
Integrated Natural Resources Management Plan Update

Naval Air Station Kingsville, Texas



2018 Update

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Cover Photographs:

Top right and top left – Reticulate collared lizard (right) and Texas indigo snake (left) from Clements, P. and C.M. Giggelman. 2012. Herpetofauna Survey of the United States Navy – Escondido Ranch, McMullen County, Texas. 2007–2012. Prepared for NAS Kingsville, Texas. Prepared by the U.S. Fish and Wildlife Service. Corpus Christi, Texas.

Middle – South Texas Ambrosia from Garvon, S. 2005. Management Plan for the Endangered South Texas Ambrosia (*Ambrosia cheiranthifolia*) on Naval Air Station Kingsville, Texas. USN Contract N32467-03-RP-00162. June 2005.

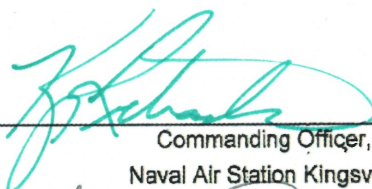
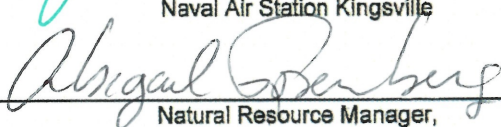
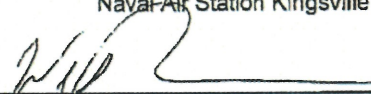
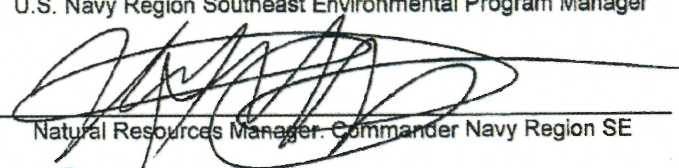

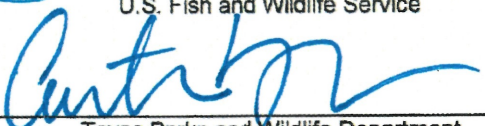
Bottom right and left – Captain's Pond (right) and mowed airfield (left) from Navy (U.S. Department of the Navy) 2014. Integrated Natural Resources Management Plan Naval Air Station Kingsville, Texas 2014 Update.

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**NAVAL AIR STATION KINGSVILLE
KINGSVILLE, TEXAS**

**INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN
(INRMP) - 2018 OPERATIONS AND EFFECT CONCURRENCE**

The Sikes Act and Department of Defense instruction require that annual and 5-year operation and effect reviews of INRMPs occur with federal and state partners. Representatives of the Navy, U.S. Fish & Wildlife Service, and the Texas Parks and Wildlife Department participate annually in the Naval Air Station Kingsville INRMP and Natural Resources Metric review. The last operation and effect review of this INRMP was in 2013 and it is due for another 5-year review. 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 the installation natural resources.

 _____ Commanding Officer, Naval Air Station Kingsville	<u>12/19/2018</u> (Date)
 _____ Natural Resource Manager, Naval Air Station Kingsville	<u>12/19/2018</u> (Date)
 _____ U.S. Navy Region Southeast Environmental Program Manager	<u>12/14/2018</u> (Date)
 _____ Natural Resources Manager, Commander Navy Region SE	<u>12/04/2018</u> (Date)
 _____ U.S. Fish and Wildlife Service	<u>6 Dec 2018</u> (Date)
 _____ Texas Parks and Wildlife Department	<u>17 December 2018</u> (Date)

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List of Acronyms

%	percent
°C	degrees Celsius
°F	degrees Fahrenheit
ac	acre(s)
AEM	Airfield Environment Management
AICUZ	Air Installation Compatible Use Zone
APHIS	Animal and Plant Health Inspection Service
BASH	bird/wildlife aircraft strike hazard
BCC	birds of conservation concern
BHWG	Bird Hazard Working Group
BMP	Best Management Practice
CAA	Clean Air Act
CATEX	categorical exclusion
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CH-1	Change Transmittal
cm	centimeter(s)
CMP	Costal Management Plan
CNIC	Commander, Navy Installations Command
CNO	Chief of Naval Operations
CNRSE	Commander Navy Region Southeast
CO	Commanding Officer
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DoD	Department of Defense
DoDI	Department of Defense Instruction
DODINST	Department of Defense Instruction
DON	Department of the Navy
DPS	Distinct Population Segment
EA	Environmental Assessment
EFH	essential fish habitat
EIS	Environmental Impact Statement
EO	Executive Order
EPR	Environmental Program Requirements
ERL	Environmental Readiness Level
ESA	Endangered Species Act
ESCP	Erosion and sediment control plan
FAA	Federal Aviation Administration

FEMA	Federal Emergency Management Agency
FIFRA	Federal Insecticide, Fungicide and Rodenticide Act
FIRM	Flood Insurance Rate Map
FR	Federal Register
ft	feet
GIS	Geographic Information System
GOMEX	Gulf of Mexico
GPS	global positioning system
ha	hectare(s)
in	inch(es)
ICRMP	integrated cultural resources management plan
INRMP	Integrated Natural Resources Management Plan
Installation	Naval Air Station Kingsville
IPM	integrated pest management
JAG	Judge Advocate General
JLUS	Joint Land Use Study
km	kilometer(s)
km ²	square kilometer(s)
m	meter(s)
mi	mile(s)
mi ²	square mile(s)
MBTA	Migratory Bird Treaty Act
MEDEVAC	Medical Evacuation
Mgmt.	Management
MILCON	military construction
MOU	Memorandum of Understanding
MSL	mean sea level
MU-1	Mixed Use Management Area 1
MU-2	Mixed Use Management Area 2
MU-3	Mixed Use Management Area 3
MU-4	Mixed Use Management Area 4
MU-5	Mixed Use Management Area 5
MWR	Morale, Welfare, and Recreation
NAAQS	National Ambient Air Quality Standards
NALFOG	Naval Auxiliary Landing Field Orange Grove
NAS	Naval Air Station
NASK	Naval Air Station Kingsville
NAVFAC	Naval Facilities Engineering Command
Navy	U.S. Department of the Navy
NCTC	National Conservation Training Center
NDAA	National Defense Authorization Act
NEPA	National Environmental Policy Act
NGO	non-governmental organization

NMFS	National Marine Fisheries Service
No.	Number
NO ₂	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPS	non-point source
NRCS	Natural Resources Conservation Service
NRM	Natural Resources Manager
NRP	Natural Resources Program
NRS-1	Natural Resource Sensitive Area 1
NRS-2	Natural Resource Sensitive Area 2
NRS-3	Natural Resource Sensitive Area 3
NWCG	National Wildfire Coordination Group
NWP	Nationwide Permit
O ₃	ozone
OEIS	Overseas Environmental Impact Statement
OGC	Office of the General Counsel
O&MN	Operations and Maintenance, Navy
OP-1	Operational Protected Area 1
OP-2	Operational Protected Area 2
OP-3	Operational Protected Area 3
OP-4	Operational Protected Area 4
OPAREA	Operating Area
OPNAVINST	Chief of Naval Operations Instructions
OSD	Office of the Secretary of Defense
OUSD	Office of the Under Secretary of Defense
PIF	Partners in Flight
PM ¹⁰	particulate matter (10 micron)
PVC	polyvinyl chloride
PWD	Public Works Department
QRP	Qualified Recycling Program
R&D	research and development
RTE	rare, threatened, and endangered
ROTHR	Relocatable Over The Horizon Radar
SAIA	Sikes Act Improvement Act
SECNAV	Secretary of the Navy
SECNAVINST	Secretary of the Navy Instruction
SERDP	Strategic Environmental Research and Development Program
SGCN	Species of Greatest Conservation Need
Sikes Act	Sikes Act Improvement Act
SMS	Safety Management System
SO ₂	sulfur dioxide
SWCD	soil and water conservation district

SWPPP	Storm Water Pollution Prevention Plan
TCELCP	Texas Coastal and Estuarine Land Conservation Program
TCEQ	Texas Commission on Environmental Quality
TNC	The Nature Conservancy
TPWD	Texas Parks and Wildlife Department
TSSWCB	Texas State Soil and Water Conservation Board
TWDB	Texas Water Development Board
TW-2	Training Wing TWO
TXANG	Texas Air National Guard
U.S.	United States
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USC	United States Code
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VT-21	Training Squadron Twenty-One
VT-22	Training Squadron Twenty-Two
WHA	Wildlife Hazard Assessment
WHMP	Wildlife Hazard Management Plan
WM	Wildlife Management
WMA	wildlife management area
WWII	World War II

Executive Summary

ES.1 TYPE OF DOCUMENT

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

ES-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 (USC) § 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 in cooperation with the U.S. Fish and Wildlife Service (USFWS) and state fish and wildlife agencies. The 1997 amendments to the Sikes Act require the Department of Defense (DoD) to develop and implement an Integrated Natural Resources Management Plan (INRMP) for each military installation with significant natural resources. The SAIA also mandated that these military installations prepare and implement their INRMPs by 17 November 2001.

The U.S. Department of the Navy (Navy) has prepared this INRMP and revises it regularly for management of natural resources of the Naval Air Station Kingsville (NASK) located in Kingsville, Texas. This most recent revision is the product of a thorough review of the 2014 INRMP in accordance with the five-year review cycle. This INRMP is a living document that provides for the proper and sustainable management of natural resources. The goal of ecosystem management, as established by the Department of Defense (DoD), is to ensure that military lands support present and future training requirements while preserving, improving, and enhancing ecosystem integrity. Over the long term, this approach maintains and improves the sustainability and biological diversity of terrestrial and aquatic ecosystems while supporting sustainable economies, human use, and the environment required for realistic training operations (DoD 2013). This INRMP will ensure that lands remain available and in good condition to support the military mission with “no net loss” of military training capability.

The NASK falls under the jurisdiction and control of the Commanding Officer (CO) of the NASK who reports to the Commander Navy Region Southeast (CNRSE), for administrative and facilities support. In addition to the Main Station, the NASK CO is also responsible for the following two properties; the Naval Auxiliary Landing Field Orange Grove (NALFOG) and Dixie Target Range. Hereafter, the Main Station, NALFOG, and Dixie Target Range will be referred to as the NASK Complex unless individually specified.

ES.3 GOALS AND OBJECTIVES OF THE INRMP

The goal of the INRMP is to implement an ecosystem-based conservation program that ensures frequent and continued use of land for military training now and in the future, management programs and actions in this INRMP prescribe natural resource conservation/management that is; integrated with existing military installation plans, mission safety, and security requirements; sustainable; and provides public access to the extent that the use is consistent with the needs of fish and wildlife resources. The implementation of this INRMP, will follow an adaptive management approach that acknowledges uncertainty, monitors the various INRMP components, and lessons learned with the end goal of improving future management actions and ecosystem health.

The NASK implements ecosystem management principles that are consistent with DoD and Navy policy. The ecosystem management approach seeks to balance the dual goals of maximizing land use for military readiness and maintaining native habitats. The overriding focus is to develop, promote, and refine a comprehensive, ecosystem-based management program for resource conservation. Such an ecosystem-based approach is intended to facilitate maximum support of the Navy military training mission and infrastructure, while simultaneously promoting both the sustainability of native species and habitat diversity, and compliance with applicable laws and regulations. This INRMP identifies four ecosystem management goals and 25 objectives. The objectives support desired future end-state or successful outcome that support a goal or Navy policy or other relevant law or regulation. The following goals and objectives have been established to provide direction, and construct the framework for measuring INRMP success.

Goal 1: Provide for the conservation, management and enhancement of natural resources by continuing to implement ecologically appropriate and beneficial land uses and management practices, while ensuring the continuation of the military mission.

Issue: Development and training activities have a significant potential to affect land area; as a result, land management decisions and practices are important aspects of ecosystem management. The use and management of lands for military mission needs, and the decision-making process regarding such land use, directly affects the sustainability of the ecosystem.

Land and water management decisions will become increasingly important as development and training activities increase. Land and water use during military training, and the decision-making progress regarding such land and water use, directly affect ecosystem sustainability. The following objectives were developed to address Goal 1.

- Objective 1.1:** Manage, maintain, and enhance land areas with natural resources value, and maintain ecological function.
- Objective 1.2:** Achieve no net loss of wetlands.
- Objective 1.3:** Improve and enhance water quality by reducing nonpoint sources of pollution by continuing to implement and update as appropriate, an overall management strategy for the management of stormwater runoff and soil erosion to protect surface water bodies and wetlands.
- Objective 1.4:** Preserve, protect, and enhance water resources (e.g. wetlands, surface water, groundwater), including protection of undisturbed acreage located with 100-year floodplain areas and management of coastal zone resources.
- Objective 1.5:** Maintain vegetation to reduce BASH potential.
- Objective 1.6:** Maintain vegetation to reduce wildland fire hazards.
- Objective 1.7:** Maintain and enhance native vegetation, including forest habitats, to promote community diversity; and to control and monitor noxious, invasive, and exotic plant species.
- Objective 1.8:** Implement environmentally beneficial and cost-effective landscaping and grounds maintenance practices.
- Objective 1.9:** Protect and promote sustainable management of forest resources.
- Objective 1.10:** Manage forest habitats to promote use by a diverse range of wildlife species, including protection of mature tree stands and snags; protection of tree species that provide suitable nesting and foraging habitat for wildlife; and maintenance of wildlife travel corridors, streamside protection, and aesthetic buffer zones.

Objective 1.11: Ensure that land management and land use decisions, including agricultural out leases, comply with all applicable laws, executive orders, regulations, directives, and instructions, and that adverse impacts to the natural environment are minimized.

Issue: Human activities on the NASK Complex and in the surrounding community have removed native vegetative communities and altered natural habitats. Environmental resources on these properties provide vital habitat for fish and wildlife, especially in view of the considerable development and economic growth surrounding the Installation. The following practice will be implemented to address this issue:

Objective 1.12: Protect, conserve, and promote habitat for native terrestrial and aquatic fauna, consistent with BASH Program requirements.

Issue: Occasionally, nuisance wildlife species (e.g., feral cats, wild hog [*Sus scrofa*], and some bird species) become overpopulated or congregate in areas creating a threat to human health and/or the military mission. In such cases, these wildlife species must be controlled to prevent problems. The following practice will be implemented to address this issue:

Objective 1.13: Prevent and control invasive and nuisance wildlife species, and wildlife diseases that may adversely affect human health and welfare, the health of the ecosystem, and the military mission.

Issue: Federally or state-listed plant and animal species have been identified as conservation priorities and require special protection efforts. Managing federally listed threatened and endangered species is important to achieving no net loss to the military mission. The following practice will be implemented to address this issue:

Objective 1.14: Provide adequate special management or protection of threatened, endangered, and rare plant and animal species; significant rare communities; and at-risk plant and wildlife species and their habitats.

Goal 2: Provide quality, outdoor recreational and educational opportunities to improve the quality of life for Navy personnel and authorized guests, if such opportunities are available and within the DoD security standards.

Issue: In accordance with the SAIA, an INRMP shall, to the extent appropriate and applicable, provide for public access to the military installation that is necessary or appropriate for sustainable public use that is consistent with the needs of fish and wildlife resources, and subject to requirements necessary to ensure safety and military security. In addition to traditional outdoor recreation activities (e.g., hiking, wildlife watching, and hunting) can include educational programs that foster a sense of responsible stewardship for individuals with authorized access. The following objectives were developed to address Goal 2.

- Objective 2.1:** Evaluate additional opportunities for natural resources-related outdoor recreation.
- Objective 2.2:** Provide and promote outdoor recreation opportunities (e.g., hunting, wildlife observation, photography) to DoD personnel and their families.
- Objective 2.3:** Provide and promote outdoor recreation opportunities to the public, subject to requirements necessary to ensure safety and military security.

Goal 3: Integrate the various activities conducted under this INRMP by fostering knowledge of, and participation in, adaptive ecosystem management.

Issue: Plans and programs need to consider the interrelationships of natural resource conservation and supporting the Installation's "no net loss" of military training capability. The DoD continues to shift its focus to provide for the protection of individual species through management of ecosystems. The ecosystem management approach seeks to balance the dual goals of maximizing land use for military readiness and maintaining native habitats. The focus is to develop, promote, and refine a comprehensive, ecosystem-based conservation management. Such an ecosystem-based approach is intended to facilitate maximum support of the Navy's military training mission and infrastructure, while simultaneously promoting both native species sustainability and habitat diversity, and compliance with applicable laws and regulations.

Ecosystem management requires a coordinated effort among all departments and personnel, from tenant commands to decision-making authorities, to protect the interdependent components of communities that define an ecosystem. The coordinated effort will address the consequences of actions on related resources, and will resolve conflicts between competing programs and plans for use of the Installation's natural resources. The following objectives were developed to address Goal 3:

- Objective 3.1:** Provide adequate staffing, equipment, technology, and training for the Natural Resources Program to ensure proper INRMP implementation.
- Objective 3.2:** Incorporate the concept of ecosystem management into all planning and management processes.
- Objective 3.3:** Implement training, education, and stewardship initiatives for ecosystem management.
- Objective 3.4:** Establish a planning team to review and update the INRMP in accordance with Chief of Naval Operations (CNO) Instructions (OPNAVINST) 5090.1D, 12-3.4(c).
- Objective 3.5:** Promote educational awareness and stewardship of NASK natural resources.

Goal 4: Protect, conserve, and enhance the ecological value and natural resource diversity by building productive relationships with regulatory agencies and the public in support of the military mission.

Issue: The input and cooperation of regulatory agencies and other experts will ensure the successful INRMP implementation.

- Objective 4.1:** Maintain interagency cooperation with USFWS and Texas Parks and Wildlife Department (TPWD).
- Objective 4.2:** Develop partnerships with the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), TCEQ, Texas A&M University–Kingsville, Texas Ornithological Society, Coastal Bend Audubon Society, DoD Partners in Flight, Kleberg County (encroachment partnering), and other local agencies and organizations to implement wildlife monitoring and protection programs.
- Objective 4.3:** Coordinate natural resources activities with local community, conservation organizations, and private groups.

The management strategies presented were developed from the goal and objectives identified and are described in Section 4. Project details are provided in Appendix A. Annual INRMP reviews will be used to determine if management action modifications are needed to reach the

desired goal. For example, management action changes may become necessary as a result of unforeseen and large-scale disturbance (e.g., hurricane or drought).

In accordance with the Integrated Natural Resources Management Program (32 CFR Appendix to Part 190), SAIA, and OPNAVINST 5090.1D, 12-3.4, this plan must provide for the following goals, consistent with military operations at the installation:

- Management of fish and wildlife, land, and forest resources, and fish and wildlife-oriented recreation;
- Fish and wildlife habitat enhancement or modifications;
- Wetlands protection, enhancement, and restoration where necessary for support of fish, wildlife, or plants;
- Integration of, and consistency among, the various activities conducted under the INRMP;
- Establishment of specific natural resource objectives and time frames for proposed actions;
- Sustained use by the public of natural resources to the extent that such use is consistent with the needs of natural resources management, subject to installation safety and security requirements;
- Enforcement of natural resources laws and regulations;
- No net loss in the capability of military lands to support the military mission of the installation; and
- Annual INRMP reviews, and updates no less often than every five years.

Some of the INRMP projects identified may require some level of ground disturbance; however, these activities are not expected to substantially affect natural resources. If impacts to sensitive natural resources are expected, discussions with appropriate agencies that have jurisdictional oversight will be coordinated during the construction planning process. Best management practices (BMPs) will be implemented for natural resource protection. Section 4.2 describes agency consultation requirements for potential impacts to federally listed species.

ES.4 FUNCTIONAL AREAS AND MANAGEMENT FOCUSES

The goals and objectives have been divided into functional land-use areas for the Main Station, NALFOG, and Dixie Annex. Within each functional area, natural resources management focuses are identified (i.e., land management, fish and wildlife, and/or outdoor recreation).

The NASK Complex has been divided 12 functional areas; specifically, four Operational Protected areas; three Natural Resource Sensitive areas; and five Mixed-Use areas.

- **Operational Protected Areas (OP)** are vital to the continuance of the military mission which include Air Installation Compatible Use Zones (AICUZ), intensively developed dredge spoil, high security/restricted, industrial support, and BASH areas;

Natural Resource Sensitive Areas (NRS) include land protected due to the unique natural, cultural or aesthetic value which include geological features, historical and natural heritage sites, threatened and endangered species' critical habitat, recreational areas, and exemplary natural communities.

Mixed-Use Management Areas (MU) Sustainable multipurpose use of the resources include hunting, fishing, trapping, and agricultural and grazing out leases. These activities comply with the multiple-use concept and the requirement for installations to improve, utilize, and maintain all land and water areas for the greatest public benefits while supporting the military mission. Program Activities do not encumber the land that is needed for conducting mission operations. While pursuing and planning reimbursable activities, natural resource managers coordinate with mission operators to identify opportunities to improve long-term mission access to land, increase training realism, and improve training flexibility.

ES.5 SPECIES MANAGEMENT

Over the next five-year period, factors upon which this INRMP is based on may change, including military mission requirements, federal list of threatened and endangered species, information available for listed species and their ecosystems. The implementation of this INRMP will follow an adaptive management approach that acknowledges uncertainty, monitors the various INRMP components, and lessons learned with the end goal of improving future management actions and ecosystem health. Special attention is given to rare, threatened, and endangered species through management actions identified in Section 5, INRMP Projects table and descriptions included in Appendix A.

Table ES-1 Habitat Management Actions at the NASK Complex

Habitat Management Actions	Section
Coastal Zone Management	5.2.1
Wetland Management	5.2.2
Soil Conservation and Erosion Control	5.2.3
Storm-water and Water Quality Control	5.2.4
Floodplain Management	5.2.5
Landscaping and Grounds Maintenance	5.2.6
Invasive, Exotic and Noxious Species and Pests	5.2.7
Urban Forestry	5.2.8
Agricultural Outleasing	5.2.9
Forest Protection: Wildland Fire Management	5.3.1
Migratory Birds	5.4.1
Threatened and Endangered Species	5.4.2
Nuisance Wildlife and BASH	5.4.3

Wildlife Diseases: Zoonosis Prevention	5.4.4
Wildlife Officer	5.5.2
Outdoor Recreation	5.5
Training	5.6
Natural Resource Training	5.6.1
Global Information Systems (GIS)	5.6.2

The “Wildlife Habitat Management and Threatened and Endangered Species, and Natural Communities” section of this INRMP (Section 5.3.3) includes additional goals, objectives, strategies, and projects for the benefit and long-term conservation of RTE species found, or potentially found, on the installation. Animal and plant species explicitly accounted for in this INRMP are:

- Audubon’s oriole** (*Icterus graduacauda audubonii*)
- Black-spotted newt** (*Notophthalmus meridionalis*)
- Brown pelican** (*Pelecanus occidentalis*)
- Cave myotis bat** (*Myotis velifer*)
- Desert massasauga** (*Sistrurus catenatus edwardsii*)
- Dickcissel** (*Spiza americana*)
- Golden orb** (*Quadrula aurea*)
- Gulf Coast jaguarundi** (*Herpailurus yaguarondi cacomitli*)
- Keeled earless lizard** (*Holbrookia propinqua*)
- Maritime pocket gopher** (*Geomys personatus maritimus*)
- Mexican blackhead snake** (*Tantilla atriceps*)
- Monarch butterfly** (*Danaus plexippus plexippus*)
- Northern aplomado falcon** (*Falco femoralis septentrionalis*)
- Ocelot** (*Leopardus pardalis*)
- Peregrine falcon** (*Falco peregrinus*)
- Plains spotted skunk** (*Spilogale putorius interrupta*)
- Reticulate collared lizard** (*Crotaphytus reticulatus*)
- Rio Grande lesser siren** (*Siren intermedia texana*)
- Sennett’s hooded oriole** (*Icterus cucullatus sennitti*)
- Sheep frog** (*Hypopachus variolosus*)
- South Texas ambrosia** (*Ambrosia cheiranthifolia*)
- Southern yellow bat** (*Lasiurus ega*)
- Sprague’s pipit** (*Anthus spragueii*)
- Spot-tailed earless lizard** (*Holbrookia lacerate*)
- Texas horned lizard** (*Phrynosoma cornutum*)
- Texas indigo snake** (*Drymarchon melanurus*)
- Texas tortoise** (*Gopherus berlandieri*)
- Tricolored bat** (*Perimyotis subflavus*)
- Western burrowing owl** (*Athene cunicularia hypugaea*)

White-tailed hawk (*Geranoaetus albicaudatus*)

Yellow-billed cuckoo (*Coccyzus americanus*)

Wood stork (*Mycteria americana*)

ES.6 PROJECTS OF THE INRMP

The identified projects are discrete actions for fulfilling objectives that may be required in order to fulfill regulatory requirements and enhancements to ensure compliance. Planned projects are shown in Appendix A, Table A-1. Appendix A also includes one-page project descriptions. Projects associated with management actions are provided in Sections 4 and 5.

Project implementation is largely dependent upon availability of funds that come from the Installation, Commander, Navy Installations Command (CNIC; Major Claimant), or Naval Facilities Engineering Command (NAVFAC) natural resources fund sources. Projects are divided into mandatory and stewardship categories to reflect implementation priorities. Every effort will be made to acquire Operations and Maintenance, Navy (O&MN) Environmental, or other funding for timely implementation of DoD mandatory projects. Stewardship projects will be funded through forestry, agricultural outlease, fish and wildlife, Legacy, or other sources as funding and personnel resources become available. Table A-1 (Appendix A) summarizes the projects.

ES.7 MISSION SUSTAINABILITY

The Station's primary military mission is to provide advanced pilot training for future aircraft carrier aviators. The NASK is home to two training squadrons, Training Squadron Twenty-One (VT-21) and Training Squadron Twenty-Two (VT-22), which operate the T-45 "Goshawk", a single engine tandem seat training jet (DoD, Office of Economic Adjustment 2012). Construction and facility maintenance are necessary to carry out support its mission that provides (1) support to permanently and temporarily assigned Navy aircraft and personnel, (2) administrative and logistic support for naval aircraft operations, and (3) for the training and Morale, Welfare, and Recreation needs of Navy personnel assigned to NASK, Training Air Wing Two (TW-2), and tenant military units.

Specifically, the mission can be correlated with the following major commands that are assigned to the NASK, including TW-2, VT-21, VT-22, L-3 VERTEX and Rolls-Royce maintenance and flight facilities, and the Texas Army National Guard. NASK also functions as a refueling base for transient Navy aircraft.

Table ES-2 provides a cross reference of the discussions presented in this INRMP and the April 2006 Navy Guidance for INRMPs.

Table ES-2 Cross-Reference of Navy Guidance to Format Used in this INRMP

Recommended INRMP format from Navy Guidance	Cross reference to required information in this document
Cover Page	Cover Page
Signature Page	Signature Page
Executive Summary	Executive Summary
Table of Contents	Table of Contents
Chapter 1 - Overview	Section 1 – Introduction
1.a – Purpose	1.1 – Purpose and Organization
1.b – Scope	1.4 – Scope
1.c – Goals and Objectives Summary	1.5 – Goals and Objectives
1.d – Responsibilities of Stakeholders	1.3 – Responsibilities
1.e – Commitment of Regulatory Agencies	1.7 – Commitment of Regulatory Agencies
1.f – Authority	1.2 – Authority
1.g – Stewardship of Compliance Statement	1.6 – Stewardship and Compliance
1.h – Review and Revision Process	1.8 – Review and Revision Process
1.i – Management Strategies	1.9 – Management Strategies
1.j – Integration with other Plans	Not applicable
Chapter 2 – Current Conditions and Use	Section 2 – Current Conditions and Use
2.0 – Installation Information	2.1 – Installation Information
2.a.1 – Location Statement (concise)	2.1.1 – General Description
2.a.2 – Regional Land Use	2.1.6 – Regional Land Use
2.a.3 – History and Pre-Military Land Use (abbreviated)	2.1.5 – Abbreviated History and Pre-Military Land Use
2.a.4 – Military Mission (concise)	2.1.2 – Military Mission
2.a.5 – Operations and Activities	2.1.1 – General Description
2.a.6 – Constraints Map	2.1.3 – Constraints Map
2.a.7 – Opportunities Map	2.1.4 – Opportunities Map
2.b – General Physical Environment and Ecosystems	2.2 – General Physical Environment and Ecosystems
2.c – General Biotic Environment	2.3 – Biological Environment
2.c.1 – Threatened and Endangered Species and Species of Concern	2.3.3 – Rare, Threatened and Endangered Species
2.c.2 – Wetlands and Deep Water Habitats	2.2.4.6 – Wetlands
2.c.3 – Fauna	2.3.1 – Natural Communities
2.c.4 - Flora	2.3.1 – Natural Communities
Chapter 3 – Environmental Management Strategy and Mission Sustainability	Section 3 – Environmental Management Strategy and Mission Sustainability
3.a – Supporting Sustainability of the Military Mission and the Natural Environment	3.1 – Supporting Sustainability of the Military Mission and the Natural Environment
3.a.1 – Integrate Military Mission and Sustainability Land Use	3.1.1 – Military and Mission and Sustainable Land Use
3.a.2 – Define Impact to the Military Mission	3.1.2 – Defining Impact on the Military Mission
3.a.3 – Describe Relationship to Range Complex Management Plan or other Operational Area Plans	3.1.3.1 - Relationship to the Gulf of Mexico Range Complex and Corpus Christi Operational Area Management Plans
3.b – Natural Resources Consultation Requirements (Section 7, EFH)	3.2 – Natural Resource Consultation Requirements
3.c – NEPA Compliance	3.3 – Planning for National Environmental Policy Act Compliance

Table ES-2 Cross-Reference of Navy Guidance to Format Used in this INRMP

Recommended INRMP format from Navy Guidance	Cross reference to required information in this document
3.d – Opportunities for Beneficial Partnerships and Collaborative Resource Planning	3.4 – Beneficial Partnerships and Collaborative Resource Planning
3.e – Public Access and Outreach	3.5 – Public Access and Outreach
3.e.1 – Public Access and Outdoor Recreation	3.5 – Public Access and Outreach
3.e.2 – Public Outreach	3.5 – Public Access and Outreach
3.e.3 – Encroachment Partnering	3.6 – Encroachment Partnering
3.e.4 – State Comprehensive Wildlife Plans (SCWP) Integration	3.7 – Texas’ State Wildlife Action Plan
Chapter 4 – Program Elements	Section 5 – Program Elements
4.a – Threatened and Endangered Species and Species Benefit, Critical Habitat, Species of Concern Management	5.4.2 –Threatened and Endangered Species
4.b – Wetlands and Deep Water Habitats	5.2.2 – Wetlands
4.c – Law Enforcement	Not Applicable
4.d – Fish and Wildlife	5.4 – Fish and Wildlife
4.e – Forestry	5.3 – Forest Management
4.f – Vegetation	5.1 – Land Management
4.g – Migratory Birds	5.4.1 – Migratory Birds
4.h – Invasive Species	5.2.7 – Invasive, Exotic, and Noxious Species
4.i – Pest Management	5.4.3 – Nuisance Wildlife and BASH
4.j – Land Management	5.1 – Land Management
4.k – Agricultural Outleasing	5.2.9 – Agricultural Outleasing
4.l – GIS Management, Data Integration, Access, and Reporting	5.6.2 – Geographical Information Systems, Data Integration, and Reporting
4.m – Outdoor Recreation	5.5 – Outdoor Recreation
4.n – Bird Aircraft Strike Hazard	5.4.3 – Nuisance Wildlife and BASH
4.o – Wildland Fire	5.3.1 – Forest Protection
4.p – Training of Natural Resource Personnel	5.6.1 – Training of Natural Resource Personnel
4.q – Coastal/Marine	Not Applicable
4.r – Floodplains	5.2.5 – Floodplain Management
4.s – Other Leases	Not Applicable
Chapter 5 - Implementation	Section 6 – Implementation
5.a – Summary of Project Prescription Development Process	Appendix A – NASK Complex Projects
5.b – Achieving No Net Loss	6.2 – Planning and Mission Sustainability
5.c – Use of Cooperative Agreements	6.3 - Partnerships
5.d – Funding Process	6.4 - Funding
Appendix 1. Acronyms	List of Acronyms
Appendix 2. Detailed Natural Resources Prescriptions	2.3 – Biological Environment
Appendix 3. List of Projects	Appendix A. NASK Complex Projects
Appendix 4. Surveys: Results of Planning Level Surveys	Not Applicable
Appendix 5. Research Requirements	Not Applicable
Appendix 6. Migratory Bird Management	5.4.1 – Migratory Birds
Appendix 7. Benefits for Endangered Species	5.4.2 – Threatened and Endangered Species
Appendix 8. Critical Habitat	2.3.4 – Critical Habitat

1.0 Introduction

1.1 PURPOSE AND ORGANIZATION

This document meets statutory requirements under the SAIA, Public Law 105-85, Div. B. Title XXIX, November 18, 1997, 111 Stat 2017-2019, 2020-2022. The Sikes Act, 16 U.S.C. § 670a et seq., was amended in November 1997 to require the Secretary of Defense to carry out a program to provide for the conservation and rehabilitation of natural resources on military installations. 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 inappropriate. The SAIA mandated all military installations with significant natural resources to prepare and implement an INRMP by November 17, 2001.

The primary purpose of the INRMP is to ensure natural resources conservation measures and military operations are consistent with stewardship and legal requirements. This INRMP was developed to balance resource uses utilizing an ecosystem management approach, considering mission requirements and other land use activities affecting the Installation. This INRMP was prepared in cooperation with the USFWS and the TPWD to reflect mutual agreement on the fish and wildlife management aspects of the plan.

No less than every five years, the INRMP is reviewed for operation and effect to determine if the Installation is complying with the Sikes Act. The review for operation and effect of the INRMP either concludes that is 1) meeting the intent of the Sikes Act, in which case it is updated and the prescribed implementation continues, or 2) not meeting Sikes Act stipulations and must be revised in accordance with the following regulations and guidance documents:

- SAIA;
- Department of Defense Instruction (DoDI) 4715.03, Natural Resources Conservation Program (18 March 2011);
- Chief of Naval Operations (CNO) Instructions (OPNAVINST) 5090.1D, Environmental Readiness Program Manual Chapter 12: Natural Resources Management;
- Endangered Species Act (ESA) of 1973 (16 USC §1531 et seq.);
- NAVFAC Natural Resources Management Procedural Manual (P-73, Chapter 2: Integrated Natural Resources Management Plans dated 7 December 2005); and
- Navy INRMP Guidance (10 April 2006).
- Assistant Secretary of the Navy (ASN) Energy, Installations, and Environment (EI&E) Memorandum of 12 August 1998
- Office of the Under Secretary of Defense (OUSD) Memorandum of 21 September 1998,

- CNO letter Ser N45D/8U589016 of 25 September 1998, and CNO letter Ser N456F/8U589129 of 30 November 1998.

Navy installations are required to implement and maintain an integrated program to manage natural resources under their administration through multiple-use, protection and enhancement of natural resources. Maintaining sustainable yields and biological integrity are requirements under DoDI 4715.03 and OPNAVINST 5090.1D, Chapter 12. SAIA requires military installations having significant natural resources to prepare an INRMP. INRMPs serve as a planning tool for Natural Resources Managers (NRMs) to conserve and restore installation natural resources in a coordinated manner within the context of the operational military mission. The primary INRMP user is the NASK NRM; however, environmental planners will also find the INRMP useful in preparation of environmental assessments. The INRMP provides natural resources guidance for integrated management of land, fish and wildlife, forestry, and outdoor recreation resources. It also identifies relevant natural resource laws and regulations that should be considered for implementing the military mission and/or natural resources management actions.

This document was prepared in cooperation with the USFWS Ecological Services Field Office in Corpus Christi. Congress has directed the DoN to utilize USFWS resources "to the maximum extent practical" to provide natural resources research on DoD installations in accordance with 16 U.S.C. 670c-670f(b). The INRMP was also prepared in cooperation with the TPWD District 8 Office. The Sikes Act, 16 U.S.C. 670a(a)(2), states that the INRMP will reflect the "mutual agreement" of the USFWS, the state fish and wildlife agency, and the DoD "concerning conservation, protection, and management of fish and wildlife resources." The requirement for mutual agreement is further clarified by Section 670a(a)(4)(A)(ii), which states that "nothing in this subchapter enlarges or diminishes the responsibility and authority of any state for the protection and management of fish and resident wildlife."

Mutual agreement with the USFWS and TPWD is met through the participation of these agencies in the review/update process, involvement throughout any revision development, and by signature to this INRMP. Coordination with the USFWS and the TPWD is expected to continue indefinitely as the review, planning, and revision cycle for this document will be ongoing. To the extent practicable, these agencies will participate in an ongoing review process by providing comments, recommendations, and input on the status of regional processes, surveys, and species.

The first three sections of this INRMP establish the existing conditions at NASK. Section 1 provides a general overview INRMP review, implementation, and revisions. Section 2 discusses the existing physical characteristics (i.e., climate, topography, geology, soils, hydrology, groundwater, and land use) and biological characteristics (i.e., wetlands, wildlife, rare threatened and endangered species (RTE), coastal zone issues, and natural vegetative communities). Section 3 establishes the importance of the DON's military mission, discusses the roles and responsibilities onboard NASK, partnerships and stakeholders.

Section 4 discusses ecosystem management goals, objectives, strategies, initiatives, and projects that comprise a logical sequence of actions for achieving the long-range aim of ecosystem management. Section 5 discusses ecosystem management. Finally, Section 6 describes implementation plans.

Appendices include: Projects of the INRMP, Agency Correspondence, BASH Instruction for the Kingsville Station and NALFOG, Applicable Regulations and Public Laws, South Texas Ambrosia Management Plan and Studies, Flora and Fauna Lists, Native Landscaping Plants, Invasive and Noxious Species, Hunting Regulations, Zoonoses of Concern, and Internet Resources

1.2 AUTHORITY

Legal authority for this INRMP is provided by the Sikes Act. The Sikes Act sets forth resource management policies and guidance for U.S. military installations and requires the preparation of INRMPs for installations with significant natural resources—including those composed of withdrawn lands. The Sikes Act requires that the "Secretary of Defense shall carry out a program to provide for the conservation and rehabilitation of natural resources" [16 U.S.C. 670a (a)(1)(A) and (B)]. The Sikes Act further specifies in 16 U.S.C. 670a that:

Consistent with the use of military installations to ensure the preparedness of the Armed Forces, the Secretaries of the military departments shall carry out [a natural resources management program] to provide for—

- i. the conservation and rehabilitation of natural resources on military installations;
- ii. the sustainable multipurpose use of the resources, which shall include hunting, fishing trapping, and non-consumptive uses; and
- iii. subject to safety requirements and military security, public access to military installations to facilitate the use.

The Sikes Act also requires that INRMPS are consistent with military installations use to ensure the preparedness of the Armed Forces. Each INRMP will, where appropriate and applicable, provide for:

- Fish and wildlife management, land management, forest management, and fish- and wildlife-oriented recreation
- Fish and wildlife habitat enhancement or modifications
- Wetland protection, enhancement, and restoration where necessary for support of fish or wildlife
- Integration of, and consistency among, the various activities conducted under the INRMP
- Establishment of specific natural resources management objectives and time frames for proposed action
- Sustained use by the public of natural resources to the extent such use is not inconsistent with the needs of fish and wildlife resources management

- Public access to the military installation that is necessary or appropriate for sustained use by the public of natural resources to the extent that the use is not inconsistent with the needs of fish and wildlife resources, subject to requirements necessary to ensure safety and military security
- Enforcement of natural resource laws and regulations
- No net loss in the capability of military installation lands to support the military mission of the installation
- Such other activities as the Secretary of the military department considers appropriate.

The Sikes Act also requires that the INRMP be submitted for public review and comment before being finalized. To fulfill this requirement, appropriate documentation, an Environmental Assessment (EA), was prepared to satisfy National Environmental Policy Act (NEPA) requirements (Navy 2001). DoDI 4715.03 and OPNAVINST 5090.1D, Chapter 10, state that the INRMP must incorporate the principles of ecosystem management as the basis for natural resources management on Navy lands. In accordance with this policy, the Navy will strive to maintain healthy, contiguous ecosystems on its own lands; where ecosystem boundaries extend onto adjoining lands, the Navy will strive to work cooperatively with neighboring landowners to manage these ecosystems.

1-1.3 RESPONSIBILITIES

The Commanding Officer, Navy Region Southeast (CNRSE) ensures that activities and operations fully comply with federal, state, and local laws/regulations and with written DoD, Navy, and CNO policy. The Installation COs participates in the annual INRMP metrics review because INRMPs are prepared to assist the installation commander with his or her natural resources responsibilities and to ensure adequate and appropriate conservation support for operational requirements.

The Commanding Officer is charged with tasks under OPNAVINST 5090.1D, Chapter 12, to oversee the natural resources program and ensure the Installation's ability to carry out its military mission. The Commanding Officer also ensures that the INRMP is consistent with the use of military installations to ensure the preparedness of the Armed Forces and fulfills the requirements of the Sikes Act (16 United States Code Section 670a, et seq.) as amended. The Commanding Officer's signature on the INRMP constitutes a commitment to seek funding and execute, subject to the availability of funding, all "must fund" projects and activities in accordance with the timeframes identified. Funding of these projects should be pursued within the specific timeframes identified in the INRMP projects table provided in Appendix A.

The NRM and the Environmental Compliance Division, Public Works Department (PWD) review INRMPs for operation and effect with the cooperation of USFWS and the appropriate state fish and wildlife agency, at least once every 5 years. This review is the statutory responsibility of these agencies and Navy funds may not be used to pay for their participation in this requirement. It is recommended that the review for operation and effect be conducted during

an annual INRMP metrics review. Mutual agreement on operation and effect must be documented in writing from the parties in the form of a new signature page.

1.4 SCOPE

This INRMP outlines conservation efforts and establishes procedures to ensure compliance with related environmental laws and regulations for the five year INRMP implementation period. The Navy requested input from state and federal stakeholders during its development. As required under the SAIA, this INRMP update reflects mutual agreement of agencies concerned with the conservation, protection, and management of fish and wildlife resources, including the USFWS and the TPWD. This INRMP provides the management direction; however, it does not replace or affect any federal laws or state responsibility and authority for protecting fish and wildlife resources.

NASK is a DoD installation that is comprised of four land parcel located in southeast Texas within Kleberg, Jim Wells, and McMullen counties (Figure 1-1). The Installation's primary mission is to provide advanced training support for future aircraft carrier pilots, and includes two airfields and two target areas. The airfield, maintenance, and administrative functions are located at the Main Station located in Kleberg County. The NALFOG, located in Jim Wells County, serves as an airfield for NASK pilots to practice approaches and landings. The Dixie Target Range, located in McMullen County, is used as a practice bombing area for Navy pilots. The Dixie Annex, former Escondido Ranch, serves as a range buffer and recreation area administered by the Environmental Department. The ROTHM Premont facility is owned by the federal government and is managed by Raytheon Technical Services Company, LLC. The Yankee Target Range is leased by the Navy, but is used a practice bombing target facility, and is managed by Texas Air National Guard (TXANG) through a lease agreement. Management strategies for Yankee Target Range and the ROTHM Premont facility are not included in this INRMP. These four parcels are strategically located to meet operational and training requirements of the Navy, and comprise approximately 15,622 acres (ac) (6,322 hectares [ha]). The Main Station, NALFOG, Dixie Target Range and Dixie Annex will be referenced as the NASK Complex.

This INRMP creates the framework for the implementation of a natural resources management program to conserve and rehabilitate natural resources across the entire installation. Appropriate and effective management of natural resources on Navy lands will be achieved in accordance with the principles and practices of ecosystem management. Ecosystem management initiatives include the following steps, which do not necessarily take place in a

particular sequence and often occur in parallel with each other and can be repeated as the process evolves:

- recognizing and defining the problems or opportunities;
- delineating boundaries;
- identifying and involving participants;
- establishing a common vision;
- assessing ecological, economical, and social constraints and opportunities;
- acquiring funding;
- making decisions and implementing solutions; and
- monitoring progress, evaluating impacts, and adapting based on new information.

