhite.
6) Keep records of all game taken.
7) Review results of surveys and management yearly with cooperating agencies and improve management as necessary to maintain the species.

Project 16: Manage Deer.

Strategy: Conduct habitat improvement actions for the species and allow hunting to the extent that the game species can sustain the take.

Tasks:

1) Conduct deer hunts in accordance with SCDNR regulations in a manner compatible with Installation security and safety considerations.
2) Plant food plots in areas that will not conflict with BASH management.
3) Maintain forest stands in conditions conducive to deer production through stand thinnings and prescribed fire.
4) Keep records of all deer taken.

5) If necessary, utilize depredation permits and shoot deer around runways to prevent deer / aircraft collisions.
6) Review results of surveys and management yearly with cooperating agencies and improve management as necessary to maintain the species and prevent collisions with aircraft.

Additional Sources of Information

Telephone Contacts:

Jan Cantrell: (803) 6253569

Internet Addresses:

SCDNR: http://www.dnr.sc.gov/

Northern Bobwhite Conservation Initiative: http://www.qu.org/seqsg/nbci/nbci.cfm

Quail Unlimited: http://www.qu.org/

National Wild Turkey Federation: http://www.nwtf.org/

Prevention and Control of Wildlife Damage and Disease

The prevention and control of wildlife damage are actions to reduce wildlife conflicts with people or other wildlife species. The primary wildlife damage problem on MCAS Beaufort is the potential for bird / aircraft collisions with subsequent loss of aircraft and possible mortality to aircrew members. Additionally, raccoons, gray squirrels, feral cats, and bats are known to occur on the Station and may be considered nuisance individuals under certain circumstances. Some birds, such as house sparrows, starlings, pigeons, grackles, and crows may also be considered nuisance wildlife in some instances. Nuisance wildlife on the Station could pose a threat to the military mission.

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

Objectives

3. Control invasive species throughout the Installation.

10. Maintain populations of all animals appropriate for the local area, habitats, and size of the Installation; maintain average or better populations for species determined to be declining in the region.
20. Maintain airfield clear zones free of shrubs and trees and airfield grass between 7 and 14 inches high (or as recommended by the Naval Safety Center).
23. Test various management schemes in the woods around the airfield for impacts on the number of deer using the airfield.
24. Control the deer herd through hunting and other legal means to keep deer away from the runways and taxiways.

Long-Term Management

Bird / Aircraft Strike Hazards (BASH)

Like all airfields, MCAS Beaufort it at risk from BASH. MCAS Beaufort has a BASH plan (Air Station Order 3750.6; Appendix C) to mitigate for animal hazards. Implementation of the plan is mandatory. As part of this plan, the Installation has an interagency agreement with the USDA Animal and Plant Health Inspection Service's Wildlife Services office to provide personnel for the reduction of wildlife damage at MCAS Beaufort's airfield. A Wildlife Hazard Assessment has been completed for MCAS Beaufort; this assessment provides a comprehensive look at safety problems associated with Wildlife on the Installation.

In general, the installation manages its lands to reduce the number of bird and mammal hazards on and around the airfield environment. Large or flocking bird species along with medium to large mammals that utilize relatively open areas are more dangerous to aviation. Thus, the installation tries to manage the usage of the airfield environment by the aforementioned types of animals. This is done by using an integrated wildlife damage management plan. This plan incorporates non lethal harassment and exclusion methods along with lethal control to reinforce the non lethal methods.

Wildlife Damage

In the event that MCAS Beaufort identifies another wildlife conflict, a damage control program will be established. The program will have four parts (Dolbeer et al. 1994):

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, the Station will keep records for the following:

Ecology of the problem species: to understand the life history of the species, especially in relationship to the conflict.

Control method: takes the information gained from parts 1 and 2 and develops an appropriate management program to alleviate or reduce the conflict.

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.

Wildlife Disease

There have been no reports of diseases affecting wildlife or humans on the Station. However, MCAS Beaufort will have a long-term management policy of public awareness (e.g., informing employees and visitors) about the issues of concern to management. Management will focus on, but will not be limited to, the following issues:

- Knowledge of the diseases in the area and the specific times of year that present the greatest risk of exposure.
- Knowledge of and recognition of early symptoms of diseases and the condition of exposure.
- The use of extreme caution when approaching or handling a wild animal, especially one that looks sick or acts abnormally.
- The use of protective measures against fungal diseases where there is an accumulation of animal feces (e.g., under bird and bat roosts).
- 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.
- Eliminating undesirable manmade wildlife attractants such as exposed garbage and unmaintained picnic areas.

Project Summaries

Project 17: Conduct BASH Program.

Strategy: Continue the MOA with USDA APHIS to provide personnel for BASH management. Monitor the airfield and adjacent areas to spot and prevent problems before damage occurs. Utilize all available methods to drive wildlife that is hazardous to aircraft away from the airfield after obtaining any required permits from the USFWS and SCDNR.

Tasks:

1) Conduct night light surveys around airfield biweekly. Keep records of life stage (adult or fawn), sex, and number of points.
2) Conduct point counts at the 13 existing points around the runways as necessary, but no less than monthly, to determine potential bird hazards.
3) Maintain records of all migratory birds taken as a result of military readiness activities and from depredations to prevent bird strikes. Maintain records of all deer taken to prevent deer strikes.
4) Obtain required permits necessary to conduct operations.

5) Whenever hazardous wildlife situations occur, use appropriate techniques to drive birds away from airfields.

Project 18: Prevent other wildlife damage and disease.

Strategy: MCAS Beaufort will prevent human/wildlife health conflicts by proper garbage handling and by either preventing problems before they occur or handling problems as soon as they occur through the use of appropriate assistance.

Tasks:

1) Make all putrecible garbage unavailable to raccoons, rats, opossums, armadillos, etc. so their populations are not artificially increased.
2) To control feral cats on the installation, implement Armed Forces Pest Management Board Technical Information Memorandum 41, Guidelines for Reducing Feral/Stray Cats on Military Installations in the United States (located at: http://www.afpmb.org/pubs/tims/tim37.htm).

Laws, Executive Orders, Regulations, Directives, and Memoranda Relevant to Wildlife Damage and Disease

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.

Additional Sources of Information

Telephone Contacts:

North Central Region Nuisance Alligator: (904) 758-0525

Internet Addresses:

Nuisance Wildlife Control Information: http://www.aphis.usda.gov/wildlife_damage/

Bird Strike Committee USA: http://www.birdstrike.org/

USGS National Wildlife Health Station Web: http://www.emtc.usgs.gov/nwhchome.html.

Internet Center for Wildlife Damage Management: http://icwdm.org/

Armed Forces Pest Management Board: http://www.afpmb.org/

Fisheries Management

Fishing at MCAS Beaufort is authorized from the banks of the Broad River, from fishing piers on the Broad River, Salt Creek and Albergottie Creek, and on four freshwater ponds – Scout,

Round Island, Fuel Farm and MCCS. Personnel fishing on the Station are required to abide by and subject to all South Carolina and Federal laws and regulations.

Where fishing occurs regularly, the Station will regularly police the area to remove trash. If feasible and useful, trashcans are provided at frequently used fishing spots.

Objectives

30. Maintain balanced bass and bluegill populations for recreational fishing.
31. Maintain pond fertility along with other physical and chemical properties of the pond within limits suitable for fish and other naturally occurring aquatic organisms.
32. Implement fertilization and liming program to increase pond productivity and fishing opportunities.
33. Monitor and control recreational fishing sufficiently to maintain balanced fish populations.
34. Monitor ponds for noxious aquatic weeds and eliminate these plants from the ponds should they occur in the ponds.
35. Implement a program to remove brush from the around the banks of the fish ponds to increase access for fishing.
36. Improve fish habitat through the use of techniques recommended by fisheries biologist from cooperating agencies

Long-Term Management

Specific management considerations for fisheries habitat include the following: 1) physical characteristics, 2) fish stocking and fish harvest, 3) water quality management, and 4) aquatic vegetation management. MCAS Beaufort will monitor these management principles with the assistance of the South Carolina Department of Natural Resources in order to sustain the Installation's fisheries resources.