The INRMP does not substitute for a pest management plan, hazardous waste plan, stormwater retention plan, or Integrated Cultural Resources Management Plan (ICRMP). It has the dual purpose of complying with various natural resources related laws while supporting the military mission of NASK.

1.5 GOALS AND OBJECTIVES

The goal of the INRMP is to implement an ecosystem-based conservation program that ensures frequent and continued use of land for military training now and in the future. Management programs and actions in this INRMP prescribe natural resource conservation and management that is integrated with existing military installation plans, mission safety, and security requirements, sustainable, and provides public access to the extent that the use is consistent with the needs of fish and wildlife resources. The implementation of this INRMP will follow an adaptive management approach that acknowledges uncertainty, monitors the various INRMP components, and lessons learned with the end goal of improving future management actions and ecosystem health. This INRMP identifies four ecosystem management goals and 25 objectives. The objectives support desired future end-state or successful outcome that support a goal or Navy policy or other relevant law or regulation.

1.6 STEWARDSHIP AND COMPLIANCE

Compliance in terms of an INRMP refers to the actions that must be taken to abide by the statutes and regulations applicable to natural resources. These are actions that an installation is legally mandated or obligated to take to meet current or recurring natural and cultural resources conservation management requirements, and for which it *must* obtain funding. Examples of compliance actions including developing, updating, and revising INRMPs; conducting biological surveys to determine population status of rare, threatened, and endangered (RTE) species; and conducting wetland surveys for planning, monitoring and/or permit applications. Compliance is essential, so these projects are of the utmost priority.

Stewardship is the responsibility to inventory, manage, conserve, protect, and enhance the natural resources entrusted to one's care in a way that respects the intrinsic value of these resources and the needs of present and future generations (OPNAVINST 5090.1D, Chapter

12). Installations are required to recognize and balance environmental stewardship with mission readiness in retaining control and use of Navy land, sea, and air space for maintaining the military mission. Conscious and active concern for the inherent value of natural resources must be given in all Navy plans, actions, and programs (OPNAVINST 5090.1D, Chapter 12). Stewardship projects and programs enhance an installation's natural resources, promote proactive conservation measures, and support investments that demonstrate Navy environmental leadership. Examples include education and public awareness projects, biological surveys or habitat protection for non-listed species, or management and execution of volunteer and partnership programs. Stewardship is an important component of the Navy's Environmental Readiness Program, and because stewardship projects can occur on an indefinite time-scale, these projects are prioritized after compliance projects.

1.7 COMMITMENT OF REGULATORY AGENCIES

The USFWS and TPWD are integral parts of the INRMP development, review, and revision process for the NASK Complex, under a cooperative agreement with the DON, as outlined in the Sikes Act. The USFWS and TPWD cooperate in the development of the INRMP and participate in the annual reviews and revisions, as well as the formal 5-year review of the document.

Stakeholders include federal and state natural resource agencies, local governments and landowners, civic and conservation groups and the Navy. A stakeholder has the responsibility or mandate to preserve and manage natural resources, the right or privilege to make use of the natural resources, and may be affected directly or indirectly by NASK actions. State and federal agencies are the primary stakeholders responsible for natural resources protection and preservation. Other stakeholders are responsible for providing natural resources for economic and recreational purposes. Table 1-1 provides a list of stakeholders and Table 1-2 lists legal drivers currently involved with natural resources management at NASK.

Table 1-1 NASK Natural Resources Stakeholders

Federal, State, and Local Agencies	
U.S. Fish and Wildlife Service	Texas Parks and Wildlife Department
U.S. Department of Agriculture (USDA), Natural Resources Conservation Service	Texas Commission on Environmental Quality
U.S. Geological Survey	USDA Wildlife Services
U.S. Environmental Protection Agency	U.S. Army Corps of Engineers
Texas General Land Office	Jim Wells County
Kleberg County	McMullen County
City of Kingsville*	City of Orange Grove
City of Alice	City of Freer
Navy	
Public Works Department	Morale, Welfare, and Recreation
Commanding Officer	Training Squadron 21
Training Air Wing TWO	Training Squadron 22
Non-governmental Organizations and Individuals	
King Ranch Inc.*	Military Retirees
DoD Partners In Flight	Dependents of Navy Personnel
DoD Partners in Amphibian and Reptile Conservation	Dependents of Navy Personnel
Major Navy Contractors - Boeing	The Nature Conservancy of Texas
National Audubon Society	Native Plant Society of Texas
Texas A&M University - Kingsville	

Note: asterisk (*) denotes adjacent landowner

Table 1-2 Legal Drivers for Natural Resources Management

Name/Description	Citation
Addresses off-road vehicle use	Executive Order 12608
Bald Eagle Protection Act of 1940	16 U.S.C. 668
Clean Air Act	42 U.S.C. 7401
Clean Water Act	33 U.S.C. 1251, 33 USC 1341
Coastal Zone Management Act	16 U.S.C. 1456
Endangered Species Act	16 U.S.C. 1531 & 1536
Environmental Conservation Program	DODINST 4715.3
Erosion Protection Act	33 U.S.C. 426
Estuary Protection Act of 1968	16 U.S.C. 1221
Farm Land Protection Policy	7 CFR 658
Farmland Protection Policy Act of 1981	7 U.S.C. 4201
Federal Insecticide, Fungicide, and Rodenticide Act	7 U.S.C. 136
Federal Land Policy and Management Act of 1976	43 U.S.C. 1701
Federal Leadership in Environmental, Energy, and Economic Performance	Executive Order 13514
Federal Noxious Weed Act of 1974	7 U.S.C. 2801
Federal Pest Plant Act	7 U.S.C. 150
Fish and Wildlife Conservation Act	16 U.S.C. 2901
Fish and Wildlife Coordination Act, as amended	16 U.S.C. 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 U.S.C. 2814
Marine Mammal Protection Act of 1972	16 U.S.C. 1361
Migratory Bird Treaty Act	16 U.S.C. 703
Military Construction and Authorization Act – Leases, Non-excess property	10 U.S.C. 2667
Military Reservations and Facilities – Hunting, Fishing, and Trapping	10 U.S.C. 2671
Multiple-Use Sustained Yield Act of 1960	16 U.S.C. 528
National Environmental Policy Act of 1969	42 U.S.C. 4321
Natural Resources Management Program	32 CFR 190
North American Wetland Conservation Act	16 U.S.C. 2912, 4401, 4808
Outdoor Recreation – Federal/State Program Act	16 U.S.C. 460 P-3
Protection and Enhancement of Environmental Quality	Executive Order 11514
Protection of Wetlands	Executive Order 11990
Recreational Fisheries	Executive Order 12962
Rivers and Harbors Act of 1899	33 U.S.C. 401
Sikes Act Improvement Act of 1997	16 U.S.C. 670
Soil and Water Conservation Act of 1977	16 U.S.C. 2001
Soil Conservation Act	16 U.S.C. 590
Timber Sales on Military Lands	10 U.S.C. 2665
Use of Off-Road Vehicles on DOD Lands	Executive Order 11989
Water Resources Planning Act	42 U.S.C. 1962
Watershed Protection and Flood Prevention Act	16 U.S.C. 1001, 33 USC 701

1.8 REVIEW AND REVISION PROCESS

In accordance with 32 CFR Part 190, the Sikes Act, and 5090.1D, Chapter 12, installations are required to perform an informal annual review of their INRMP. Installations are not required to revise their INRMP within a specified time interval; however, a formal review of the INRMP is required every five years in coordination with USFWS and state partners (Navy 2006). Minor revisions should be completed annually to reduce costs and time for the completing the formal five-year revision. The INRMP need not be revised if the formal review determines that the existing INRMP is effective. Any revisions to the authorities and guidance documents driving plan update requirements would be implemented as appropriate the review process.

The formal review conducted in coordination with USFWS and state partners shall verify that all environmental compliance projects have been budgeted for and implemented on schedule, that natural resource positions are filled with trained staff, or are in the process of being filled, that future projects and activities are included, and that significant changes made to the Installation's mission requirements or natural resources program are identified.

Activities that may constitute an INRMP revision include, but are not limited to, changes in mission requirements of land use intensity of ecosystem baseline conditions, determination that the current INRMP has proven to be inadequate, that it was not able to be implemented, or that its projects are ineffective in meeting goals as evidenced from monitoring results. Revisions may also be necessary if goals have changed, the planning horizon has expired, or base realignment and closure actions have been put into effect. Any of these activities should be communicated to the USFWS and state partners during the review process.

1.9 MANAGEMENT STRATEGIES

The NASK implements ecosystem management principles that are consistent with DoD and Navy policy. The ecosystem management approach seeks to balance the dual goals of maximizing land use for military readiness and maintaining native habitats. The overriding focus is to develop, promote, and refine a comprehensive, ecosystem-based management program for resource conservation. Such an ecosystem-based approach is intended to facilitate maximum support of the Navy's military training mission and infrastructure, while simultaneously promoting both the sustainability of native species and habitat diversity, and compliance with applicable laws and regulations.

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

Some strategies identify the need for incorporating sound natural resources management principles into the day-to-day decision-making processes and other actions of the various NASK departments. These types of initiatives typically strive to elevate awareness throughout the Installation, avoid potentially reactive approaches, and facilitate a proactive approach to

addressing natural resources within the mission of the installation. Initiatives are fundamental, non-measurable actions necessary for successful implementation of a strategy. Initiatives attempt to solve problems that preclude meeting specific strategies.

Natural resources management practices and activities at NASK are divided into four natural resources management focuses: land management, fish and wildlife, outdoor recreation, and integrated ecosystems management and partnering. The following natural resources topics are relevant to NASK, and are discussed in Section 5.

This INRMP includes a review of potential projects to be implemented over the next five years, and has been prepared to accommodate anticipated changes in land use and habitat management. Projects and actions to achieve INRMP goals, with measurable objectives, are described in Section 4, and Appendix A provides a summary table of INRMP Projects and detailed description of each project's purpose, goals, objectives, baseline and monitoring.

This INRMP provides benefit to federally listed species known to occur at NASK as described in Section 5.4.2 for RTE plants and wildlife.

South Texas ambrosia is the focus of RTE plant species management, a federally endangered species that occurs on the Main Station. Proper management of this species is afforded through implementation of the South Texas Ambrosia Management Plan, the Texas Coastal Bend Shortgrass Prairie Multi-Species Recovery Plan, as well as other INRMP Projects and management actions that will directly benefit this species. INRMP Projects that provide direct benefit to this species include biological resources survey and inventory (Project No. 1), RTE species habitat management (Project No. 2), invasive species control (Project No. 3), prescribed fire management (Project No. 5), habitat management and restoration (Project No. 7), natural resources outreach (Project No. 8), and South Texas ambrosia management plan and survey (Project No. 9). An assessment regarding the effects of prescribed burns and mowing recommendations has been prepared (see Appendix E); a research study on the effectiveness of relocation also is recommended, should the need arise to relocate populations to meet mission requirements. Educational outreach for the purpose of showcasing Navy's efforts to conserve and protect this species should also be conducted, as well as encouraging local landowners to search for South Texas ambrosia on adjacent lands.

The focus of managing the coastal shortgrass prairie ecosystem benefits the slender rush-pea (*Hoffmannseggia tenella*). Land conversion and habitat fragmentation threaten the shortgrass prairie habitat, agricultural practices being a main culprit. Currently, the two plant species are most affected by the introduction of nonnative grass species (USFWS 2017). This habitat is also important for the Sprague's pipit (*Anthus spragueii*), which is a former federal candidate species. Specific INRMP Projects that directly benefit the Sprague's pipit include biological resources survey and inventory (Project No. 1), RTE species habitat management (Project No. 2), prescribed fire management (Project No. 5), neotropical migratory bird survey (Project No. 6), habitat management and restoration (Project No. 7), and natural resources outreach

(Project No. 8). Other beneficial management actions include conducting internal and agency consultation during project planning for actions as required for projects that may impact federally listed species. Routine migratory bird monitoring by the BASH Program will also provide valuable information on the population of listed avian species and its preferred habitat locations on the Main Station.

These measures will ensure proper management of federally listed species known to occur at the Installation, and will allow for improved management measures to be implemented, as needed. Furthering knowledge of federally listed plant and wildlife species occurring at NASK through research projects will promote conservation of these species beyond the boundaries of the Installation and ensures Navy's stewardship requirements and compliance with the ESA. No federally designated critical habitat has been identified at NASK.

Appendix D provides a list of regulations and policies that are applicable to INRMP development and implementation. Section 5 also lists the relevant laws, EOs, regulations, directives, and memoranda relevant to each goal and objective described.

2.0 Current Conditions and Use

2.1 INSTALLATION INFORMATION

2.1.1 General Description

A site overview map of the NASK Complex is included in Figure 2-1. Site aerial photographs for the Main Station, NALFOG, and Dixie Target Range are presented in Figure 2-2, Figure 2-3, and Figure 2-4, respectively.

Yankee Target Range comprises approximately 2,780 ac (1,125 ha), is leased by the Navy, but is managed by TXANG. As the leaseholder, the Navy is responsible for providing range policy and guidance that adhere to Navy regulations while TXANG is required to 1) provide guidance and standard operating procedures on the proper utilization of designated frequencies, 2) ensure that all ordnance used at the Yankee Target Range are standard and fall within existing range restrictions, 3) assume all range clearance responsibilities, 4) ensure that ordnance disposal follows established Navy policy, and 5) suspend operations and notify the Installation Commander of any errant drops if additional ordnance falls outside of the established range restricted area (Navy 2009). Management strategies for Yankee Target Range is not included in this INRMP.

Main Station

The Main Station is located 43 miles (mi) (69 kilometers [km]) southwest of the City of Corpus Christi, Texas, about 35 mi (56 km) inland from the Gulf of Mexico, and approximately 3 mi (5 km) southeast of the City of Kingsville. It occupies approximately 3,346 ac (1,354 ha) and is bordered on three sides by the King Ranch. The Main Station contains the active airfield and airfield support facilities (Figure 2-2). An inactive airfield is located in the southern portion of the parcel, which contains small ponds and recreational facilities. Several recreation and athletic fields are located within the developed area located west of the active airfield. Main Station contains several agricultural outlease areas, which are described in Section 5.2.9. Additionally, it contains both big game and small game/bird hunting areas.

NALFOG

The NALFOG occupies approximately 1,380 ac (558 ha), and is located 35 mi (56 km) north of the City of Kingsville and 40 mi (64 km) west of the City of Corpus Christi in Jim Wells County, Texas. NALFOG contains the active airfield and airfield support facilities (Figure 2-3). No recreational facilities are associated with the NALFOG.

Dixie Target Range

The Dixie Target Range is located in the southwest corner of McMullen County, approximately 66 mi (106 km) northwest of the City of Kingsville, about 70 mi (112 km) northeast of the U.S.–Mexico border. It is comprised of approximately 8,116 ac (3,284 ha) that includes the Dixie Annex (4,899 ac [1983 ha]) and the impact area and buffer (2,915 ac [1180 ha]) (Table 2-1). The complex does not contain substantial development and consists primarily of open areas. A hunting lodge, which previously functioned as a

recreation and hunting preserve for DoD personnel, has been condemned and is scheduled for demolition. A barn and tool shed used for hunting equipment storage and a bunk house utilized for offices remain.

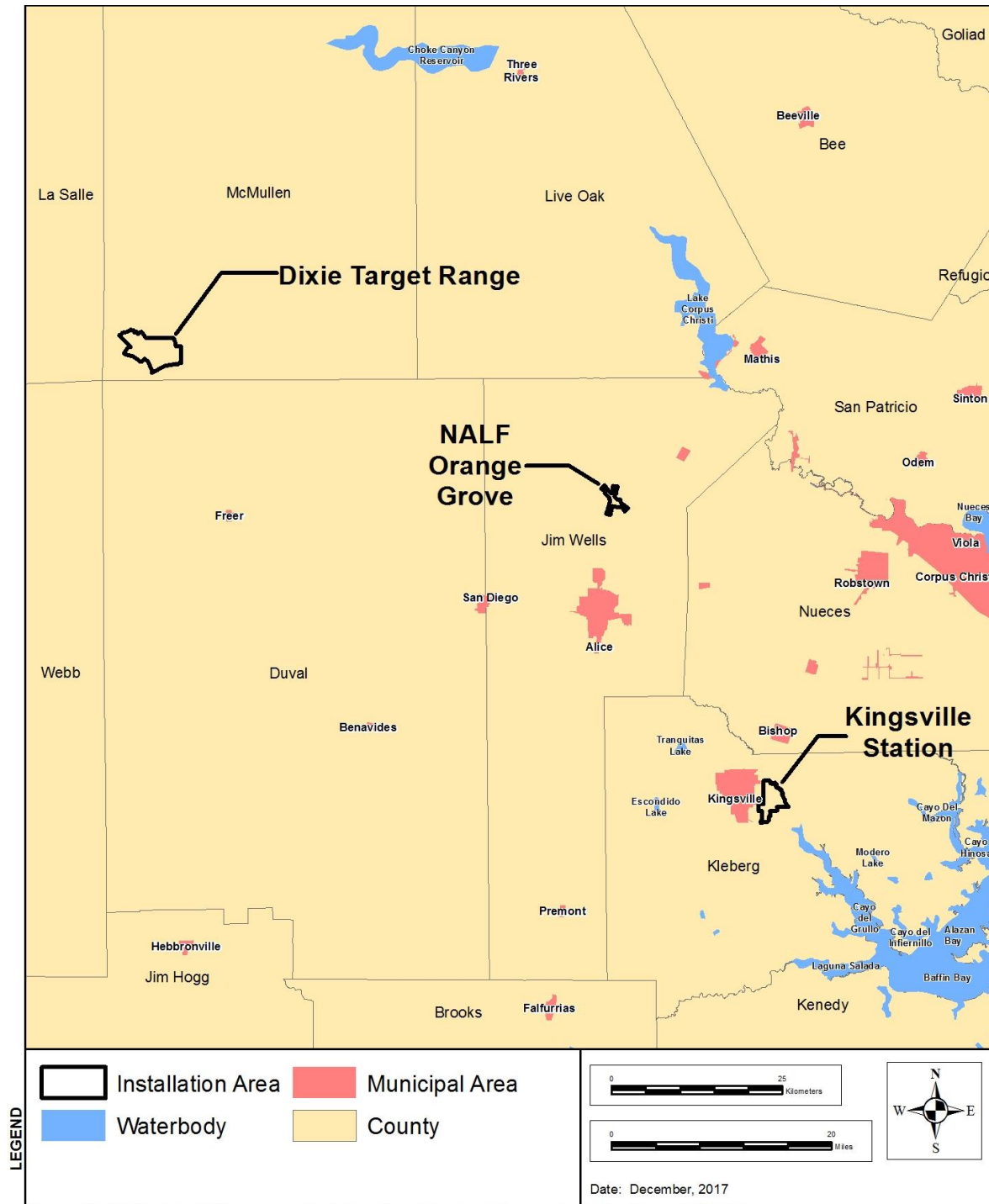


Figure 2-1 Naval Air Station Kingsville Complex

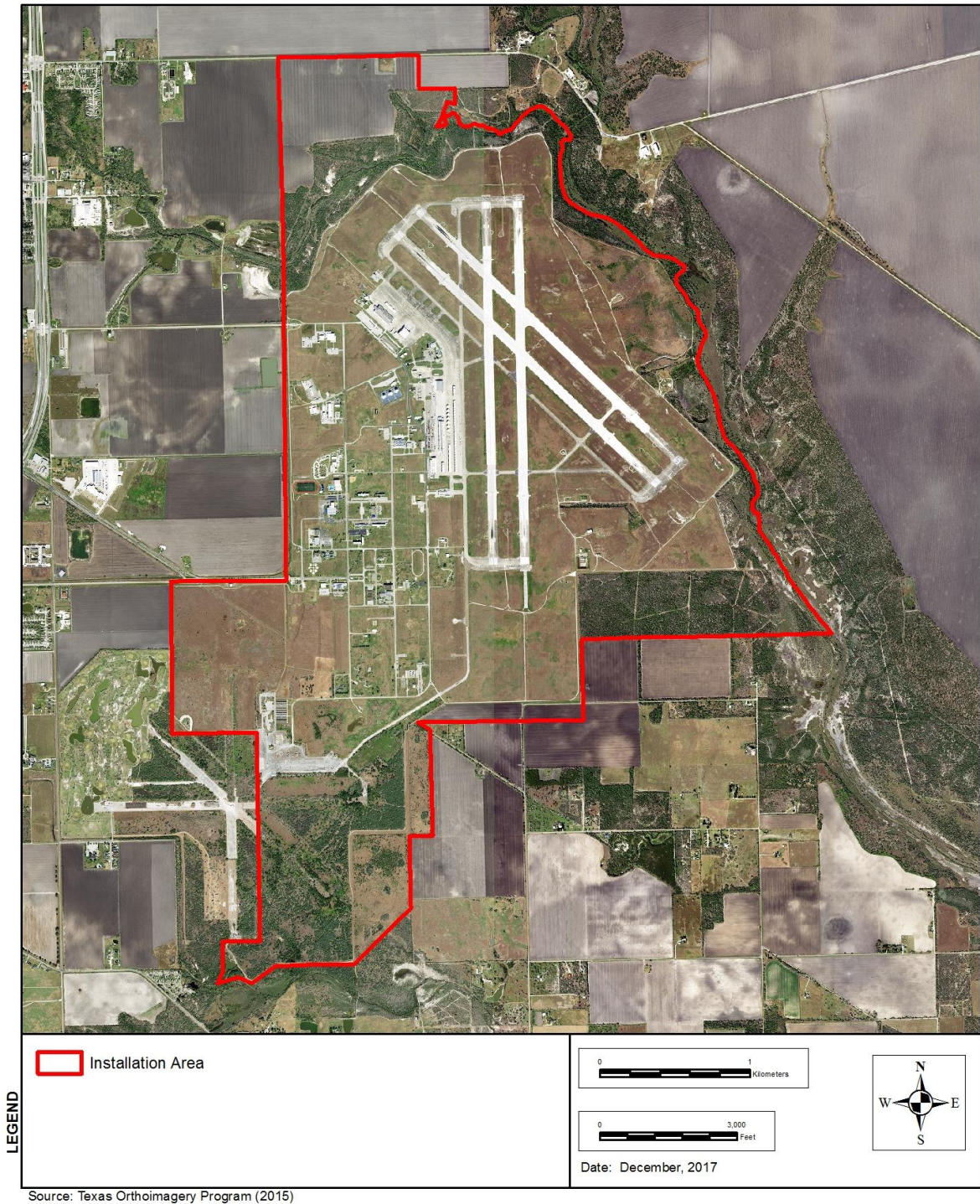


Figure 2-2 Naval Air Station Kingsville Aerial Photograph



Source: Texas Orthoimagery Program (2015)

Figure 2-3 NALFOG Aerial Photograph



Source: Texas Orthoimagery Program (2015); NAVFACSE GRC

Figure 2-4 Dixie Target Range Aerial Photograph

2.1.2 Military Mission

The primary military mission of NASK is to provide advanced pilot training for future aircraft carrier aviators. NASK is home to two training squadrons, VT-21 and VT-22, which operate the T-45 “Goshawk,” a single engine tandem seat training jet (DoD, Office of Economic Adjustment 2012), stationed at NASK.

To carry out its mission, NASK must build and maintain facilities to provide:

- Support to permanently and temporarily assigned Navy aircraft and personnel,
- Administrative and logistic support for naval aircraft operations, and
- Training and MWR needs of Navy personnel assigned to NASK, TW-2, and tenant military units.

The Main Station contains the main operation and housing facilities for personnel stationed at NASK. The Main Station has an average population of 1,850 which is comprised of student pilots, flight instructors, aircraft maintenance contract employees, fuel servicing, Air Operations, and facility maintenance (Commander, Navy Installations Command, Naval Air Station Kingsville 2012). The Rolls-Royce and L-3 VERTEX aircraft maintenance and flight facilities are located on the Main Station.

The NALFOG is situated in a relatively remote area. Its mission is to serve as a training field for Navy pilots to practice approaches and landings. Practice of arrested landings are necessary for pilots to become qualified to land on aircraft carriers, and are regularly scheduled.

The Dixie Target Range mission is to provide aerial bombing practice for Navy and U.S. Air Force (USAF) aircraft pilots. Pilots use this range to improve their aerial bombardment techniques and flying skills. The Dixie Target Range Impact Area is routinely cleared of native vegetation to preempt the potential occurrence of fire caused by ordnance-to-ordnance impacts. It is manned and maintained during operation by Government Wage Grade personnel assigned to NASK operations.

The Dixie Annex surrounds three sides of the Dixie Target Range and is allowed to stay in a native vegetative state throughout much of its acreage. The Dixie Annex ecosystem management activities are managed by NAVFAC and the Installation’s Environmental Department. It is managed as a hunting preserve for both recreation and wildlife. Hunting is currently the only recreational activity regularly performed on the parcel.

Table 2-1 NASK Property Locations and Mission/Function

Property	Acres	Location	Directions	Mission/Function
Main Station	3,346	Kleberg County, TX	Northern Kleberg County, 1 miles east of US Highway 77, east of Kingsville	Training site for Navy and Marine Corps Jet/Strike aviators
NALFOG	1,380	Jim Wells County, TX	Northern Jim Wells County, 2 miles east of US Highway 281, north of Alice	Additional training site for Training Air Wing Two as an extension of usable air sir space

Dixie Target Range	8,116	McMullen County, TX	Southwest McMullen County, 5.5 mi. west of River Street	Target range and hunting grounds
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2.1.3 Constraints Map

The natural resources constraints and development opportunities in support of the military mission are identified in Figure 2-5, Figure 2-6, and Figure 2-7. Natural resources management issues and requirements pose the following constraints to the military mission:

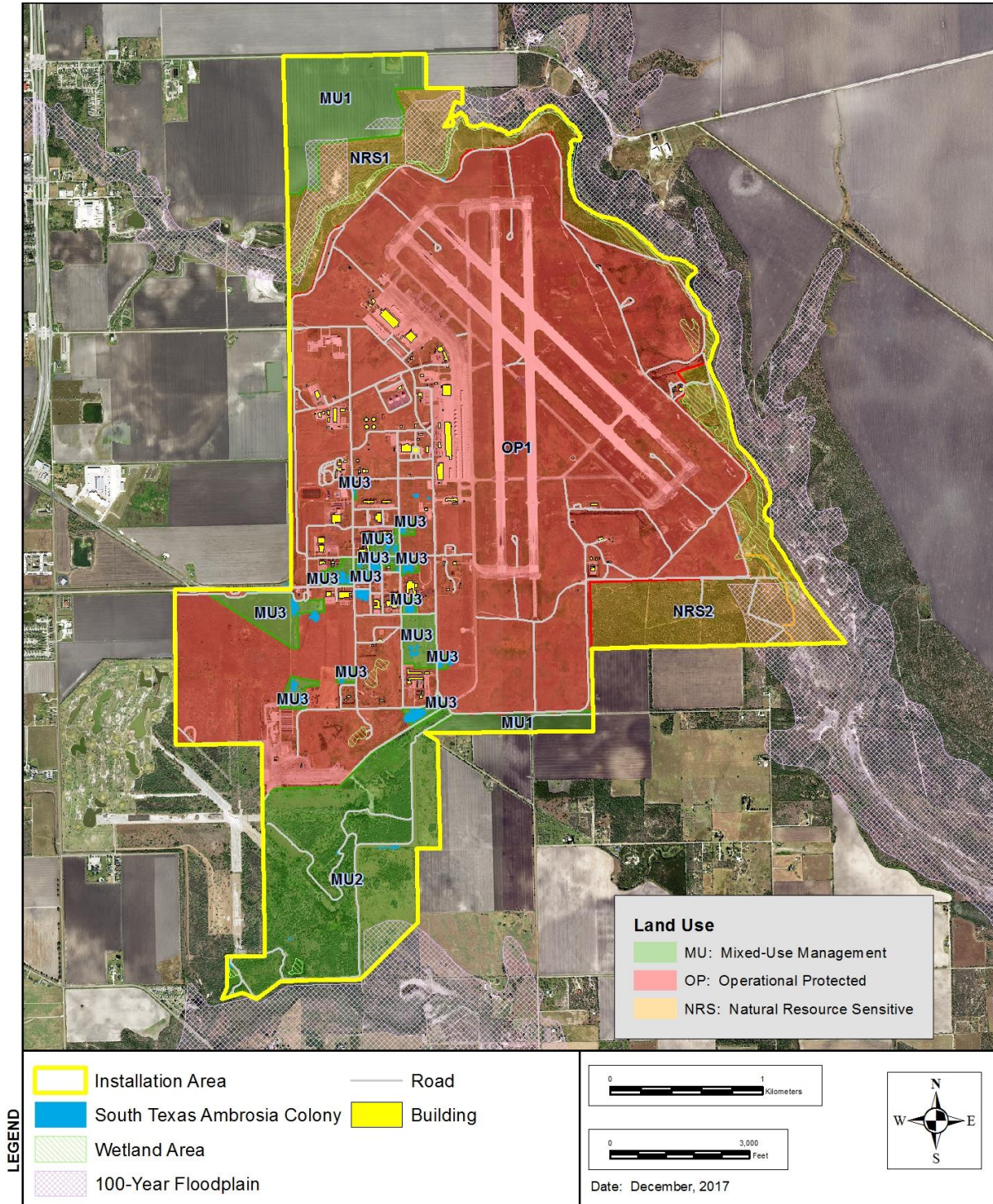
- Need for conservation and management of federally protected species known to occur at NASK;
- Limitation on new construction in wetlands, floodplains, and riparian buffer areas; and
- Inability to conduct management activities to maintain the airfield Clear Zones for areas located outside of the installation boundaries.

Outside of these constraints, the remaining areas present opportunity areas where mission activities would not be restricted by natural resources management issues.

The major constraints on the Main Station are wetland and floodplain areas, South Texas ambrosia populations, and maintaining the airfield Clear Zone outside of the Installation boundary. At the NALFOG the major constraints are floodplain areas located north and south and maintaining the Clear Zone outside of the Installation boundary. There are very few constraints associated with Dixie Target Range, and these are limited to pockets of surface waters that dot the landscape.

2.1.4 Opportunities Map

In addition to the opportunities (i.e., open areas) at the Main Station are identified in Figure 2-5, Figure 2-6, and Figure 2-7, there are some possible opportunities to leverage undeveloped habitat outside of the Installation boundaries in support of the military mission via encroachment partnering. The undeveloped habitat areas that border the Main Station present ideal opportunities for buffers to separate the Installation from encroaching development, as well as to maintain the airfield Clear Zone areas.



Source: Texas Orthoimagery Program (2015); NAVFACSE GRC;

Figure 2-5 Naval Air Station Kingsville Land Use and Opportunities and Constraints

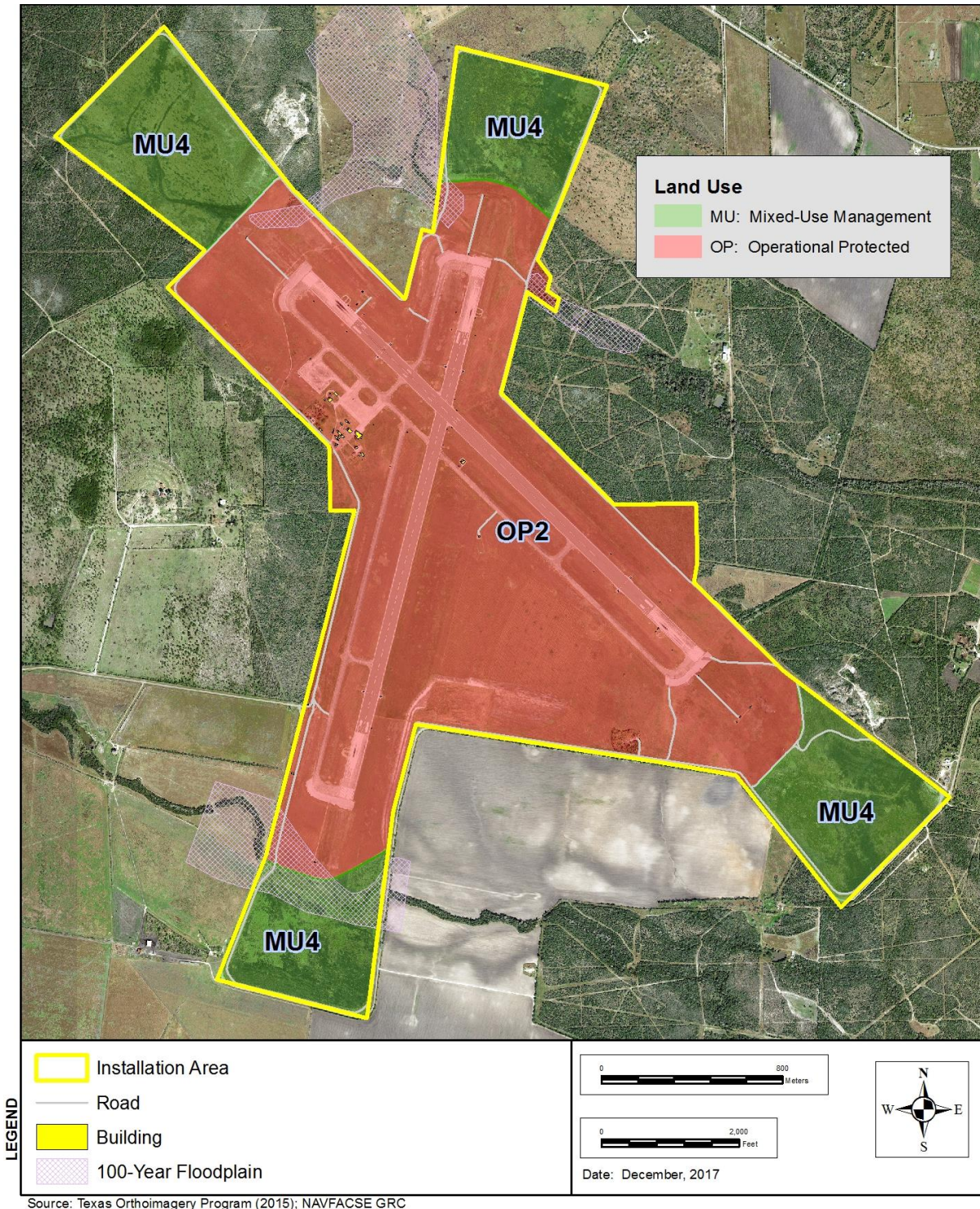


Figure 2-6 NALFOG Land Use and Opportunities and Constraints

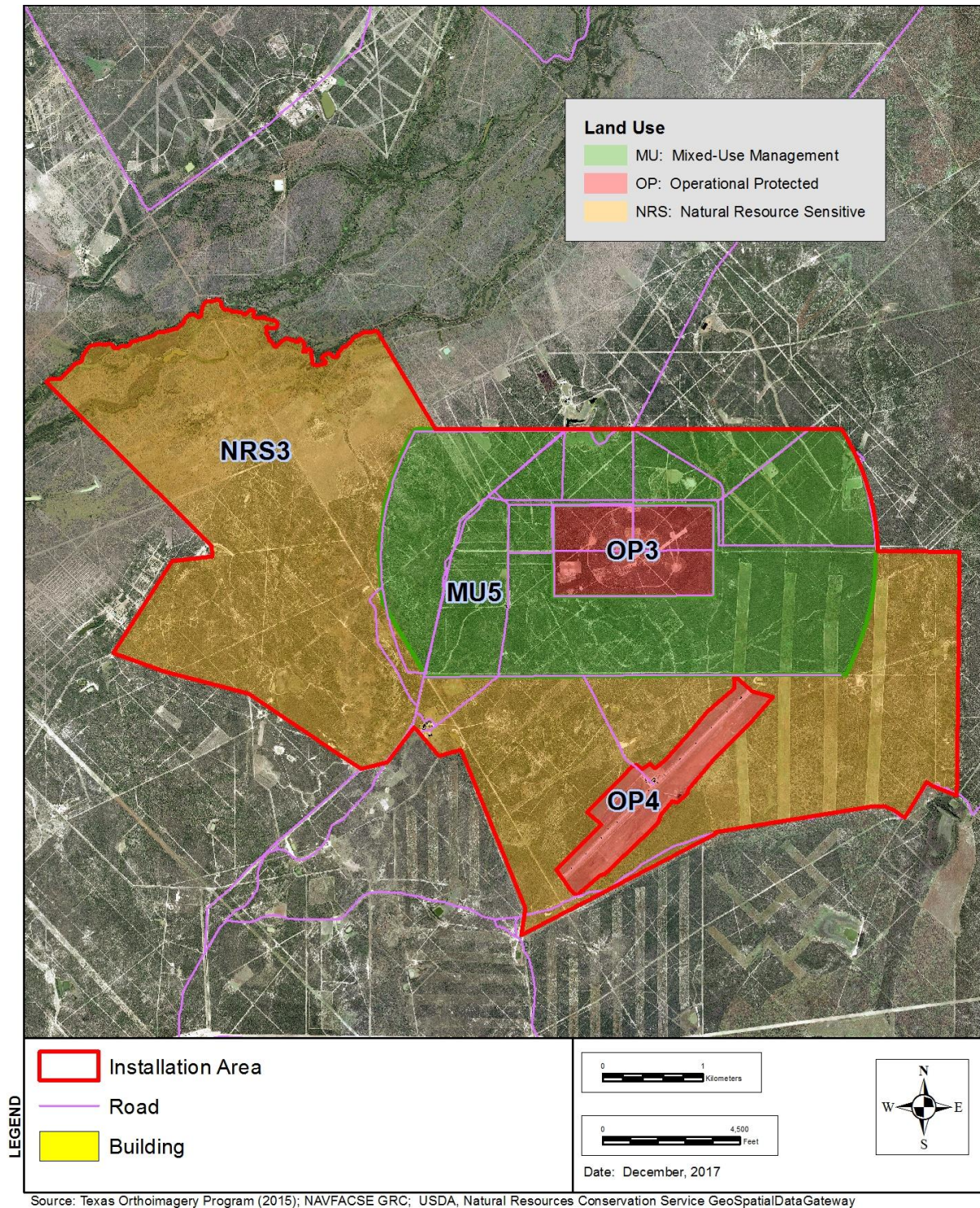


Figure 2-7 Dixie Target Range Land Use and Opportunities and Constraints

2.1.5 Abbreviated History and Pre-Military Land Use

The Main Station was constructed in 1942, and during World War II (WWII) the base housed four squadrons that provided fighter and bomber pilot training tactics and gunnery training for combat crews. After WWII the station was placed in caretaker status and leased to Texas Agricultural and Industrial College for use as an agricultural station. It was reactivated in 1951 in response to the Korean War, and used as an Auxiliary Air Station, eventually becoming a jet training activity center. It was rededicated as a Naval Air Station in 1968.

In general terms, the primary objective of NASK is to serve as a center for training Navy jet pilots. Specifically, the mission can be correlated with the following major commands that are assigned to NASK, including TW-2, (VT-21, VT-22, L-3 VERTEX, Rolls-Royce maintenance and flight facilities, Texas Army National Guard, and 11th Aviation Army Reserve MEDEVAC Squadron. NASK also functions as a refueling base for transient Navy aircraft. The missions of the major units at NASK are not expected to change in the immediate future.

The Dixie Annex was obtained through the process of inverse condemnation. The previous landowner claimed that the Navy was responsible for expending ordnance outside the range boundary, and that because this had occurred over a considerable length of time, the land could no longer be used for its intended purpose. The Navy purchased the ranch as directed by federal authority to purchase and maintain the property.

2.1.6 Regional Land Use

Main Station

The 2008 Kingsville Joint Land Use Study (JLUS) was the result of a collaborative effort between the City of Kingsville, Kleberg County, NASK, and representatives from local organizations and agencies. With the support of the DoD and the Office of Economic Adjustment, the primary goal of the study was to develop strategies to protect the quality of life of residents, growth of the City of Kingsville, and the Installation mission. The JLUS provides a complete list of Identified Compatibility Concerns, which include wetlands and groundwater, migratory birds, agricultural issues, public outreach, infrastructure development, and alternative energy development. The list of Identified Compatibility Concerns also identifies challenges to joint land use between the City of Kingsville, Kleberg County, and NASK, and indicates what existing tools and implementation actions can be used to combat these problems. In light of recent growth trends, including the expansion of the City of Kingsville urban area, continued collaborative land use planning between the JLUS representatives is of critical importance (City of Kingsville and Kleberg County 2008).

The City of Kingsville and Kleberg County enacted the JLUS recommendation to create the Joint Airport Zoning Board in 2010, as authorized by Local Government Code 241. This board has regulation creating authority and enacted the Main Station Compatible Land Use and Hazard Zoning Regulations (2010). These regulations mirror the Navy's Clear Zone (OPNAV 11010.36C) recommendations and provide Main Station with protection from incompatible development in an area bounded by 5 mi (8 km) from each runway end and 3 mi (5 km) wide centered on the extended centerline of each runway.

NALFOG

A review of online resources did not identify a regional land use plan for Jim Wells County.

Dixie Target Range

A review of online resources did not identify a regional land use plan for McMullen County.

2-2.1.7 Regional Conservation Lands

Regional conservation lands include state or federally protected conservation lands, such as state and national parks, wildlife refuges, and wildlife management areas (WMAs). The TPWD operates all state parks, state forests, and WMAs in Texas, which are established to represent habitats and wildlife populations typical of each ecological region in the state (TPWD 2005). The objective of the WMA program is to perform research on wildlife populations and habitats, to conduct education on sound resource management, and to provide public hunting, hiking, bird watching and other outdoor recreational opportunities that are compatible with conservation goals.

Main Station

A review of available online resources did not identify any regional conservation lands in proximity to the Main Station.

NALFOG

Based on an online review of conservation lands located within 50 mi (81 km) of NALFOG, two State Parks were identified. The 26,000-ac (10,522-ha) Choke Canyon State Park is located on Choke Canyon Reservoir, which is owned by the U.S. Bureau of Reclamation. Lake Corpus Christi State Park is an 11,000-ac (4,452-ha) park located on the southeastern corner of Lake Corpus Christi, 15 mi (24 km) northeast of NALFOG (TPWD n.d.b).

Dixie Target Range

The James E. Daughtrey Wildlife Management Area (WMA) is a 4,400-ac (1,781-ha) multiple use recreational area located approximately 34 mi (55 km) northeast of Dixie Target Range. The WMA is a multi-use area that surrounds Choke Canyon Reservoir, which provides valuable habitat for migratory species, including waterfowl (TPWD n.d.b).

2.2 General Physical Environment and Ecosystems

2.2.1 Climate

The climate of South Texas is complex, and is largely influenced by the regional geography in an area lying near the intersection of two of Earth's three first-order climate divides: the interface between the "winterless" tropical regimes to the south and the seasonal, temperate or middle-latitude regimes to the north; and the division between the arid west and the moisture-surplus east, a north-south divide extends through South Texas (Yu et al. n.d.). This results in the region being both subtropical and semi-arid. More specifically, South Texas has a regional climate that is dominated by three main aspects:

1. It is neotropical or mega thermal, with high summer and annual temperatures (about 72–75 degrees Fahrenheit [°F] [22–24 degrees Celsius [°C]] compared with about 81 °F [27 °C] at the

Equator), and mild winters with occasional severe or killing freezes (historically about one such event per decade).

2. It is both wet and dry: near the surface the prevailing southeasterly winds bring copious quantities of moisture from the Gulf of Mexico, causing South Texas to experience higher atmospheric moisture contents (humidity levels) than any other part of the continental U.S. except southern Florida. However, due to the sinking action associated with the nearby subtropical Bermuda and Pacific Highs, South Texas is climatically subhumid to semiarid, meaning it is uniformly moisture-deficient because of limited annual rainfall 20–30 inches (in) (50–75 centimeter [cm]) combined with high evapotranspiration rates (mean yearly potential evapotranspiration ranges from double to quadruple average annual precipitation).
3. It is marginal or vulnerable (e.g., agriculturally and ecologically) in that most years are either significantly wetter or drier than the long-term average. Rather than average annual rainfall being “normal” it would be more accurate to consider it as “abnormal” because the precipitation of most years is either well above or below the mean. Such unusually large interannual variability of precipitation (30 percent [%] in eastern South Texas and 40% in the west near Laredo, Texas) represent rainfall variability values more typically associated with many of the world’s semi-desert regions.