Physical Characteristics

MCAS Beaufort freshwater resources serve a variety of purposes such as stormwater retention, wildlife management/observation and recreational fishing for the Installation. Because of this, fisheries are more susceptible to changing physical conditions (e.g., water quality, depth and surface area ratio). Any change to the physical characteristics of these ponds will require a reevaluation to determine appropriate management practices to ensure the achievement of all objectives.

Fish Stocking and Population Maintenance

Effective pond management requires careful consideration of fish types and populations and desired outcomes identified for the pond. In accordance with the recreational fishing activities for MCAS Beaufort ponds, the Installation will stock a balanced combination of largemouth bass and

bluegill sunfish, as prey for the bass, and/or channel catfish to provide good quality, sustainable sport fishing, when necessary and feasible. All stocking and population maintenance will be completed in accordance with recommendations from the SCDNR and the USFWS.

MCAS Beaufort will continue the population-monitoring program to ensure a healthy and balanced fish population. Population sampling will provide valuable information regarding number of each species, breeding success, and general health of the fish.

Water Quality Management

Good water quality is essential to successful fish production. Dissolved oxygen, pH, alkalinity, and total hardness as well as physical properties such as clarity are important factors that contribute to the relationships that determine good pond health for fisheries management purposes. MCAS Beaufort will monitor water quality, when feasible, in freshwater ponds to determine necessary corrective actions in order to maintain appropriate recreational fishing resources.

Corrective actions to improve freshwater quality parameters for fish production at MCAS Beaufort include:

- The use of lime, which is the most common pond treatment in the southeast because of the presence of acidic soils, acid rain, and acidic runoff from decaying leaves and pine straw. Lime raises the pH and increases the availability of nutrients, thus making fertilization more effective. Lime also buffers the water to prevent stressful fluctuations in water chemistry; ponds that require lime may have drastic changes in pH (relative acidity) from morning to evening on a bright sunny day. Lime also provides the benefit of helping to clear muddy ponds by encouraging sediments to settle out more quickly.
- The use of proper amounts of fertilizer. Proper fertilization will increase fish production, and better control aquatic weeds. Ponds should not be fertilized if the water is muddy, turbid, or darkly stained, if the pond has heavy growth of aquatic weeds and if alkalinity is below 20 mg/l. Over fertilization can contribute to low dissolved oxygen levels and subsequent fish mortality.

Aquatic Vegetation Management

MCAS Beaufort impoundments have the potential to be overtaken by dense aquatic vegetation. The presence of excessive aquatic vegetation in sport fishing ponds is undesirable for several reasons. Aquatic plants use available nutrients in the water, thus preventing proper algal blooms; they provide cover for small fish, especially bluegill sunfish, which reduces the availability of this food source for largemouth bass and results in overcrowding and stunting in both species. Extensive vegetation coverage can also result in the depletion of dissolved oxygen from the water during the processes of decay.

Corrective actions will be implemented at the discretion of the Natural Resources Manager for the treatment of aquatic weed infestations, which include the following:

- Proper fertilization of ponds. Fertilization can prevent vegetation from becoming established in ponds that are 3 feet deep and deeper. Fertilizer promotes algal blooms that prevent sunlight from reaching the bottom and prevents plants from becoming established. However, in ponds with shallow edges or excessive flow, fertilization will not be effective.
- Stocking ponds with sterile grass carp can also serve as a natural, biological control of unwanted plant growth. Grass carp are not effective as a means of control for woody plants that commonly grow along the edges of ponds in the Southeast, such as button bush, willows, and alders. Stocking rates for grass carp depend on plant species, plant densities, and plant distribution. SCDNR fisheries biologists recommend stocking grass carp at the rate of 10 to 15 fish per acre.
- If problem vegetation cannot be removed by the means discussed above, herbicides can be used as a spot treatment or as temporary control of vegetation. Many variables must be considered and researched before using herbicides. Proper identification of a nuisance plant is essential when choosing an herbicide as no single herbicide is effective for all plants. Knowledge of the pond's water volume and/or surface area is important when deciding on application amounts and methods. Once unwanted vegetation is removed from a pond, fertilization is the best treatment to prevent reestablishment.

Pond Specific Strategies

Scout Pond: Bass – Bream – Catfish fishery with fertilization and catfish feeding; limit harvest of bass to prevent bream overpopulation; monitor with creel checks and periodic sampling of the pond.

Round Island Pond: Bass – Bream – Catfish fishery with fertilization and catfish feeding; limit harvest of bass to prevent bream overpopulation; monitor with creel checks and periodic sampling of the pond.

MCCS Pond: Catch and release Bass – Bream – Catfish fishery without fertilization or feeders.)

Fuel Farm Pond: Catch and release Bass – Bream – Catfish fishery without fertilization or feeders.

Softball Field Pond: Catch and release Bass – Bream fishery without fertilization.

Project Summaries

Project 19: Provide Pond Access

Strategy: Maintain and improve existing recreational freshwater fishing opportunities at MCAS Beaufort by repairing the existing fishing piers and constructing new ones. Make the piers ADA compliant where feasible. Keep brush around the ponds cut back so that between 15% and 35% of the banks are accessible for fishing.

Tasks:

1) Repair piers and boat ramps as needed.
2) Check on use of piers and boar ramps during other work, add new piers and boat ramps if the need exists.
3) Cut brush back from banks of ponds when it starts limiting access for bank fishing.

Project 20: Fish Pond Management

Strategy: Maintain and improve existing recreational freshwater fishing opportunities at MCAS Beaufort by ensuring the availability of freshwater fisheries through stocking, fertilization, weed control, harvest restrictions, and monitoring programs in fish ponds.

Tasks:

1) The Conservation Officer will conduct creel checks of persons fishing at the Installation fish ponds.
2) Request, as needed, visit(s) from SCDNR fisheries biologist or other public or private fisheries biologist for analysis of fish ponds.
3) Monitor pond fertility and other water quality measures. Lime and fertilize Scout and Round Island Ponds when needed.
4) Install fish feeders and feed catfish at all ponds.
5) Maintain the existing aeration system at Scout and Round Island Ponds.
6) Based on creel checks and other collected information, restrict bass harvest as necessary to maintain a balance between bass and bluegill so that too many bluegill do not become a problem.
7) Conduct other fish pond management such as stocking and weed control after consulting with SCDNR biologist.

Laws, Executive Orders, Regulations, Directives, and Memoranda Relevant to Fisheries Management

EO 12962 directs Federal agencies to cooperate in conservation of aquatic resources and enhancement of opportunities for recreational fishing.

Federal Water Pollution Control Act, as amended by the CWA of 1977, 33 USC 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).

Fish and Wildlife Coordination Act as amended; Public Law 85-624, 16 USC 661 et seq., this law was enacted to ensure that fish and wildlife conservation receives consideration equal to, and coordinated with, other features of water resources programs. Section 10 of the Act directs Federal

agencies to consult the USFWS, NMFS, and the appropriate state agencies before authorizing alteration to water bodies.

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.

Clean Water Act: Section 401 Water Quality Certification, 1986, 33 USC 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 5090.1B, par 22-4.3(a), discusses natural resources management relating to wetland management.