Average annual temperatures in Texas gradually increase from about 52 °F (11 °C) in the northern Panhandle of Texas to about 68 °F (20 °C) in the Lower Rio Grande Valley, except for cooler isolated mountainous areas of west Texas. Across the state, the warmest month of the year is August, with temperatures above 90 °F (32 °C) in the southwestern part of the state. The coolest months of the year are January and December with temperatures below 20 °F (-7 °C) in the northern portion of the state. The National Climatic Data Center divides Texas into 10 climate divisions, which are defined by similar characteristics such as vegetation, temperature, humidity, and rainfall. The three NASK parcels are located in the Post Oak Savanna and South Texas Plains climate divisions, which are identified as subtropical sub-humid (Texas Water Development Board 2012). These regions are characterized by an onshore flow of tropical maritime air from the Gulf of Mexico with decreasing moisture content from east to west across the region, and by hot summers and dry winters (Texas A&M University – College Station 2005). Characteristic of this region, the climate in the NASK area is hot during the summer, with air temperatures typically in the mid-80s °F (27 °C) (Idcide 2012). Winters are cool with temperatures typically in the mid-50s °F, (10 °C). The warmest month of the year is August with an average maximum temperature of approximately 96.3 °F (35.7 °C), and January is typically the coldest month of the year with an average minimum temperature of about 45.5 °F (7.5 °C). Temperature variations between night and day tend to be moderate during the summer with a daily temperature difference of 22 °F (12 °C), and moderate during winter with an average daily temperature difference of 25 °F (14 °C).

The average annual precipitation in the NASK area is 28.5 in (72.4 cm), with rainfall fairly evenly distributed throughout the year (NOAA 2017). State-wide average annual precipitation ranges from less than 10 in (25 cm) in the west to greater than 60 in (152 cm) in the southeast (Texas A&M University – College Station 2005). The wettest month of the year is September with an average rainfall of 5.21 in

(13.2 cm) (NOAA 2017). Across the state of Texas, average precipitation for the month of June ranges from less than 1 in (3 cm) in the western region of the state to greater than 7 in (18 cm) in the southeastern region of the state (Texas Water Development Board 2012). Tropical storms and hurricanes routinely track west through the Gulf of Mexico and may periodically affect coastal areas around NASK.

Table 2-2 Average Temperatures and Rainfall in the Kingsville Vicinity (1950-2017)

Month	Average Temp (°F)	Average Min Temp (°F)	Average Max Temp (°F)	Average Rainfall (inches)
January	56.9	45.5	68.6	1.61
February	60.9	49.2	72.7	1.68
March	67.2	55.5	78.8	1.26
April	73.8	62.9	84.8	1.56
May	79.0	69.0	88.9	3.32
June	83.4	73.3	93.5	3.16
July	85.0	74.4	95.6	2.19
August	85.4	74.4	96.3	2.84
September	81.5	71.0	91.9	5.21
October	74.4	62.6	86.1	2.89
November	65.9	54.3	77.5	1.59
December	59.1	47.4	70.8	1.21
Average/Total	72.7	61.6	83.7	2.38

Source: National Oceanic and Atmospheric Administration (NOAA) Online Weather Data
(<http://w2.weather.gov/climate/xmacis.php?wfo=crp>)

2.2.1.1 Climate Change

Climate change is estimated to result in rising sea levels, altered precipitation patterns, and changing ecological systems; and will shape strategic, infrastructure, and natural resource considerations for the foreseeable future. NASK must have land, air, and water resources necessary to train and operate to successfully execute its military mission. The frequent and intense heat extremes projected to occur with climate change may affect outdoor training, strain personnel efficiency, degrade air quality through elevated ozone caused by higher temperatures, and strain electrical supplies due to increased demand on the grid. Changes in precipitation patterns may reduce water supply, increase frequency and intensity of wildfires, damage local ecosystems, and cause shifts in species composition and geographic range.

Most of the state of Texas has warmed by between one-half and one degree (F) in the past century (USEPA, 2016). The western part of Texas has warmed by twice as much as the eastern part (USEPA, 2016). In the eastern two-thirds of the state, average annual rainfall is increasing, yet the soil is becoming drier. Evaporation increases as the atmosphere warms, increasing humidity, average rainfall, and the frequency of heavy rainstorms in many places. Atmosphere warming can also contribute to drought in other places where increased evaporation exceeds rainfall. Rainfall increased on average about 15 percent for the great plains region (USEPA, 2016), during the four wettest days of each year over the past 50-years. This shows a potential for increased inland flooding in Texas, due to increased rainfall during the wettest days of the year.

Sea level rise has been occurring and is likely to rise two to five feet in the next century along much of the Texas coast (USEPA, 2016). With sea level rise, salt water pushes further inland and upstream into rivers, bays, wetlands, and aquifers. As the water table rises, increases in the salinity of both surface water and ground water may destroy natural vegetation and contaminate freshwater aquifers. Sea level rise will also lead to increased coastal flooding and exacerbate storm surge from hurricanes by slowing drainage and increasing the height of storm surges.

These impacts from climate change may increase over time until they seriously threaten operations, infrastructure, natural resources, and availability of fresh water supplies from aquifer sources necessary to sustain the military mission. The Main Station is likely most vulnerable to aquifer impacts, because it is located closest to the coast and tidally influenced water bodies. The Dixie Target Range and NALFOG are probably more susceptible to drought, desertification, ecosystem disruption and habitat shifts, as well as flash flooding from increased amounts of inland rainfall. At the Main Station, a potential benefit from sea level rise is natural restoration of brackish marshes in the San Fernando Creek, Tranquitas Creek and Santa Gertrudis Creek floodplains from increased water levels and salinity. Brackish marshes within these creeks have been decreasing over the years due to encroachment by shrubby vegetation species, which are less tolerant of extended hydroperiods with elevated salinity water.

A warmer Gulf of Mexico provides tropical storms and hurricanes with more potential energy. Over the past 20 years, tropical storms and hurricanes have become more intense on average. While scientists are not sure whether the recent intensification reflects a long-term trend, hurricane wind speeds and rainfall rates are likely to increase as the climate continues to warm. Recent evidence of this trend includes Hurricane Harvey (Category 4) that impacted the Texas coast in 2017, causing unprecedented inland flooding in the Houston area.

Air quality changes due to climate change may include increased ozone formation in the lowest layer of the atmosphere. Higher temperatures can contribute to an increase in the number of “bad ozone” days. Ground level ozone aggravates respiratory illnesses such as asthma, reduces existing lung function, and induces respiratory inflammation (USEPA 2016).

2.2.2 Air Quality

The Clean Air Act (CAA) is the primary federal statute governing the control of air pollution. The CAA requires the U.S. Environmental Protection Agency (USEPA) to set National Ambient Air Quality Standards (NAAQS) for six criteria pollutants considered harmful to public health and the environment. These pollutants are respirable particulate matter (PM¹⁰), carbon monoxide, sulfur dioxide (SO²), nitrogen dioxide (NO²), lead, and ozone (O³), and the levels of these pollutants must not exceed limits set by the NAAQS.

Air pollutant emissions at the NASK Complex are generated from stationary and mobile sources. Stationary sources include surface coating, fuel storage and handling, and firefighting training facilities and miscellaneous small stationary combustion sources. Mobile sources include aircraft, motor vehicles, and ground support equipment. Military aircraft operations are the most significant source of air pollutant emissions at NASK.

2-2.2.3 Geology, Topography, and Soils

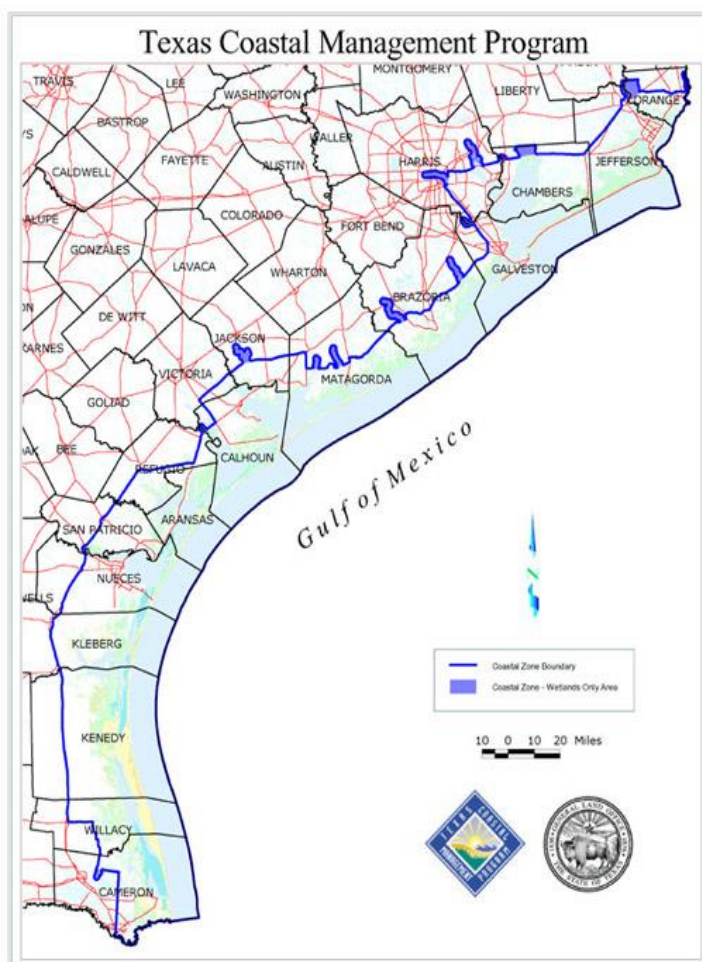
2.2.3.1 Geological Formations

NASK Complex is located within the Gulf Coastal Plains Province of Texas, which includes Coastal Prairies, Interior Coastal Plains, and Blackland Prairies subprovinces (University of Texas at Austin, Bureau of Economic Geology 1996). Elevations within this province range from at or near mean sea level (MSL) to 300 ft (91.4 m) above MSL within the Coastal Prairies Subprovince, 300–800 ft (91.4–243.7 m) above MSL within the Interior Coastal Plains Subprovince, and 450–1,000 ft (137.2–304.8 m) above MSL for the Blackland Prairies Subprovince. The NASK Complex is located within the Coastal Prairies and Interior Coastal Plains subprovinces as described below. The physiography and surrounding region is dominated by Mesquite-Granjeno Parks vegetation and agricultural areas. Vegetation associated with Mesquite-Granjeno Parks is described in Section 2.3.1.

Main Station

The Main Station is located along a transition area between the Coastal Prairies and Interior Coastal Plain subprovinces of the Gulf Coastal Plains Province (University of Texas at Austin, Bureau of Economic Geology 1996). The Coastal Prairies Sub-province consists of nearly flat, tallgrass prairie grasslands that include adjacent coastal wetlands and gallery forests (United States Geological Survey [USGS], National Wetlands Research Center 2012). Texas is estimated to contain about 6.5 million ac (2.6 million ha) of Coastal Prairies habitat that extends along a band adjacent to the coastal region of the state, immediately inland from coastal marsh habitats. The Interior Coastal Plains is characterized by pine and hardwood forests with many permanent streams located throughout the region (University of Texas at Austin, The Walter Geology Library 2011). The Main Station is located near the western boundary of the Texas Coastal Management Program Coastal Zone.

The Beaumont formation underlies the Kingsville region and is the primary geologic formation associated with the Main Station. The Beaumont formation is composed mostly of sand, with silt, clay or



Source: Department of Oceanography, Texas A&M University

mud, and gravel comprising the secondary rock types (U.S. Geological Survey [USGS] 2012). This formation includes older stream channels, point bars and natural levees. Recent and older lake bottoms, clay dune and sand dune deposits with concretions and massive accumulations of calcium carbonate and concretions of iron oxide are usually present. These clay and mud formations are of low permeability and have a high water holding capacity with high shrink-swell potential and low shear strength.

NALFOG

NALFOG is located within the Interior Coastal Plains Subprovince of the Gulf Coastal Plains Province. The Interior Coastal Plains Subprovince is described above for the Main Station.

The main portion of the NALFOG is underlain by Lissie Formation, which contains rocks of the Phanerozoic, Cenozoic, Quaternary, and Pleistocene-Middle geologic time periods. The Lissie Formation consists mostly of sand, silt, clay, and lesser amounts of gravel (USGS 2012). This formation is characterized by moderate permeability and drainage, and has a high shear strength. In some areas along El Caro and Tecolote creeks, a mantle of recent alluvium deposits may be present.

Dixie Target Range

The Dixie Target Range is located within the Interior Coastal Plains Subprovince of the Gulf Coastal Plains Province, which is described above.

Dixie Target Range is underlain by Eocene deposits of the Jackson Group (undivided) which consist of alternating beds of clay, sandstone, siltstone, and tuff (USGS 2012), as well as deposits of the Frio clay. Frio clay deposits are from the Phanerozoic, Cenozoic, Tertiary, and Oligocene geologic time periods and include primarily clay and mud.

2.2.3.2 Topography

Topography of Main Station, NALFOG and Dixie Target Range is shown in Figure 2-8, Figure 2-9, and Figure 2-10, respectively.

Main Station

Elevations at Main Station range from 4-to-71 feet (1.2-to-21.6 m) above MSL (Figure 2-8). The topography surrounding Main Station is generally flat with elevations within the developed areas of the parcel having an elevation of 50 feet (15.2 m) or greater above MSL. Lower elevations at Main Station are located within the floodplain areas adjacent to San Fernando Creek along the eastern boundary, Tranquitas Creek along the northern boundary, and Santa Gertrudis Creek near the southern boundary. The coastal plain in this area is gently but irregularly inclined toward the Gulf of Mexico at about 5 feet (1.5 m) or less per mile. Wind acting on the dry sandy coastal plain has imposed a strong, northwest to southeast linearity to many topographical and vegetative features.

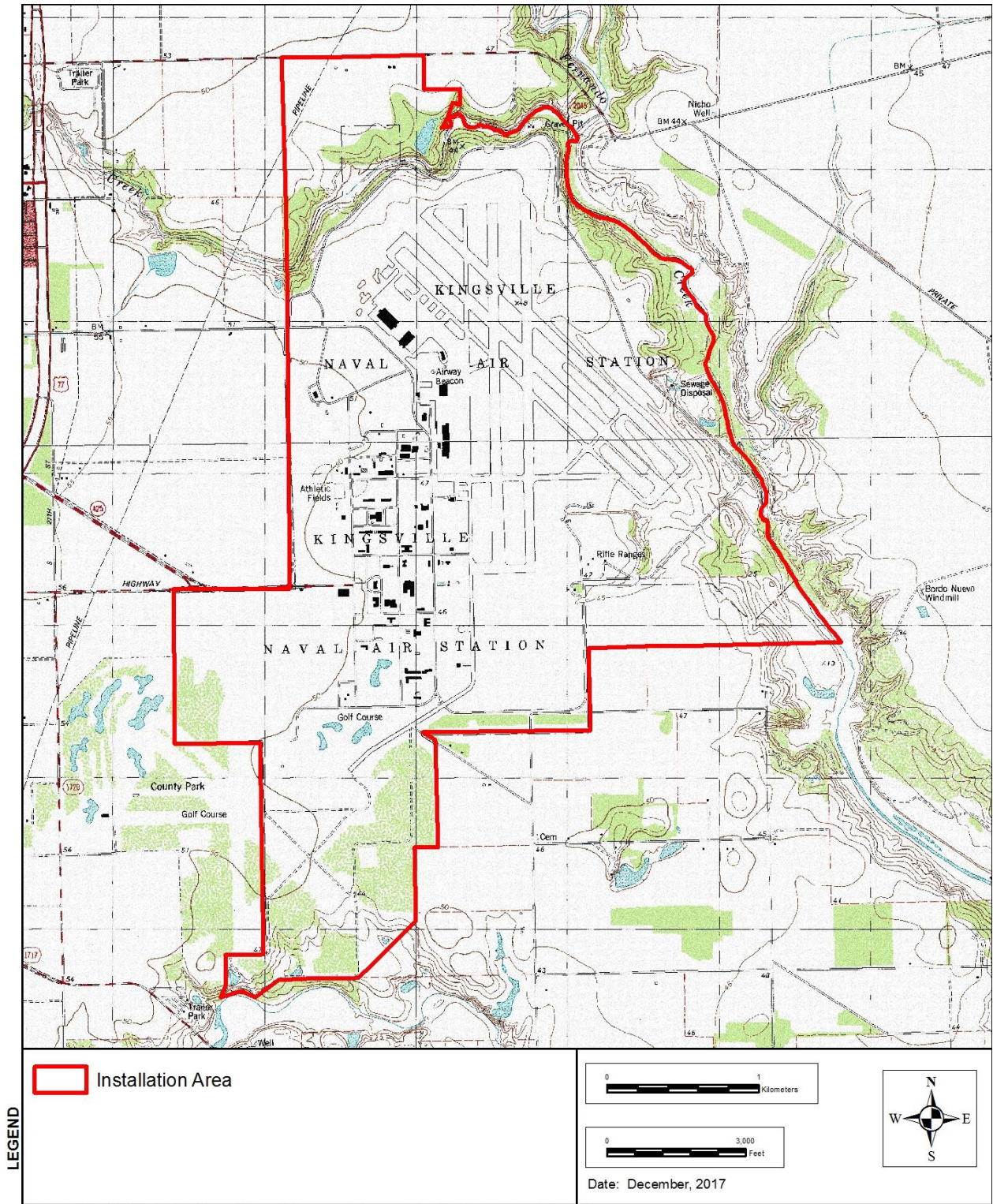


Figure 2-8 NAS Kingsville, Main Station, Topography

NALFOG

Elevations at NALFOG range from 197-to-273 feet (60.0-to-83.2 m) above MSL (Figure 2-9). The topography surrounding the area is rolling. Elevations are highest in the northern half of the parcel, with the lowest elevations occurring in the southern half of the parcel in the area where El Caro Creek crosses the southern boundary.

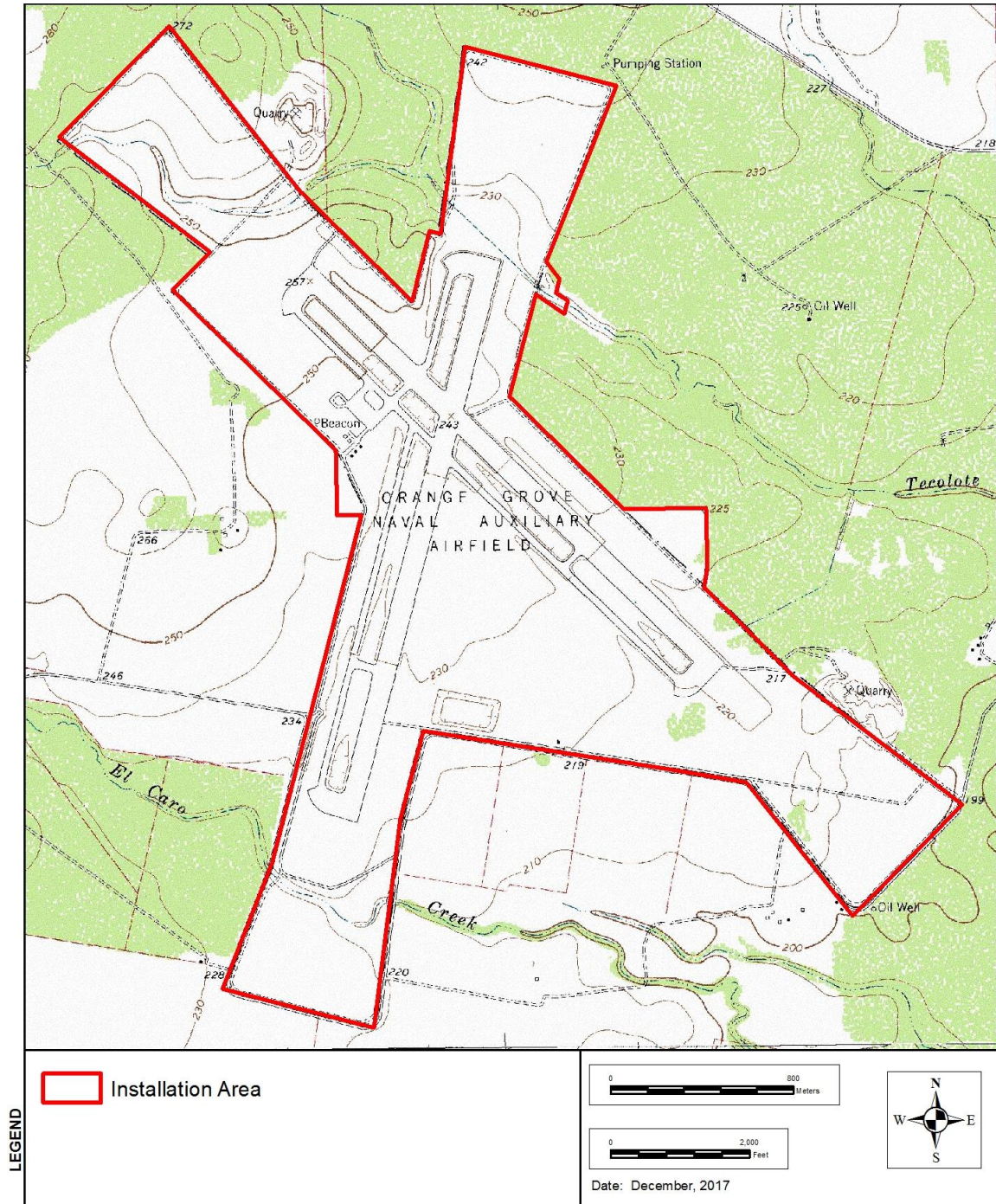


Figure 2-9 NALFOG Topography

Dixie Target Range

Elevations at Dixie Target Range vary from 240-to-376 feet (73.1-to-114.6 m) above MSL (Figure 2-10). The topography surrounding the area is gently rolling. The highest elevations are within the southern-most sections of the parcel, with elevations increasing from south to north located in the southeastern corner of the parcel, with topography sloping down to the north and west towards the Nueces River.

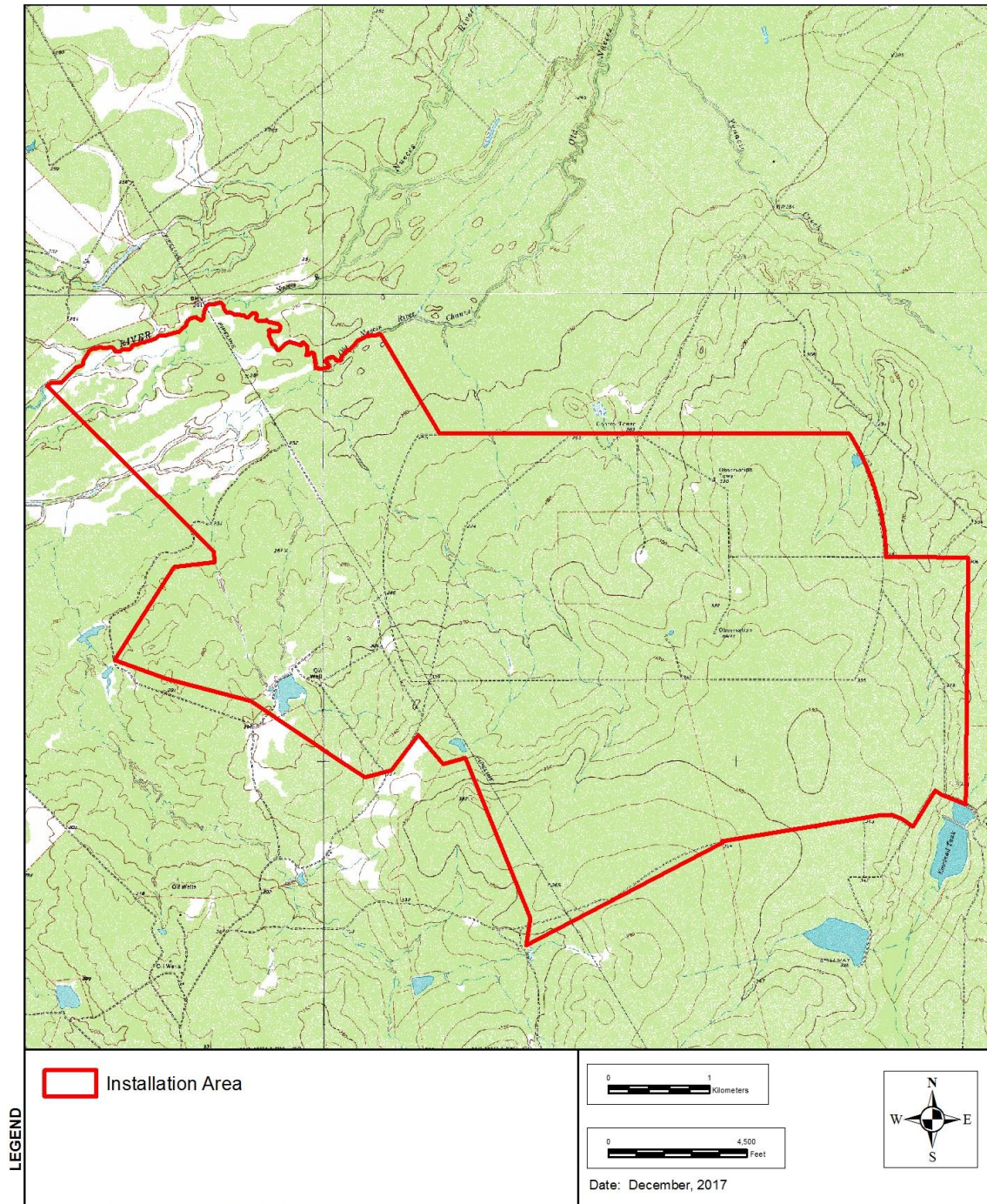


Figure 2-10 Dixie Target Range Topography

2.2.3.3 Soils

Soils information for Main Station, NALFOG, and Dixie Target Range is shown in Figure 2-11, Figure 2-12, and Figure 2-13, respectively.

Main Station

A review of NRCS soils data identified eight soil types at Main Station as shown in Figure 2-11. Cranell soils (47%) are the most widespread throughout Main Station, followed by Victoria clay soils, 0–1 % slopes (37%). A minor amount of Gullied land-riverwash complex soils (7%), Gertrudis fine sandy clay loam (5%), and Calallen sandy clay loam (4%) are also associated with the Main Station. Banquet clay soils and Victoria clay, 1–3% slopes, are located in the southern section of the parcel, and each comprises less than 1% of the soil types present. A pit comprising less than 1% of the soil types also is present in the northern portion of Main Station.

The low topographic relief associated with the Main Station often contributes to poor drainage in some areas, although drainage is adequate within improved areas and throughout most of the parcel. Creeks located along the Installation boundaries are subject to flooding during the most severe storm events such as tropical storms and hurricanes. These events are responsible for depositing alluvial soils and rearranging the stream channels of the two creeks on the borders of the Installation. None of the soils identified are classified as hydric (USDA, NRCS 2009b).

NALFOG

A review of NRCS soils data identified 16 soil types at the NALFOG as shown in Figure 2-12. Goliad sandy clay loam (26%) is the primary soil type associated with the airfield, followed by Lattas clay (24%) and Clareville loam (23%). A minor amount of Parrita sandy clay loam (7%), Danjer clay (6%), Pernitas sandy clay loam 0–1% slope (3%), Pettus sandy clay loam (2%), Pernitas sandy clay loam 1–5% slopes (1%), Edroy clay (1), and Aransas clay (1%) are also associated with NALFOG. Papagua soils, Runge fine sandy loam, Goliad sandy clay loam, and Papalote fine sandy loam also are present, with each of these soil types comprising less than 1% of the site soil. A pit comprising less than 1% of the soil types is also located in the southern section of NALFOG. The majority of these soil types are deep, well drained, mildly alkaline loam and clay loam Mollisols. In some areas these give way to deep, somewhat poorly drained, moderately alkaline clay Vertisols. Shallower, well drained, moderately alkaline, gravelly loam Mollisols are present on some higher locations. Of the soils present on this parcel, Aransas clay, Edroy clay, and Papagua soil, are classified as hydric (USDA, NRCS 2009c).

Dixie Target Range

Portions of the Dixie Target Range have not been subject to a soil survey. The remaining areas of the Dixie Target Range contain 22 soil types as shown in Figure 2-13. Aquilares fine sandy loam (19%) is the primary soil type associated with the airfield, followed by Houla clay loam (15%). A minor amount of 13 soil types are associated with Dixie Target Range, including Cotulla clay loam (8%); Leoncita fine sandy loam (8%); Salco fine sandy loam (7%); Cochina clay, 0–1% slopes, frequently flooded (6%); Cochina clay, 0–1% slopes, occasionally flooded (5%); Chacon sandy clay loam (5%); Viboras clay (3%); Lasalle clay (3%); Tela sandy clay loam (2%); Catarina clay (2%); Montell clay (2%); Mata gravelly clay (2%); and

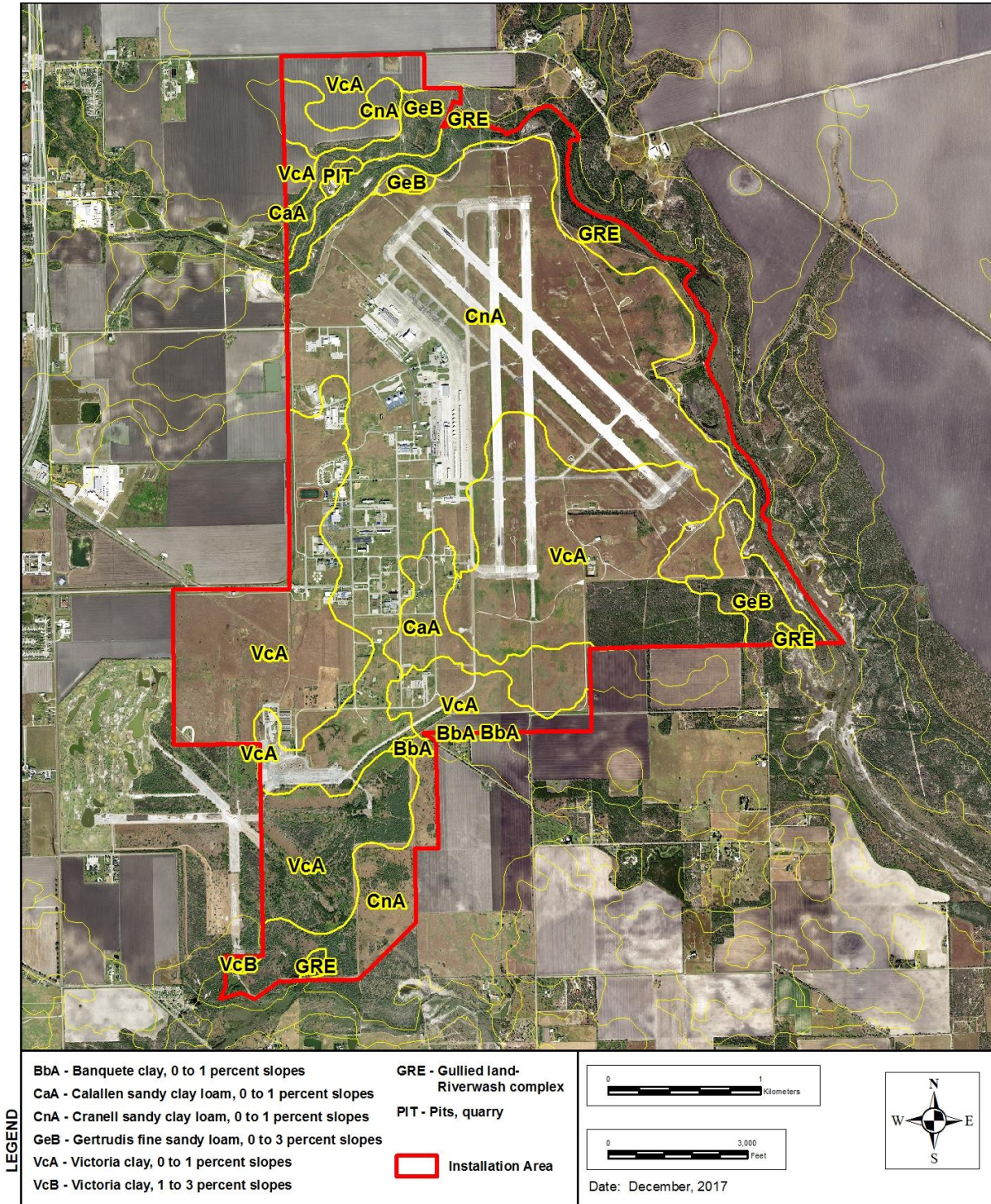


Figure 2-11 NAS Kingsville, Main Station, Soils

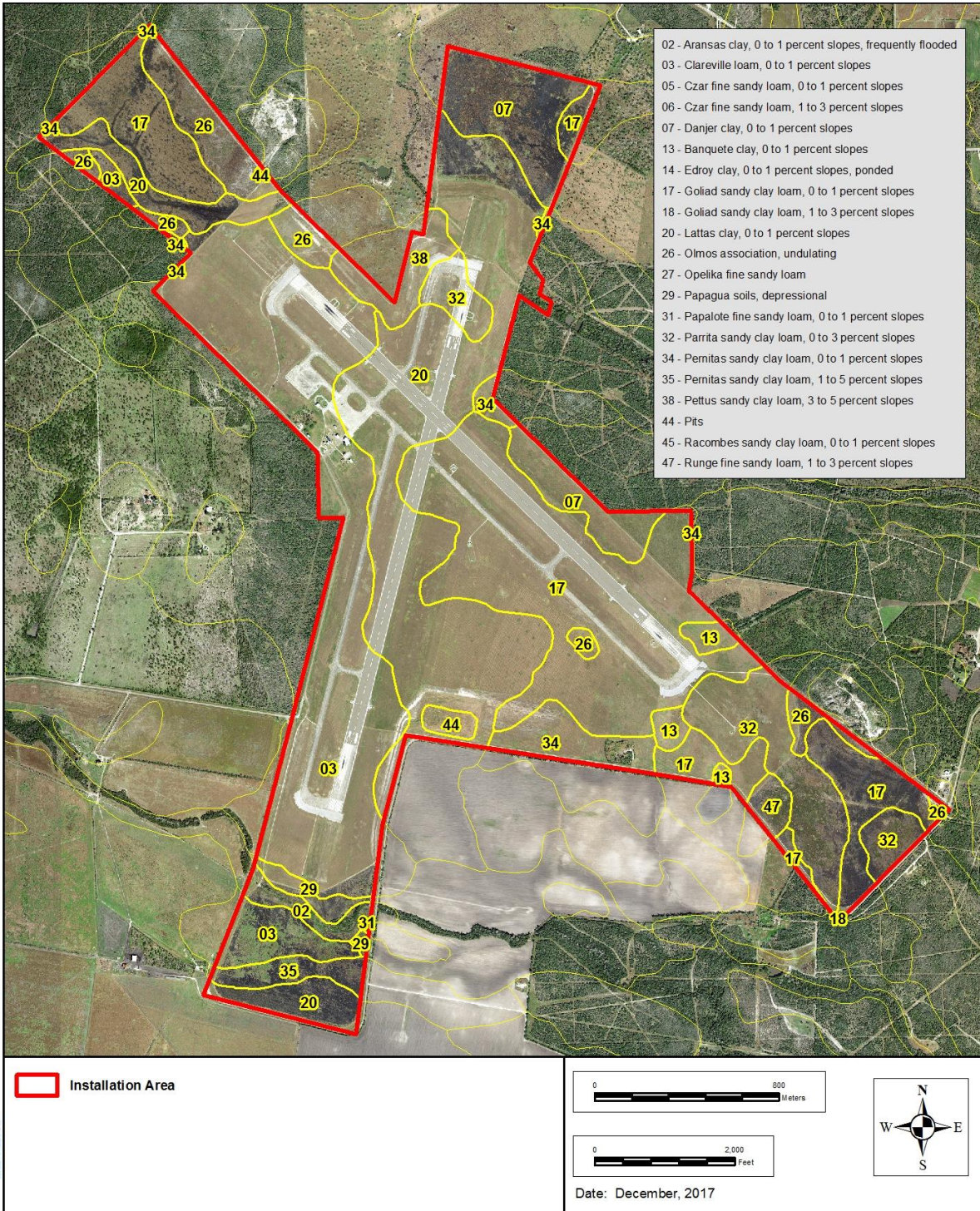


Figure 2-12 NALFOG Soils

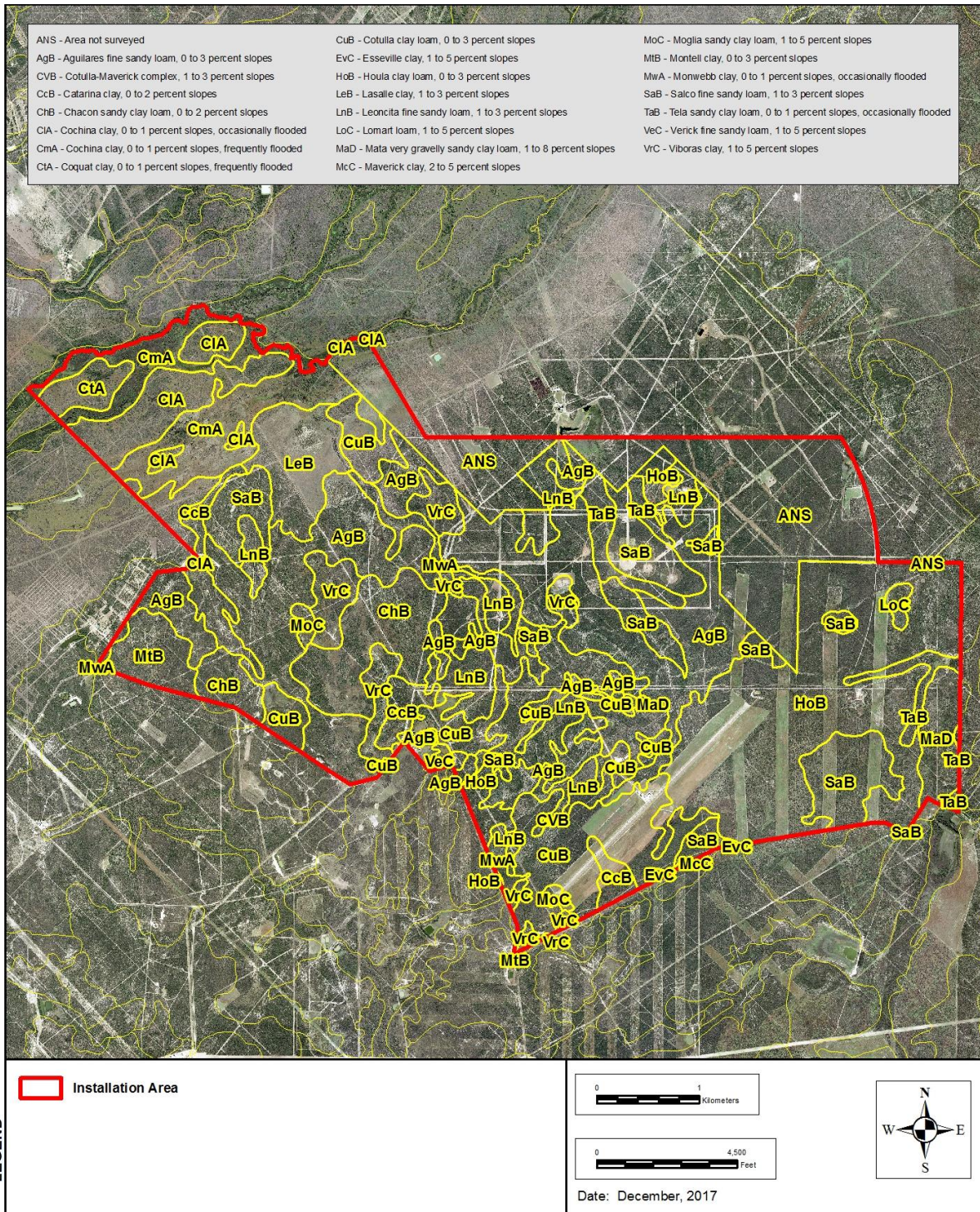


Figure 2-13 Dixie Target Range Soils

Monwebb clay (1%). Coquat clay, Moglia sandy clay loam, Cotulla-Maverick complex, Lomart loam, Verick fine sandy loam, Esseville clay, and Maverick clay each constitute less than 1% of identified soil types. Most of the complex is covered by deep, well drained sandy to silty soils on level to gently sloping topography. Other areas, particularly the eastern edge of the Dixie Annex, have shallower gravelly soils on steeper slopes and hilltops. Alluvial soils are likely present along the terraces of the Nueces River. Remnant sloughs or other features of the braided stream terrace of the Nueces River contain many small depressions of silty and clayey soils. These swales hold water during wet seasons but go dry during summer and fall. Of the soils that are identified within the complex, none are classified as hydric (USDA, NRCS 2009d).

2.2.4 Hydrology and Water Quality

Water resources information for The Main Station, NALFOG and Dixie Target Range is shown in Figure 2-14, Figure 2-15, and Figure 2-16, respectively. The Main Station is located approximately 30 miles west of the Gulf of Mexico. Two perennial streams, San Fernando Creek and Tranquitas Creek, are within the northeast and northwest boundaries of the Main Station. The creeks flow southeast to estuarine waters and Cayo del Grullo. Cayo del Grullo empties into Baffin Bay, then travels to west of the barrier islands lining Texas and flows out of the inlets located north and south of Padre Island. The NALFOG is approximately 50 miles from the Gulf of Mexico and the Tecolote Creek and the El Caro Creek run east to west on the northern and southern ends of the property. These creeks eventually flow southeast to Cayo de Hinoso. Cayo de Hinoso empties into Baffin Bay and exits Texas on the same route as the NASK creeks. The Dixie Target Range is located approximately 995 miles from the Gulf of Mexico. Dixie Target Range is bordered by the Nueces River which flows northeast then southeast passing the cities of Three Rivers, George West, and Mathis before reaching Lake Corpus Christi and Corpus Christi Bay on the north side of Padre Island. The Main Station is within the Coastal Bend Regional Water Planning Area Region (Region N). The Coastal Bend Region depends mostly on surface water sources for its municipal and industrial water supply use, which accounted for 85% of the region's total water use in 2000. Additionally, Kleberg, Jim Wells, and McMullen counties accounted for 14% of the Region's total municipal water demand in 2000. Complete information on the water supply for the NASK area is available in the 2011 Coastal Bend Regional Water Plan (September 2010), Volumes 1 and 2, and the 2014 Amendment (Coastal Bend Regional Water Planning Group 2010, 2014).

The Coastal Zone Management Act (CZMA) requires federal facilities to carry out activities in a manner consistent with the state's coastal zone management program. The coastal construction control line occurs only on mainland or barrier island coasts bordering the Gulf of Mexico or the Atlantic Ocean. Construction in the Coastal Building Zone is also subject to stricter requirements than structures built farther inland. The Coastal Building Zone extends 1,500 feet landward for mainland coasts and 5,000 ft (or the entire island, whichever is less) for barrier islands.

2.2.4.1 Watersheds

Main Station

Main Station is located in the Nueces-Rio Grande Coastal Basin. This basin drains a total area of 10,442 square miles (mi²) (27,045 square kilometers [km²]). This basin drains eastward toward the coast, eventually emptying to the Laguna Madre Estuary system. There are no perennial streams within the

drainage area. More than 1.1 million-acre feet (1.3 billion cubic meters) of water per year are imported into the basin. The Main Station purchases its drinking water from the City of Kingsville (Texas Water Development Board 1997).