South Carolina Code of Laws, Title 50, Chapter 9, requires all people engaged in fishing activities to have a state issued license.

South Carolina Code of Laws, Title 50, Chapter 13 Protection of Fish, describes the regulations governing fishing activities in Florida waters.

South Carolina Marine Resources Act of 2000, governs commercial and recreational salt water fishing.

Additional Sources of Information

Telephone Contacts:

Chris Thomason (SCDNR Fisheries Biologist): (803) 259-5474 or thomasonc@dnr.sc.gov

Internet Addresses:

SCDNR Fishing Information: http://www.dnr.sc.gov/fishing.html

Fish Pond Management: http://www.aces.edu/dept/fisheries/rec_fishing/pdf/fishpond.pdfhttp://www.wildlifemanagement.info/fish_pond_management.htm

4.4 Outdoor Recreation

For the purposes of this INRMP, outdoor recreation is defined as the use of natural resources where the primary focus is on the understanding and use of the natural environment. Outdoor

recreation includes nature trails, picnic and camping areas, establishment and management of recreational trails, scenic rivers, and other consumptive and non-consumptive uses of natural resources. The use of off-road vehicles, as well as other highly developed outdoor uses such as golf courses, tennis courts, ball/athletic fields, or swimming pools is not considered outdoor recreation in the context of this plan. In accordance with Executive Order 11644, as amended by Executive Order 11989, off-road vehicles are specifically prohibited on the Station. Military and DOD vehicles being used in training or military operations are not considered off-road vehicles.

Objectives

5. Maintain records and collect data of fish & wildlife based outdoor recreation to determine desired and needed activities.
6. Provide fish & wildlife based outdoor recreation, including hunting, appropriate to the present resource base and compatible with military use of the Installation.
7. Upgrade, refurbish, or replace at least one recreation facility every other year. Each improved facility will be made accessible to the handicapped

23. Control the deer herd through hunting and other legal means to keep deer away from the runways and taxiways.
30. Maintain balanced bass and bluegill populations for recreational fishing.
31. Maintain pond fertility along with other physical and chemical properties of the pond within limits suitable for fish and other naturally occurring aquatic organisms.
32. Utilize a fertilization and liming program to increase pond productivity and fishing opportunities.
33. Monitor and control recreational fishing sufficiently to maintain balanced fish populations.
34. Monitor ponds for noxious aquatic weeds and eliminate these plants from the ponds should they occur in the ponds.
35. Control and remove brush from the around the banks of the fish ponds to increase access for fishing.
36. Improve fish habitat through the use of techniques recommended by fisheries biologist from cooperating agencies.

Hunting

Hunting is authorized on the Installation to control deer and provide recreation for installation personnel and their dependents. The hunting program is controlled under Air Station Order 1700.2E.

Fishing

Fishing opportunities at MCAS Beaufort are limited by the small size of the Station. Fishing is authorized in four Installation ponds: Scout, Round Island, MCCS, and Fuel Farm. Fishing also

occurs in the rivers and streams near MCAS Beaufort by personnel utilizing MCAS Beaufort's boat ramps. Fishing in the Installation ponds is controlled under Air Station Order 1700.2E.

Nature Trails and Study

The woods on the Station are available for nature observation and study by Station personnel. The major trail for nature study is the jogging / nature trail along Albergottie Creek. The woods behind Laurel Bay housing also are open for nature study and receive frequent use from residents.

Horseback Riding

Horseback riding is authorized on Laurel Bay. Riders may utilize existing roads and firebreaks.

Boating

Boating with electric trolling motors is authorized at Scout and Round Island ponds. Two other boat ramps are maintained for the use of Installation personnel and their dependents. One ramp is at Laurel Bay on the Broad River. The other ramp is on the Main Station along Albergottie Creek. (Figures 11 & 12)

Camping and Picnic Areas

Camping is not authorized on the Station. Picnicking is authorized, but formal areas are not set aside. Picnic tables and picnic areas may be added at appropriate locations at the discretion of the Station's Commanding Officer.