NALFOG

The NALFOG is located within the Greater Nueces River Basin. This regional watershed is made up of the Nueces River, Frio River, San Miguel Creek and Atascosa River, which collectively drain an area of approximately 16,700 mi² (43,253 km²) (Texas Water Development Board 1997). An intermittent stream known as El Caro Creek drains the south end of NALFOG and another, more ephemeral stream, Tecolote Creek, drains the Installation to the north. Both El Caro Creek and Tecolote Creek flow generally southeast, and empty into Palo Hueco Creek and ultimately into Baffin Bay.

Dixie Target Range

Dixie Target Range is also located within the Greater Nueces River Basin. The Nueces River forms the northwestern limit of the Dixie Annex and is the major stormwater drainage outlet for the region. In particularly dry years the river has no flow in this area yet during floods it can swell into a broad floodplain that is inundated for more than a mile wide. Blackbrush mesquite and agricultural lands are the dominant vegetation types associated with the Dixie Target Range region of the Interior Coastal Plains Subprovince.

2.2.4.2 Freshwater Streams and Ponds

The two major sources of surface water resources in the Coastal Bend Region are the Choke Canyon Reservoir/Lake Corpus Christi System in the Nueces River Basin and Lake Texana on the Navidad River in Jackson County (Coastal Bend Regional Water Planning Group 2010).

Main Station

Five freshwater ponds exist at the Main Station. Four ponds are located on the abandoned golf course, and Captain's Pond is located in the area known as South Field. These ponds range in size from 0.4 to 2.4 ac (0.2 to 1.0 ha).

Captain's Pond maintains its water level through both stormwater runoff and overflow from Santa Gertrudis Creek. The pond is surrounded by plant species associated with wetlands, and provides sufficient aquatic habitat to support a healthy fish community.



Captain's Pond, NASK Main Station

Two perennial creeks, Tranquitas Creek and San Fernando Creek, are located within the boundaries of Main Station (Figure 2-14). Tranquitas Creek is classified as a perennial stream where it crosses the northern-most section of the parcel and becomes less intermittent as it flows eastward beyond the western boundary. San Fernando Creek is a perennial stream that is located along the eastern perimeter

of the Main Station. The Santa Gertrudis Creek is a perennial stream located just outside of the southern perimeter. The San Fernando Creek, Santa Gertrudis Creek, and Tranquitas Creek are freshwater streams that are tidally influenced downstream and have the potential for hurricane storm surge. Storm surge would cause a higher inflow of marine water and increase salinity upstream.

NALFOG

Two streams, El Caro Creek and Tecolote Creek, traverse the NALFOG boundary (Figure 2-15). El Caro Creek is a perennial stream that crosses the NALFOG boundary just south of Runway 16/34. Outside of the NALFOG boundary this stream is classified as intermittent. Tecolote Creek is a perennial and intermittent stream that runs from west to east across the northern sections of the parcel.

Dixie Target Range

Dixie Target Range has several ponds supporting wetland vegetation throughout the complex, with the larger ponds retaining water year-round; however, most of ponds are dry throughout much of the year. Along the Nueces River border to the Dixie Annex, the ponds within the floodplain are seasonally and periodically inundated.

Dixie Target Range includes a series of intermittent channels (Figure 2-16). Nueces River borders the Dixie Annex to the north and unlike most other streams and rivers of the Coastal Plains it flows in a northeasterly direction in this area rather than southeast to the Gulf of Mexico. The river is braided in this region and several different channels are apparent, as the river has not yet cut a channel southeast through the Catahoula Escarpment/Reynosa Plateau (Navy 2008). Juanita Creek is located outside the property boundary to the west. Ygnacia Creek is located outside of the eastern boundary; however, an intermittent drainage that collects stormwater runoff from the property eventually connects to this creek to the east. Other unnamed intermittent drainages traverse the Dixie Target Range.

There are more than 30 stock tanks and ponds on Dixie Target Range that are used for stormwater detention; however, a majority of these are in a state of disrepair and are unusable. These tanks were connected by a network of polyvinyl chloride (PVC) pipes, and in many places the pipe system has become exposed to the sun or has fractured due to road maintenance. Due to the large amounts of piping that would need to be repaired to reestablish the distribution system, the Navy has determined it would not be cost effective to repair or upgrade the water system. In addition, a shallow well with a solar powered pump is located along the northern border, in proximity the Nueces River. The well casing of this well has collapsed around the shaft and would need to be re-drilled before it can be made functional. This well is shallow (approximately 40 feet or 12.1 m in depth), and has been a good source of water for filling the stock tanks in the past. The Navy does not have any immediate plans to repair this well. Two small reservoirs, located in proximity to Nueces River, hold water for most of the year and are maintained by stormwater runoff, rainfall, and overflow from the river during periods of flooding.

2.2.4.3 Estuarine and Marine Waters

Estuaries are semi-enclosed coastal bodies of water in which the ocean water is significantly diluted by fresh water from land runoff. Marine waters are tidally influenced with increased salinity (Thurman, 1988). Only freshwater aquatic systems are present on NASK; estuarine and marine systems are absent.

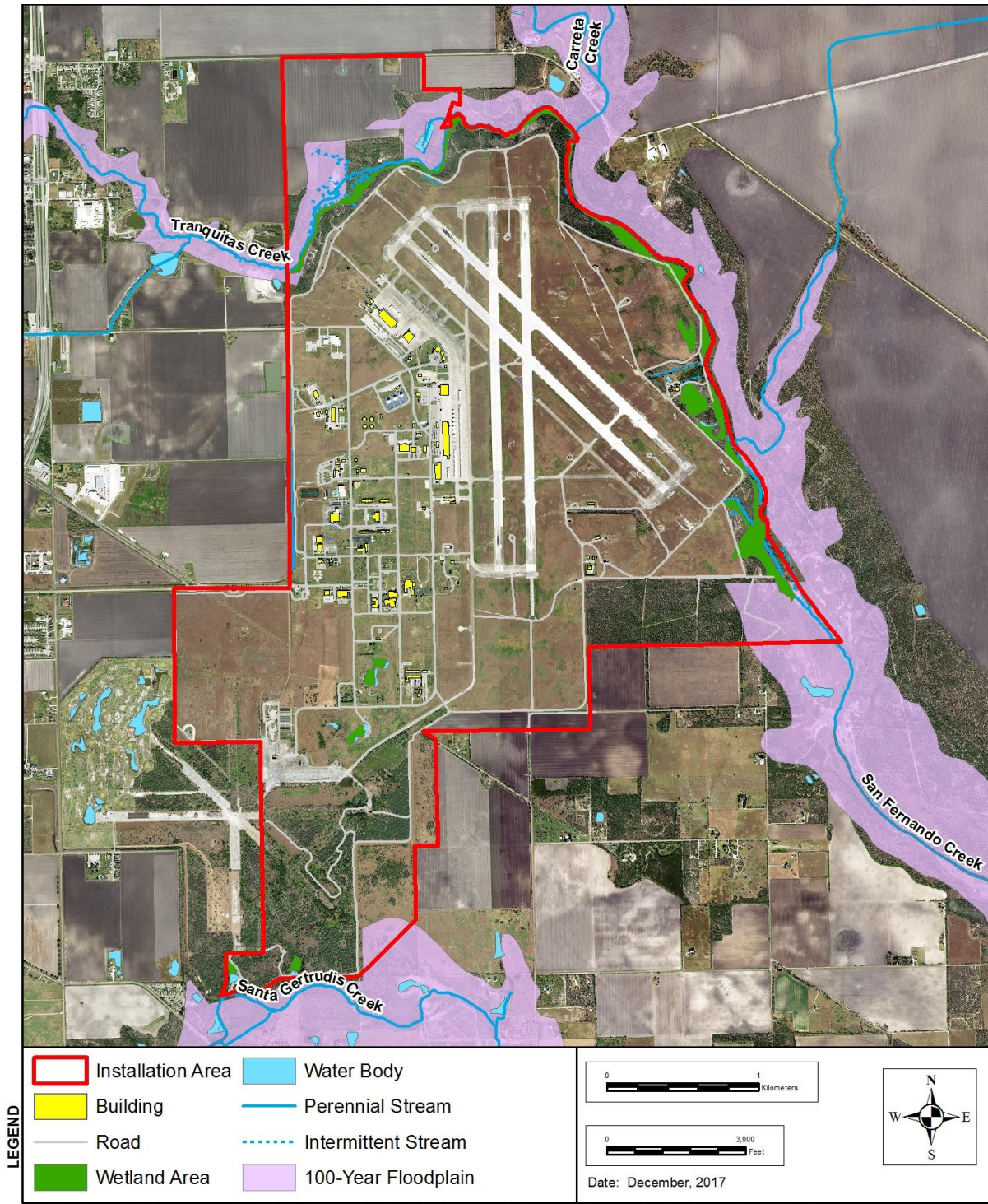


Figure 2-14 NAS Kingsville, Main Station, Water Resources

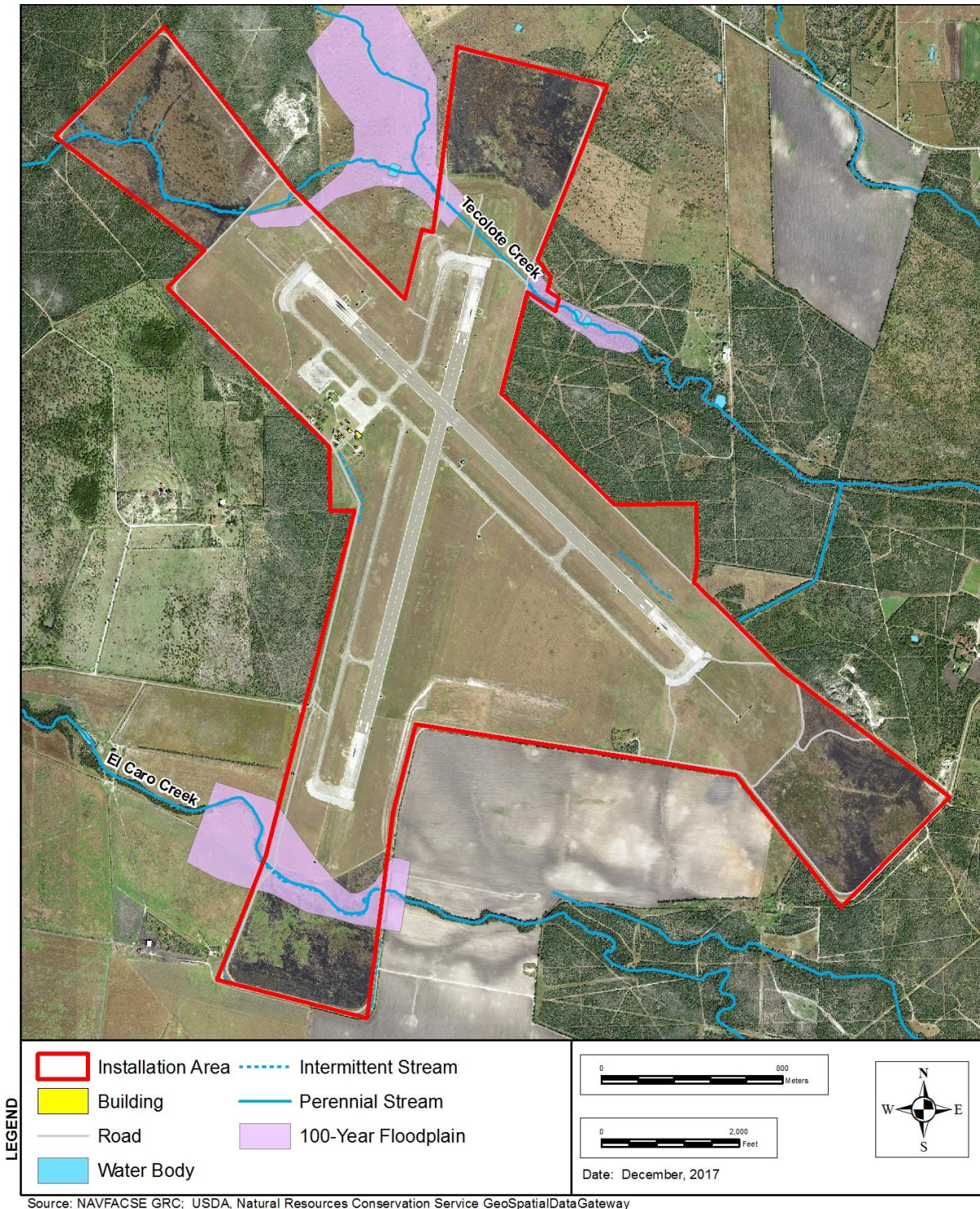


Figure 2-15 NALFOG Water Resources

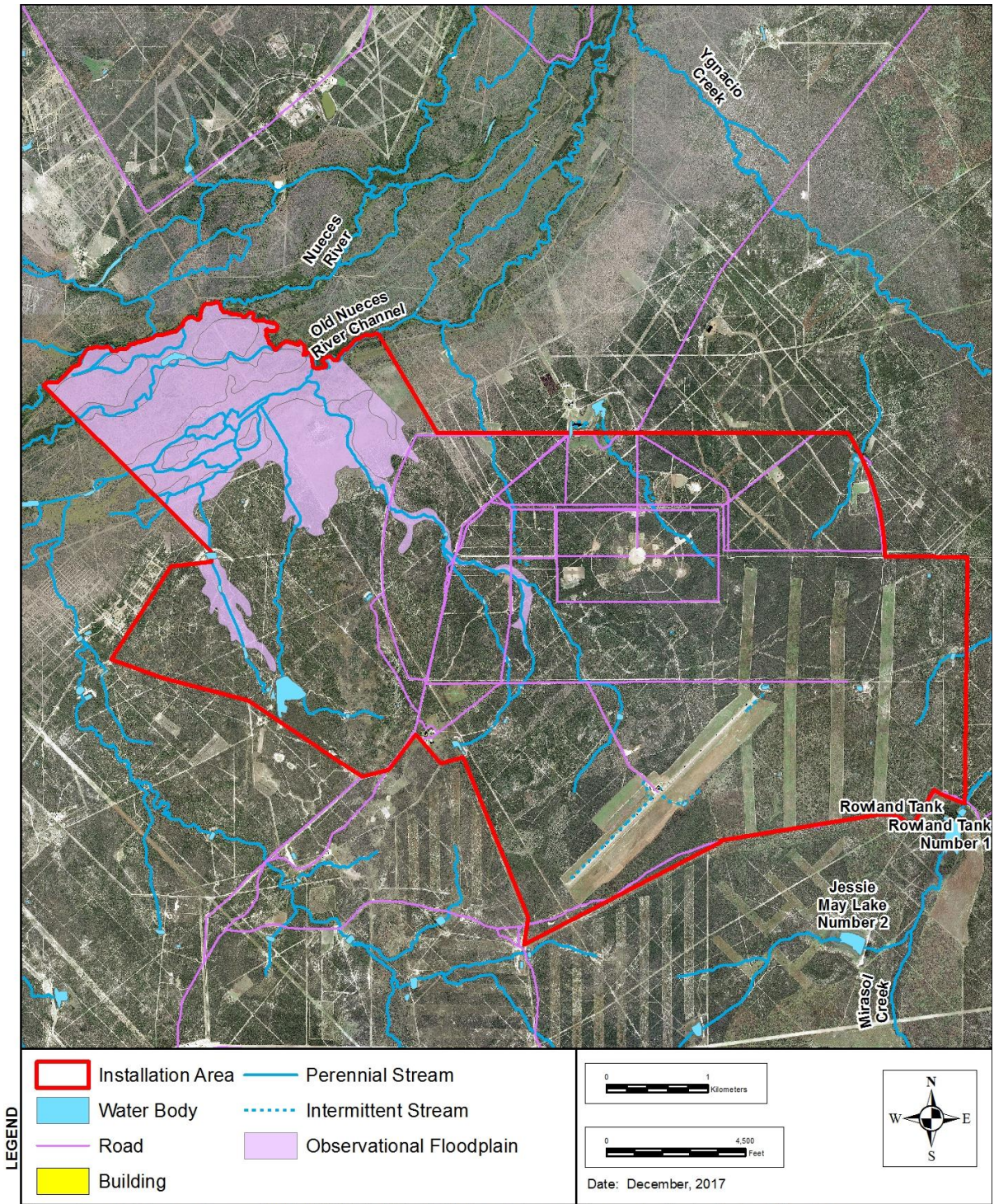


Figure 2-16 Dixie Target Range Water Resources

2.2.4.4 Groundwater

The two major aquifers that lie beneath the NASK region are the Carrizo-Wilcox and Gulf Coast aquifers. The Gulf Coast Aquifer, which is located beneath the three NASK properties, yields moderate to large amounts of both fresh and slightly saline water. Subsidence has been reported within the Gulf Coast Aquifer in the Coastal Bend Region and areas within Kleberg County have reported a 0.5-foot drop in elevation due to pumping. However, due to the increase in surface water use within Kleberg County, water levels of the aquifer are rising and the subsidence rate is decreasing. Water quality in the Gulf Coast Aquifer is generally good, although there is a risk of saltwater intrusion in the southeast portion of the aquifer (Coastal Bend Regional Water Planning Group 2010).

The three counties in which the NASK Complex are located each have Groundwater Conservation Districts established. The primary purpose of the Kleberg Groundwater Conservation District is the conservation, preservation, protection, and recharge of groundwater resources. The Jim Wells Groundwater Conservation District, included in the Brush Country Groundwater Conservation District, has not established conservation rules. The McMullen Groundwater Conservation District was established in 1999, with amendments to its conservation rules made in 2003 and 2008. The Groundwater Conservation District imposes spacing and production limitations on all new well users with regard to drilling and pumping (Coastal Bend Regional Water Planning Group 2010).

Main Station

Groundwater recharge in Kleberg County and in adjacent counties to the west and northwest occurs primarily from infiltration of precipitation on the outcrops of the aquifers. Only a small portion of precipitation water migrates downward through the zone of aeration, or essentially dry sediments, until it reaches the zone of saturation. The principal aquifer in Kleberg County is the Goliad Sand aquifer (USGS 1973). High levels of pumping in certain areas of the county have created cones of depression that have altered the natural movement, direction and rate of groundwater flow. The primary groundwater concern in Kleberg County is maintaining levels of chloride and dissolved-solids within suitable ranges.

Historically, well water was used to fill the former golf course ponds when waters levels were low. However, this practice was discontinued in November 2012 (Barrera 2012).

Potable water for Main Station is provided by the City of Kingsville, and primarily obtained via groundwater sources. The City of Kingsville operates 21 wells, which provides for approximately 85% of potable water sources used by the City. Approximately 15% of the City's water provided by surface water sources.

NALFOG

A Regional Water Supply Study was conducted in 1996 for Duval and Jim Wells counties. The three primary aquifers that supply the area with groundwater are the Catahoula Tuff, Oakville Formation, and Goliad Formation (Naismith Engineering, Inc. 1996). Groundwater used for public water supplies is obtained from wells in the Goliad Formation and Catahoula Tuff. The primary groundwater issue in the area is decreased recharge due to drought conditions, and elevated concerns about the potential for

higher levels of dissolved solids to occur in the groundwater due to increased pumping rates that are associated with meeting the growing demand for drinking water.

Dixie Target Range

The McMullen Groundwater Conservation District was created in 2001 with the mission to develop, promote and implement water conservation, augmentation, and management strategies to protect water resources for the benefit of the citizens, economy, and environment of the district. A Conservation District Management Plan, adopted in August 2008, guides the district's monitoring, conservation, and management activities within the county (McMullen Groundwater Conservation District 2008).

Groundwater recharge in McMullen County and in adjoining areas on the north and west primarily occurs from infiltration of precipitation on the land surface. Only a small portion of precipitation migrates downward through the zone of aeration until it reaches the zone of saturation (USGS 1965). The primary groundwater issue in the area is decreased recharge due to drought conditions. The principal water-bearing formations underlying the county are the Carrizo sand, Oakville sandstone, Lagarto clay, and Goliad sand, Queen City, and the Sparta aquifers McMullen Groundwater Conservation District 2008. Sand is the dominant type of sediment that defines the aquifers in the area (USGS 1965).

A water distribution system at Dixie Target Range that utilized deep well water has been used in the past to maintain water levels in a number of stock ponds; however, this system is no longer used due to broken pipes along the distribution system, as well as a problem with the water quality detected in the well water. The water from the well has high sulfur content and is unfit for human consumption. If needed, water can be pumped from the ground and aerated in an adjacent stock tank for wildlife or non-potable uses.

2.2.4.5 Floodplains

Floodplains are defined as low and relatively flat areas adjoining inland and coastal waters, and include flood-prone areas of offshore islands. The Federal Emergency Management Agency defines these areas as being subject to a 1% or greater chance of flooding in any given year.

Main Station

A portion of three 100-year floodplains is located within Main Station (Figure 2-14). The 100-year floodplain for Tranquitas Creek is partially located inside the northern perimeter. The 100-year floodplain for San Fernando Creek extends along the outside of the eastern boundary, with portions of the floodplain located within the southeastern boundary. The 100-year floodplain for Santa Gertrudis Creek is located to the south, with a small portion entering the southern-most section of the property.

NALFOG

Portions of the 100-year floodplain for Tecolote Creek are located within the northern boundary sections of both runways at NALFOG (Figure 2-15). The 100-year floodplain for El Caro Creek extends within the parcel boundary on either side of the creek where it crosses south of Runway 16/34.

Dixie Target Range

There are no mapped 100-year floodplains located within the Dixie Target Range boundaries (Figure 2-16). However, the Nueces River annually floods the northwest portion of the range during the wet season or times with high rainfall.

2.2.4.6 Wetlands

In general terms, wetlands are semi-terrestrial areas where saturation with water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil or on its surface. Wetlands are areas that are inundated or saturated by surface or groundwater 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.

Main Station

A wetland reconnaissance survey conducted in 2007 identified approximately 74 ac (30 ha) of wetlands (Figure 2-15 and Navy 2007). Several wetland areas exist along Main Station's perimeter, and are located mostly within the floodplain areas of Tranquitas and San Fernando creeks. Tranquitas Creek contains a level terrace area dominated by upland plant species including many grasses, shrubs and broad leaved herbaceous species. One of the largest wetland areas is located below the Main Station waste water treatment plant, and has been subject to past disturbance from placement of cement rubble at the edge of the wetland (Navy 2008). This wetland is caused by the flooding of an old landfill by flood waters from Tranquitas and San Fernando creeks. Based on the vegetation surrounding Captain's Pond located in the South Field, these ponds have characteristics of an emergent wetland. A few small wetland areas that are associated with Santa Gertrudis Creek are located within the southern section of the parcel. Drainage ditches also are present that function as part of the Main Station's stormwater management system.

The physical and biological characteristics of the Main Station wetlands are affected by the surrounding brushland and grasslands, as well as the variability in soil and hydrological characteristics. Some of the potential wetlands are saturated or inundated for a few months, but are dry the remainder of the year (seasonal wetlands), with others remaining saturated or inundated nearly year-round (permanent wetlands). Plants associated with wetland areas are described in Section 2.1.8.

NALFOG

A wetland reconnaissance survey conducted at NALFOG identified emergent wetland vegetation in association with a former pond located south of the intersection of the two runways; however, no wetland data are available for inclusion on the water resources map for this parcel (Figure 2-16 and Navy 2007). It is likely that no emergent wetland vegetation is associated with this area currently, since the pond has been drained. The former pond appears to have been a sand and gravel quarry and was filled in 2012 to minimize the BASH potential at this parcel. Plants associated with wetland areas are described in Section 2.1.8.

Dixie Target Range

A wetland survey has not been conducted at Dixie Target Range. A review of available wetland data did not identify any wetland habitat within its boundaries. Although some of the stock ponds may contain small clusters of cattails, there have been no hydric soils discovered within the complex (Navy 2008). Additionally, although investigation of the various ponds has not resulted in the presence of hydric soils, there are several ponds that if abandoned from their use for game watering could become classified as wetlands. Areas along the Nueces River to the north support wetland vegetation.

2.2.5 Land Use

The NASK Complex is delineated into Functional Areas, each of which accommodates different types of land uses. Functional Areas serve military purposes, and some have potential for natural resources management. Land uses at various functional areas are largely fixed and the potential for natural resources management depends upon the availability and suitability of natural resources within the parameters of the military use on the property. Functional areas can be classified into one or more of the following classes:

- **Natural Resource Sensitive Areas** include land protected due to the unique natural, cultural or aesthetic value. Examples include rare geologic features, significant historical sites, natural heritage sites, threatened and endangered species' critical habitat, unique high-value recreation areas, and exemplary natural communities;
- **Operational Protected Areas** are vital to the continuance of the military mission, and intensively utilized for this purpose. Examples include AICUZ areas, intensively developed and built areas, dredge spoil sites, high security restricted areas, industrial support areas, and BASH areas;
- **Mixed-Use Management Areas** facilitate the military mission, but also exist in a natural condition, contain valued natural features, and could benefit from effective natural resources management practices. Consistent with the military mission, non-timber values such as wildlife habitat, water quality (wetland, storm water and floodplains protection), and recreational potential, provide the framework for management decisions. Examples include streamside management zones, cypress domes and ponds, shoreline, habitat for established conservation priorities, and grounds maintenance.

The NASK Complex is composed of the Main Station, NALFOG, and Dixie Target Range. The NASK Complex is divided into three functional areas based upon geography, land use, and natural resources depending on the requirements of the military mission and the presence of unique natural resources (Figures 2-7, 2-8, and 2-9).

2.2.5.1 Main Station

Operational Protected Area 1

Operational Protected Area 1 (OP-1) includes the majority of land area on the Main Station that includes an active air field, clear zones, and cantonment area (except for South Texas Ambrosia areas) (Figure 2-7). This is an Operational Protected Area due to the developed condition of the land, and its intensive use for fulfilling mission requirements. Rare species found in OP-1 include the South Texas Ambrosia, which is designated as Mixed-Use Area due to special management activities to maintain the species. It is interspersed throughout the cantonment area, mainly on vacant grassed parcels.

Natural Resource Sensitive Area 1

Natural Resource Sensitive Area 1 (NRS-1) includes areas along the Tranquitas Creek and San Fernando Creek's, 100-year floodplain, including all wooded areas (Figure 2-7). This is a Protected Area due the presence of a primary water courses, floodplain swamp, other wetlands, designated hunting areas, and opportunities for nature study. The management focus of NRS-1 is fish and wildlife due to its unique and high quality natural communities and close proximity to Tranquitas and San Fernando Creeks.

Natural Resource Sensitive Area 2

Natural Resource Sensitive NRS-2 is a wooded, scrub area located in the southeast corner of the site (Figure 2-7). This area is located outside south of the airfield and is a natural undisturbed buffer to offsite properties. The management focus of ESP-2 is fish and wildlife and vegetated buffers to the airfield.

Mixed Use Management Area 1

Mixed Use Management Area 1 (MU-1) is located in two distinct areas; one in the northwest extreme of the installation and one along the southern boundary of the installation (Figure 2-7). This is a Mixed-Use Management Area because it is used as an agricultural outlease area and modified for crop production.

Mixed Use Management Area 2

Mixed Use Management Area 2 (MU-2) is located in the southern extreme of the installation (Figure 2-7). This area is part of the previous abandoned air field that has been allowed to regenerate the native mesquite scrub forest, common for this area. It contains both mesquite forest and tall grass land areas. This is a Mixed-Use Management Area because it mostly vegetated and undisturbed with wildlife management as a focus, yet it is used also used for military training of ground troops.

Mixed Use Management Area 3

Mixed Use Management Area 3 (MU-3) comprise many areas located within the cantonment area and would be considered as part of OP-1, except for the occurrence of the listed South Texas Ambrosia (Figure 2-7). These areas are frequently and regularly maintained by mowing as part of the cantonment area landscaping. Threatened and endangered species and flora planning level surveys identified this listed species in these areas. Due to its operational necessity and occurrence of this listed species, these areas are designated as mixed use. Specific focused management of these areas to promote and protect the species must be balanced with regular scheduled mowing for BASH avoidance as well as for aesthetics.

2.2.5.2 NALFOG

Operational Protected Area 2

Operational Protected Area 2 (OP-2) includes the entire air field and immediate clear zone areas with intensive use air training and emergency landing operations (Figure 2-8). Land Management at OP-2 will focus on developed land use. Natural resources management issues will be dominated by activities related to soil erosion, grounds maintenance, and stormwater management practices.

Mixed Use Management Area 4

Mixed Use Management Area 4 (MU-4) is located in four distinct areas; each at the termini of the two crossing flight lines (Figure 2-8). This is a Mixed-Use Management Area because it relatively natural terrain that is also maintained for BASH and as clear zone through control burns and other vegetation management methods.

2.2.5.4 Dixie Target Range

Natural Resource Sensitive Area 3

Natural Resource Sensitive Area 3 (NRS-3) includes nearly all of the Dixie Target Range property excluding the active range (MU-5 and OP-3) and the ROTH site (OP-4) (Fig. 2-9). This area is mostly managed as natural mesquite forests and floodplain. Hunting is the primary outdoor recreational use of the property, with feed plots, watering ponds, hunting blinds and senderos maintained for hunting purpose. The floodplain to the Nueces River covers most of the northwest end on the property. This area is subject to significant flooding. It is also maintained as natural land but will likely be managed for some protected bivalves and control of invasive species.

Operational Protected Area 3

Operational Protected Area 3 (OP-3) includes the center target area of the range (Fig. 2-9). It is operationally protected for military flight training uses only with no natural resource management.

Operational Protected Area 4

Operational Protected Area 4 (OP-4) comprises the Relocatable Over The Horizon Radar (ROTHR) site located within NRS-3 (Fig. 2-9). This site is fully restricted to only authorized personnel. As such, this area is not included in this INRMP and no management activities are performed by NASK.

Mixed Use Management Area 5

Mixed Use Management Area 5 (MU-5) is the buffer area assigned to the Dixie Target Range target area (OP-3) (Fig. 2-9). This is a Mixed-Use Management Area because it is still managed as natural mesquite forests and is used for hunting activities. However, it is designated as mixed use due to its importance as a managed buffer to the range target.

2.3 BIOLOGICAL ENVIRONMENT

The biological environment of the NASK Complex was considerably different prior to colonization and development. Historically, the area was dominated by natural communities that are, today, only scattered throughout the NASK Complex. Ecosystems at the NASK Complex have been affected by development to varying degrees. Areas that have been highly developed by the Navy contain little or no natural

vegetation and wildlife associated with previous ecosystems. Areas not developed, or have allowed to revert to natural systems, result in the typical mesquite-mixed brush woodlands that characterize the general area. At the NASK Main Station, this occurs mostly in the southern portion of the installation around the old abandoned airfields. NALFOG is almost all cleared of native vegetation and is maintained as airfield and clear zone. Dixie Target Range is almost entirely natural with very little change in its native communities, except for the Dixie Target area, maintained hunting areas, and the ROTH site.

2.3.1 Natural Communities

A natural community is a distinct and reoccurring assemblage of populations of plants, animals, fungi, and microorganisms naturally associated with each other and their physical environment. Several surveys have been completed to identify natural communities and vegetation types at NASK. Table 2-3 provides information on surveys conducted for the NASK Complex that included collection of natural community and vegetation data. No mapping is available because official habitat delineation has not occurred.

Main Station

Floristic surveys were completed for Main Station in July 1992 by a TPWD botanist, in September 2007 by The Nature Conservancy (TNC) (TNC 2007a), and in September 2015 by Caesar Kleberg Wildlife Research Institute of Texas A&M University-Kingsville (Rideout-Hanzak and Wester 2015), which documented more than 425 species. A list of plant species encountered during these surveys is provided in Appendix F, Table F-1.

Agricultural Outlease Areas

Much of the natural vegetation at Main Station has been removed throughout the history of the site in support of either the military mission or agricultural outleasing. Agricultural outlease areas, maintained areas around the airfield, and areas of maintained lawn around buildings and in recreational areas occupy large areas at Main Station. The present landscaping scheme on the Main Station is dominated by large expanses of frequently mowed lawns and landscaped areas dotted with a few species of native trees and shrubs. Some areas are associated with the agricultural outlease program, and are maintained for cattle grazing and row crop production. Information on recommend plantings for native landscaping and native plant nurseries are included in Appendix G.

Terrace Community

Tranquitas Creek contains a level terrace area dominated by upland plant species including many grasses, shrubs and broad leaved herbaceous species including three-awn grass (*Aristida* sp.), windmill grass (*Chloris* sp.), buffelgrass (*Pennisetum ciliare*), guinea grass (*Urochloa maxima*), spiny hackberry (*Celtis pallida*), Texas kidneywood (*Eysenhardtia texana*), Barbados cherry (*Malpigia glabra*), mesquite (*Prosopis glandulosa*), Don Quixote's lace (*Yucca treculeana*), brook snakeweed (*Gutierrezia sarothrae*), Drummond's goldenweed (*Isocoma drummondii*), mariola (*Parthenium incanum*) and Texas desert goldenrod (*Xylothamia palmeri*). The area adjacent to Tranquitas Creek, just north of the confluence with San Fernando Creek, includes potential wetland areas dominated by plants typically found in "salt prairies" including Gulf cordgrass (*Spartina spartinae*) and bushy seaside tansy (*Borrchia frutescens*). These areas also include retama (*Parkinsonia aculeata*). The

wetland plants identified along San Fernando Creek are similar to those described for Tranquitas Creek.

Table 2-3 Summary of NASK Surveys That Collected Natural Community Data

Survey Title	Year	NASK Parcels		
		Main Station	NALFOG	Dixie Target Range
Evaluation of Bird/Aircraft Hazards in Relation to Agriculture at Main Station and NALFOG	1986	X	X	
Surveys of RTE plants on U.S. Navy Property in South Texas	1992	X	X	
South Texas Ambrosia Management Plan	2005	X		
The Nature Conservancy Plant Species Inventory Update for NASK	2006 to 2007	X	X	X
Additional Plant Surveys Identified in The Nature Conservancy Plant Species Inventory Update	1991 & 1993	X	X	
Additional Plant Surveys Identified in The Nature Conservancy Plant Species Inventory Update	1991 to 1992			X
Rinker Design Associates Wetland Reconnaissance Report	2007	X	X	
Grassland Birds Wintering at U.S. Navy Facilities in Southern Texas	2010	X	X	X
Herpetofauna Survey of the United States Navy – Escondido Ranch	2007 to 2012			X
Biological Resources Inventory for Rare, Threatened, And Endangered Plants and Birds at Naval Air Station Kingsville And Associated Properties	2013	X	X	X
Survey for the South Texas Ambrosia	2015	X		
Plant Species Inventory and Vegetation Survey	2015	X	X	X
Presence/Absence Survey for the Golden Orb (<i>Quadrula aurea</i>)	2016	X		

Freshwater Ponds

Captain’s Pond is surrounded by cattails (*Typha* sp.); several species of trees and shrubs surround the perimeter that are often associated with wetlands. Other wetland species identified around the pond edges include annual saltmarsh aster (*Aster subulatus*), disk waterhyssop (*Bacopa rotundifolia*),

Pennsylvania smartweed (*Polygonum pennsylvanicum*), Mexican sprangletop (*Leptochloa uninervia*), royal flatsedge (*Cyperus elegans*) and bushy bluestem (*Andropogon glomeratus*). The other ponds at Main Station associated that were associated with the former golf course have small areas of emergent wetland adjacent to the open water habitat. Plants growing along the pond margins include spikerush (*Eleocharis* sp.), bushy bluestem, herbaceous mimosa (*Mimosa strigillosa*), common Bermuda grass (*Cynodon dactylon*), mesquite and Kleberg bluestem (*Dichanthium annulatum*).

Drainage ditches that are part of the Main Station stormwater management system include huisache (*Acacia minuta*), Rooseveltweed (*Baccharis neglecta*), sugarberry (*Celtis laevigata*), common Bermuda grass, Kleberg bluestem, retama, mesquite and Gulf cordgrass.

NALFOG

Floristic surveys were completed at NALFOG in July 1992, September 2007 (TNC 2007b), and September 2015 (Rideout-Hanzak and Wester 2015), which documented more than 370 species. A list of plant species encountered during these surveys is provided in Appendix F, Table F-2.

Mixed-Evergreen Deciduous Shrubland

Natural vegetation consists of mixed evergreen-deciduous shrubland consisting of blackbrush (*Acacia rigidula*), guajillo (*Acacia berlandieri*), and Cenizo Texas sage (*Lucophyllum frutescens*) on shallow, gravelly soils.

Deciduous Woodland

Deciduous woodlands are dominated by sugar hackberry (*Celtis laevigata*) and huisache on deeper, poorly drained clay soils. A few areas also support young deciduous woodland dominated by mesquite and acacia.

Maintained Fields

A small landscaped and grassed area associated with the administrative building and control tower is the only substantial area of the NALFOG that is subject to grounds maintenance and native landscaping. Upland plants located adjacent to El Caro Creek and a small channel 300 ft (91 m) north of the creek, both located in the south end of the clear zone of the northeast/southeast runway, include huisache, Rooseveltweed, sugarberry, Kleberg bluestem, anaqua (*Ehretia anacua*), retama, buffelgrass, eastern poison ivy (*Toxicodendron radicans*), cedar elm (*Ulmus crassifolia*), and lime pricklyash (*Zanthoxylum fagara*). The upland area located in the



Typical mowed field, NALFOG

northwest section of Main Station contains huisache, spiny hackberry, Cenizo Texas sage, prickly pear (*Opuntia lindheimeri*), Texas ebony (*Pithecellobium ebano*), mesquite, and desert yaupon (*Schaefferia cuneifolia*).

Dixie Target Range

Limited vegetation information is available for Dixie Target Range. This area is largely denuded of vegetation due training exercises and vegetation removal that occurs to reduce fire danger. There are fire breaks that have been dug and some vegetation removal has been accomplished in areas where fires are possible from practice bombs. A species flora list is provided in Appendix F, Table F-3, which is largely a compilation of the various completed plant surveys. A vegetative survey was completed by TNC in 2007 (TNC 2007c) and 2015 (Rideout-Hanzak and Wester 2015). Flora surveys have identified more than 455 species.



Typical vegetation at Dixie Target Range

The flora of the Dixie Target Range consists of several natural plant communities that have been modified by livestock or game management practices. An extensive network of jeep trails and senderos crisscross the eastern maintained portion of the Range.

Mesquite-Mixed Brush Woodland

Mesquite-mixed brush woodlands including mesquite, guajillo, blackbrush, mixed with a shorter shrub layer of prickly pear, Texas lignum-vitae (*Guaiacum angustifolium*), lotebush (*Ziziphus obtusifolius*), Christmas cactus (*Opuntia leptocaulis*), and spiny hackberry or granjeno are common on upland slopes and ridges.

Blackbrush/Cenizo texas sage

Another upland plant community found at Dixie Target Range is a blackbrush/Cenizo texas sage community occupying shallower gravelly soils on small hilltops and slopes. This community is composed of many of the same trees and shrubs of the mesquite-mixed brush woodlands with blackbrush and Cenizo Texas sage being the dominant species.

Hackberry-Ash Riparian Woodland

A narrow riparian community of hackberry-ash riparian woodlands exists along the bank of the Nueces River with a canopy that is generally no more than one or two trees in width. Tree species found here include Mexican ash (*Fraxinus berlandieriana*), sugar hackberry, retama, huisache, and black willow.

Mesquite-Huisache-Granjeno-Retama Woodland

Mesquite-huisache-granjeno-retama woodlands include mesquite, huisache, granjeno, retama and other woody plants including Texas desert goldenrod (*Ericameria austrotexana*) and Rooseveltweed (*Baccharis neglecta*) occupy edges of slight depressions and natural levees. These woodlands are successional on former Gulf cordgrass meadows and the herbaceous flora is quite similar.

No attempt at controlling the landscape through fertilizers or other artificial means is attempted in the Dixie Target Range portion of the complex.

2.3.1.1 Sensitive Wildlife Habitat and Rare Ecosystems

Protection of ecologically sensitive areas is provided by SAIA under the provisions of wildlife and fish habitat enhancement in support of managing these populations. Texas, especially southern Texas, is world renowned for the variety of bird species that reside or migrate through the state to spend the winter months in Central and South America. Coastal forests, grasslands and wetlands are valuable feeding, nesting and resting areas for passerines, waterfowl, wading birds and shorebirds, for both resident and migrant species throughout the year. The availability of a diversity of habitats is extremely important to migratory birds because these habitats provide the necessary food and resting sites needed to replenish energy stores before continuing their migration. The NASK Complex provide habitat diversity to both migratory and resident species. Throughout these parcels there is a highly diverse assemblage of plant communities providing excellent habitat for a variety of birds, mammals, herpetofauna (amphibians and reptiles) and insects. The sensitivity of the areas and their importance to wildlife requires proper management of this complex of communities. Conversely, these areas are also sensitive to human activities, including development, and must be carefully managed to prevent degradation or loss of these extremely valuable ecosystems.

Main Station

A review of the rare community list for Texas identified two rare communities associated with Kleberg County that have the potential to occur, based on the flora lists associated with these communities and the flora known to occur on the Main Station.

Curly-mesquite-Texas Grama-Buffalo Grass-Texas Wintergrass

Curly-mesquite-Texas Grama-Buffalo Grass-Texas Wintergrass is an herbaceous rare community with a global rank of G1 and a state rank of S1 (TPWD Wildlife Diversity Program 2012). The plant species that define this community have all been identified on the Main Station. In addition to the plant species that define this rare community, it also frequently contains rare taxa such as South Texas ambrosia, slender rush-pea, and Chandler's craglily (*Echeandia chandleri*). Of these rare taxa, only South Texas ambrosia is known to occur on the Main Station.

Sugarberry-Cedar Elm-(Rio Grande Ash)/Pigeonberry

Sugarberry-Cedar Elm-(Rio Grande Ash)/Pigeonberry is another rare community that has the potential to occur on the Main Station. The species that define this rare community are all known to occur there.

NALFOG

A review of the rare community list for Texas identified one rare community associated with Jim Wells County that have the potential to occur, based on the flora lists associated with these communities and the flora known to occur at NALFOG.

Curly–mesquite–Texas Grama–Buffalo Grass–Texas Wintergrass

Curly–mesquite–Texas Grama–Buffalo Grass–Texas Wintergrass is known to occur in Jim Wells County (TPWD Wildlife Diversity Program 2012). All of the species that define this rare community occur at NALFOG so there is a potential for this community to occur on the parcel. None of the rare plant taxa associated with this rare community, as described for the Main Station above, are known to occur on the site.

Tamaulipan Thornscrub

The Tamaulipan thornscrub habitat is known to occur from Coahuila and Tamaulipas, Mexico to south Texas. Mesquite-grassland is characteristic of this area accompanied by subtropical and semi-arid vegetation. Spiny shrubs and trees dominate, but grasses, forbs, and succulents are present. The flat, deep soils support the mesquite and drought-resistant plant species (Cook et. al. no date). This habitat occurs at the NALFOG in the Mixed-Use areas north and south of the airfield.

Dixie Target Range

Blacklace cactus is known to occur within McMullen County (TPWD Wildlife Diversity Program 2012).

2.3.2 Wildlife Observed During Surveys at the NASK Complex

Invertebrates

Table 2-4 includes a summary of NASK Complex surveys that have collected invertebrate fauna data.

Main Station

A detailed invertebrate survey of the Main Station would provide information on prey items that are available for insectivorous bird and mammal species, which would contribute to management of wildlife in support of the BASH Program. The survey for the black-spotted newt conducted in 2010 identified grass shrimp (*Paleomonetes* sp.) at the Main Station.

NALFOG

An invertebrate survey of NALFOG has not been performed. A detailed invertebrate survey of the Main Station and NALFOG would provide information on prey items that are available for insectivorous bird and mammal species, which would contribute to management of wildlife in support of the BASH Program. The survey for the black-spotted newt conducted in 2009-10 did not identify any invertebrates at NALFOG.

Dixie Target Range

A golden orb survey of Dixie Target Range was performed in 2016 by the USFWS Texas Coastal Ecological Services Office-Houston, Texas. During the survey, 195 live invertebrates were collected representing five species. Species composition was dominated by the yellow sandshell (*Lampsilis teres*), Texas lilliput (*Toxolasma texasensis*) and the Pondhorn (*Uniomerus tetralasmus*). No live golden orb mussels were collected; however, two recent long-dead shells were collected (USFWS 2016).

Table 2-4 Summary of NASK Complex Surveys that Collected Invertebrate Data

Survey Title	Year	NASK Parcels		
		NAS Kingsville	NALFOG	Dixie Target Range
Survey for the Black-Spotted Newt	2010	X	X	
Presence/Absence Survey for the Golden Orb (<i>Quadrula aurea</i>)	2016			X

Source: Navy 2011a, USFWS 2016

Fish

Only freshwater aquatic systems are present on the NASK Complex; estuarine and marine systems are absent. As ponds dry out, the concentration of total dissolved solids increases, and the water becomes more “saline”. This phenomenon does not create estuarine or marine habitat, but rather it is simply an aspect of ephemeral aquatic systems. Table 2-5 includes a summary of NASK Complex surveys that have collected fish data.

Main Station

One survey has been conducted at the Main Station that identified fish species (Table 2-5). This survey identified nine fish species at the Main Station, one fish species at NALFOG, and 17 fish species at Dixie Target Range. As previously noted, several surface water areas are present at the Main Station, including creek, stream, river, pond, and wetland habitats. A detailed fish survey of these habitats has not been conducted, but it is expected that many of the surface water habitats at the Main Station support fish populations. The former golf course ponds, as well as Captain’s Pond, previously provided sufficient aquatic habitat to support a healthy fish community. Species of fish included largemouth bass (*Micropterus salmoides*), channel catfish (*Ictalurus punctatus*), and bluegill sunfish (*Lepomis macrochirus*). Additional fish species identified on the Main Station during the 2010 survey for black-spotted newt include mosquito fish (*Gambusia affinis*), silverside (*Menidia* sp.), sailfin molly (*Poecilia latipinna*), sheepshead minnow (*Cyprinodon variegatus*), and Rio Grande cichlid (*Cichlasoma cyanoguttatum*) (Navy 2011a).

NALFOG

The 2009-10 survey identified one fish species at NALFOG (Navy 2011a), but a detailed fish survey of NALFOG surface waters has not been conducted. Intermittent streams bordering NALFOG provide

limited habitat for fish at NALFOG, and the site does not have an active fishing program. During periods of water flow, bluegill sunfish have occasionally been caught in Tecolote Creek.

Dixie Target Range

Two surveys have been conducted that identified fish species at Dixie Target Range (Table 2-6). The 2009-10 survey identified a total of 23 fish species that have the potential to occur at Dixie Target Rang. Of these, 17 fish species have been documented as occurring (Appendix F, Table F-6). Along the Nueces River border of Dixie Target Range, there is one large pond that usually maintains enough water to support invertebrates, fish, snakes, as well as an American alligator (*Alligator mississippiensis*). Largemouth bass, alligator gar (*Lepisosteus spatula*), channel catfish, and bluegill sunfish also are found in this pond (Navy 2011a).

The 2007-12 Herpetofauna Survey conducted by USFWS identified 22 fish species at Dixie Target Range representing 10 families from 2007-2009 (Clements and Giggelman 2012). Species included the common carp (*Cyprinus carpio*), orange-spotted sunfish (*Lepomis humilis*), Western mosquitofish (*Gambusia affinis*), and the freshwater drum (*Aplodinotus grunniens*). Fish were incidentally collected while seining stock tanks and the river for amphibians and reptiles.

Table 2-5 Summary of NASK Surveys That Collected Fish Data

Survey Title	Year	NASK Parcels		
		NAS Kingsville	NALFOG	Dixie Target Range
Survey for the Black-Spotted Newt	2009 to 2010	X	X	X
Herpetofauna Survey of the U.S. Navy – Escondido Ranch	2007 to 2012			X

Sources: Navy 2011a, Clements and Giggelman 2012

Birds

Table 2-6 includes a summary of NASK Complex surveys that have collected bird data.

Main Station

Surveys of the Main Station have identified 137 bird species, with an additional 22 bird species having the potential to occur (Appendix F, Table F-7). These surveys include a 1986 survey conducted in support of the BASH Program (Navy 2008) and surveys conducted in 2006-2007 (TNC 2007d), 2010 (USGS 2010). An inventory survey conducted by the Caesar Kleberg Wildlife Research Institute from 2012 to 2013, identified 149 species and a total of 2,373 individuals (Langschied 2013). Game bird hunting of northern bobwhite (*Colinus virginianus*), mourning dove (*Zenaida macroura*), white-winged dove (*Zenaida asiatica*), and turkey (*Meleagris gallopavo*) is a popular recreational activity on the Main Station.

NALFOG

Surveys of NALFOG have identified 126 bird species, with an additional 22 bird species having the potential to occur (Appendix F, Table F-8). These surveys include a 1986 survey conducted in support of the BASH Program (Navy 2008) and surveys conducted in 2006-2007 (TNC 2007d), 2010 (USGS 2010). Subsequently, an inventory survey was conducted by the Caesar Kleberg Wildlife Research Institute from 2012 to 2013, identified 97 species and a total of 1,828 individuals (Langschied 2013).

Dixie Target Range

A total of 173 bird species have the potential to occur at Dixie Target Range (Appendix F, Table F-9). Surveys were conducted in 2006-2007 (TNC 2007d), and 2010 (USGS 2010). An inventory survey conducted by the Caesar Kleberg Wildlife Research Institute from 2012 to 2013, identified 101 species and a total of 2,570 individuals (Langschied 2013). Surveys of Dixie Target Range have confirmed 84 resident, migratory, and transient bird species as occurring. Table 2-8 includes a summary of NASK Complex surveys that have collected bird data. Due to the diversity of the south Texas bird population future bird surveys are likely to document additional bird species at this site. Dixie Target Range is managed for game species including scaled quail (*Callipepla squamata*), northern bobwhite, mourning dove, and Rio Grande turkey (*Meleagris gallopavo intermedia*). The ponds, stock tanks, and other wet areas at Dixie Target Range provide feeding and resting areas for many types of migratory waterfowl. The range has a primary objective of providing hunting opportunities for quail and other bird species.

Table 2-6 Summary of NASK Surveys That Collected Bird Data

Survey Title	Year	NASK Parcels		
		NAS Kingsville	NALFOG	Dixie Target Range
Evaluation of Bird/Aircraft Hazards in Relation to Agriculture at the Main Station and NALFOG	1986	X	X	
The Nature Conservancy Inventory of Birds at Three South Texas Naval Sites	2006 to 2007	X	X	X
USGS Grassland Birds Wintering at U.S. Navy Facilities in Southern Texas	2010	X	X	X
Biological Resources Inventory for Rare, Threatened, and Endangered Plants and Birds	2013	X	X	X

Sources: Navy 2008, TNC 2007d, USGS 2010, Langschied 2013

Herpetofauna

Table 2-7 includes a summary of NASK Complex surveys that have collected herpetofauna data.

Main Station

Based on species distribution information and Kleberg County records, 79 herpetofauna (amphibians and reptiles) species have the potential to occur on the Main Station. Of these, 12 amphibian species and 22 reptile species have been documented as occurring (Appendix F, Table F-4). A herpetofauna survey was conducted on the Main Station in 1996 (Navy 2008) and 2004 (Long and Henke 2004). Herpetofauna occurrence data also were collected as part of a survey for black-spotted newt conducted on the Main Station in 2011 (Navy 2011a). The herpetofauna identified as occurring on the Main Station in Appendix F, Table F-4, are based on survey results or casual observations. Herpetofauna expected are those cosmopolitan species that are well adapted to living in close proximity to human activities. In the area of South Field and around the ponds within the Main Station, both venomous and non-venomous snakes occasionally are found.

NALFOG

Herpetofauna surveys have identified 25 herpetofauna species at NALFOG. Based on species distribution information and Jim Wells County records, 76 herpetofauna species have the potential to occur at NALFOG. Of these, 4 amphibian species and 21 reptile species have been documented as occurring (Appendix F, Table F-5). An herpetofauna survey was conducted at NALFOG in 2004 (Long and Henke 2004). Herpetofauna occurrence data also were collected as part of a survey for black-spotted newt conducted at NALFOG in 2011 (Navy 2011a). The herpetofauna identified as occurring at NALFOG in Appendix F, Table F-5, are based on survey results or casual observations. Snakes have been observed along the fence line or around the former location of a pond that has since been drained via ditching, but these species have not been identified as game species for hunting, nor do they pose a threat to be eradicated.

Dixie Target Range

Herpetofauna surveys have identified 41 herpetofauna species at Dixie Target Range. Based on species distribution information and McMullen County records, 70 herpetofauna species have the potential to occur at Dixie Target Range. Of these, 13 amphibian species and 28 reptile species have been documented as occurring (Appendix F, Table F-6). An herpetofauna survey was conducted at Dixie Target Range in 1996 (Navy 2008) and 2004 (Long and Henke 2004). Herpetofauna occurrence data were also collected as part of a survey for black-spotted newt conducted at Dixie Target Range in 2007–2012 (Clements and Giggelman 2012). The 2007-2012 Herpetofauna Survey conducted by USFWS identified 38 species from 19 families (Clements and Giggelman 2012). The herpetofauna identified as occurring at Dixie Target Range in Appendix F, Table F-6, are based on survey results, and primarily represent the species identified at Dixie Target Range. Because the natural history for this area is generally not well known, the distribution and relative abundance of the herpetofauna of McMullen County can only be estimated based upon available habitat. Future surveys are likely to document additional species as occurring at the Dixie Target Range.

Table 2-7 Summary of NASK Surveys That Collected Herpetofauna Data

Survey Title	Year	NASK Parcels		
		NAS Kingsville	NALFOG	Dixie Target Range
Amphibian and Reptile Survey, Mammal Survey	1996	X		X
Mammalian and Herptile Survey Results for NAS-Kingsville and NALF-Orange Grove, and Escondido Ranch	2004	X	X	X
Herpetofauna Survey of the U.S. Navy – Escondido Ranch	2007 to 2012			X
Survey for the Black-Spotted Newt	2010 to 2011	X	X	X

Sources: Clements and Giggelman 2012, Long and Henke 2004, Navy 2008, and Navy 2011a

Mammals

Several surveys have been conducted that identified mammal species at NASK parcels (Table 2-8).

Main Station

Mammal surveys have identified 37 mammal species on the Main Station. Based on Kleberg County records, 51 mammal species have the potential to occur, with 37 of these mammal species documented as occurring on the Main Station (Appendix F, Table F-10). A mammal survey was conducted on the Main Station in 2004 (Long and Henke 2004), which identified 22 mammal species from 14 families. The mammals identified as occurring on the Main Station in Appendix F, Table F-10 are based on survey results or casual observation.

Mammals commonly associated with the urban or suburban environment include opportunistic scavengers such as the common raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), Virginia opossum (*Didelphis virginiana*), Norway rat (*Rattus norvegicus*), roof rat (*R. rattus*), and house mouse (*Mus musculus*). The eastern cottontail rabbit (*Sylvilagus floridanus*) and fox squirrel (*Sciurus niger*) are common residents of open areas but are never far from the protective cover of shrubbery. More reclusive small mammals, such as hispid cotton rats (*Sigmodon hispidus*) and pocket mice (*Perognatus* spp. and *Chaetodipus* spp.), as well as large mammals, including coyote (*Canis latrans*), bobcat (*Lynx rufus*), gray fox (*Urocyon cinereoargenteus*), white-tailed deer, and wild hog have been observed in the undeveloped areas on and around the Main Station.

Mammalian species known or with the potential to occur on the Main Station include species commensal with humans and some more reclusive species. Several of the above listed mammals are actively hunted on NAS Kingsville; however, these are not specifically identified in Appendix F, Table F-10.

NALFOG

Mammal surveys have identified 35 mammal species at NALFOG. Based on Jim Wells County records, 47 mammal species have the potential to occur, with 35 of these mammal species documented as occurring at NALFOG (Appendix F, Table F-11). A mammal survey was conducted at NALFOG in 2004 (Long and Henke 2004), which identified 20 mammal species from 12 families. The mammals identified as occurring at NALFOG in Appendix F, Table F-11 are based on survey results or casual observation.

White-tailed deer, wild hog, and javelina are common residents of NALFOG. Javelina is a colloquial term and the more common name is collared peccary. An active trapping program for wild hogs, as well as limited habitat for game animals, makes it difficult for game species to propagate within the boundaries of NALFOG.

Dixie Target Range

Mammal surveys have identified 84 mammal species at Dixie Target Range. Based on McMullen County records, 52 mammal species have the potential to occur, with 32 of these mammal species documented as occurring at Dixie Target Range (Appendix F, Table F-12). A mammal survey was conducted at Dixie Target Range in 1996 (Navy 2008) and 2004 (Long and Henke 2004). The 2004 survey identified 24 mammal species from 15 families. A survey for rare felines that have the potential to occur in McMullen County was conducted at Dixie Target Range in 2010 and 2011 (Texas A&M University–Kingsville 2011). The rare feline species covered by the survey included ocelot (*Leopardus pardalis*), Gulf Coast jaguarundi (*Herpailurus yaguarondi cacomitli*), and mountain lion (*Puma concolor*). None of these rare felines were identified during the survey, which utilized remote-sensing wildlife cameras to document wildlife activity. The mammals identified as occurring at Dixie Target Range in Appendix F, Table F-12 are based on survey results or casual observation, and primarily represent the species identified at Dixie Annex.

Table 2-8 Summary of NASK Surveys That Collected Mammal Data

Survey Title	Year	NASK Parcels		
		NAS Kingsville	NALFOG	Dixie Target Range
Mammal Survey (Dixie Range–Escondido Ranch)	1996			X
Mammalian and Herptile Survey Results for NAS-Kingsville and NALF-Orange Grove, and Escondido Ranch	2004	X	X	X
Texas A&M University–Kingsville Rare Feline Survey at NAS Kingsville’s Escondido Ranch	2010 to 2011			X

Sources: Long and Henke 2004, Navy 2008, and Texas A&M University-Kingsville 2011

2.3.3 Rare, Threatened and Endangered Species

This subsection describes rare, threatened and endangered wildlife species identified on the Installation. A description of rare, threatened and endangered plant species found on the Installation is provided in Section 5.4.2 of this INRMP.

Several fish and wildlife surveys have been conducted at the NASK Complex, including surveys for RTE wildlife species that have the potential to occur (Table 2-9). Table 2-10 summarizes rare, threatened and endangered plant species surveys conducted at the NASK Complex

Sprague’s pipit, a former federal candidate for listing, has been identified at all of the NASK parcels (Table 2-11). Appendix F, Tables F-13 through F-15 list the state and federally listed RTE for each county in which the NASK parcels are located.

The following is a brief discussion of the rare, threatened and endangered flora known historically from Kleberg, Jim Wells and McMullen counties that have the potential to occur on the NASK Complex. A listing of the state and federally-listed RTE that have the potential to occur in each county associated with the NASK Complex is provided in Appendix F, Tables F-13, F-14, and F-15.

Table 2-9 Summary of NASK Surveys That Collected Rare, Threatened, and Endangered Wildlife Data

Survey Title	Year	NASK Parcels		
		NAS Kingsville	NALFOG	Dixie Target Range
The Nature Conservancy Inventory of Birds at Three South Texas Naval Sites	2006 to 2007	X	X	X
Herpetofauna Survey of the U.S. Navy – Escondido Ranch	2007 to 2012			X
USGS Grassland Birds Wintering at U.S. Navy Facilities in Southern Texas	2010	X	X	X
Texas A&M University–Kingsville Rare Feline Survey at NAS Kingsville’s Escondido Ranch	2010 to 2011			X
Survey for the Black-Spotted Newt	2010 to 2011	X	X	X

Sources: Clements and Giggelman 2012, Navy 2011a, Texas A&M University-Kingsville 2011, TNC 2007a, TNC 2007b, TNC 2007c, and USGS 2010

Table 2-10 Summary of NASK Surveys that Collected Rare, Threatened, and Endangered Species Plant Data

Survey Title	Year	NASK Parcels		
		NAS Kingsville	NALFOG	Dixie Target Range
Surveys of RTE plants on U.S. Navy Property in South Texas	1992	X	X	
The Nature Conservancy Plant Species Inventory Update for NASK	2006 to 2007	X	X	X
Additional Plant Surveys Identified in The Nature Conservancy Plant Species Inventory Update	1991 & 1993	X	X	
Additional Plant Surveys Identified in The Nature Conservancy Plant Species Inventory Update	1991 to 1992			X
Grassland Birds Wintering at U.S. Navy Facilities in Southern Texas	2010	X	X	X
Survey for the South Texas Ambrosia	2015	X		
Plant Species Inventory and Vegetation Survey	2015	X	X	X

Sources: Carr 1992, Garvon 2005, TNC 2007a, TNC 2007b, TNC 2007c, USGS 2010, Gulf South Research Corporation 2015, Rideout-Hanzak and Wester 2015

Main Station

South Texas ambrosia is a federally endangered plant species (59 Federal Register [FR] 43648-42652) that is known to occur at the NASK Complex. Surveys and monitoring for this species have identified 26 colonies on the Main Station (Figure 2-17). Occurrences of South Texas ambrosia are known only from Nueces, Kleberg, and Jim Wells counties (USFWS 2012). The first documented observation occurred on 7 February 1991. Since then, more than a dozen occurrences have been documented in management studies conducted in successive years (Navy 2008). A management plan was prepared for South Texas ambrosia in 2005 (Garvon 2005), an assessment of effects of prescribed burn and mowing frequency on South Texas ambrosia has been prepared (date unknown), and a genetics study of South Texas ambrosia was completed in 2013. Copies of these plans and studies are provided in Appendix E. No other federally listed threatened or endangered plant species are known to occur on the Main Station. In addition to South Texas ambrosia, Appendix F, Table F-13 provides a list of the federal and state-listed

plants species that have the potential to occur at the NASK Complex, based on occurrence data for Kleberg County.

Based on species distribution information and county records, 59 rare and federal and state-listed species, including birds listed by USFWS as birds of conservation concern (BCC) species, have the potential to occur in Kleberg County (Appendix F, Table F-13). Sprague's pipit, a former federal candidate species for listing, has also been documented as occurring. The non-breeding population of Sprague's pipit was formerly listed as a USFWS BCC species. Three bird species that are listed as threatened in the state of Texas with BCC status, white-tailed hawk (*Geranoaetus albicaudatus*), peregrine falcon (*Falco peregrinus*), and wood stork (*Mycteria americana*) are known to occur. Twelve (12) other bird species listed by USFWS as BCC species that are known to migrate through Kleberg County have been documented (Appendix F, Table F-13).

Three reptile species that are listed as Texas-threatened are known to occur, including Texas indigo snake (*Drymarchon melanurus erebennus*), Texas tortoise (*Gopherus berlandieri*), and Texas horned lizard (*Phrynosoma cornutum*). A survey for the black-spotted newt, a Texas-threatened species, was conducted in 2011; however, this species was not identified as occurring (Navy 2011a). The desert massasauga rattlesnake is petitioned for listing (currently under 12-month review for candidacy) under the ESA (US Federal Register 2012). This species has the potential to occur in Kleberg County (Keeping Texas First 2012).



South Texas ambrosia near front gate, Kingsville

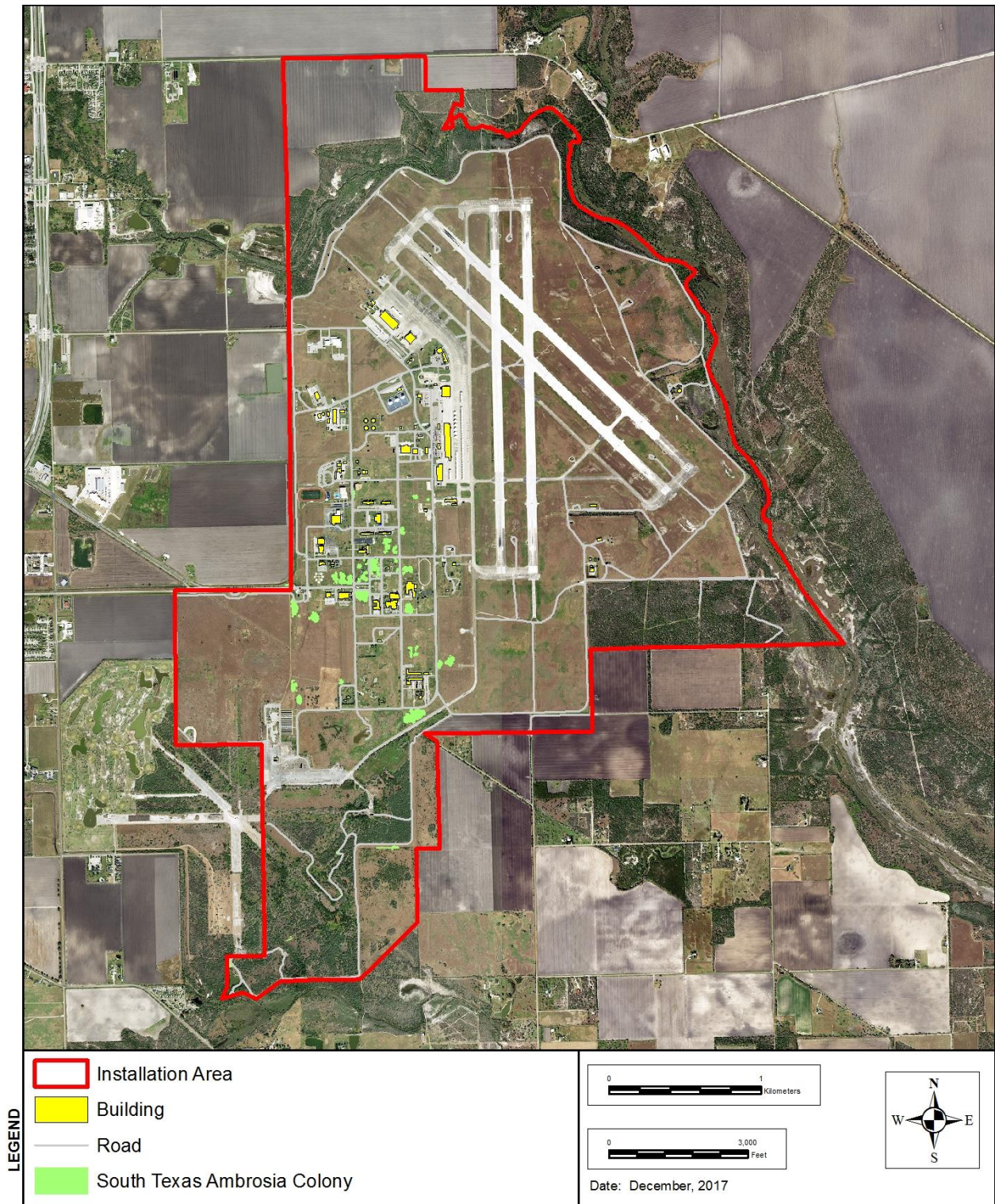


Figure 2-17 Naval Air Station Kingsville South Texas Ambrosia Colonies

NALFOG

No rare, threatened or endangered plant species are known to exist within NALFOG (Carr 1992). Appendix F, Table F-14 provides a list of the federal and state-listed plants species that have the potential to occur at NALFOG based on occurrence data for Jim Wells County.

Based on species distribution information and county records, 37 rare and federal and state-listed species, including birds listed by USFWS as BCC species, have the potential to occur in Jim Wells County (Appendix F, Table F-14). Sprague's pipit is the only formerly federally-listed species that has been documented. Two other bird species that are listed as threatened in the state of Texas with BCC status, white-tailed hawk and peregrine falcon, are known to occur. Nine other bird species listed by USFWS as BCC species that are known to migrate through Jim Wells County have been documented (Appendix F, Table F-14).

Three reptile species that are listed as threatened by the state of Texas are known to occur including Texas indigo snake, Texas tortoise, and Texas horned lizard. The desert massasauga has the potential to occur in Jim Wells County (Keeping Texas First 2012).

A survey for the black-spotted newt, a Texas threatened species, was conducted in 2011; however, this species was not identified as occurring (Navy 2011a). The black-spotted newt is currently under review for listing as threatened or endangered under the ESA (74 FR 66866-66905).

Dixie Target Range

No rare, threatened or endangered plant species are known to exist within Dixie Target Range (Navy 2008). Appendix F, Table F-15 provides a list of the federal and state-listed plants species that have the potential to occur, based on occurrence data for McMullen County (Navy 2008).

Based on species distribution information and county records, 39 rare and federal and state-listed species, including birds listed by USFWS as BCC species, have the potential to occur in McMullen County (Appendix F, Table F-15). Sprague's pipit, a former federal candidate for listing, is the only rare species that has been documented. Two other bird species that are listed as threatened in the state of Texas, white-tailed hawk and wood stork, are also known to occur. Sixteen (16) other bird species listed by USFWS as BCC species that are known to migrate through McMullen County have been documented (Appendix F, Table F-15).

A survey for the golden orb mussel, a Texas threatened species, was conducted in 2016 along the Nueces River. No live golden orb mussels were collected; however, two recent long dead shells were collected (USFWS 2016).

Black spotted newt and the Rio Grande lesser siren are listed as threatened by the state of Texas, and have been documented and confirmed present during a survey of the site conducted in 2007–2012. One Rio Grande lesser siren was recorded during this survey. It was not recorded in any of the previous surveys conducted, nor was it ever documented in

McMullen County (Clements and Giggelman 2012). Three reptile species that are listed as threatened by the state of Texas are also known to occur including Texas indigo snake, Texas tortoise, and Texas horned lizard. The Texas indigo snake is relatively common (Navy 2008). In addition, American alligators (*Alligator mississippiensis*) are residents in the more permanent sources of water along the Nueces River at Dixie Annex. This species is a federally listed species; however, this species is not threatened with extinction as the listing is due to its similarity of appearance with American crocodile (*Crocodylus acutus*), a federally endangered species. The desert massasauga has the potential to occur in McMullen County (Keeping Texas First 2012).

2.3.4 Critical Habitat

The ESA requires the conservation of critical habitat, which is defined as the USFWS-designated areas of land, water, and air space a threatened or endangered species need for survival. Critical habitat also includes such things as food and water, breeding sites, cover or shelter, and sufficient habitat area to provide for normal population growth and behavior. Section 7 of the ESA restricts destructive or adverse modification of critical habitat by any activity funded, authorized, or carried out by any Federal agency. One of the primary threats to many species is the destruction and modification of critical habitat by uncontrolled land and water development.

There are no designated critical habitats on the NASK Complex. The nearest designated critical habitat is for the piping plover located on Padre Island approximately 35 miles east of the Main Station in Kleberg County (FWS 2017).

2.4 AGRICULTURAL OUTLEASES

Agricultural outleasing is the use of non-excess DoD lands, under a lease, by an agency, organization, or person for growing crops or grazing domestic animals. Agricultural outleasing occurs on approximately 235 acres on the fringes of the Main and is administered by the NRM. Surveys will be made periodically to determine if the market situation has changed and additional land can be put under lease. Additional information on the program and on what agricultural activities take place at each property is provided in Section 5.2.9.

2.5 RECREATIONAL OPPORTUNITIES

Outdoor recreation activities are dependent upon the natural environment. Opportunities for outdoor recreation at the Main Station, NALFOG, and Dixie Target are maintained by the MWR Division, Natural Resources Program, and grounds maintenance contractors. These include hunting at the Main Station and Dixie Target Range, skeet and trap shooting, and fitness and jogging. INRMP implementation will increase opportunities for natural resources-based outdoor recreation for both the public and military personnel.

3.0 Environmental Management Strategy and Mission Sustainability

3.1 SUPPORTING SUSTAINABILITY OF THE MILITARY MISSION AND THE NATURAL ENVIRONMENT

Sustainability is the ability to provide for the needs of the current mission without damaging the ability of future missions to maintain their needs in coordination with natural resources adaptive management. A sustainable process can be carried out over and over without substantial negative environmental impacts, increased operational costs or a decrease in mission readiness and training.

Training and management activities detrimental to the functional values of the natural communities on the NASK Complex can affect the Navy's military mission. For example, improper vegetation management around the airfields could result in encroachment of trees and shrubs into the runway clear zones, dead and dying trees that create perches for large bird species, and heavy wildland fire fuel loads. These consequences would pose visibility, BASH, and smoke issues that would negatively impact aviation training. Conversely, properly managed vegetation provides beneficial wildlife habitat, improves biodiversity, improves visibility, and reduces wildland fire potential. Proper vegetation management also prevents erosion and increased sediment loading in stormwater runoff, which may increase turbidity and reduce water quality in the surrounding watersheds, threatening vital aquatic habitat. Environmental conditions detrimental to the habitat of federally or state-protected species could result in enforcement action by the responsible regulatory agency, possibly threatening the mission of NASK.

Outdoor recreational use by the public can affect the security and safety of the military mission. Outdoor recreational opportunities must be planned, developed, and used consistently with the constraints of the military mission, so as not to affect security or safety at the NASK Complex. Unplanned and uncontrollable use of natural recreational areas by the general public may also affect the military mission.

Monitoring and measurement is fundamental to adaptive natural resources management and mission sustainability. NASK will follow legal mandates and requirements to ensure the effectiveness of management, plans, controls, and training is monitored. Furthermore, the use of BMPs and established monitoring protocols will enable the NASK natural resources program to identify its progress toward achieving goals and objectives. Without effective monitoring and measurement, it would be difficult for natural resources management to continually improve, which is the basis of sustainability.

3.1.1 Military Mission and Sustainable Land Use

Over the long term, this approach maintains and improves the sustainability and biological diversity of terrestrial and aquatic ecosystems while supporting sustainable economies, human use, and the environment required for realistic training operations (DoD 2013). DoDI 4715.03, *Natural Resource Conservation Program*, established the following principles and guidelines (DoD 2013):

- Maintain and improve the sustainability and native biological diversity of ecosystems.
- Administer with consideration for ecological units and timeframes. Ecosystem management requires consideration of the effects of installation programs and actions at spatial and temporal ecological scales that are relevant to natural processes.
- Support sustainable human activities. People and their social, economic, and national security needs are an integral part of ecological systems, and management of ecosystems depends upon sensitivity to these issues.
- Develop a vision of ecosystem health. Existing social and economic conditions should be factored into the vision.
- Develop priorities and reconcile conflicts.
- Develop coordinated approaches to work toward ecosystem health. Since ecosystems rarely coincide with ownership and political boundaries, cooperation across ownership is an important component of ecosystem management.
- Rely on best science and available data.
- Use benchmarks to monitor and evaluate outcomes.
- Use adaptive management. Ecosystems are recognized as open, changing, and complex systems. Management should be flexible to accommodate the evolution of scientific understanding of ecosystems.
- Implement through installation plans and programs. An ecosystem's desirable range of future conditions should be achieved through linkages with other stakeholders.

3.1.3 NEPA Compliance

3.1.3.1 Relationship to the Gulf of Mexico Range Complex and Corpus Christi Operational Area Management Plans

The Gulf of Mexico (GOMEX) Range Complex represents an essential combination of air, land, and sea space that provides realistic training areas for Navy in Florida, Alabama, Mississippi, Louisiana, and Texas. An Operating Area (OPAREA) is a designated area of the ocean organized and managed to provide a safe and controlled surface and underwater military training and testing environment. The Corpus Christi OPAREA is one of four OPAREAs in the GOMEX Range. An Environmental Impact Statement / Overseas Environmental Impact Statement (EIS/OEIS) in 2010 and was completed in cooperation with the National Marine Fisheries Service (NMFS) Office of Protected Resources. Potential impacts to the physical, environmental, and manmade environments from aircraft that take off and land at the NASK Complex as part of training on the Range are evaluated in the GOMEX Range Complex Final EIS/OEIS, Volumes 1 and 2. No natural resources management actions described in this INRMP are compromised to accommodate training on the GOMEX Range or within the Corpus Christi OPAREA.

3.2 NATURAL RESOURCE CONSULTATION REQUIREMENTS

Section 7 of the ESA requires federal agencies to formally consult with USFWS or NOAA National Marine Fisheries Service (NMFS) (fish or fisheries) when any proposed activity authorized, carried out, or conducted by that agency may significantly affect a listed species or designated critical habitat, except when the USFWS or NOAA NMFS concurs, in writing, that a proposed action “is not likely to adversely affect” listed species or designated critical habitat (50 CFR §402.02, 50 CFR §402.14). Formal consultation under Section 7 of the ESA:

(1) determines whether a proposed federal action is likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat; (2) begins with the federal agency's written request and submittal of a complete initiation package; and (3) concludes with the issuance of a biological opinion and incidental take statement by the federal agency. If, as a result of consultation, the USFWS issues a biological opinion, it will include actions that must be completed in order to conduct the proposed activity. If critical habitat is located on federal property and adequate protection and management has been included in the installation INRMP, the ESA allows USFWS to preclude this habitat from the biological opinion. However, in order for the critical habitat to be excluded, the qualifying INRMP must address the maintenance and improvement of the primary constituent elements important to the species, and must manage for the long-term conservation of the species. For minor or less than significant impacts to ESA-listed species or designated critical habitat, informal consultation with USFWS may be appropriate. Section 7 consultation (formal or informal) is not expected to be required for any of the natural resources management measures recommended in this document.

Information on Section 7 of the ESA is available from USFWS at:

<http://www.fws.gov/endangered/laws-policies/section-7.html>

Information on Section 9 of the ESA (prohibited activities to protect species from being harassed or killed, and having their habitat destroyed or disturbed) is available from USFWS at:

<http://www.fws.gov/endangered/laws-policies/section-9.html>

Information on Section 10 of the ESA (exceptions for activities otherwise prohibited by Section 9) and Section 10(a)(1)(A) of the ESA (USFWS permits for scientific purposes or to enhance the propagation or survival of listed species) is available from USFWS at:

http://www.fws.gov/endangered/esa-library/pdf/HCP_Incidental_Take.pdf

The NASK's CO or his agent coordinates with the appropriate regulatory agency on any actions that have the potential to impact RTE species. Early informal consultation is key to resolving potential problems and addresses issues in a proactive and positive manner, and is the preferred method of consultation. Informal consultation includes all discussions and correspondence with the regulatory agency, and occurs prior to formal consultation to determine whether a proposed Federal action may affect listed species or critical habitat. A flow chart of the informal consultation process is provided in Figure 3-1.

The NASK natural resources program may determine through the informal consultation process or simply by the nature of the proposed action that formal consultation is required for an action. If

NASK determines an activity may have an adverse effect upon a federally-listed species and/or critical habitat, formal consultation with USFWS or NMFS will be initiated to determine whether a proposed action is likely to jeopardize the continued existence of listed species, destroy or adversely modify designated critical habitats, or potentially result in the incidental take of a species. The formal consultation process begins with a NASK written request and submittal of a complete initiation package and concludes with USFWS's or NMFS's issuance of a biological opinion and "incidental take" statement, if applicable. A flow chart detailing the steps of the formal consultation process is presented as Figure 3-2.

South Texas ambrosia is the only federally-listed species known to occur on the Main Station; however, future surveys may identify additional ESA-listed species. The USFWS has not designated any critical habitat rules for this species. The NASK prepared the South Texas Ambrosia Management Plan (Appendix E) in 1992 and updated in 2016, and management recommendations have been considered in development of the this INRMP. INRMP Project No. 9 will consist of surveys and updates to the 2016 South Texas Ambrosia Management Plan, including updates to recommendations for mowing and prescribed burning regimes that would benefit this species. Management yearly monitoring of known locations quantitative analysis of stem density. Additionally, surveys to search for new populations should be performed every 3–6 years. Surveys conducted in February 2015 and found plants in 32 locations covering a total area of 1.86 ac (Gulf South Research Corporation, 2015). In 2013, a genetics study was completed that determined the genetic diversity that provided valuable information for regional management of this rare species. "Take" of the consultation under ESA. Management recommendations for this species are provided in Section 3.0 of this document.

The MBTA prohibits the taking, killing, or possessing of migratory birds unless a depredation permit is obtained; however, consultation is not required. Section 315 of the 2003 National Defense Authorization Act (NDAA) provides as exemption to the Navy for the incidental take of migratory birds during military readiness activities authorized by the Secretary of Defense or the Secretary of the Navy. However, the Navy must still assess through the NEPA process, or other environmental requirements, the expected impact of proposed or ongoing military readiness activities on migratory bird species likely to occur in the action areas. Military readiness activities are defined under the NDAA as all training and operations of the Armed Forces that relate to combat, and the adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use. This does not include the routine operation support functions (i.e., administrative offices, military exchanges, commissaries, water treatment facilities, storage facilities, motor pools, MWR activities, mess halls, operation of industrial activities, construction, and demolitions).

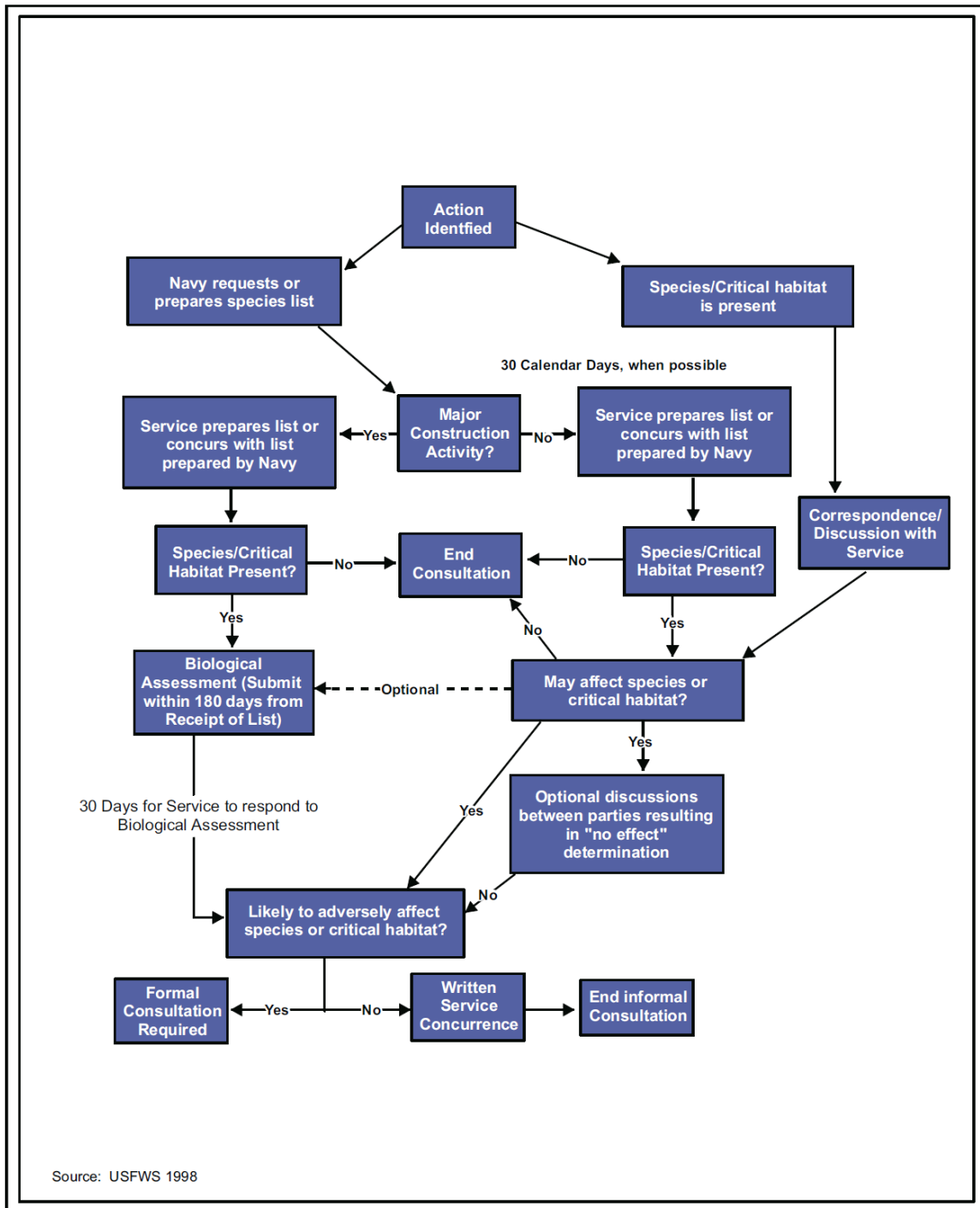


Figure 3-1 Flow Chart for the Informal Consultation Process

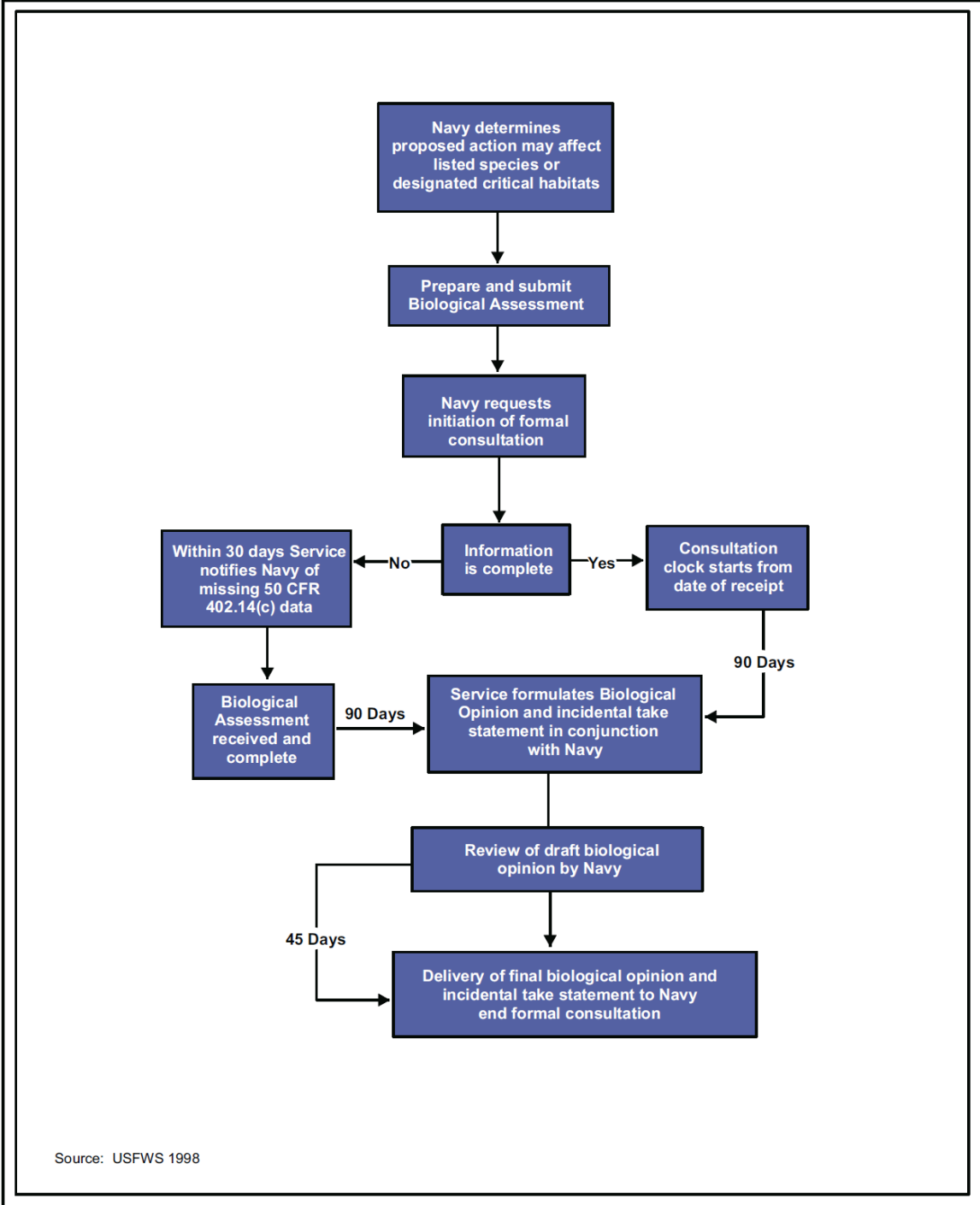


Figure 3-2 Flow Chart for the Formal Consultation Process

3.3 PLANNING FOR NEPA COMPLIANCE

Prior to passage of Sikes Act legislation, the extent of natural resources management on military lands was largely discretionary. Although installations with applicable natural resources were required to prepare an INRMP, it was not a legal requirement. The only legal natural resources requirements were related to compliance with ESA, CWA, and other statutory requirements, or DoD directives. Passage of the SAIA brought into effect the requirement for “the Secretary of each military department to prepare and implement an integrated natural resources management plan for each military installation in the U.S. under the jurisdiction of the Secretary” (Navy 2006). The Council on Environmental Quality (CEQ) defines an INRMP as a major Federal action requiring NEPA analysis, and as a result the Navy Office of General Counsel (Installations and Environment) has established that implementation of an INRMP per SAIA requirements, necessitates the NEPA preparation prior to INRMP approval. An EA is usually sufficient to satisfy the NEPA review requirement; however, in cases where actions would have significant impact on the environment, an EIS is required. Annual updates and revisions are covered by the original NEPA documentation unless a major change in installation mission or programmatic objectives occurs.