Project Summaries

Project 21: Conduct Recreational Hunting and Fishing Program.

Strategy: Implement projects entitled Manage Game Species, Provide Fish Pond Access, and Fish Pond Management in a manner that maximizes outdoor recreation opportunities for Installation personnel and their dependents.

Tasks: Provided in Projects entitled Manage Game Species, Provide Fish Pond Access, and Fish Pond Management.

Project 22: Provide Non-consumptive Nature Observation Opportunities.

Strategy: Maintain woods roads and nature trails to allow passive outdoor recreation such as walking, jogging, bird watching, etc.

Tasks:

1) Maintain woods roads and trails. Upgrade and add signage to improve interpretive opportunities.
2) Maintain the Boy Scout camping area at Scout Pond.
3) Add picnic area and information kiosk at Round Island Pond.
4) Add picnic tables in administrative areas for lunch breaks.
5) Add additional picnic tables around the log cabin community center.
6) Maintain boat ramps and fishing/observation piers/platforms.
7) Make all of these facilities Americans w/ Disabilities Act (ADA) compatible by making all new facilities ADA compatible and upgrading one old facility when funding is available.

Project 23: Natural Resources Public Outreach.

Strategy: Provide Installation personnel, dependents, and the public with information about the recreational and other natural resources available at MCAS Beaufort to further cooperation and understanding between the community, Station personnel and MCAS Beaufort regarding the management of the Station's natural resources.

Tasks:

1) Utilize the Station newspaper, handouts, brochures, and other means to inform Installation personnel and their dependents of the outdoor recreation resources available on the Installation.
2) Hunter safety course.
3) Conduct other public outreach such as Earth Day, National Migratory Bird Day, and Christmas Bird Counts.

Laws, Executive Orders, Regulations, Directives, and Memoranda Relevant to Outdoor Recreation

Sikes Act and Improvement Act of 1997, 16 USC 670a(b)(1)(G), requires public access to a military Station 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 USC 460 P-3, defines a program for managing lands for outdoor recreation.

OPNAVINST 5090.1B, par 22-4.5, discusses natural resources management relating to the protection and management of outdoor recreational resources.

Additional Sources of Information

Telephone Contacts:

National Park Service – Southeast Regional Office: (404) 562-3100

South Carolina Park Service: (850) 245-2157

Internet Addresses:

National Parks Service: http://www.nps.gov/

South Carolina Parks Recreation and Tourism: http://www.scprt.com/

4.6 Law Enforcement

The Installation will enforce state and federal natural resources related laws aboard MCAS Beaufort in coordination and cooperation with the USFWS and SCDNR. The Installation will maintain a full time law enforcement position to enforce these laws and regulations. State and federal law enforcement officials will also be allowed complete access to all areas of the Installation subject to appropriate safety and security precautions. Enforcement of state and federal laws and Installation orders will protect game and nongame species from poachers, protect habitats and facilities from vandalism and inadvertent destruction, and ensure an equitable distribution of harvested game and fish.

4.7 Staffing and Training

This Section addresses the staffing, training and technology of the natural resources program at MCAS Beaufort necessary to manage the natural resources at MCAS Beaufort and to implement this INRMP as required by the Sikes Act Improvement Act (SAIA).

The natural resources staff currently consists of one (1) full time natural resources manager, one full time Conservation Officer, and two fulltime BASH specialists under the direction of the NREAO. This has not proved adequate for maintaining vegetation by prescribed fire or other means. In order to maintain adequate communications between the tower and aircraft on the runway and in the pattern, the forest stands will have to be more intensively managed for a more open forest with less of an understory. This will require more time spent thinning timber and controlling the forest understory by prescribed fire, mechanical, or chemical means. Given the current problems with prescribed burning that result from both operations and encroachment, the time required to maintain the woods is only going to increase. The acquisition of the Joint Strike Fighter will further exacerbate these issues. Recently, requirements to maintain the airfield communications cleared areas and to maintain habitat for the endangered pondberry recently resulted in much emergency work to coordinate the two so that communications could be maintained without violating the endangered species act. The addition of a technician dedicated to forest management should prevent these issues in the future; however, funding is not currently available for additional staff.