Decisions that affect future land or resource use that are associated with an INRMP require NEPA analysis. The NRM should refer to Secretary of the Navy Instruction (SECNAVINST) 5090.6A and Chapter 10 of OPNAVINST 5090.1D for basic guidance on the preparation of NEPA documents. The INRMP and associated NEPA documentation should be prepared as individual documents to ensure that the viability, integrity, and intent of each are maintained. The intent of the INRMP is to outline projects that would fulfill Navy compliance and stewardship obligations, while the intent of the NEPA documentation is to analyze the programmatic impacts. While each of these are prepared as separate documents, they should be prepared simultaneously, as it is important for installation NRMs to coordinate the two documents at the earliest possible stage to ensure that decisions reflect current environmental values, and avoid potential conflicts.

Preparation of the NEPA documentation should be completed early to accommodate Navy decision-makers. If a comment period or public notice is required for NEPA process, public notice and comment periods should be coordinated with the INRMP. Some Navy actions fall under existing categorical exclusion (CATEX) and require no further analysis. For those actions not covered by an existing CATEX, the initial environmental document, the EA determines the potential for significant project impacts and the feasibility of proposed actions. The NEPA process requires coordination with appropriate Federal and state agencies and the general public. The public review process scopes or identifies significant issues to develop and evaluate alternatives. The preparation of an EIS occurs only if significant impacts are identified. If the EA finds “no significant impacts”, the Navy would complete the preparation of a formal Finding of No Significant Impact (FONSI) and make it available for public review.

A FONSI must be achieved before an INRMP may be approved. If a finding of no significant impact is not achievable, the NEPA process must proceed to an EIS. One of the first steps in the NEPA process is to define the proposed action and explain its purpose and need. The proposed

action is to develop and implement an INRMP that integrates natural resources management with the installation's military use in a manner that ensures military readiness and provides for sustainable multipurpose uses and conservation of natural resources (Navy 2006). The purpose and need for the INRMP is to meet statutory requirements imposed by the SAIA as well as the requirements of various DoD and Navy instructions. The purpose and need section of the NEPA document can be further clarified with a brief discussion of the required plan elements (as outlined in the SAIA) applicable to the installation.

The majority of the NEPA document should focus on the discussion of relevant environmental issues and reasonable alternatives. Alternatives that are not feasible because they are inconsistent with the installation mission, unreasonably expensive, too technically or logistically complex should not be included in the analysis. Additionally, any alternative that are associated with significant environmental impacts cannot be analyzed in an EA, and would require preparation of an EIS. The CEQ defines reasonable alternatives as those that are economically and technically feasible and utilize common sense. Feasibility is a measure of whether the alternative makes sense and is achievable. The analysis should focus on the alternatives and methodologies proposed for implementing the programmatic objectives that have been established for natural resources management. The 2006 Navy INRMP Guidance document recommends that the NEPA analysis for INRMP documents adopt a "programmatic" approach that provides opportunities for the installation to accommodate unforeseen projects that meet pre-established criteria for significance evaluation, as well as changes to the projects, as long as impacts are covered within the overall scope and analysis for the selected alternative (Navy 2006). Analysis in the NEPA document would focus on evaluation and comparison of alternative plans in association with the four programmatic objectives established for NASK: land management, fish and wildlife management, forestry management, and outdoor recreation management. Analysis should not focus on the individual projects or practices except in the cases of controversial projects, or projects considered outside the scope of, or a major deviation from a previously existing INRMP (Navy 2006). The projects and recommendations outlined in an INRMP should provide a framework for reviewing on-going activities, and will also assist in reviewing changes for unforeseen projects or modifications in the future. It is important to distinguish that the NEPA analysis for evaluating the programmatic objectives is different from the project level of analysis used for project specific actions.

The No Action/Status Quo alternative should always be included as an alternative to implementation of the INRMP. The No Action/Status Quo alternative describes impacts that would occur if the installation did not implement the INRMP, and the installation continued to operate without a plan or the existing plan if one is in place. The No Action/Status Quo alternative serves as a baseline to which all other alternatives are compared. Each alternative should describe the general geographical extent applicable to each of the programmatic objectives. Each of the reasonable alternatives may only represent variable intensities of one or more of the programmatic objectives; however, differences in funding levels for each alternative would not constitute a valid range of alternatives. For example, it is not acceptable for all required compliance projects to represent an alternative. A brief summary of all alternatives considered for

the INRMP should be included to provide the review agencies and the local community the range of management scenarios that were analyzed.

Although specific projects are not required to be analyzed in the NEPA document, a complete list of projects, including description, cost estimate, funding priority designations, and implementation schedule must be included to provide the basis of the proposed action. If agency stakeholders and the Navy determine that potential projects are controversial, sufficient project details must be provided in the INRMP so that a decision can be made regarding significance as part of the NEPA analysis. Additionally, controversial projects, or projects outside the scope may require a tiered or amended NEPA document for that specific project. All projects must be consistent with the methodologies analyzed in the NEPA document, and the installation should ensure that the NEPA documentation for the INRMP is prepared such that it would accommodate for unforeseen projects, and changes to original projects. The Navy INRMP Guidance document (Navy 2006) includes more information (in Appendix F of that document) on preparing NEPA documents for INRMPs.

In conclusion, during the planning process for Navy actions and projects that impact sensitive natural resources, the Navy will coordinate as early as practical with appropriate federal and state natural resource agencies. When actions or projects are mission essential and/or severely time-constrained, agency coordination may not occur except as required by laws or regulations for impacts to wetlands and/or federally threatened or endangered plant and wildlife species. This INRMP has been prepared to provide guidance on avoiding or minimizing impacts to natural resources, and to limit disturbance to natural resources located in non-priority mission areas. Suitable mitigation will be sought for unavoidable natural resources impacts that result from military mission or INRMP activities. The final EA prepared for this INRMP was prepared upon completion of the environmental review and public comment process.

3.4 BENEFICIAL PARTNERSHIPS AND COLLABORATIVE RESOURCE PLANNING

The current staffing level of natural resource personnel at the NASK Complex and the need for outside expertise increases the importance of developing cooperative projects with other agencies, universities, contractors, other installations, local residents, conservation organizations, and the Navy command. Cooperating Federal and state agencies, universities, and NGOs can provide a beneficial exchange of technical information, natural resources services, and field assistance. Partnerships, cooperative agreements, and community programs that affect natural resources management within NASK Complex are discussed below.

Technical assistance may be provided by USDA NRCS, USFWS, USGS, TPWD, Texas A&M University–Kingsville, and National Interagency Prescribed Fire Training Center. Future collaboration would occur with NGOs such as the TNC, other non-profit entities, and universities, to further protect and conserve natural resources, maintain environmental compliance, and enhance the Navy's ability to meet its mission-critical objectives.

The implementation and continuing management of the NASK INRMP will be dependent upon the continued assignment of a full time NRM. This is primarily attributed to the large amount of acreage that is associated with the NASK Complex, the diverse nature of the terrestrial and aquatic habitat on the properties, and the number of mandatory and stewardship projects that have been identified in this INRMP.

To broaden the scope of the NASK natural resources program and encourage participation in planned activities, NASK should seek out development of partnerships with the TPWD, USFWS, USDA NRCS, TCEQ, Texas A&M University – Kingsville, Texas Ornithological Society, Coastal Bend Audubon Society, DoD PIF, and other local agencies and organizations.

The Navy solicits input during the development and update of this INRMP from cooperating federal and state agencies, the USFWS and TPWD (Appendix B). Cooperative agreements with local or regional fish and wildlife agencies, conservation organizations, and education organizations have been initiated in the past and will continue to be supported. Current objectives include:

- maintaining interagency cooperation with USFWS and TPWD; and
- developing partnerships with USDA NRCS, TCEQ, Texas A&M University–Kingsville, Texas Ornithological Society, Coastal Bend Audubon Society, DoD PIF, Kleberg County (encroachment partnering), and other local agencies and organizations to implement wildlife monitoring and protection programs.

NASK will continue to seek out cooperative agreements, memoranda, and other agreements between the Installation and federal and state agencies that oversee and regulate natural resources protection. The NRM is responsible for ensuring that NASK has up-to-date agreements in place. The NRM will also consult federal, state, university, NGO, and Navy experts as needed to ensure regulatory compliance and adequate management measures are in place for RTE flora and fauna associated with the NASK Complex.

Partnering with federal and state agencies, universities, and NGOs is applicable to most of the management activities and natural resources identified in this INRMP, as described in the Integration with other Natural Resources Management Activities discussions throughout Section 5.0.

Plans and programs for maintaining and managing natural resources on the NASK Complex need to fully consider the interrelationships among resources on the Installation and assure no net loss of the military mission. The input and cooperation of regulatory agencies and other experts will best facilitate the success of these plans and program, including protection of federally listed species known to occur at the NASK Complex.

3.5 PUBLIC ACCESS AND OUTREACH

The MWR promotes and maintains the morale and welfare of military personnel and their dependents, both active and retired, in addition to DoD civilians when possible. This is

accomplished through the programming and operation of recreation and club facilities. The MWR maintains outdoor recreational programs and facilities such as the marinas, picnic pavilions, campgrounds, hiking trails, and beaches. The NRM reviews and provides natural resources recommendations and guidance for all new projects proposed by MWR.

Access to natural resources management areas generally is limited to active duty and reserve military personnel assigned to the Installation, their dependents and accompanied guests, federal and civilian employees, their dependents and accompanied guests, and military retirees. Access should also be considered in terms of accessibility of facilities and programs for the physically challenged. The Architectural Barriers Act of 1968 (Public Law 90-480) requires facilities to be accessible to the physically challenged. Section 504 of the Rehabilitation Act of 1973, as amended (Public Law 93-112), prohibits discrimination on the basis of handicap in program participation and in all facets of employment. 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 the dependents and civilians employed, are not exempt from these laws.

The military mission of NASK limits public access to most areas of the Installation; however, controlled public access is allowed on a case-by-case basis. At the Main Station escorted visits by educational groups or for controlled recreational activities can be arranged to allow the public to view natural resources. Public access to the Installation for participation in outdoor recreation activities is limited to authorized DoD personnel and their guests.

Due to the military mission, safety, and security requirements of NALFOG, public access to this site is limited. The Dixie Target Range of Dixie Target Range also is restricted to authorized personnel, and do not allow public access. Access to Dixie Annex is restricted to active military, retired military, or DoD civilian equivalents. Due to the circumstances under which Dixie Annex was obtained, and the associated potential for unexploded practice ordnance to be present within the confines of the property, public safety cannot be assured. Additionally, public access would require staffing requirements beyond what is currently available at Dixie Annex.

Navy policy is to permit access to outdoor recreation resources to the greatest degree possible, consistent with the installation's safety and security requirements and its available manpower and natural resources to support such activities without degradation or impairment of environmental qualities. The degree of public access for recreational purposes will be dependent on which of the NASK properties is being considered. Any limitation or regulation required will be based on mission, security and safety requirements.

In accordance with the SAIA, an INRMP shall, to the extent appropriate and applicable, provide for public access that is necessary or appropriate for sustainable use by the public of natural resources to the extent that the use is not inconsistent with the needs of fish and wildlife resources, and subject to requirements necessary to ensure safety and military security.

Additionally, public access for the use of the natural resources for outdoor recreation should not result in degradation of installation natural resources. In addition to traditional outdoor recreation activities such as hiking, wildlife watching, and hunting, outdoor recreation activities can include educational programs that foster a sense of responsible stewardship for military personnel and the general public who are authorized access to an installation for these recreational purposes.

The military mission of the Installation restricts public access, and therefore long-term management of public access issues is concentrated on providing public access in relation to education and stewardship purposes.

Ecosystem management practices are enhanced by environmental stewardship and by educating the general public about environmental conservation issues, problems, and solutions. By providing natural recreational and educational opportunities on the Installation, NASK would help promote public awareness of vital environmental resource issues, including federally protected resources, thus providing a regionally limited educational resource. In addition, the Installation will provide opportunities for educating the public on the values and characteristics of a healthy environment, identify some of the problems and solutions associated with human use of the environment, and showcase the measures the Navy has adopted for protection of natural resources under their jurisdiction, including federally listed plant and animal species known to occur at the Installation.

3.5.1 Educational Outreach

An outdoor education program is needed at NASK to showcase the Navy's stewardship of natural resources, and to emphasize that this stewardship is important to the military mission and habitat conservation. Educational programs foster a sense of responsible stewardship in military personnel and the general public who use the wildlife recreational opportunities of an installation. Educational outreach may include coordination with local, regional, state, national, or international organizations or public groups. The NRM will strive to work with the installation MWR department to develop, coordinate, and implement outdoor recreation and education activities that highlight the environmental stewardship of the station.

One of the goals and purpose of this INRMP is to provide for effective stewardship and management of NASK's natural resources, which includes promoting outdoor recreation and education under the requirements of SAIA, while meeting military mission requirements. The NASK Complex provides unique opportunities for scientific study. Cooperative agreements with local or regional fish and wildlife agencies, conservation organizations, and education organizations have been initiated in the past and will continue to be supported.

Outdoor education and recreation are complementary activities that create or enhance both recreational opportunities and educational opportunities. Training or hiring an outdoor educator must be considered in order to maintain the highest quality outdoor education program.

Educational programs foster a sense of responsible stewardship in military personnel and other authorized personnel who participate in outdoor recreation and educational outreach opportunities at NASK. Educational outreach may include coordination with local, regional, state, national, or international organizations or public groups. The NASK MWR Department is responsible for developing and coordinating the outdoor recreation and educational programs as part of implementation of this INRMP in coordination with the NRM.

Ecosystem management practices are enhanced by environmental stewardship and by educating the general public about environmental conservation issues, problems, and solutions. By providing natural recreational and educational opportunities on the Installation, NASK would help promote public awareness of vital environmental resource issues, including protection and conservation measures in place at NASK for South Texas ambrosia. In addition, NASK will promote activities that teach the values and characteristics of a healthy environment and responsible use of the environment.

Management strategies related to educational outreach at NASK include the following.

1. Continue to coordinate the development and implementation of the outdoor recreation and educational program covered by this INRMP with the MWR Department.
2. Develop an outdoor education program to showcase the Navy's stewardship of natural resources, and to emphasize that this stewardship is important to the military mission and habitat conservation.
3. Develop an information kiosk to identify and highlight the unique characteristics of South Texas ambrosia populations at NASK.
4. Seek out partnerships with USFWS, TPWD, USDA NRCS, TCEQ, Texas A&M University – Kingsville, Texas Ornithological Society, Coastal Bend Audubon Society, DoD PIF, and other local agencies and organizations, to provide educational opportunities at NASK.

3.6 ENCROACHMENT PARTNERING

Encroachment is any issue external to military operations that inhibits, curtails, or has the potential to impede the performance of the military mission. Continued growth around the NASK Complex can limit operational capability. Complaints about noise, dust, and smoke from aircraft and vehicles can force the curtailment of certain types of training and available hours. As development destroys or displaces native species of plants and animals, military posts become their refuge. This, too, can restrict the military mission and so it is in the DoD's interest to help protect habitat, wildlife corridors, biodiversity, ecosystems, and water quality off base, and help educate local governments and communities about the need for ecosystem protection and management.

3.7 TEXAS' STATE WILDLIFE ACTION PLAN

The U.S. Congress mandated each state to develop a comprehensive wildlife conservation plan. Each plan was required to include the species and habitats to be conserved, the conservation actions proposed, procedures to review the plan, and coordination with the public and other agencies. Texas established their State Wildlife Action Plan in 2005 in response to this mandate.

The Action Plan provides a list of 1,320 Species of Greatest Conservation Need (SGCN) in Texas and report the status and trends of each species. The Action Plan also contains detailed conservation information about specific habitats in each state; there are 190 rare community associations.

4.0

Natural Resources Goals, Objectives, and Strategies

4.1 GOALS, OBJECTIVES, AND STRATEGIES

This section presents the goals, objectives, and management strategies for natural resources management at the NASK over the next five-year period (2018-2022). Four INRMP goals have been identified for NASK:

- Goal 1 Provide for the conservation, management and enhancement of natural resources at NASK by continuing to implement ecologically appropriate and beneficial land uses and management practices, while ensuring the continuation of the military mission.
- Goal 2 Provide quality, outdoor recreational and educational opportunities to improve the quality of life for Navy personnel and authorized guests, if such opportunities are available and within DoD security standards.
- Goal 3 Integrate the various activities conducted under this INRMP by fostering knowledge of, and participation in, adaptive ecosystem management.
- Goal 4 Protect, conserve, and enhance the ecological value and diversity of natural resources by building productive relationships with regulatory agencies and the public in support of the military mission.

Goal 1 covers a broad range of management issues, including those associated with Land Management (Section 5.1) and Fish and Wildlife Management (Section 5.4). Goal 2 primarily pertains to Outdoor Recreation Management (Section 5.5). Goals 3 and 4 primarily pertain to Integrated Ecosystems Management and Partnering. By implementing these goals, NASK will create and maintain a balance between management of the Installation's natural resources and implementation of the military mission. To ensure success in achieving these goals, a framework or "road map" of objectives, strategies, projects, and management initiatives is provided in this section. The goals, issues, objectives, strategies, projects, and initiatives are referenced throughout the INRMP where appropriate and relevant.

Definitions

Goals: Goals are general expressions of desired future conditions that represent the long-range aim of management. For this INRMP, goals are compatible with the military mission of NASK and provide conservation and ecosystem management targets and direction.

Issues: Issues may include the presence, abundance, distribution, function, condition, and sensitivity of a particular natural resources feature, resources-based human function or other attribute on the Installation, or a broader ecological or community setting. Issues may also include the effectiveness or ineffectiveness of existing or past practices regarding management and use of resources on the Installation, and the requirements for regulatory compliance regarding the management and use of these natural resources. Section 5

addresses issues that have been identified to establish objectives for achieving the stated INRMP goals at the NASK.

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

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

Projects: Projects are discrete actions for fulfilling a particular strategy. Projects may be required to fulfill NASK's compliance and/or regulatory requirements related to natural resources management, or may enhance existing conditions for ensuring compliance. Other projects are not compliance-driven, but may allow for more effective and efficient management of natural resources and provide for sound natural resources stewardship. Projects require labor resources and funding in addition to the day-to-day requirements of the Installation.

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

Goal 1: Provide for the conservation, management and enhancement of natural resources at NASK by continuing to implement ecologically appropriate and beneficial land uses and management practices, while ensuring the continuation of the military mission.

Issue: Development and training activities have a significant potential to affect land area at NASK; as a result, land management decisions and practices are important aspects of ecosystem management. The use and management of lands for military mission needs, and the decision-making process regarding such land use, directly affects the sustainability of the ecosystem.

Land and water management decisions will become increasingly important at NASK as development and training activities increase. Land and water use during military training, and the decision-making progress regarding such land and water use, directly affect ecosystem sustainability. To protect and maintain

natural resources while ensuring the continuation of the military mission, NASK will implement practices to meet the following objectives:

- Objective 1.1: Manage, maintain, and enhance land areas with natural resources value, and maintain ecological function.
- Objective 1.2: Achieve no net loss of wetlands.
- Objective 1.3: Improve and enhance water quality (SEE NOTES FROM MEETING) and soil erosion to protect surface water bodies and wetlands.
- Objective 1.4: Preserve, protect, and enhance water resources (e.g. wetlands, surface water, groundwater), including protection of undisturbed acreage located with 100-year floodplain areas and management of coastal zone resources.
- Objective 1.5: Maintain vegetation to reduce BASH potential.
- Objective 1.6: Maintain vegetation to reduce wildland fire hazards.
- Objective 1.7: Maintain and enhance native vegetation, including forest habitats, to promote community diversity; and to control and monitor noxious, invasive, and exotic plant species.
- Objective 1.8: Implement environmentally beneficial and cost-effective landscaping and grounds maintenance practices.
- Objective 1.9: Protect and promote sustainable management of forest resources.
- Objective 1.10: Manage forest habitats to promote use by a diverse range of wildlife species, including protection of mature tree stands and snags; protection of tree species that provide suitable nesting and foraging habitat for wildlife; and maintenance of wildlife travel corridors, streamside protection, and aesthetic buffer zones.
- Objective 1.11: Ensure that land management and land use decisions, including agricultural outleases, comply with all applicable laws, executive orders, regulations, directives, and instructions, and that adverse impacts to the natural environment are minimized.

Objective 1.1: Manage, maintain, and enhance land areas with natural resources value, and maintain ecological function.

Strategy 1.1.1: Protection of watersheds and floodplains at NASK

Projects: None

- Initiatives:**
- (1) Avoid activities, particularly vegetation clearing and ground-disturbing activities that would adversely affect flood attenuation.
 - (2) Clear stream or drainage blockages such as beaver dams or obstructed culverts that could result in increased flood levels or prevent flood waters from subsiding. This effort is the responsibility of the Public Works Department, with assistance provided by the NRM.

Strategy 1.1.2: Wetlands Management

- Projects:**
- Project No. 1 – Biological Resources Survey and Inventory
 - Project No. 7 – Habitat Management and Restoration

- Initiatives:**
- (1) Provide wetlands identification and management training to natural resources personnel.
 - (2) Identify and locate jurisdictional waters of the U.S., including wetlands that have the potential to be impacted by activities associated with the military mission, as directed by the CWA. Complete a survey of wetlands and associated habitats in accordance with the USFWS recommendations for NASK to assist the NRM in proper management of wetlands and to identify management measures that will enhance wetland functions and/or the military mission (Navy 2008).
 - (3) Use bioengineering techniques where restoration or enhancement opportunities exist to improve wetland function and stabilize compromised streambanks, and plant using native species. Consider BASH Program requirements for all enhancement/restoration actions identified for The Main Station and NALFOG when identifying sites for shoreline and habitat improvement.

Strategy 1.1.3: Riparian Areas Management

- Projects:**
- Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
 - Project No. 2 – RTE Habitat Management; see Appendix A.
 - Project No. 3 – Invasive Species Control; see Appendix A.
 - Project No. 7 – Habitat Management and Restoration
 - Project No. 8 – Natural Resources Outreach

- Initiatives:**
- (1) Implement riparian enhancement projects in consideration of BASH Program requirements.

Strategy 1.1.4: Coastal Zone Management

- Projects:**
- Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
 - Project No. 2 – RTE Habitat Management; see Appendix A.
 - Project No. 3 – Invasive Species Control; see Appendix A.
 - Project No. 4 – NASK INRMP Update; see Appendix A.
 - Project No. 7 – Habitat Management and Restoration
 - Project No. 8 – Natural Resources Outreach

Initiatives: (1) Minimize impacts of construction activities in the coastal zone through use of appropriate BMPs.

Strategy 1.1.5: Forestry Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 5 – Prescribed Fire Management
Project No. 7 – Habitat Management and Restoration
Project No. 8 – Natural Resources Outreach

Initiatives: (1) Reduce BASH and maintain the health and vigor of the forest ecosystems that are present.

(2) Determine the desired forest condition.

(3) Consider the requirements of the BASH Program in the management of the forest resources at NASK. For safety reasons the BASH Program must adhere to NASK's Air Installations Compatible Use Zone study and decrease the surrounding area's attractiveness to birds and wildlife that increase the risk of an aircraft strike. This includes management of any forest resources in these areas to maintain airfield Clear Zones.

(4) Ensure the conservation, restoration, and/or maintenance of native ecosystem integrity and native biological diversity, to the maximum extent practicable, with consideration of the BASH Program.

Strategy 1.1.6: RTE Plant Species Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.
Project No. 9 -- South Texas Ambrosia Mgmt. Plan & Survey; see Appendix A.

Initiatives: (1) Continue to conduct species survey updates to identify changes in populations and habitat on the properties, as needed. Use species information provided by these surveys to modify management practices. Modification to management practices will be administered by the NRM in consultation with environmental staff at NAVFAC Southeast, and federal and state agency representatives. Black lace cactus (*Echinocereus reichenbachii* var. *albertii*) and slender rushpea are known to occur in Kleberg and Jim Wells counties, Texas. Determining the presence of these species or habitats that could support them at NASK, as well as the other rare, threatened, or endangered plant species identified in Appendix F, Tables F-13 through F-15 of this

document will be specifically targeted in the next NASK biological resources survey and inventory (Project No. 1).

(2) Coordinate with the Environmental Section of the PWD during the planning process for all construction projects at NASK. Review the location and footprint of the project and an analysis of the project against known occurrences of RTE species. During the planning process, it is advised that the NRM review the TPWD Project Coordination and Review Request to obtain information regarding RTE species. Database queries by county or species names can be conducted on the RTE Species of Texas website or specific information can be requested from the Texas Natural Diversity Database. Additionally, the Wildlife Habitat Assessment Program, administered by TPWD, is available to assist project developers in identifying, evaluating, and addressing potential impacts to natural resources of conservation concern in Texas. Guidance on obtaining information on endangered species, important natural resources, project documentation and review, and applicable state and federal regulations, including planning tools and BMPs is available on their website (see text box for link).

(3) Coordinate, and conduct informal or formal consultation if necessary, with the USFWS and/or TPWD as appropriate to determine if Installation actions are likely to jeopardize the continued existence of any endangered or threatened species, or result in the destruction or adverse modification of critical habitat of such species.

(4) Monitor grounds maintenance and landscaping activities conducted in proximity to known populations of South Texas ambrosia to ensure habitat conditions are maintained to preserve this species.

(5) Develop an informational pamphlet for South Texas ambrosia to supplement face-to-face to bring about awareness, education, and protection of this species. It will be disseminated to NASK PWD employees, contractors, and anyone else who conducts grounds maintenance or landscaping activities on the Main Station. Enhancing workers' awareness may prevent further loss and damage and help in the identification of new locations.

(6) Encourage local landowners to search for South Texas ambrosia on their properties. A recent study found that populations located outside of the Main Station are likely to contain some unique clones, suggesting higher diversity of this species than indicated in previous genetic studies. Higher genetic diversity improves the ability of a species to respond to environmental changes or diseases. The identification of unique South Texas ambrosia clones could reduce some of the management burden at NASK (Overath et al. 2013).

(7) Update the 2005 South Texas Ambrosia Management Plan to include comprehensive survey information and recommendations for implementing mowing and prescribed burn regimes that would benefit this species.

Strategy 1.1.7: Wildlife Management and Habitat Enhancement

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.
Project No. 10 – Game Animal Survey; see Appendix A.

Initiatives:

- (1) Conduct censuses of wildlife populations as necessary to monitor the effectiveness of management activities in reaching management goals. These surveys should document the relative abundance of selected species that are indicators of healthy, self-sustaining ecosystems.
- (2) Provide habitat enhancement for wildlife, including habitat that supports RTE species as well as migratory birds, in consideration of BASH Program requirements.
- (3) Coordinate with the USFWS and TPWD regional biologists to develop specific plans addressing Tamaulipan thornscrub habitat on NALFOG.
- (4) Establish conservation partnerships.

Strategy 1.1.8: Fisheries and Aquatic Species Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.

Initiatives:

- (1) Improve fishery resources in consideration of BASH Program requirements.
- (2) Monitor freshwater ponds at the Main Station to determine if supplemental water should be used to maintain water levels to support fisheries.
- (3) Monitor freshwater ponds and wetlands to ensure a 100-foot vegetative buffer is maintained to protect water quality. Ground disturbance should be minimized allowed within these buffer areas.
- (4) Identify and locate jurisdictional waters of the U.S., including wetlands that have the potential to be impacted by activities associated with the military mission, as directed by the CWA.

(5) Minimize impacts of construction activities at NASK. All ground-disturbing activities conducted at NASK will incorporate appropriate stormwater and erosion and sediment controls and will coordinate the timing of land-disturbing activities and implementation of erosion and sedimentation control measures to reduce NPS pollution that could result from those activities. To ensure that such controls are applied consistently, an ESCP will be developed for all land-disturbing activities, as needed in accordance with state regulations.

(6) Maintain routine monitoring in accordance with specifications outlined in the existing National Pollutant Discharge Elimination System (NPDES) Stormwater Permit.

(7) Minimize the impacts of fertilizers and pesticides on water quality using management practices that balance the desire to have aesthetically pleasing grounds while protecting water quality.

(8) Maintain proper function of stormwater control and conveyance structures by frequently removing debris. Litter and yard wastes can clog inlets, catch basins and outlets, lead to overflows, erosion, and unintended flooding, and make these devices ineffective for stormwater pollutant removal.

Strategy 1.1.9: RTE Wildlife Species Management

Projects:

- Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
- Project No. 2 – RTE Habitat Management; see Appendix A.
- Project No. 3 – Invasive Species Control; see Appendix A.
- Project No. 5 – Prescribed Fire Management; see Appendix A.
- Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
- Project No. 7 – Habitat Management and Restoration; see Appendix A.
- Project No. 8 – Natural Resources Outreach; see Appendix A.

Initiatives:

- (1) Continue to evaluate management practices and their effects on ecosystems and wildlife habitat, and continue programs to protect RTE wildlife species and their habitats known to occur at NASK.
- (2) Review management recommendations identified in wildlife survey reports to determine if additional management measures should be implemented for protection of RTE wildlife species known to occur at NASK.
- (3) Seek additional management guidance and recommendations from federal, state, and Navy wildlife biologists for protection of RTE wildlife species and their habitats known to occur at NASK.
- (4) Continue to conduct monitoring programs for wildlife and natural communities at NASK, to keep these inventories up-to-date.
- (5) Coordinate with the Environmental Section of the PWD during the planning process for all construction projects at NASK. Review the location

and footprint of the project and an analysis of the project against known occurrences of RTE species.

(6) Coordinate with the USFWS and TPWD as appropriate to determine if Installation actions are likely to jeopardize the continued existence of any endangered or threatened species, or result in the destruction or adverse modification of critical habitat of such species.

Strategy 1.1.10: Natural Resources Law Enforcement

Projects: There are no INRMP projects directly related to natural resources law enforcement; however, by providing training for natural resources personnel, natural resources law enforcement at NASK will be improved.

Initiatives:

- (1) Develop a wildlife law enforcement program and ensure that personnel are qualified and trained to carry out all assigned duties and responsibilities.
- (2) Enforce federal, state, and Installation laws and regulations pertaining to fish and wildlife.
- (3) Build interagency relationships with National Military Fish and Wildlife Association and USFWS to support the natural resources law enforcement program.
- (4) Identify staffing needs to manage hunting, GIS and natural resources management programs.

Objective 1.2: Achieve no net loss of wetlands.

Strategy 1.2.1 Wetland Management

Projects Project No. 1 -- Biological Resources Survey and Inventory
Project No. 7 – Habitat Management and Restoration

Initiatives

- (1) Provide wetlands identification and management training to natural resources personnel.
- (2) Identify and locate jurisdictional waters of the U.S., including wetlands that have the potential to be impacted by activities associated with the military mission, as directed by the CWA. Complete a survey of wetlands and associated habitats in accordance with the USFWS recommendations for NASK to assist the NRM in proper management of wetlands and to identify management measures that will enhance wetland functions and/or the military mission (Navy 2008).
- (3) Conduct a wetlands delineation for all NASK properties and obtain a jurisdictional determination from USACE. This jurisdictional determination will be used in project planning to avoid impacts to Installation wetlands. Jurisdictional determinations are usually valid for a period of 5 years, after which time the wetland delineation should be repeated to validate the status of Installation wetlands.

(4) Avoid wetland and riparian areas during future construction of structures and other facilities, including roads, unless essential to the military mission. Locate new roads outside riparian areas, whenever possible. Design stream crossings to minimize the area disturbed, and unimproved stream crossings are prohibited.

(5) Implement appropriate wetland mitigation for unavoidable wetland impacts, as authorized and required by the federal and state permit process and the CWA.

Strategy 1.2.2: Wildlife Management and Habitat Enhancement

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.
Project No. 10 – Game Animal Survey; see Appendix A.

Initiatives: (1) Conduct censuses of wildlife populations as necessary to monitor the effectiveness of management activities in reaching management goals. These surveys should document the relative abundance of selected species that are indicators of healthy, self-sustaining ecosystems.

(2) Provide habitat enhancement for wildlife, including habitat that supports RTE species as well as migratory birds, in consideration of BASH Program requirements.

(3) Coordinate with the USFWS and TPWD regional biologists to develop specific plans addressing Tamaulipan thornscrub habitat on Dixie Annex.

(4) Establish conservation partnerships.

Objective 1.3: Improve and enhance water quality by reducing NPS pollution by continuing to implement and update as appropriate, an overall management strategy for the management of stormwater runoff and soil erosion to protect surface water bodies and wetlands.

Strategy 1.3.1 Wetland Management

Projects Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.

Initiatives (1) Use bioengineering techniques where restoration or enhancement opportunities exist to improve wetland function and stabilize compromised streambanks, and plant using native species. Consider BASH Program requirements for all enhancement/restoration actions identified for the Main

Station and NALFOG when identifying sites for shoreline and habitat improvement.

(2) Avoid wetland and riparian areas during future construction of structures and other facilities, including roads, unless essential to the military mission. Locate new roads outside riparian areas, whenever possible. Design stream crossings to minimize the area disturbed, and unimproved stream crossings are prohibited.

(3) Monitor stormwater runoff to ensure wetlands are not negatively impacted by stormwater flows, sedimentation, or erosion.

(4) Maintain regulated buffers around wetland areas to avoid ground-disturbance activities with these areas.

Strategy 1.3.2: Water Quality Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 7 – Habitat Management and Restoration
Project No. 8 – Natural Resources Outreach

Initiatives: (1) Minimize the impacts of fertilizers and pesticides on water quality using management practices that balance the desire to have aesthetically pleasing grounds while protecting water quality.
(2) Maintain routine monitoring in accordance with specifications outlined in the existing NPDES Stormwater Permit.
(3) Maintain proper function of stormwater control and conveyance structures by frequently removing debris. Litter and yard wastes can clog inlets, catch basins and outlets, lead to overflows, erosion, and unintended flooding, and make these devices ineffective for stormwater pollutant removal.

Strategy 1.3.3: Agricultural Outleasements Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 8 – Natural Resources Outreach

Initiatives: (1) Regularly review all existing and future agricultural outleasements to ensure that there are no conflicts between natural resources management recommendations made in this INRMP and the agricultural outlease contracts, especially in regards to crop selection and the use of pesticides/herbicides.
(2) Ensure that all agricultural outleasements are updated as required by FAA guidelines or DoD instructions.
(3) Consider haying versus planting of certain types of row crops in the agricultural outlease areas with regard to the BASH Program requirements.

Evaluate whether to take the agricultural outlease areas out of production and include them in a mowing contract.

Objective 1.4: Preserve, protect, and enhance water resources (e.g. wetlands, surface water, groundwater), including protection of undisturbed acreage located with 100-year floodplain areas and management of coastal zone resources.

Strategy 1.4.1 Protection of watersheds and floodplains at NASK

Projects None

Initiatives (1) Avoid activities, particularly vegetation clearing and ground-disturbing activities that would adversely affect flood attenuation.

(2) Clear stream or drainage blockages such as beaver dams or obstructed culverts that could result in increased flood levels or prevent flood waters from subsiding. This effort is the responsibility of the Public Works Department, with assistance provided by the NRM.

Strategy 1.4.2 Wetland Management

Projects Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.

Initiatives (1) Provide wetlands identification and management training to natural resources personnel.

(2) Identify and locate jurisdictional waters of the U.S., including wetlands that have the potential to be impacted by activities associated with the military mission, as directed by the CWA. Complete a survey of wetlands and associated habitats in accordance with the USFWS recommendations for NASK to assist the NRM in proper management of wetlands and to identify management measures that will enhance wetland functions and/or the military mission (Navy 2008).

(3) Conduct a wetlands delineation for all NASK properties and obtain a jurisdictional determination from USACE. This jurisdictional determination will be used in project planning to avoid impacts to Installation wetlands. Jurisdictional determinations are usually valid for a period of 5 years, after which time the wetland delineation should be repeated to validate the status of Installation wetlands.

(4) Avoid wetland and riparian areas during future construction of structures and other facilities, including roads, unless essential to the military mission. Locate new roads outside riparian areas, whenever possible. Design stream crossings to minimize the area disturbed, and unimproved stream crossings are prohibited.

Strategy 1.4.3: Riparian Areas Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.

Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 7 – Habitat Management and Restoration
Project No. 8 – Natural Resources Outreach

- Initiatives:**
- (1) Implement riparian enhancement projects in consideration of BASH Program requirements.
 - (2) Avoid and minimize impacts to vegetated buffer areas along streams and other waterbodies during disturbance activities through use of appropriate BMPs.

Strategy 1.4.4: Water Quality Management

Projects:

Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 7 – Habitat Management and Restoration
Project No. 8 – Natural Resources Outreach

- Initiatives:**
- (1) Minimize impacts of construction activities at NASK. All ground-disturbing activities conducted at NASK will incorporate appropriate stormwater and erosion and sediment controls and will coordinate the timing of land-disturbing activities and implementation of erosion and sedimentation control measures to reduce NPS pollution that could result from those activities. To ensure that such controls are applied consistently, an ESCP will be developed for all land-disturbing activities, as needed in accordance with state regulations.

Strategy 1.4.5: Coastal Zone Management

Projects:

Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 7 – Habitat Management and Restoration
Project No. 8 – Natural Resources Outreach

- Initiatives:**
- (1) Conduct a federal consistency review for any activity that may affect the natural resources in the Texas Coastal Zone, and include coordination with the Texas Land Office to ensure consistency with CZMA and the TCELCP.
 - (2) Consider and be aware of any Installation activities that could impact the Texas Coastal Zone, including but not limited to sedimentation problems, and activities that could affect wetlands and habitats for RTE species, which are covered under the Texas Coastal and Estuarine Land Conservation Program (TCELCP), and if necessary coordinate with the Texas Land Office.

Strategy 1.4.6: Fisheries and Aquatic Species Management

Projects:

Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.

Project No. 4 – NASK INRMP Update; see Appendix A.

Project No. 7 – Habitat Management and Restoration; see Appendix A.

Project No. 8 – Natural Resources Outreach; see Appendix A.

Initiatives:

(1) Improve fishery resources in consideration of BASH Program requirements.

(2) Monitor freshwater ponds at the Main Station to determine if supplemental water should be used to maintain water levels to support fisheries.

(3) Monitor freshwater ponds and wetlands to ensure a 100-foot vegetative buffer is maintained to protect water quality. Ground disturbance should be minimized allowed within these buffer areas.

(4) Identify and locate jurisdictional waters of the U.S., including wetlands that have the potential to be impacted by activities associated with the military mission, as directed by the CWA.

(5) Minimize impacts of construction activities at NASK. All ground-disturbing activities conducted at NASK will incorporate appropriate stormwater and erosion and sediment controls and will coordinate the timing of land-disturbing activities and implementation of erosion and sedimentation control measures to reduce NPS pollution that could result from those activities. To ensure that such controls are applied consistently, an ESCP will be developed for all land-disturbing activities, as needed in accordance with state regulations.

(6) Maintain routine monitoring in accordance with specifications outlined in the existing NPDES Stormwater Permit.

(7) Minimize the impacts of fertilizers and pesticides on water quality using management practices that balance the desire to have aesthetically pleasing grounds while protecting water quality.

(8) Maintain proper function of stormwater control and conveyance structures by frequently removing debris. Litter and yard wastes can clog inlets, catch basins and outlets, lead to overflows, erosion, and unintended flooding, and make these devices ineffective for stormwater pollutant removal.

Objective 1.5: Maintain vegetation to reduce BASH potential.

Strategy 1.5.1: Management of Vegetation to Reduce BASH Potential

Projects:

Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.

Project No. 2 – RTE Habitat Management; see Appendix A.

Project No. 3 – Invasive Species Control; see Appendix A.

Project No. 4 – NASK INRMP Update; see Appendix A.

Project No. 5 – Prescribed Fire Management; see Appendix A.

Project No. 7 – Habitat Management and Restoration

Project No. 8 – Natural Resources Outreach

- Initiatives:**
- (1) Conduct careful management of wetlands and open water located in proximity to NASK airfields in order to reduce their potential to attract wildlife and contribute to BASH.
 - (2) Schedule mowing around the airfield when grass height approaches high end and mow grass to low end of height threshold. Integrate the mowing schedule into the grounds maintenance contract.
 - (3) Coordinate implementation of any INRMP projects that have the potential to conflict with BASH Program requirements with the USDA wildlife biologist responsible for implementing the BASH Program.

Strategy 1.5.2: Agricultural Outleasements Management

- Projects:**
- Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
 - Project No. 2 – RTE Habitat Management; see Appendix A.
 - Project No. 4 – NASK INRMP Update; see Appendix A.
 - Project No. 8 – Natural Resources Outreach

- Initiatives:**
- (1) Regularly review all existing and future agricultural outleasements to ensure that there are no conflicts between natural resources management recommendations made in this INRMP and the agricultural outlease contracts, especially in regard to crop selection and the use of pesticides/herbicides.
 - (2) Ensure that all agricultural outleasements are updated as required by FAA guidelines or DoD instructions.
 - (3) Consider haying versus planting of certain types of row crops in the agricultural outlease areas regarding the BASH Program requirements. Evaluate whether to take the agricultural outlease areas out of production and include them in a mowing contract.

Strategy 1.5.3: Wildland Fire Management

- Projects:**
- Project No. 4 – NASK INRMP Update; see Appendix A.
 - Project No. 5 – Prescribed Fire Management; see Appendix A.
 - Project No. 7 – Habitat Management and Restoration; see Appendix A.
 - Project No. 8 – Natural Resources Outreach; see Appendix A.

- Initiatives:**
- (1) Maintain vegetation to reduce wildland fire hazards and BASH potential.
 - (2) Control wildland fires with fire breaks and understory vegetation management.
 - (3) Implement prescribed burns where consistent with the mission, sound ecological practices, and safety considerations.

Strategy 1.5.4: BASH Reduction

- Projects:**
- Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
 - Project No. 2 – RTE Habitat Management; see Appendix A.
 - Project No. 4 – NASK INRMP Update; see Appendix A.

Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
Project No. 7 – Habitat Management and Restoration
Project No. 8 – Natural Resources Outreach
Project No. 10 – Game Animal Survey; see Appendix A.

Initiatives:

- (1) Discourage ponding of water within areas in proximity to the airfield to minimize attracting migratory birds and other wildlife, and to minimize the BASH potential for this parcel.
- (2) Implement habitat enhancement and maintain habitat diversity for migratory bird species, consistent with BASH Program requirements. Recommendations for habitat enhancement should be made to attract birds and other wildlife away from the flight operations areas.
- (3) Prevent larger game species from accessing the airfield through the installation of a security fence around NALFOG.
- (4) Maintain a Migratory Bird Depredation Permit from the USFWS to allow harm to migratory birds as part of BASH Program requirements, and to maintain airfield safety.
- (5) Map habitat types around the airfield using a GPS unit and enter information into the GIS database.
- (6) Review agricultural outleases and work with lessees to increase compliance with provisions to reduce BASH potential through crop selection.
- (7) Establish procedures for the BASH contact person to inform the Navy personnel responsible for the Installation's database of incidents.
- (8) Procure and maintain BASH response equipment (i.e., propane cans, electronic scare devices, calls).
- (9) Conduct initial BASH training workshop for staff members with refresher training as needed.

Objective 1.6: Maintain vegetation to reduce wildland fire hazards.

Strategy 1.6.1: Wildland Fire Management

Projects: Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.

Initiatives: (1) Maintain vegetation to reduce wildland fire hazards and BASH potential.
(2) Control wildland fires with fire breaks and understory vegetation management.

(3) Implement prescribed burns where consistent with the mission, sound ecological practices, and safety considerations.

Objective 1.7: Maintain and enhance native vegetation, including forest habitats, to promote community diversity; and to control and monitor noxious, invasive, and exotic plant species.

Strategy 1.7.1: Invasive Plant and Noxious Weed Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.
Project No. 9 – South Texas Ambrosia Mgmt. Plan & Survey; see Appendix A.

Initiatives: (1) Manage invasive species on the Installation by mowing, chemical control, and removal by mechanical or manual means, or a combination of control methods used to control exotic and invasive species.

(2) Control and eradicate non-native species of plants and replace them with regionally native plants to restore wildlife habitat and native ground cover.

(3) Ensure that the use of herbicides to remove invasive and exotic plants will be conducted in accordance with federal and state laws regulating the laws of pesticides.

Strategy 1.7.2: Agricultural Outleases Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 8 – Natural Resources Outreach

Initiatives: (1) Regularly review all existing and future agricultural outleases to ensure that there are no conflicts between natural resources management recommendations made in this INRMP and the agricultural outlease contracts, especially in regards to crop selection and the use of pesticides/herbicides.

(2) Ensure that all agricultural outleases are updated as required by FAA guidelines or DoD instructions.

(3) Consider haying versus planting of certain types of row crops in the agricultural outlease areas with regard to the BASH Program requirements. Evaluate whether to take the agricultural outlease areas out of production and include them in a mowing contract.

Strategy 1.7.3: Wildland Fire Management

Projects: Project No. 2 – RTE Habitat; see Appendix A.

Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.
Project No. 9 – South Texas Ambrosia Mgmt. Plan & Survey; see Appendix A.

- Initiatives:**
- (2) Control wildland fires with fire breaks and understory vegetation management.
 - (3) Implement prescribed burns where consistent with the mission, sound ecological practices, and safety considerations.
 - (4) Implement prescribed burns in consideration of locations of South Texas ambrosia at NAS Kingsville.

Strategy 1.7.4: Forestry Management

Projects:

Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 5 – Prescribed Fire Management
Project No. 7 – Habitat Management and Restoration
Project No. 8 – Natural Resources Outreach

- Initiatives:**
- (1) Because none of the properties associated with NASK contain substantial forested habitats, the focus of forestry management at NASK is directed towards BASH reduction and maintaining the health and vigor of the forest ecosystems that are present.
 - (2) Determine the desired forest condition.
 - (3) Consider the requirements of the BASH Program in the management of the forest resources at NASK. For safety reasons the BASH Program must adhere to NASK's Air Installations Compatible Use Zone study and decrease the surrounding area's attractiveness to birds and wildlife that increase the risk of an aircraft strike. This includes management of any forest resources in these areas to maintain airfield Clear Zones.
 - (4) Insure the conservation, restoration, and/or maintenance of native ecosystem integrity and native biological diversity, to the maximum extent practicable, with consideration of the BASH Program.

Strategy 1.7.5: RTE Plant Species Management

Projects:

Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.

Project No. 8 – Natural Resources Outreach; see Appendix A.

Project No. 9 -- South Texas Ambrosia Mgmt. Plan & Survey; see Appendix A.

Initiatives:

(1) Continue to conduct species survey updates to identify changes in populations and habitat on the properties, as needed. Use species information provided by these surveys to modify management practices, if necessary. Modification to management practices will be administered by the NRM in consultation with environmental staff at NAVFAC Southeast, and federal and state agency representatives. Black lace cactus (*Echinocereus reichenbachii* var. *albertii*) and slender rush-pea are known to occur in Kleberg and Jim Wells counties, Texas. Determining the presence of these species or habitats that could support them at NASK, as well as the other rare, threatened, or endangered plant species identified in Appendix F, Tables F-13 through F-15 of this document will be specifically targeted in the next NASK biological resources survey and inventory (Project No. 1).

(2) Coordinate with the Environmental Section of the PWD during the planning process for all construction projects at NASK. Review the location and footprint of the project and an analysis of the project against known occurrences of RTE species. During the planning process, it is advised that the NRM review the TPWD Project Coordination and Review Request to obtain information regarding RTE species. Database queries by county or species names can be conducted on the RTE Species of Texas website or specific information can be requested from the Texas Natural Diversity Database. Additionally, the Wildlife Habitat Assessment Program, administered by TPWD, is available to assist project developers in identifying, evaluating, and addressing potential impacts to natural resources of conservation concern in Texas. Guidance on obtaining information on endangered species, important natural resources, project documentation and review, and applicable state and federal regulations, including planning tools and BMPs is available on their website (see text box for link).

(3) Coordinate, and conduct informal or formal consultation if necessary, with the USFWS and/or TPWD as appropriate to determine if Installation actions are likely to jeopardize the continued existence of any endangered or threatened species, or result in the destruction or adverse modification of critical habitat of such species.

(4) Monitor grounds maintenance and landscaping activities conducted in proximity to known populations of South Texas ambrosia to ensure habitat conditions are maintained to preserve this species.

(5) Develop an informational pamphlet for South Texas ambrosia to supplement face-to-face to bring about awareness, education, and protection of this species. It will be disseminated to NASK PWD employees, contractors, and anyone else who conducts grounds maintenance or landscaping activities on the Main Station. Enhancing workers' awareness may prevent further loss and damage and help in the identification of new locations.

(6) Encourage local landowners to search for South Texas ambrosia on their properties. A recent study found that populations located outside of the Main Station are likely to contain some unique clones, suggesting higher diversity of this species than indicated in previous genetic studies. Higher genetic diversity improves the ability of a species to respond to environmental changes or diseases. The identification of unique South Texas ambrosia clones could reduce some of the management burden at NASK (Overath et al. 2013).

(7) Update the 2005 South Texas Ambrosia Management Plan to include comprehensive survey information and recommendations for implementing mowing and prescribed burn regimes that would benefit this species.

Strategy 1.7.6: Wildlife Management and Habitat Enhancement

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.
Project No. 9 – South Texas Ambrosia Mgmt. Plan & Survey; see Appendix A.

Initiatives: (1) Conduct censuses of wildlife populations as necessary to monitor the effectiveness of management activities in reaching management goals. These surveys should document the relative abundance of selected species that are indicators of healthy, self-sustaining ecosystems.

(2) Provide habitat enhancement for wildlife, including habitat that supports RTE species as well as migratory birds, in consideration of BASH Program requirements.

(3) Coordinate with the USFWS and TPWD regional biologists to develop specific plans addressing Tamaulipan thornscrub habitat on NALFOG.

(4) Establish conservation partnerships.

Objective 1.8: Implement environmentally beneficial and cost-effective landscaping and grounds maintenance practices.

Strategy 1.8.1: Grounds Maintenance and Landscaping Management

Projects: Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.
Project No. 9 – South Texas Ambrosia Mgmt. Plan & Survey; see Appendix A.

- Initiatives:**
- (1) Use regionally native plant species and beneficial landscaping practices to the extent practicable. Use supplemental plantings of native trees and shrubs in maintained open areas and around building and recreational areas where consistent with current and planned land uses and the NASK BASH Program, to help enhance habitat diversity, control erosion, and meet wildlife management objectives. Native trees, shrubs, and herbaceous species should be selected that are adaptable, drought tolerant and conserve water.
 - (2) Avoid application of fertilizers because increased nutrients may result in colonization by more aggressive, nutrient demanding species. When nutrients are added to the system either by exposing new soil or through fertilization, optimum growing conditions for the specialized target flora are compromised.
 - (3) Preserve ground cover and natural drainage, using drainage channels and retention ponds instead of a closed, expensive system.
 - (4) Use native plant material instead of manmade controls for controlling erosion.
 - (5) Use native groundcover and shrubs instead of turf wherever possible to reduce maintenance and irrigation requirements.
 - (6) Revegetate disturbed areas with indigenous plant materials that promote wildlife habitat and minimize erosion and runoff. Although Bermuda grass is listed in seed mixtures, this species and other introduced species should be avoided as much as possible.

Strategy 1.8.2: Agricultural Outleases Management

- Projects:**
- Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
 - Project No. 2 – RTE Habitat; see Appendix A.
 - Project No. 4 – NASK INRMP Update; see Appendix A.
 - Project No. 8 – Natural Resources Outreach

- Initiatives:**
- (1) Regularly review all existing and future agricultural outleases to ensure that there are no conflicts between natural resources management recommendations made in this INRMP and the agricultural outlease contracts, especially in regards to crop selection and the use of pesticides/herbicides.
 - (2) Ensure that all agricultural outleases are updated as required by FAA guidelines or DoD instructions.
 - (3) Consider haying versus planting of certain types of row crops in the agricultural outlease areas regarding the BASH Program requirements. Evaluate whether to take the agricultural outlease areas out of production and include them in a mowing contract.

Objective 1.9: Protect and promote sustainable management of forest resources.

Strategy 1.9.1: Forestry Management

- Projects:**
- Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.

Project No. 2 – RTE Habitat Management; see Appendix A.

Project No. 3 – Invasive Species Control; see Appendix A.

Project No. 4 – NASK INRMP Update; see Appendix A.

Project No. 5 – Prescribed Fire Management; see Appendix A.

Project No. 7 – Habitat Management and Restoration; see Appendix A.

Project No. 8 – Natural Resources Outreach; see Appendix A.

Initiatives:

(1) Because none of the properties associated with NASK contain substantial forested habitats, the focus of forestry management at NASK is directed towards BASH reduction and maintaining the health and vigor of the forest ecosystems that are present.

(2) Determine the desired forest condition.

(3) Consider the requirements of the BASH Program in the management of the forest resources at NASK. For safety reasons the BASH Program must adhere to NASK's Air Installations Compatible Use Zone study and decrease the surrounding area's attractiveness to birds and wildlife that increase the risk of an aircraft strike. This includes management of any forest resources in these areas to maintain airfield Clear Zones.

(4) Insure the conservation, restoration, and/or maintenance of native ecosystem integrity and native biological diversity, to the maximum extent practicable, with consideration of the BASH Program.

Objective 1.10: Manage forest habitats to promote use by a diverse range of wildlife species, including protection of mature tree stands and snags; protection of tree species that provide suitable nesting and foraging habitat for wildlife; and maintenance of wildlife travel corridors, streamside protection, and aesthetic buffer zones.

Strategy 1.10.1: Forestry Management

Projects:

Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.

Project No. 2 – RTE Habitat Management; see Appendix A.

Project No. 3 – Invasive Species Control; see Appendix A.

Project No. 4 – NASK INRMP Update; see Appendix A.

Project No. 5 – Prescribed Fire Management; see Appendix A.

Project No. 7 – Habitat Management and Restoration; see Appendix A.

Project No. 8 – Natural Resources Outreach; see Appendix A.

Initiatives:

(1) Reduce BASH and maintain the health and vigor of the forest ecosystems that are present.

(2) Determine the desired forest condition.

(3) Consider the requirements of the BASH Program in the management of the forest resources at NASK. For safety reasons the BASH Program must adhere to NASK's Air Installations Compatible Use Zone study and decrease the surrounding area's attractiveness to birds and wildlife that increase the

risk of an aircraft strike. This includes management of any forest resources in these areas to maintain airfield Clear Zones.

(4) Insure the conservation, restoration, and/or maintenance of native ecosystem integrity and native biological diversity, to the maximum extent practicable, with consideration of the BASH Program.

Strategy 1.10.2: Wildlife Management and Habitat Enhancement

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.
Project No. 10 – Game Animal Survey; see Appendix A.

Initiatives: (1) Conduct censuses of wildlife populations as necessary to monitor the effectiveness of management activities in reaching management goals. These surveys should document the relative abundance of selected species that are indicators of healthy, self-sustaining ecosystems.

(2) Provide habitat enhancement for wildlife, including habitat that supports RTE species as well as migratory birds, in consideration of BASH Program requirements.

(3) Coordinate with the USFWS and TPWD regional biologists to develop specific plans addressing Tamaulipan thornscrub habitat on Dixie Annex.

(4) Establish conservation partnerships.

Strategy 1.10.3: Migratory Bird Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.
Project No. 10 – Game Animal Survey; see Appendix A.

Initiatives: (1) Reduce pesticide use on the Installation.

(2) Implement habitat enhancement and maintain habitat diversity for migratory bird species, consistent with BASH Program requirements. Recommendations for habitat enhancement should be made to attract birds and other wildlife away from the flight operations areas. Additionally,

modification to habitat should also take into consideration bird nesting and breeding seasons so as not to conflict with the MBTA.

- (3) Conduct bird surveys to monitor the bird populations at NASK.
- (4) Control invasive bird species that compete with native migratory bird species and their habitats.
- (5) Maintain a Migratory Bird Depredation Permit from the USFWS to allow harm to migratory birds as part of BASH Program requirements, and to maintain airfield safety.
- (6) Locate military readiness activities to avoid or minimize impacts on migratory birds, where possible. If NASK notes clear evidence of a take as a result of military readiness activities, the NASK NRM will document the take, evaluate these activities, and where practicable, reduce or eliminate the take of migratory birds.
- (7) Maintain compliance with the MBTA for all non-military readiness activities.
- (8) Request assistance from the DoD PIF Work Group, as needed, to assist and support military installations in migratory bird conservation while protecting the military mission.
- (9) Develop partnerships with federal, state, and local agencies, universities, and NGOs such as the National Audubon Society to enter into conservation partnerships, allow for bird research on the Installation, conduct monitoring surveys, and participate in International Migratory Bird Day.

Strategy 1.10.4: RTE Wildlife Species Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.

Initiatives:

- (1) Continue to evaluate management practices and their effects on ecosystems and wildlife habitat, and continue programs to protect RTE wildlife species and their habitats known to occur at NASK.
- (2) Review management recommendations identified in wildlife survey reports to determine if additional management measures should be implemented for protection of RTE wildlife species known to occur at NASK.
- (3) Seek additional management guidance and recommendations from federal, state, and Navy wildlife biologists for protection of RTE wildlife species and their habitats known to occur at NASK.

(4) Continue to conduct monitoring programs for wildlife and natural communities at NASK, to keep these inventories up-to-date.

(5) Coordinate with the Environmental Section of the PWD during the planning process for all construction projects at NASK. Review the location and footprint of the project and an analysis of the project against known occurrences of RTE species.

(6) Coordinate with the USFWS and/or TPWD as appropriate to determine if Installation actions are likely to jeopardize the continued existence of any endangered or threatened species, or result in the destruction or adverse modification of critical habitat of such species.

Objective 1.11: Ensure that land management and land use decisions, including agricultural outleases, comply with all applicable laws, executive orders, regulations, directives, and instructions, and that adverse impacts to the natural environment are minimized.

Strategy 1.11.1: Agricultural Outleases Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.

Initiatives: (1) Regularly review all existing and future agricultural outleases to ensure that there are no conflicts between natural resources management recommendations made in this INRMP and the agricultural outlease contracts, especially in regards to crop selection and the use of pesticides/herbicides.
(2) Ensure that all agricultural outleases are updated as required by FAA guidelines or DoD instructions.
(3) Consider haying versus planting of certain types of row crops in the agricultural outlease areas with regard to the BASH Program requirements. Evaluate whether to take the agricultural outlease areas out of production and include them in a mowing contract.

Strategy 1.11.2: RTE Wildlife Species Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.

Initiatives: (1) Continue to evaluate management practices and their effects on ecosystems and wildlife habitat, and continue programs to protect RTE wildlife species and their habitats known to occur at NASK.

- (2) Review management recommendations identified in wildlife survey reports to determine if additional management measures should be implemented for protection of RTE wildlife species known to occur at NASK.
- (3) Seek additional management guidance and recommendations from federal, state, and Navy wildlife biologists for protection of RTE wildlife species and their habitats known to occur at NASK.
- (4) Continue to conduct monitoring programs for wildlife and natural communities at NASK, to keep these inventories up-to-date.
- (5) Coordinate with the Environmental Section of the PWD during the planning process for all construction projects at NASK. Review the location and footprint of the project and an analysis of the project against known occurrences of RTE species.
- (6) Coordinate with the USFWS and/or TPWD as appropriate to determine if Installation actions are likely to jeopardize the continued existence of any endangered or threatened species, or result in the destruction or adverse modification of critical habitat of such species.

Issue: Human activities at NASK and in the surrounding community have removed native vegetative communities and altered natural habitats. Environmental resources on the Installation provide vital habitat for fish and wildlife, especially in view of the considerable development and economic growth surrounding the Installation. To protect and maintain wildlife habitats while ensuring the continuation of the military mission, NASK will implement practices to meet the following objective:

Objective 1.12: Protect, conserve, and promote habitat for native terrestrial and aquatic fauna, consistent with BASH Program requirements.

Strategy 1.12.1: Management of Vegetation to Reduce BASH Potential

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 7 – Habitat Management and Restoration
Project No. 8 – Natural Resources Outreach

Initiatives: (1) Map habitat types around the airfield using a global positioning system (GPS) unit and enter information into the GIS database.
(2) Establish procedures for the BASH contact person to inform the Navy personnel responsible for the Installation's database of incidents.
(3) Coordinate implementation of any INRMP projects that have the potential to conflict with BASH Program requirements with the USDA wildlife biologist responsible for implementing the BASH Program.

(4) Conduct a BASH training workshop for staff members, and provide refresher training as needed.

(5) Procure and maintain BASH response equipment (i.e., propane cans, electronic scare devices, calls).

Strategy 1.12.2: Wildlife Management and Habitat Enhancement

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.
Project No. 10 – Game Animal Survey; see Appendix A.

Initiatives: (1) Conduct censuses of wildlife populations as necessary to monitor the effectiveness of management activities in reaching management goals. These surveys should document the relative abundance of selected species that are indicators of healthy, self-sustaining ecosystems.

(2) Provide habitat enhancement for wildlife, including habitat that supports RTE species as well as migratory birds, in consideration of BASH Program requirements.

(3) Coordinate with the USFWS and TPWD regional biologists to develop specific plans addressing Tamaulipan thornscrub habitat on NALFOG.

(4) Establish conservation partnerships.

Strategy 1.12.3: Migratory Bird Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.
Project No. 10 – Game Animal Survey; see Appendix A.

Initiatives: (1) Reduce pesticide use on the Installation.

(2) Implement habitat enhancement and maintain habitat diversity for migratory bird species, consistent with BASH Program requirements. Recommendations for habitat enhancement should be made to attract birds and other wildlife away from the flight operations areas. Additionally, modification to habitat should also take into consideration bird nesting and breeding seasons so as not to conflict with the MBTA.

- (3) Conduct bird surveys to monitor the bird populations at NASK.
- (4) Control invasive bird species that compete with native migratory bird species and their habitats.
- (5) Maintain a Migratory Bird Depredation Permit from the USFWS to allow harm to migratory birds as part of BASH Program requirements, and to maintain airfield safety.
- (6) Locate military readiness activities to avoid or minimize impacts on migratory birds, where possible. If NASK notes clear evidence of a take as a result of military readiness activities, the NASK NRM will document the take, evaluate these activities, and where practicable, reduce or eliminate the take of migratory birds.
- (7) Maintain compliance with the MBTA for all non-military readiness activities.
- (8) Request assistance from the DoD PIF Work Group, as needed, to assist and support military installations in migratory bird conservation while protecting the military mission.
- (9) Develop partnerships with federal, state, and local agencies, universities, and NGOs such as the National Audubon Society to enter into conservation partnerships, allow for bird research on the Installation, conduct monitoring surveys, and participate in International Migratory Bird Day.

Strategy 1.12.4: BASH Reduction

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
Project No. 7 – Habitat Management and Restoration
Project No. 8 – Natural Resources Outreach
Project No. 10 – Game Animal Survey; see Appendix A.

Initiatives:

- (1) Discourage ponding of water within areas in proximity to the airfield to minimize attracting migratory birds and other wildlife, and to minimize the BASH potential for this parcel.
- (2) Implement habitat enhancement and maintain habitat diversity for migratory bird species, consistent with BASH Program requirements. Recommendations for habitat enhancement should be made to attract birds and other wildlife away from the flight operations areas.
- (3) Prevent larger game species from accessing the airfield through the installation of a security fence around NALFOG.

- (4) Maintain a Migratory Bird Depredation Permit from the USFWS to allow harm to migratory birds as part of BASH Program requirements, and to maintain airfield safety.
- (5) Map habitat types around the airfield using a GPS unit and enter information into the GIS database.
- (6) Review agricultural outleases and work with lessees to increase compliance with provisions to reduce BASH potential through crop selection.
- (7) Establish procedures for the BASH contact person to inform the Navy personnel responsible for the Installation's database of incidents.
- (8) Procure and maintain BASH response equipment (i.e., propane cans, electronic scare devices, calls).
- (9) Conduct initial BASH training workshop for staff members with refresher training as needed.

Strategy 1.12.5: RTE Wildlife Species Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.

Initiatives:

- (1) Continue to evaluate management practices and their effects on ecosystems and wildlife habitat, and continue programs to protect RTE wildlife species and their habitats known to occur at NASK.
- (2) Review management recommendations identified in wildlife survey reports to determine if additional management measures should be implemented for protection of RTE wildlife species known to occur at NASK.
- (3) Seek additional management guidance and recommendations from federal, state, and Navy wildlife biologists for protection of RTE wildlife species and their habitats known to occur at NASK.
- (4) Continue to conduct monitoring programs for wildlife and natural communities at NASK, to keep these inventories up-to-date.
- (5) Coordinate with the Environmental Section of the PWD during the planning process for all construction projects at NASK. Review the location and footprint of the project and an analysis of the project against known occurrences of RTE species.
- (6) Coordinate with the USFWS and/or TPWD as appropriate to determine if Installation actions are likely to jeopardize the continued existence of any

endangered or threatened species, or result in the destruction or adverse modification of critical habitat of such species.

Issue: Occasionally, nuisance wildlife species (e.g., feral cats, wild hog, and some bird species) become overpopulated or congregate in areas creating a threat to human health and/or the military mission. In such cases, these wildlife species must be controlled to prevent problems. To protect, maintain, and restore habitat for native plants and wildlife, while preventing nuisance wildlife from negatively impacting quality of life and the military mission, NASK will implement programs to address the following objective:

Objective 1.13: Prevent and control invasive and nuisance wildlife species, and wildlife diseases that may adversely affect human health and welfare, the health of the ecosystem, and the military mission.

Strategy 1.13.1: Wildlife Management and Habitat Enhancement

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.
Project No. 10 – Game Animal Survey; see Appendix A.

Initiatives:

- (1) Conduct censuses of wildlife populations as necessary to monitor the effectiveness of management activities in reaching management goals. These surveys should document the relative abundance of selected species that are indicators of healthy, self-sustaining ecosystems.
- (2) Provide habitat enhancement for wildlife, including habitat that supports RTE species as well as migratory birds, in consideration of BASH Program requirements.
- (3) Coordinate with the USFWS and TPWD regional biologists to develop specific plans addressing Tamaulipan thornscrub habitat on NALFOG.
- (4) Establish conservation partnerships.

Strategy 1.13.2: Fisheries and Aquatic Species Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.

Initiatives: (1) Improve fishery resources in consideration of BASH Program requirements.

- (2) Monitor freshwater ponds at the Main Station to determine if supplemental water should be used to maintain water levels to support fisheries.
- (3) Monitor freshwater ponds and wetlands to ensure a 100-foot vegetative buffer is maintained to protect water quality. Ground disturbance should be minimized allowed within these buffer areas.
- (4) Identify and locate jurisdictional waters of the U.S., including wetlands that have the potential to be impacted by activities associated with the military mission, as directed by the CWA.
- (5) Minimize impacts of construction activities at NASK. All ground-disturbing activities conducted at NASK will incorporate appropriate stormwater and erosion and sediment controls and will coordinate the timing of land-disturbing activities and implementation of erosion and sedimentation control measures to reduce NPS pollution that could result from those activities. To ensure that such controls are applied consistently, an ESCP will be developed for all land-disturbing activities, as needed in accordance with state regulations.
- (6) Maintain routine monitoring in accordance with specifications outlined in the existing NPDES Stormwater Permit.
- (7) Minimize the impacts of fertilizers and pesticides on water quality using management practices that balance the desire to have aesthetically pleasing grounds while protecting water quality.
- (8) Maintain proper function of stormwater control and conveyance structures by frequently removing debris. Litter and yard wastes can clog inlets, catch basins and outlets, lead to overflows, erosion, and unintended flooding, and make these devices ineffective for stormwater pollutant removal.

Strategy 1.13.3: BASH Reduction

Projects:

- Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
- Project No. 2 – RTE Habitat Management; see Appendix A.
- Project No. 4 – NASK INRMP Update; see Appendix A.
- Project No. 5 – Prescribed Fire Management; see Appendix A.
- Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
- Project No. 7 – Habitat Management and Restoration
- Project No. 8 – Natural Resources Outreach
- Project No. 10 – Game Animal Survey; see Appendix A.

Initiatives:

- (1) Discourage ponding of water within areas in proximity to the airfield to minimize attracting migratory birds and other wildlife, and to minimize the BASH potential for this parcel.
- (2) Implement habitat enhancement and maintain habitat diversity for migratory bird species, consistent with BASH Program requirements.

Recommendations for habitat enhancement should be made to attract birds and other wildlife away from the flight operations areas.

(3) Prevent larger game species from accessing the airfield through the installation of a security fence around NALFOG.

(4) Maintain a Migratory Bird Depredation Permit from the USFWS to allow harm to migratory birds as part of BASH Program requirements, and to maintain airfield safety.

(5) Map habitat types around the airfield using a GPS unit and enter information into the GIS database.

(6) Review agricultural outleases and work with lessees to increase compliance with provisions to reduce BASH potential through crop selection.

(7) Establish procedures for the BASH contact person to inform the Navy personnel responsible for the Installation's database of incidents.

(8) Procure and maintain BASH response equipment (i.e., propane cans, electronic scare devices, calls).

(9) Conduct initial BASH training workshop for staff members with refresher training as needed.

Strategy 1.13.4: Invasive and Nuisance Wildlife Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
Project No. 7 – Habitat Management and Restoration
Project No. 8 – Natural Resources Outreach
Project No. 10 – Game Animal Survey; see Appendix A.

Initiatives: (1) Maintain a hunting program for large game animals to minimize BASH potential at NAS Kingsville and NALFOG. Management of nuisance species, including trapping of wild hog, should be allowed to continue at NALFOG.

Strategy 1.13.5: Zoonosis Prevention

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 8 – Natural Resources Outreach

Initiatives: (1) Develop a system for alerting Installation residents and employees of any public health alerts as they arise.

(2) Develop an informational pamphlet or fact sheet on the zoonosis diseases of concern for Texas and highlighting measures to prevent their spread.

(3) The NRM should look for educational outreach opportunities to disseminate information on preventing the spread of the zoonosis diseases of concern in Texas, and alerting Installation residents and employees of any public health alerts as they arise. The information provided in Appendix J can be used to develop a pamphlet or fact sheet for zoonosis prevention at NASK.

Issue: Federally or state-listed plant and animal species that occur at NASK have been identified as conservation priorities and require special protection efforts. Managing federally listed as threatened or endangered is important to achieving no net loss to the military mission. To provide for protection and conservation of the state and federal rare, threatened or endangered species known or with the potential to occur at NASK, NASK will implement programs to address the following objective:

Objective 1.14: Provide adequate special management or protection of threatened, endangered, and rare plant and animal species; significant rare communities; and at-risk plant and wildlife species and their habitats.

Strategy 1.14.1: Invasive Plant and Noxious Weed Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.
Project No. 9 – South Texas Ambrosia Mgmt. Plan & Survey; see Appendix A.

Initiatives: (1) Manage invasive species on the Installation by mowing, chemical control, and removal by mechanical or manual means, or a combination of control methods used to control exotic and invasive species.

(2) Control and eradicate non-native species of plants and replace them with regionally native plants to restore wildlife habitat and native ground cover.

(3) Ensure that the use of herbicides to remove invasive and exotic plants will be conducted in accordance with federal and state laws regulating the laws of pesticides.

Strategy 1.14.2: Wildland Fire Management

Projects: Project No. 2 – RTE Habitat; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.

Project No. 8 – Natural Resources Outreach; see Appendix A.

Project No. 9 – South Texas Ambrosia Mgmt. Plan & Survey; see Appendix A.

Initiatives:

- (1) Maintain vegetation to reduce wildland fire hazards and BASH potential.
- (2) Control wildland fires with fire breaks and understory vegetation management.
- (3) Implement prescribed burns where consistent with the mission, sound ecological practices, and safety considerations.
- (4) Implement prescribed burns in consideration of locations of South Texas ambrosia at NAS Kingsville.

Strategy 1.14.3: RTE Plant Species Management

Projects:

- Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.
Project No. 9 -- South Texas Ambrosia Mgmt. Plan & Survey; see Appendix A.

Initiatives:

- (1) Continue to conduct species survey updates to identify changes in populations and habitat on the properties, as needed. Use species information provided by these surveys to modify management practices, if necessary. Modification to management practices will be administered by the NRM in consultation with environmental staff at NAVFAC Southeast, and federal and state agency representatives. Black lace cactus (*Echinocereus reichenbachii* var. *albertii*) and slender rush-pea are known to occur in Kleberg and Jim Wells counties, Texas. Determining the presence of these species or habitats that could support them at NASK, as well as the other rare, threatened, or endangered plant species identified in Appendix F, Tables F-13 through F-15 of this document will be specifically targeted in the next NASK biological resources survey and inventory (Project No. 1).
- (2) Coordinate with the Environmental Section of the PWD during the planning process for all construction projects at NASK. Review the location and footprint of the project and an analysis of the project against known occurrences of RTE species. During the planning process, it is advised that the NRM review the TPWD Project Coordination and Review Request to obtain information regarding RTE species. Database queries by county or species names can be conducted on the RTE Species of Texas website or specific information can be requested from the Texas Natural Diversity Database. Additionally, the Wildlife Habitat Assessment Program, administered by TPWD, is available to assist project developers in identifying, evaluating, and addressing potential impacts to natural resources of conservation concern in Texas. Guidance on obtaining information on

endangered species, important natural resources, project documentation and review, and applicable state and federal regulations, including planning tools and BMPs is available on their website (see text box for link).

(3) Coordinate, and conduct informal or formal consultation if necessary, with the USFWS and/or TPWD as appropriate to determine if Installation actions are likely to jeopardize the continued existence of any endangered or threatened species, or result in the destruction or adverse modification of critical habitat of such species.

(4) Monitor grounds maintenance and landscaping activities conducted in proximity to known populations of South Texas ambrosia to ensure habitat conditions are maintained to preserve this species.

(5) Develop an informational pamphlet for South Texas ambrosia to supplement face-to-face to bring about awareness, education, and protection of this species. It will be disseminated to NASK PWD employees, contractors, and anyone else who conducts grounds maintenance or landscaping activities on the Main Station. Enhancing workers' awareness may prevent further loss and damage and help in the identification of new locations.

(6) Encourage local landowners to search for South Texas ambrosia on their properties. A recent study found that populations located outside of the Main Station are likely to contain some unique clones, suggesting higher diversity of this species than indicated in previous genetic studies. Higher genetic diversity improves the ability of a species to respond to environmental changes or diseases. The identification of unique South Texas ambrosia clones could reduce some of the management burden at NASK (Overath et al. 2013).

(7) Update the 2005 South Texas Ambrosia Management Plan to include comprehensive survey information and recommendations for implementing mowing and prescribed burn regimes that would benefit this species.

Strategy 1.14.4: Wildlife Management and Habitat Enhancement

- Projects:**
- Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
 - Project No. 2 – RTE Habitat Management; see Appendix A.
 - Project No. 3 – Invasive Species Control; see Appendix A.
 - Project No. 4 – NASK INRMP Update; see Appendix A.
 - Project No. 5 – Prescribed Fire Management; see Appendix A.
 - Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
 - Project No. 7 – Habitat Management and Restoration; see Appendix A.
 - Project No. 8 – Natural Resources Outreach; see Appendix A.
 - Project No. 10 – Game Animal Survey; see Appendix A.

- Initiatives:**
- (1) Conduct censuses of wildlife populations as necessary to monitor the effectiveness of management activities in reaching management goals. These

surveys should document the relative abundance of selected species that are indicators of healthy, self-sustaining ecosystems.

(2) Provide habitat enhancement for wildlife, including habitat that supports RTE species as well as migratory birds, in consideration of BASH Program requirements.

(3) Coordinate with the USFWS and TPWD regional biologists to develop specific plans addressing Tamaulipan thornscrub habitat on NALFOG.

(4) Establish conservation partnerships.

Strategy 1.14.5: Migratory Bird Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.
Project No. 10 – Game Animal Survey; see Appendix A.

Initiatives:

(1) Reduce pesticide use on the Installation.

(2) Implement habitat enhancement and maintain habitat diversity for migratory bird species, consistent with BASH Program requirements. Recommendations for habitat enhancement should be made to attract birds and other wildlife away from the flight operations areas. Additionally, modification to habitat should also take into consideration bird nesting and breeding seasons so as not to conflict with the MBTA.

(3) Conduct bird surveys to monitor the bird populations at NASK.

(4) Control invasive bird species that compete with native migratory bird species and their habitats.

(5) Maintain a Migratory Bird Depredation Permit from the USFWS to allow harm to migratory birds as part of BASH Program requirements, and to maintain airfield safety.

(6) Locate military readiness activities to avoid or minimize impacts on migratory birds, where possible. If NASK notes clear evidence of a take as a result of military readiness activities, the NASK NRM will document the take, evaluate these activities, and where practicable, reduce or eliminate the take of migratory birds.

(7) Maintain compliance with the MBTA for all non-military readiness activities.

(8) Request assistance from the DoD PIF Work Group, as needed, to assist and support military installations in migratory bird conservation while protecting the military mission.

(9) Develop partnerships with federal, state, and local agencies, universities, and NGOs such as the National Audubon Society to enter into conservation partnerships, allow for bird research on the Installation, conduct monitoring surveys, and participate in International Migratory Bird Day.

Strategy 1.14.6: Invasive and Nuisance Wildlife Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
Project No. 7 – Habitat Management and Restoration
Project No. 8 – Natural Resources Outreach
Project No. 10 – Game Animal Survey; see Appendix A.

Initiatives: (1) Maintain a hunting program for large game animals to minimize BASH potential at The Main Station and NALFOG. Management of nuisance species, including trapping of wild hog, should be allowed to continue at NALFOG.

Strategy 1.14.7: RTE Wildlife Species Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.

Initiatives: (1) Continue to evaluate management practices and their effects on ecosystems and wildlife habitat, and continue programs to protect RTE wildlife species and their habitats known to occur at NASK.
(2) Review management recommendations identified in wildlife survey reports to determine if additional management measures should be implemented for protection of RTE wildlife species known to occur at NASK.
(3) Seek additional management guidance and recommendations from federal, state, and Navy wildlife biologists for protection of RTE wildlife species and their habitats known to occur at NASK.
(4) Continue to conduct monitoring programs for wildlife and natural communities at NASK, to keep these inventories up-to-date.

(5) Coordinate with the Environmental Section of the PWD during the planning process for all construction projects at NASK. Review the location and footprint of the project and an analysis of the project against known occurrences of RTE species.

(6) Coordinate with the USFWS and/or TPWD as appropriate to determine if Installation actions are likely to jeopardize the continued existence of any endangered or threatened species, or result in the destruction or adverse modification of critical habitat of such species.

Goal 2: Provide quality, outdoor recreational and educational opportunities to improve the quality of life for Navy personnel and authorized guests, if such opportunities are available and within DoD security standards.

Issue: In accordance with the SAIA, an INRMP shall, to the extent appropriate and applicable, provide for public access that is necessary or appropriate for sustainable use by the public of natural resources to the extent that the use is not inconsistent with the needs of fish and wildlife resources, and subject to requirements necessary to ensure safety and military security. Additionally, public access for the use of the natural resources for outdoor recreation should not result in degradation of installation natural resources. In addition to traditional outdoor recreation activities such as hiking, wildlife watching, and hunting, outdoor recreation activities can include educational programs that foster a sense of responsible stewardship for military personnel and the general public who are authorized access to an installation for these recreational purposes. The following objectives were developed to address Goal 2.

Objective 2.1: Evaluate additional opportunities for natural resources-related outdoor recreation.

Objective 2.2: Provide and promote outdoor recreation opportunities (e.g., hunting, wildlife observation, photography) to DoD personnel and their families.

Objective 2.3: Provide and promote outdoor recreation opportunities to the public, subject to requirements necessary to ensure safety and military security.

Objective 2.1: Evaluate additional opportunities for natural resources-related outdoor recreation.

Strategy 2.1.1: Hunting Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.
Project No. 10 – Game Animal Survey; see Appendix A.

Initiatives: (1) Maintain and hunting logs for NAS Kingsville and Dixie Annex.
(2) Determine if a shorter big game hunting season than that allowed by the state is needed due to volunteer manpower and mission constraints. It is

recommended that the big game hunting season at NASK correspond with the annual rut to make hunting success more effective. An example of this would be to allow hunting only from the day after Thanksgiving to New Year's Day.

(3) Evaluate the potential to provide additional hunting opportunities for big game in the South Field area of the Main Station as a (rifled) shot-gun only area.

(4) Evaluate the potential to provide additional bird hunting opportunities within agricultural outlease areas located east of South Field (old grazing lease) outside of the chain-link perimeter fence at NAS Kingsville.

(5) Conduct an annual helicopter survey of Dixie Annex in February each year to determine harvest numbers for the coming year.

(6) Establish hunting harvesting limits by species for Dixie Annex, based on the number of animals removed each year, and based on the results of annual helicopter surveys.

(7) Coordinate with TPWD and Navy biologists to establish hunting harvest limits based on available data.

Strategy 2.1.2: Public Access

Projects: Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.

Initiatives: (1) Provide for public access that is necessary or appropriate for sustainable use by the public of natural resources to the extent that the use is not inconsistent with the needs of fish and wildlife resources, and subject to requirements necessary to ensure safety and military security.

(2) Review issues that currently affect public access to outdoor recreational resources, and modify access to provide for greater recreational opportunities to the extent possible based on security and mission requirements.

Strategy 2.1.3: Natural Resources Law Enforcement

Projects: There are no INRMP projects directly related to natural resources law enforcement; however, by providing training for natural resources personnel, will also improve natural resources law enforcement at NASK.

Initiatives: (1) Develop a wildlife law enforcement program and ensure that personnel are qualified and trained to carry out all assigned duties and responsibilities.

(2) Enforce federal, state, and Installation laws and regulations pertaining to fish and wildlife.

(3) Build interagency relationships with National Military Fish and Wildlife Association and USFWS to support the natural resources law enforcement program.

(4) Identify staffing needs to manage hunting, GIS and natural resources management programs.

Objective 2.2: Provide and promote outdoor recreation opportunities (e.g., hunting, wildlife observation, photography) to DoD personnel and their families.

Strategy 2.2.1: Aquatic Species Management

Projects: Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.

Initiatives: (1) Improve aquatic species resources in consideration of BASH Program requirements.

(2) Monitor freshwater ponds at the Main Station to determine if supplemental water should be used to maintain water levels to support aquatic species.

Strategy 2.2.2: Hunting Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.
Project No. 10 – Game Animal Survey; see Appendix A.

Initiatives: (1) Maintain hunting logs for the Main Station and Dixie Annex.

(2) Determine if a shorter big game hunting season than that allowed by the state is needed due to volunteer manpower and mission constraints. It is recommended that the big game hunting season at NASK correspond with the annual rut to make hunting success more effective. An example of this would be to allow hunting only from the day after Thanksgiving to New Year's Day.

(3) Evaluate the potential to provide additional hunting opportunities for big game in the South Field area of the Main Station as a (rifled) shot-gun only area.

(4) Evaluate the potential to provide additional bird hunting opportunities within agricultural outlease areas located east of South Field (old grazing lease) outside of the chain-link perimeter fence at NAS Kingsville.

(5) Conduct an annual helicopter survey of Dixie Annex in February each year to determine harvest numbers for the coming year.

(6) Establish hunting harvesting limits by species for Dixie Annex, based on the number of animals removed each year, and based on the results of annual helicopter surveys.

(7) Coordinate with TPWD and Navy biologists to establish hunting harvest limits based on available data.

Objective 2.3: Provide and promote outdoor recreation opportunities to the public, subject to requirements necessary to ensure safety and military security.

Strategy 2.3.1: Aquatic Species Management

Projects: Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.

Initiatives: (1) Improve aquatic species resources in consideration of BASH Program requirements.

(2) Monitor freshwater ponds at the Main Station to determine if supplemental water should be used to maintain water levels to support aquatic species.

Strategy 2.3.2: Hunting Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.
Project No. 10 – Game Animal Survey; see Appendix A.

Initiatives: (1) Maintain hunting logs for the Main Station and Dixie Annex.

(2) Determine if a shorter big game hunting season than that allowed by the state is needed due to volunteer manpower and mission constraints. It is recommended that the big game hunting season at NASK correspond with the annual rut to make hunting success more effective. An example of this would be to allow hunting only from the day after Thanksgiving to New Year's Day.

(3) Evaluate the potential to provide additional hunting opportunities for big game in the South Field area of the Main Station as a (rifled) shot-gun only area.

(4) Evaluate the potential to provide additional bird hunting opportunities within agricultural outlease areas located east of South Field (old grazing lease) outside of the chain-link perimeter fence at NAS Kingsville.

(5) Conduct an annual helicopter survey of Dixie Annex in February each year to determine harvest numbers for the coming year.

(6) Establish hunting harvesting limits by species for Dixie Annex, based on the number of animals removed each year, and based on the results of annual helicopter surveys.

(7) Coordinate with TPWD and Navy biologists to establish hunting harvest limits based on available data.

Strategy 2.3.3: Public Access

Projects: Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.

Initiatives: (1) Provide for public access that is necessary or appropriate for sustainable use by the public of natural resources to the extent that the use is not inconsistent with the needs of fish and wildlife resources, and subject to requirements necessary to ensure safety and military security.

(2) Review issues that currently affect public access to outdoor recreational resources, and modify access to provide for greater recreational opportunities to the extent possible based on security and mission requirements.

Strategy 2.3.4: Educational Outreach

Projects: Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.

Initiatives: (1) Continue to coordinate the development and implementation of the outdoor recreation and educational program covered by this INRMP with the MWR Department.

(2) Develop an outdoor education program to showcase the Navy's stewardship of natural resources, and to emphasize that this stewardship is important to the military mission and habitat conservation.

(3) Develop an information kiosk to identify and highlight the unique characteristics of South Texas ambrosia populations at NASK.

(4) Seek out partnerships with USFWS, TPWD, USDA NRCS, TCEQ, Texas A&M University – Kingsville, Texas Ornithological Society, Coastal Bend Audubon Society, DoD PIF, and other local agencies and organizations, to provide educational opportunities at NASK.