The natural resources coordinator for the Station will continue to ensure that natural resources management practices are consistent with military mission requirements. He or she will also review MCAS Beaufort military activities that potentially impact natural resources (e.g. wetlands, natural areas, floodplains, water quality, etc.). This will allow actions affecting natural resources to be identified early, and potential problems with sensitive resources (e.g. threatened and endangered species, wetlands, floodplains) be addressed in the most efficient manner compatible with the completion of the mission and protection of those resources.

Training is essential in providing and sustaining skills necessary in managing the natural resources program at MCAS Beaufort. The interdisciplinary nature of the natural resources positions requires attending pertinent conferences, workshops, symposia, and training courses.

Project Summaries

Project 24: Natural Resources Staffing.

Strategy: Maintain adequate staffing levels for implementing the INRMP. Staffing will include:

1) Natural Resources and Environmental Affairs Officer (Oversees all environmental programs on the Installation).
2) Natural Resources Manager (Natural Resources Professional with direct responsibility for the Natural Resources Program).
3) Conservation Officer (Federal Law Enforcement school trained biologist responsible for natural resources law enforcement duties on MCAS Beaufort and assisting with other natural resources management on an as needed/as available basis).
4) BASH specialist (Currently USDA APHIS employees assigned to work on MCAS Beaufort with responsibility for keeping bird and deer strikes at a minimum).
5) Specific tasks, such as spraying herbicides to kill invasive plants, can be performed by contract personnel under the direction of the actual federal employees listed above.

Project 25: Natural Resources Training.

Strategy: Provide natural resources personnel with proper training/certifications for programs identified in this INRMP and provide information regarding natural resources laws and nature in general to Installation personnel and their dependents.

Tasks:

1) Provide training to the Station's Natural Resources Manager, Conservation Officer and other staff yearly. Training will be directed at military requirements, legal requirements, and natural resources science.
2) Train other Station personnel regarding the protection, uses, and benefits of natural resources. Examples of training include:

i. Newspaper articles.
ii. Informational brochures and bookmarks.
iii. Displays and kiosk
iv. Nature trail signage.
v. Hunter safety course.

4.8 Monitoring

Monitoring is essential to understanding the progress made during the implementation of this INRMP. Monitoring is also required by 32 CFR Part 190, DOD Instruction 4715.3, Executive Order 13202, and the Marine Corps' "Handbook for Preparing, Revising, and Implementing Integrated Natural Resources Management Plans".

The monitoring described below is a compilation of other monitoring from the rest of the plan. This provides an overall picture of the information managers will have available to institute adaptive management, make adjustments to the plan at the annual reviews, and provide a record of accomplishments.

Objectives

8. Determine species richness and diversity Installation wide and by area of the Installation so biodiversity can be monitored and maintained.
9. Determine indicator species or criteria for future monitoring of management actions.
11. Monitor the deer herd through collection of information from harvested deer supplemented with other studies as recommended by the State.
12. Monitor, maintain, and provide a conservation benefit for endangered species on MCAS Beaufort.
21. Conduct bird surveys to evaluate bird strike hazards daily.
22. Conduct deer surveys to evaluate deer hazards monthly or more frequently as determined on site by the NREAO

General Monitoring

1. Keep records of all management actions including food plots, prescribed fire, other plantings, fish stocking, pond fertilization, etc.

Soil Erosion Monitoring

1. Natural resources personnel will check suspected areas for soil erosion during their regular rounds of the Installation. Areas of suspected erosion will be photographed at least twice yearly to determine if erosion is occurring and how fast it is occurring.

Wetlands Monitoring

1. Keep records of area of wetlands created, restored, enhanced, drained or filled each year. This includes the area of pinewood ponds burned each year.

2. Conduct a Floristic Quality Assessment of Each installation wetland once every 5 years.
3. Sample each isolated wetland for larval amphibians once every other year by dip netting. Check for deformities and species diversity in each wetland. Keep records of dragonfly and damselfly larvae captured while sampling for amphibians.

Invasive Species Monitoring

1. Monitor the efficacy of treatment with field notes, photographs, and test plots. Monitor both the reduction in invasive plants and the return of desired native plants.

Forest Monitoring

1. Monitor forest periodically for disease or pest outbreaks.
2. Inventory the forest stands in 2011 to make informed choices for the next plan.
3. Keep records of area burned each year by prescribed fire and wildfire.
4. Keep records of all timber sales including salvage operations.

Wildlife Monitoring

1. Keep records of deer harvested. For each deer collect information on sex, age, weight, # points, condition, and location taken.
2. Conduct night light surveys around airfield biweekly. Keep records of age (adult or fawn), sex (when possible) and number points.
3. For other game species, keep records of numbers and locations of game taken.
4. Conduct winter bird searches for Henslow's and other winter sparrows in January or February of each year in the longleaf stand at Laurel Bay once it has been prescribed burned. Expand to other pine stands once forestry practices provide the correct habitat.
5. Count stems, flowers, and fruits from each sub population of pondberry twice yearly. Check out each pine stand the summer following prescribed burning to look for pondberry and other listed endangered plants.
6. Search for bald eagle nest each December and January.
7. Look for wood storks each summer while conducting other surveys.
8. Look for Southeastern myotis (a bat) and Rafinesque's big-eared bat in tree roost and Northern yellow bats under palmetto leaves on an opportunistic basis.
9. Conduct point counts at the 13 existing points around the runways as necessary, but no less than monthly, to determine potential bird hazards.
10. Maintain records of all migratory birds taken as a result of military readiness activities and from depredations to prevent bird strikes. Maintain records of all deer taken to prevent deer strikes.

Fish Pond Monitoring

1. The conservation officer will conduct creel checks of all ponds during his normal duties. When conducting these checks, the officer will inquire of fishermen of fish caught, but not kept and keep records of the species returned.
2. Natural resources personnel will check the ponds for aquatic weeds during their normal duties and keep records of the number of checks and the types of weeds present.
3. Each pond will be checked for "bass-bluegill balance" and the presence of other fish species if the creel checks indicate that a problem may be starting.
4. Keep records of all fish pond stocking to include species, numbers, size, and date.
5. The Natural Resources Manager will check water quality of the fish ponds looking for excessive algae blooms and low dissolved oxygen conditions during seasons and weather conditions conducive to these problems.

Project 26: INRMP Review.

Strategy: MCAS Beaufort will review the plan annually with the signature agencies.

Tasks:

1) Review the plan annually with the signature agencies for effectiveness and implementation. NAVFAC SE will help with this if requested to do so.
2) Following the annual review, update the INRMP by making changes to the INRMP as determined at the annual review.
3) Update the project tables and budget request computer site and notify HQMC of any changes in required funding.

Project 27: Renew INRMP.

Strategy: MCAS Beaufort will renew the plan every 5 years. Complete rewrites may not be necessary if annual reviews have been conducted and the plan updated each year.

Tasks:

1) During the fourth annual review with the signature agencies, determine if a rewrite is necessary or if minor changes will suffice.
2) Update the project table to be sure projects are scheduled for at least the next five years.
3) If a complete rewrite is not necessary, make only the changes determined in the annual review and circulate the plan to appropriate parties for signature.
4) If a complete rewrite is necessary, initiate rewrite in full cooperation with the signature agencies.

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