Strategy 2.3.5: Natural Resources Law Enforcement

Projects: There are no INRMP projects directly related to natural resources law enforcement; however, by providing training for natural resources personnel, natural resources law enforcement at NASK will also be improved.

Initiatives: (1) Develop a wildlife law enforcement program and ensure that personnel are qualified and trained to carry out all assigned duties and responsibilities.

(2) Enforce federal, state, and Installation laws and regulations pertaining to fish and wildlife.

(3) Build interagency relationships with National Military Fish and Wildlife Association and USFWS to support the natural resources law enforcement program.

(4) Identify staffing needs to manage hunting and GIS and natural resources management programs.

Goal 3: Integrate the various activities conducted under this INRMP by fostering knowledge of, and participation in, adaptive ecosystem management.

Issue: Plans and programs for maintaining and managing natural resources on NASK need to fully consider the interrelationships of Installation resources and insuring no net loss of the military mission. Often in the past, existing programs and plans have frequently focused on the management of individual resources in accordance with federal or state laws.

Ecosystem management cannot be accomplished solely through the implementation of programs and plans focused on individual resources. A coordinated effort among all programs and personnel, from tenant commands to decision-making authorities, is necessary to protect the interdependent components of communities that define an ecosystem. The coordinated effort will address the consequences of actions on related resources, and will resolve conflicts between competing programs and plans for use of the Installation's natural resources.

Ecosystem management is a holistic, adaptive management concept that transcends human-made boundaries, both internal and external to NASK. Management intended to promote sustainable ecosystems requires awareness, education and training, and responsible participation of all individuals potentially affecting the ecosystem, as well as adjustments in management principles and practices to respond to new knowledge and dynamic conditions. To participate in adaptive ecosystem management, NASK will implement programs to meet the following objectives:

Objective 3.1: Provide adequate staffing, equipment, technology, and training for the NRP at NASK to ensure proper implementation of this INRMP.

Objective 3.2: Incorporate the concept of ecosystem management into all planning and management processes.

Objective 3.3: Implement training, education, and stewardship initiatives for ecosystem management.

Objective 3.4: Establish a planning team to review and update the INRMP in accordance with Chief of Naval Operations (CNO) Instructions (OPNAVINST) 5090.1D, 12-3.4(c).

Objective 3.5: Promote educational awareness of NASK natural resources and the importance of natural resources stewardship.

Objective 3.1: Provide adequate staffing, equipment, technology, and training for the NRP at NASK to ensure proper implementation of this INRMP.

Strategy 3.1.1: Grounds Maintenance and Landscaping Management

Projects: Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.
Project No. 9 – South Texas Ambrosia Mgmt. Plan & Survey; see Appendix A.

Initiatives: (1) Use regionally native plant species and beneficial landscaping practices to the extent practicable. Use supplemental plantings of native trees and shrubs in maintained open areas and around building and recreational areas where consistent with current and planned land uses and the NASK BASH Program, to help enhance habitat diversity, control erosion, and meet wildlife management objectives. Native trees, shrubs, and herbaceous species should be selected that are adaptable, drought tolerant and conserve water.

(2) Avoid application of fertilizers because increased nutrients may result in colonization by more aggressive, nutrient demanding species. When nutrients are added to the system either by exposing new soil or through fertilization, optimum growing conditions for the specialized target flora are compromised.

(3) Preserve ground cover and natural drainage, using drainage channels and retention ponds instead of a closed, expensive system.

(4) Use native plant material instead of manmade controls for controlling erosion.

(5) Use native groundcover and shrubs instead of turf wherever possible to reduce maintenance and irrigation requirements.

(6) Revegetate disturbed areas with indigenous plant materials that promote wildlife habitat and minimize erosion and runoff. Although Bermuda grass is listed in seed mixtures, this species and other introduced species should be avoided as much as possible.

Strategy 3.1.2: Wildland Fire Management

Projects: Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.
Project No. 9 – South Texas Ambrosia Mgmt. Plan & Survey; see Appendix A.

Initiatives: (1) Maintain vegetation to reduce wildland fire hazards and BASH potential.

(2) Control wildland fires with fire breaks and understory vegetation management.

(3) Implement prescribed burns where consistent with the mission, sound ecological practices, and safety considerations.

(4) Implement prescribed burns in consideration of locations of South Texas ambrosia at NAS Kingsville.

Strategy 3.1.3: RTE Plant Species Management

Projects:

Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.

Project No. 2 – RTE Habitat Management; see Appendix A.

Project No. 3 – Invasive Species Control; see Appendix A.

Project No. 5 – Prescribed Fire Management; see Appendix A.

Project No. 7 – Habitat Management and Restoration; see Appendix A.

Project No. 8 – Natural Resources Outreach; see Appendix A.

Project No. 9 -- South Texas Ambrosia Mgmt. Plan & Survey; see Appendix A.

Initiatives:

(1) Continue to conduct species survey updates to identify changes in populations and habitat on the properties, as needed. Use species information provided by these surveys to modify management practices, if necessary. Modification to management practices will be administered by the NRM in consultation with environmental staff at NAVFAC Southeast, and federal and state agency representatives. Black lace cactus (*Echinocereus reichenbachii* var. *albertii*) and slender rush-pea are known to occur in Kleberg and Jim Wells counties, Texas. Determining the presence of these species or habitats that could support them at NASK, as well as the other rare, threatened, or endangered plant species identified in Appendix F, Tables F-13 through F-15 of this document will be specifically targeted in the next NASK biological resources survey and inventory (Project No. 1).

(2) Coordinate with the Environmental Section of the PWD during the planning process for all construction projects at NASK. Review the location and footprint of the project and an analysis of the project against known occurrences of RTE species. During the planning process, it is advised that the NRM review the TPWD Project Coordination and Review Request to obtain information regarding RTE species. Database queries by county or species names can be conducted on the RTE Species of Texas website or specific information can be requested from the Texas Natural Diversity Database. Additionally, the Wildlife Habitat Assessment Program, administered by TPWD, is available to assist project developers in identifying, evaluating, and addressing potential impacts to natural resources of conservation concern in Texas. Guidance on obtaining information on endangered species, important natural resources, project documentation and review, and applicable state and federal regulations, including planning tools and BMPs is available on their website (see text box for link).

(3) Coordinate, and conduct informal or formal consultation if necessary, with the USFWS and/or TPWD as appropriate to determine if Installation actions are likely to jeopardize the continued existence of any endangered or threatened species, or result in the destruction or adverse modification of critical habitat of such species.

(4) Monitor grounds maintenance and landscaping activities conducted in proximity to known populations of South Texas ambrosia to ensure habitat conditions are maintained to preserve this species.

(5) Develop an informational pamphlet for South Texas ambrosia to supplement face-to-face to bring about awareness, education, and protection of this species. It will be disseminated to NASK PWD employees, contractors, and anyone else who conducts grounds maintenance or landscaping activities on the Main Station. Enhancing workers' awareness may prevent further loss and damage and help in the identification of new locations.

(6) Encourage local landowners to search for South Texas ambrosia on their properties. A recent study found that populations located outside of the Main Station are likely to contain some unique clones, suggesting higher diversity of this species than indicated in previous genetic studies. Higher genetic diversity improves the ability of a species to respond to environmental changes or diseases. The identification of unique South Texas ambrosia clones could reduce some of the management burden at NASK (Overath et al. 2013).

(7) Update the 2005 South Texas Ambrosia Management Plan to include comprehensive survey information and recommendations for implementing mowing and prescribed burn regimes that would benefit this species.

Strategy 3.1.4: RTE Wildlife Species Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.

Initiatives: (1) Continue to evaluate management practices and their effects on ecosystems and wildlife habitat, and continue programs to protect RTE wildlife species and their habitats known to occur at NASK.
(2) Review management recommendations identified in wildlife survey reports to determine if additional management measures should be implemented for protection of RTE wildlife species known to occur at NASK.

(3) Seek additional management guidance and recommendations from federal, state, and Navy wildlife biologists for protection of RTE wildlife species and their habitats known to occur at NASK.

(4) Continue to conduct monitoring programs for wildlife and natural communities at NASK, to keep these inventories up-to-date.

(5) Coordinate with the Environmental Section of the PWD during the planning process for all construction projects at NASK. Review the location and footprint of the project and an analysis of the project against known occurrences of RTE species.

(6) Coordinate with the USFWS and/or TPWD as appropriate to determine if Installation actions are likely to jeopardize the continued existence of any endangered or threatened species, or result in the destruction or adverse modification of critical habitat of such species.

Strategy 3.1.5: Training of Natural Resources Personnel

Projects: Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.

Initiatives: (1) Provide adequate staffing, equipment, technology, and training for the NRM to ensure proper implementation of this INRMP.

Strategy 3.1.6: GIS, Data Integration, Access, and Reporting

Projects: There are no INRMP projects directly related to GIS, data integration, access, and reporting; however, all of the INRMP projects have a GIS component, including collection of field data, desk top analyses, and mapping.

Initiatives: (1) Receive training on this integrated system to make use of this real-time technology and the benefits it offers, so that natural resources managers can fully implement a proactive natural resources management program that supports the mission and ecosystem integrity.

(2) Provide adequate training to natural resources personnel in data collection using global GPS technology is another essential aspect of building and maintaining an up-to-date GIS database that meets natural resources planning needs.

Objective 3.2: Incorporate the concept of ecosystem management into all planning and management processes.

Strategy 3.2.1: Wildland Fire Management

Projects: Project No. 2 – RTE Habitat; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.

Project No. 9 – South Texas Ambrosia Mgmt. Plan & Survey; see Appendix A.

Initiatives:

- (1) Maintain vegetation to reduce wildland fire hazards and BASH potential.
- (2) Control wildland fires with fire breaks and understory vegetation management.
- (3) Implement prescribed burns where consistent with the mission, sound ecological practices, and safety considerations.
- (4) Implement prescribed burns in consideration of locations of South Texas ambrosia at NAS Kingsville.

Strategy 3.2.2:

RTE Plant Species Management

Projects:

- Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.
Project No. 9 -- South Texas Ambrosia Mgmt. Plan & Survey; see Appendix A.

Initiatives:

- (1) Continue to conduct species survey updates to identify changes in populations and habitat on the properties, as needed. Use species information provided by these surveys to modify management practices, if necessary. Modification to management practices will be administered by the NRM in consultation with environmental staff at NAVFAC Southeast, and federal and state agency representatives. Black lace cactus (*Echinocereus reichenbachii* var. *albertii*) and slender rush-pea are known to occur in Kleberg and Jim Wells counties, Texas. Determining the presence of these species or habitats that could support them at NASK, as well as the other rare, threatened, or endangered plant species identified in Appendix F, Tables F-13 through F-15 of this document will be specifically targeted in the next NASK biological resources survey and inventory (Project No. 1).
- (2) Coordinate with the Environmental Section of the PWD during the planning process for all construction projects at NASK. Review the location and footprint of the project and an analysis of the project against known occurrences of RTE species. During the planning process, it is advised that the NRM review the TPWD Project Coordination and Review Request to obtain information regarding RTE species. Database queries by county or species names can be conducted on the RTE Species of Texas website or specific information can be requested from the Texas Natural Diversity Database. Additionally, the Wildlife Habitat Assessment Program, administered by TPWD, is available to assist project developers in identifying, evaluating, and addressing potential impacts to natural resources of conservation concern in Texas. Guidance on obtaining information on endangered species, important natural resources, project documentation and

review, and applicable state and federal regulations, including planning tools and BMPs is available on their website (see text box for link).

(3) Coordinate, and conduct informal or formal consultation if necessary, with the USFWS and/or TPWD as appropriate to determine if Installation actions are likely to jeopardize the continued existence of any endangered or threatened species, or result in the destruction or adverse modification of critical habitat of such species.

(4) Monitor grounds maintenance and landscaping activities conducted in proximity to known populations of South Texas ambrosia to ensure habitat conditions are maintained to preserve this species.

(5) Develop an informational pamphlet for South Texas ambrosia to supplement face-to-face to bring about awareness, education, and protection of this species. It will be disseminated to NASK PWD employees, contractors, and anyone else who conducts grounds maintenance or landscaping activities on the Main Station. Enhancing workers' awareness may prevent further loss and damage and help in the identification of new locations.

(6) Encourage local landowners to search for South Texas ambrosia on their properties. A recent study found that populations located outside of the Main Station are likely to contain some unique clones, suggesting higher diversity of this species than indicated in previous genetic studies. Higher genetic diversity improves the ability of a species to respond to environmental changes or diseases. The identification of unique South Texas ambrosia clones could reduce some of the management burden at NASK (Overath et al. 2013).

(7) Update the 2005 South Texas Ambrosia Management Plan to include comprehensive survey information and recommendations for implementing mowing and prescribed burn regimes that would benefit this species.

Strategy 3.2.3: RTE Wildlife Species Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.

Initiatives: (1) Continue to evaluate management practices and their effects on ecosystems and wildlife habitat, and continue programs to protect RTE wildlife species and their habitats known to occur at NASK.
(2) Review management recommendations identified in wildlife survey reports to determine if additional management measures should be implemented for protection of RTE wildlife species known to occur at NASK.

(3) Seek additional management guidance and recommendations from federal, state, and Navy wildlife biologists for protection of RTE wildlife species and their habitats known to occur at NASK.

(4) Continue to conduct monitoring programs for wildlife and natural communities at NASK, to keep these inventories up-to-date.

(5) Coordinate with the Environmental Section of the PWD during the planning process for all construction projects at NASK. Review the location and footprint of the project and an analysis of the project against known occurrences of RTE species.

(6) Coordinate with the USFWS and/or TPWD as appropriate to determine if Installation actions are likely to jeopardize the continued existence of any endangered or threatened species, or result in the destruction or adverse modification of critical habitat of such species.

Strategy 3.2.4: Training of Natural Resources Personnel

Projects: Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.

Initiatives: (1) Provide adequate staffing, equipment, technology, and training for the NRM to ensure proper implementation of this INRMP.

Strategy 3.2.5: Partnering with Federal and State Agencies, Universities, and NGOs

Projects: Project No. 2 – RTE Species Management
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.

Initiatives: (1) Develop partnerships with federal, state, and local agencies, NGOs, and universities to implement wildlife monitoring and protection programs.
(2) Participate in discussions with Kleberg, Jim Wells, and McMullen counties to reduce conflicts between development and the military mission.

Objective 3.3: Implement training, education, and stewardship initiatives for ecosystem management.

Strategy 3.3.1: Invasive Plant and Noxious Weed Management

Projects: Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.

Initiatives: (3) Ensure that the use of herbicides to remove invasive and exotic plants will be conducted in accordance with federal and state laws regulating the laws of pesticides.

Strategy 3.3.2: Wildland Fire Management

Projects: Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.
Project No. 9 – South Texas Ambrosia Mgmt. Plan & Survey; see Appendix A.

Initiatives: (1) Maintain vegetation to reduce wildland fire hazards and BASH potential.
(2) Control wildland fires with fire breaks and understory vegetation management.
(3) Implement prescribed burns where consistent with the mission, sound ecological practices, and safety considerations.
(4) Implement prescribed burns in consideration of locations of South Texas ambrosia at NAS Kingsville.

Strategy 3.3.3: RTE Plant Species Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.
Project No. 9 -- South Texas Ambrosia Mgmt. Plan & Survey; see Appendix A.

Initiatives: (1) Continue to conduct species survey updates to identify changes in populations and habitat on the properties, as needed. Use species information provided by these surveys to modify management practices, if necessary. Modification to management practices will be administered by the NRM in consultation with environmental staff at NAVFAC Southeast, and federal and state agency representatives. Black lace cactus (*Echinocereus reichenbachii* var. *albertii*) and slender rush-pea are known to occur in Kleberg and Jim Wells counties, Texas. Determining the presence of these species or habitats that could support them at NASK, as well as the other rare, threatened, or endangered plant species identified in Appendix F, Tables F-13 through F-15 of this document will be specifically targeted in the next NASK biological resources survey and inventory (Project No. 1).

(2) Coordinate with the Environmental Section of the PWD during the planning process for all construction projects at NASK. Review the location and footprint of the project and an analysis of the project against known occurrences of RTE species. During the planning process, it is advised that the NRM review the TPWD Project Coordination and Review Request to obtain information regarding RTE species. Database queries by county or

species names can be conducted on the RTE Species of Texas website or specific information can be requested from the Texas Natural Diversity Database. Additionally, the Wildlife Habitat Assessment Program, administered by TPWD, is available to assist project developers in identifying, evaluating, and addressing potential impacts to natural resources of conservation concern in Texas. Guidance on obtaining information on endangered species, important natural resources, project documentation and review, and applicable state and federal regulations, including planning tools and BMPs is available on their website (see text box for link).

(3) Coordinate, and conduct informal or formal consultation if necessary, with the USFWS and TPWD as appropriate to determine if Installation actions are likely to jeopardize the continued existence of any endangered or threatened species, or result in the destruction or adverse modification of critical habitat of such species.

(4) Monitor grounds maintenance and landscaping activities conducted in proximity to known populations of South Texas ambrosia to ensure habitat conditions are maintained to preserve this species.

(5) Develop an informational pamphlet for South Texas ambrosia to supplement face-to-face to bring about awareness, education, and protection of this species. It will be disseminated to NASK PWD employees, contractors, and anyone else who conducts grounds maintenance or landscaping activities on the Main Station. Enhancing workers' awareness may prevent further loss and damage and help in the identification of new locations.

(6) Encourage local landowners to search for South Texas ambrosia on their properties. A recent study found that populations located outside of the Main Station are likely to contain some unique clones, suggesting higher diversity of this species than indicated in previous genetic studies. Higher genetic diversity improves the ability of a species to respond to environmental changes or diseases. The identification of unique South Texas ambrosia clones could reduce some of the management burden at NASK (Overath et al. 2013).

(7) Update the 2005 South Texas Ambrosia Management Plan to include comprehensive survey information and recommendations for implementing mowing and prescribed burn regimes that would benefit this species.

Strategy 3.3.3: RTE Wildlife Species Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.

- Initiatives:**
- (1) Continue to evaluate management practices and their effects on ecosystems and wildlife habitat, and continue programs to protect RTE wildlife species and their habitats known to occur at NASK.
 - (2) Review management recommendations identified in wildlife survey reports to determine if additional management measures should be implemented for protection of RTE wildlife species known to occur at NASK.
 - (3) Seek additional management guidance and recommendations from federal, state, and Navy wildlife biologists for protection of RTE wildlife species and their habitats known to occur at NASK.
 - (4) Continue to conduct monitoring programs for wildlife and natural communities at NASK, to keep these inventories up-to-date.
 - (5) Coordinate with the Environmental Section of the PWD during the planning process for all construction projects at NASK. Review the location and footprint of the project and an analysis of the project against known occurrences of RTE species.
 - (6) Coordinate with the USFWS and/or TPWD as appropriate to determine if Installation actions are likely to jeopardize the continued existence of any endangered or threatened species, or result in the destruction or adverse modification of critical habitat of such species.

Strategy 3.3.4: Training of Natural Resources Personnel

- Projects:**
- Project No. 4 – NASK INRMP Update; see Appendix A.
 - Project No. 8 – Natural Resources Outreach; see Appendix A.

- Initiatives:**
- (1) Provide adequate staffing, equipment, technology, and training for the NRM to ensure proper implementation of this INRMP.

Strategy 3.3.5: GIS, Data Integration, Access, and Reporting

- Projects:**
- There are no INRMP projects directly related to GIS, data integration, access, and reporting; however, all of the INRMP projects have a GIS component, including collection of field data, desk top analyses, and mapping.

- Initiatives:**
- (1) Receive training on this integrated system to make use of this real-time technology and the benefits it offers, so that NRMs can fully implement a proactive natural resources management program that supports the mission and ecosystem integrity.
 - (2) Provide adequate training to natural resources personnel in data collection using global GPS technology is another essential aspect of building and maintaining an up-to-date GIS database that meets natural resources planning needs.

Objective 3.4: Establish a planning team to review and update the INRMP in accordance with OPNAVINST 5090.1D, 12-3.4(c).

Strategy 3.4.1: Partnering with Federal and State Agencies, Universities, and NGOs

Projects: Project No. 2 – RTE Species Management
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.

Initiatives: (1) Develop partnerships with federal, state, and local agencies, NGOs, and universities to implement wildlife monitoring and protection programs.
(2) Participate in discussions with Kleberg, Jim Wells, and McMullen counties to reduce conflicts between development and the military mission.

Objective 3.5: Promote educational awareness of NASK natural resources and the importance of natural resources stewardship.

Strategy 3.5.1: RTE Plant Species Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.
Project No. 9 -- South Texas Ambrosia Mgmt. Plan & Survey; see Appendix A.

Initiatives: (1) Continue to conduct species survey updates to identify changes in populations and habitat on the properties, as needed. Use species information provided by these surveys to modify management practices, if necessary. Modification to management practices will be administered by the NRM in consultation with environmental staff at NAVFAC Southeast, and federal and state agency representatives. Black lace cactus (*Echinocereus reichenbachii* var. *albertii*) and slender rush-pea are known to occur in Kleberg and Jim Wells counties, Texas. Determining the presence of these species or habitats that could support them at NASK, as well as the other rare, threatened, or endangered plant species identified in Appendix F, Tables F-13 through F-15 of this document will be specifically targeted in the next NASK biological resources survey and inventory (Project No. 1).

(2) Coordinate with the Environmental Section of the PWD during the planning process for all construction projects at NASK. Review the location and footprint of the project and an analysis of the project against known occurrences of RTE species. During the planning process, it is advised that the NRM review the TPWD Project Coordination and Review Request to obtain information regarding RTE species. Database queries by county or species names can be conducted on the RTE Species of Texas website or specific information can be requested from the Texas Natural Diversity Database. Additionally, the Wildlife Habitat Assessment Program,

administered by TPWD, is available to assist project developers in identifying, evaluating, and addressing potential impacts to natural resources of conservation concern in Texas. Guidance on obtaining information on endangered species, important natural resources, project documentation and review, and applicable state and federal regulations, including planning tools and BMPs is available on their website (see text box for link).

(3) Coordinate, and conduct informal or formal consultation if necessary, with the USFWS and TPWD as appropriate to determine if Installation actions are likely to jeopardize the continued existence of any endangered or threatened species, or result in the destruction or adverse modification of critical habitat of such species.

(4) Monitor grounds maintenance and landscaping activities conducted in proximity to known populations of South Texas ambrosia to ensure habitat conditions are maintained to preserve this species.

(5) Develop an informational pamphlet for South Texas ambrosia to supplement face-to-face to bring about awareness, education, and protection of this species. It will be disseminated to NASK PWD employees, contractors, and anyone else who conducts grounds maintenance or landscaping activities on the Main Station. Enhancing workers' awareness may prevent further loss and damage and help in the identification of new locations.

(6) Encourage local landowners to search for South Texas ambrosia on their properties. A recent study found that populations located outside of the Main Station are likely to contain some unique clones, suggesting higher diversity of this species than indicated in previous genetic studies. Higher genetic diversity improves the ability of a species to respond to environmental changes or diseases. The identification of unique South Texas ambrosia clones could reduce some of the management burden at NASK (Overath et al. 2013).

(7) Update the 2005 South Texas Ambrosia Management Plan to include comprehensive survey information and recommendations for implementing mowing and prescribed burn regimes that would benefit this species.

Strategy 3.5.2: RTE Wildlife Species Management

- Projects:**
- Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
 - Project No. 2 – RTE Habitat Management; see Appendix A.
 - Project No. 3 – Invasive Species Control; see Appendix A.
 - Project No. 5 – Prescribed Fire Management; see Appendix A.
 - Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
 - Project No. 7 – Habitat Management and Restoration; see Appendix A.
 - Project No. 8 – Natural Resources Outreach; see Appendix A.

- Initiatives:**
- (1) Continue to evaluate management practices and their effects on ecosystems and wildlife habitat, and continue programs to protect RTE wildlife species and their habitats known to occur at NASK.
 - (2) Review management recommendations identified in wildlife survey reports to determine if additional management measures should be implemented for protection of RTE wildlife species known to occur at NASK.
 - (3) Seek additional management guidance and recommendations from federal, state, and Navy wildlife biologists for protection of RTE wildlife species and their habitats known to occur at NASK.
 - (4) Continue to conduct monitoring programs for wildlife and natural communities at NASK, to keep these inventories up-to-date.
 - (5) Coordinate with the Environmental Section of the PWD during the planning process for all construction projects at NASK. Review the location and footprint of the project and an analysis of the project against known occurrences of RTE species.
 - (6) Coordinate with the USFWS and/or TPWD as appropriate to determine if Installation actions are likely to jeopardize the continued existence of any endangered or threatened species, or result in the destruction or adverse modification of critical habitat of such species.

Strategy 3.5.3: Training of Natural Resources Personnel

Projects: Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.

Initiatives: (1) Provide adequate staffing, equipment, technology, and training for the NRM to ensure proper implementation of this INRMP.

Goal 4: Protect, conserve, and enhance the ecological value and diversity of natural resources by building productive relationships with regulatory agencies and the public in support of the military mission.

Issue: The input and cooperation of regulatory agencies and other experts will ensure the success of the plans and programs implemented as part of this INRMP.

Objective 4.1: Maintain interagency cooperation with USFWS and TPWD.

Objective 4.2: Develop partnerships with the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), TCEQ, Texas A&M University–Kingsville, Texas Ornithological Society, Coastal Bend Audubon Society, DoD, PIF, Kleberg County (encroachment partnering), and other local agencies and organizations to implement wildlife monitoring and protection programs.

Objective 4.3: Coordinate natural resources activities with local community, conservation organizations, and private groups.

Objective 4.1: Maintain interagency cooperation with USFWS and TPWD.

Strategy 4.1.1: RTE Plant Species Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.
Project No. 9 -- South Texas Ambrosia Mgmt. Plan & Survey; see Appendix A.

Initiatives: (1) Continue to conduct species survey updates to identify changes in populations and habitat on the properties, as needed. Use species information provided by these surveys to modify management practices, if necessary. Modification to management practices will be administered by the NRM in consultation with environmental staff at NAVFAC Southeast, and federal and state agency representatives. Black lace cactus (*Echinocereus reichenbachii* var. *albertii*) and slender rush-pea are known to occur in Kleberg and Jim Wells counties, Texas. Determining the presence of these species or habitats that could support them at NASK, as well as the other rare, threatened, or endangered plant species identified in Appendix F, Tables F-13 through F-15 of this document will be specifically targeted in the next NASK biological resources survey and inventory (Project No. 1).

(2) Coordinate with the Environmental Section of the PWD during the planning process for all construction projects at NASK. Review the location and footprint of the project and an analysis of the project against known occurrences of RTE species. During the planning process, it is advised that the NRM review the TPWD Project Coordination and Review Request to obtain information regarding RTE species. Database queries by county or species names can be conducted on the RTE Species of Texas website or specific information can be requested from the Texas Natural Diversity Database. Additionally, the Wildlife Habitat Assessment Program, administered by TPWD, is available to assist project developers in identifying, evaluating, and addressing potential impacts to natural resources of conservation concern in Texas. Guidance on obtaining information on endangered species, important natural resources, project documentation and review, and applicable state and federal regulations, including planning tools and BMPs is available on their website (see text box for link).

(3) Coordinate, and conduct informal or formal consultation if necessary, with the USFWS and/or TPWD as appropriate to determine if Installation actions are likely to jeopardize the continued existence of any endangered or threatened species, or result in the destruction or adverse modification of critical habitat of such species.

(4) Monitor grounds maintenance and landscaping activities conducted in proximity to known populations of South Texas ambrosia to ensure habitat conditions are maintained to preserve this species.

(5) Develop an informational pamphlet for South Texas ambrosia to supplement face-to-face to bring about awareness, education, and protection of this species. It will be disseminated to NASK PWD employees, contractors, and anyone else who conducts grounds maintenance or landscaping activities on the Main Station. Enhancing workers' awareness may prevent further loss and damage and help in the identification of new locations.

(6) Encourage local landowners to search for South Texas ambrosia on their properties. A recent study found that populations located outside of the Main Station are likely to contain some unique clones, suggesting higher diversity of this species than indicated in previous genetic studies. Higher genetic diversity improves the ability of a species to respond to environmental changes or diseases. The identification of unique South Texas ambrosia clones could reduce some of the management burden at NASK (Overath et al. 2013).

(7) Update the 2005 South Texas Ambrosia Management Plan to include comprehensive survey information and recommendations for implementing mowing and prescribed burn regimes that would benefit this species.

Strategy 4.1.2: Wildlife Management and Habitat Enhancement

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.
Project No. 10 – Game Animal Survey; see Appendix A.

Initiatives: (1) Conduct censuses of wildlife populations as necessary to monitor the effectiveness of management activities in reaching management goals. These surveys should document the relative abundance of selected species that are indicators of healthy, self-sustaining ecosystems.

(2) Provide habitat enhancement for wildlife, including habitat that supports RTE species as well as migratory birds, in consideration of BASH Program requirements.

(3) Coordinate with the USFWS and TPWD regional biologists to develop specific plans addressing Tamaulipan thornscrub habitat on NALFOG.

(4) Establish conservation partnerships.

Strategy 4.1.3: Migratory Bird Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.
Project No. 10 – Game Animal Survey on the Main Station and Dixie Annex; see Appendix A.

Initiatives:

- (1) Reduce pesticide use on the Installation.
- (2) Implement habitat enhancement and maintain habitat diversity for migratory bird species, consistent with BASH Program requirements. Recommendations for habitat enhancement should be made to attract birds and other wildlife away from the flight operations areas. Additionally, modification to habitat should also take into consideration bird nesting and breeding seasons so as not to conflict with the MBTA.
- (3) Conduct bird surveys to monitor the bird populations at NASK.
- (4) Control invasive bird species that compete with native migratory bird species and their habitats.
- (5) Maintain a Migratory Bird Depredation Permit from the USFWS to allow harm to migratory birds as part of BASH Program requirements, and to maintain airfield safety.
- (6) Locate military readiness activities to avoid or minimize impacts on migratory birds, where possible. If NASK notes clear evidence of a take as a result of military readiness activities, the NASK NRM will document the take, evaluate these activities, and where practicable, reduce or eliminate the take of migratory birds.
- (7) Maintain compliance with the MBTA for all non-military readiness activities.
- (8) Request assistance from the DoD PIF Work Group, as needed, to assist and support military installations in migratory bird conservation while protecting the military mission.
- (9) Develop partnerships with federal, state, and local agencies, universities, and NGOs such as the National Audubon Society to enter into conservation partnerships, allow for bird research on the Installation, conduct monitoring surveys, and participate in International Migratory Bird Day.

Strategy 4.1.4: Invasive and Nuisance Wildlife Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
Project No. 7 – Habitat Management and Restoration
Project No. 8 – Natural Resources Outreach
Project No. 10 – Game Animal Survey; see Appendix A.

Initiatives: (1) Maintain a hunting program for large game animals to minimize BASH potential at the Main Station and NALFOG. Management of nuisance species, including trapping of wild hog, should be allowed to continue at NALFOG.

Strategy 4.1.5: RTE Wildlife Species Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.

Initiatives: (1) Continue to evaluate management practices and their effects on ecosystems and wildlife habitat, and continue programs to protect RTE wildlife species and their habitats known to occur at NASK.

(2) Review management recommendations identified in wildlife survey reports to determine if additional management measures should be implemented for protection of RTE wildlife species known to occur at NASK.

(3) Seek additional management guidance and recommendations from federal, state, and Navy wildlife biologists for protection of RTE wildlife species and their habitats known to occur at NASK.

(4) Continue to conduct monitoring programs for wildlife and natural communities at NASK, to keep these inventories up-to-date.

(5) Coordinate with the Environmental Section of the PWD during the planning process for all construction projects at NASK. Review the location and footprint of the project and an analysis of the project against known occurrences of RTE species.

(6) Coordinate with the USFWS and/or TPWD as appropriate to determine if Installation actions are likely to jeopardize the continued existence of any endangered or threatened species, or result in the destruction or adverse modification of critical habitat of such species.

Strategy 4.1.6: Hunting Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.
Project No. 10 – Game Animal Survey; see Appendix A.

Initiatives:

- (1) Maintain hunting logs for the Main Station and Dixie Annex.
- (2) Determine if a shorter big game hunting season than that allowed by the state is needed due to volunteer manpower and mission constraints. It is recommended that the big game hunting season at NASK correspond with the annual rut to make hunting success more effective. An example of this would be to allow hunting only from the day after Thanksgiving to New Year's Day.
- (3) Evaluate the potential to provide additional hunting opportunities for big game in the South Field area of the Main Station as a (rifled) shot-gun only area.
- (4) Evaluate the potential to provide additional bird hunting opportunities within agricultural outlease areas located east of South Field (old grazing lease) outside of the chain-link perimeter fence at NAS Kingsville.
- (5) Conduct an annual helicopter survey of Dixie Annex in February each year to determine harvest numbers for the coming year.
- (6) Establish hunting harvesting limits by species for Dixie Annex, based on the number of animals removed each year, and based on the results of annual helicopter surveys.
- (7) Coordinate with TPWD and Navy biologists to establish hunting harvest limits based on available data.

Strategy 4.1.7: Natural Resources Law Enforcement

Projects: There are no INRMP projects directly related to natural resources law enforcement; however, by providing training for natural resources personnel, will also improve natural resources law enforcement at NASK.

Initiatives:

- (1) Develop a wildlife law enforcement program and ensure that personnel are qualified and trained to carry out all assigned duties and responsibilities.
- (2) Enforce federal, state, and Installation laws and regulations pertaining to fish and wildlife.
- (3) Build interagency relationships with National Military Fish and Wildlife Association and USFWS to support the natural resources law enforcement program.

- (4) Identify staffing needs to manage hunting and GIS and natural resources management programs.

Strategy 4.1.8: Partnering with Federal and State Agencies, Universities, and NGOs

Projects: Project No. 2 – RTE Species Management
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.

Initiatives: (1) Develop partnerships with federal, state, and local agencies, NGOs, and universities to implement wildlife monitoring and protection programs.
(2) Participate in discussions with Kleberg, Jim Wells, and McMullen counties to reduce conflicts between development and the military mission.

Objective 4.2: Develop partnerships with USDA NRCS, TCEQ, Texas A&M University–Kingsville, Texas Ornithological Society, Coastal Bend Audubon Society, DoD PIF, Kleberg County (encroachment partnering), and other local agencies and organizations to implement wildlife monitoring and protection programs.

Strategy 4.2.1: Agricultural Outleases Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 8 – Natural Resources Outreach

Initiatives: (1) Regularly review all existing and future agricultural outleases to ensure that there are no conflicts between natural resources management recommendations made in this INRMP and the agricultural outlease contracts, especially in regard to crop selection and the use of pesticides/herbicides.
(2) Ensure that all agricultural outleases are updated as required by FAA guidelines or DoD instructions.
(3) Consider haying versus planting of certain types of row crops in the agricultural outlease areas regarding the BASH Program requirements. Evaluate whether to take the agricultural outlease areas out of production and include them in a mowing contract.

Strategy 4.2.2: RTE Plant Species Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.
Project No. 9 -- South Texas Ambrosia Mgmt. Plan & Survey; see Appendix A.

Initiatives: (1) Continue to conduct species survey updates to identify changes in populations and habitat on the properties, as needed. Use species information

provided by these surveys to modify management practices, if necessary. Modification to management practices will be administered by the NRM in consultation with environmental staff at NAVFAC Southeast, and federal and state agency representatives. Black lace cactus (*Echinocereus reichenbachii* var. *albertii*) and slender rush-pea are known to occur in Kleberg and Jim Wells counties, Texas. Determining the presence of these species or habitats that could support them at NASK, as well as the other rare, threatened, or endangered plant species identified in Appendix F, Tables F-13 through F-15 of this document will be specifically targeted in the next NASK biological resources survey and inventory (Project No. 1).

(2) Coordinate with the Environmental Section of the PWD during the planning process for all construction projects at NASK. Review the location and footprint of the project and an analysis of the project against known occurrences of RTE species. During the planning process, it is advised that the NRM review the TPWD Project Coordination and Review Request to obtain information regarding RTE species. Database queries by county or species names can be conducted on the RTE Species of Texas website or specific information can be requested from the Texas Natural Diversity Database. Additionally, the Wildlife Habitat Assessment Program, administered by TPWD, is available to assist project developers in identifying, evaluating, and addressing potential impacts to natural resources of conservation concern in Texas. Guidance on obtaining information on endangered species, important natural resources, project documentation and review, and applicable state and federal regulations, including planning tools and BMPs is available on their website (see text box for link).

(3) Coordinate, and conduct informal or formal consultation if necessary, with the USFWS and/or TPWD as appropriate to determine if Installation actions are likely to jeopardize the continued existence of any endangered or threatened species, or result in the destruction or adverse modification of critical habitat of such species.

(4) Monitor grounds maintenance and landscaping activities conducted in proximity to known populations of South Texas ambrosia to ensure habitat conditions are maintained to preserve this species.

(5) Develop an informational pamphlet for South Texas ambrosia to supplement face-to-face to bring about awareness, education, and protection of this species. It will be disseminated to NASK PWD employees, contractors, and anyone else who conducts grounds maintenance or landscaping activities on the Main Station. Enhancing workers' awareness may prevent further loss and damage and help in the identification of new locations.

(6) Encourage local landowners to search for South Texas ambrosia on their properties. A recent study found that populations located outside of the Main Station are likely to contain some unique clones, suggesting higher diversity of this species than indicated in previous genetic studies. Higher genetic

diversity improves the ability of a species to respond to environmental changes or diseases. The identification of unique South Texas ambrosia clones could reduce some of the management burden at NASK (Overath et al. 2013).

(7) Update the 2005 South Texas Ambrosia Management Plan to include comprehensive survey information and recommendations for implementing mowing and prescribed burn regimes that would benefit this species.

Strategy 4.2.3: Wildlife Management and Habitat Enhancement

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.
Project No. 10 – Game Animal Survey; see Appendix A.

Initiatives: (1) Conduct censuses of wildlife populations as necessary to monitor the effectiveness of management activities in reaching management goals. These surveys should document the relative abundance of selected species that are indicators of healthy, self-sustaining ecosystems.

(2) Provide habitat enhancement for wildlife, including habitat that supports RTE species as well as migratory birds, in consideration of BASH Program requirements.

(3) Coordinate with the USFWS and TPWD regional biologists to develop specific plans addressing Tamaulipan thornscrub habitat on NALFOG.

(4) Establish conservation partnerships.

Strategy 4.2.4: Migratory Bird Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.
Project No. 10 – Game Animal Survey; see Appendix A.

Initiatives: (1) Reduce pesticide use on the Installation.

(2) Implement habitat enhancement and maintain habitat diversity for migratory bird species, consistent with BASH Program requirements. Recommendations for habitat enhancement should be made to attract birds

and other wildlife away from the flight operations areas. Additionally, modification to habitat should also take into consideration bird nesting and breeding seasons so as not to conflict with the MBTA.

- (3) Conduct bird surveys to monitor the bird populations at NASK.
- (4) Control invasive bird species that compete with native migratory bird species and their habitats.
- (5) Maintain a Migratory Bird Depredation Permit from the USFWS to allow harm to migratory birds as part of BASH Program requirements, and to maintain airfield safety.
- (6) Locate military readiness activities to avoid or minimize impacts on migratory birds, where possible. If NASK notes clear evidence of a take as a result of military readiness activities, the NASK NRM will document the take, evaluate these activities, and where practicable, reduce or eliminate the take of migratory birds.
- (7) Maintain compliance with the MBTA for all non-military readiness activities.
- (8) Request assistance from the DoD PIF Work Group, as needed, to assist and support military installations in migratory bird conservation while protecting the military mission.
- (9) Develop partnerships with federal, state, and local agencies, universities, and NGOs such as the National Audubon Society to enter into conservation partnerships, allow for bird research on the Installation, conduct monitoring surveys, and participate in International Migratory Bird Day.

Strategy 4.2.5: RTE Wildlife Species Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.

Initiatives: (1) Continue to evaluate management practices and their effects on ecosystems and wildlife habitat, and continue programs to protect RTE wildlife species and their habitats known to occur at NASK.

(2) Review management recommendations identified in wildlife survey reports to determine if additional management measures should be implemented for protection of RTE wildlife species known to occur at NASK.

(3) Seek additional management guidance and recommendations from federal, state, and Navy wildlife biologists for protection of RTE wildlife species and their habitats known to occur at NASK.

(4) Continue to conduct monitoring programs for wildlife and natural communities at NASK, to keep these inventories up-to-date.

(5) Coordinate with the Environmental Section of the PWD during the planning process for all construction projects at NASK. Review the location and footprint of the project and an analysis of the project against known occurrences of RTE species.

(6) Coordinate with the USFWS and/or TPWD as appropriate to determine if Installation actions are likely to jeopardize the continued existence of any endangered or threatened species, or result in the destruction or adverse modification of critical habitat of such species.

Strategy 4.2.6: Hunting Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.
Project No. 10 – Game Animal Survey; see Appendix A.

Initiatives:

(1) Maintain hunting logs for the Main Station and Dixie Annex.

(2) Determine if a shorter big game hunting season than that allowed by the state is needed due to volunteer manpower and mission constraints. It is recommended that the big game hunting season at NASK correspond with the annual rut to make hunting success more effective. An example of this would be to allow hunting only from the day after Thanksgiving to New Year's Day.

(3) Evaluate the potential to provide additional hunting opportunities for big game in the South Field area of the Main Station as a (rifled) shot-gun only area.

(4) Evaluate the potential to provide additional bird hunting opportunities within agricultural outlease areas located east of South Field (old grazing lease) outside of the chain-link perimeter fence at NAS Kingsville.

(5) Conduct an annual helicopter survey of Dixie Annex in February each year to determine harvest numbers for the coming year.

(6) Establish hunting harvesting limits by species for Dixie Annex, based on the number of animals removed each year, and based on the results of annual helicopter surveys.

(7) Coordinate with TPWD and Navy biologists to establish hunting harvest limits based on available data.

Strategy 4.2.7: Public Access

Projects: Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.

Initiatives: (1) Provide for public access that is necessary or appropriate for sustainable use by the public of natural resources to the extent that the use is not inconsistent with the needs of fish and wildlife resources, and subject to requirements necessary to ensure safety and military security.

(2) Review issues that currently affect public access to outdoor recreational resources, and modify access to provide for greater recreational opportunities to the extent possible based on security and mission requirements.

Strategy 4.2.8: Educational Outreach

Projects: Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.

Initiatives: (1) Continue to coordinate the development and implementation of the outdoor recreation and educational program covered by this INRMP with the MWR Department.

(2) Develop an outdoor education program to showcase the Navy's stewardship of natural resources, and to emphasize that this stewardship is important to the military mission and habitat conservation.

(3) Develop an information kiosk to identify and highlight the unique characteristics of South Texas ambrosia populations at NASK.

(4) Seek out partnerships with USFWS, TPWD, USDA NRCS, TCEQ, Texas A&M University – Kingsville, Texas Ornithological Society, Coastal Bend Audubon Society, DoD PIF, and other local agencies and organizations, to provide educational opportunities at NASK.

Strategy 4.2.9: Natural Resources Law Enforcement

Projects: There are no INRMP projects directly related to natural resources law enforcement; however, by providing training for natural resources personnel, will also improve natural resources law enforcement at NASK.

Initiatives: (1) Develop a wildlife law enforcement program and ensure that personnel are qualified and trained to carry out all assigned duties and responsibilities.

(2) Enforce federal, state, and Installation laws and regulations pertaining to fish and wildlife.

(3) Build interagency relationships with National Military Fish and Wildlife Association and USFWS to support the natural resources law enforcement program.

- (4) Identify staffing needs to manage hunting and GIS and natural resources management programs.

Strategy 4.2.10: Partnering with Federal and State Agencies, Universities, and NGOs

Projects: Project No. 2 – RTE Species Management; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.

Initiatives: (1) Develop partnerships with federal, state, and local agencies, NGOs, and universities to implement wildlife monitoring and protection programs.
(2) Participate in discussions with Kleberg, Jim Wells, and McMullen counties to reduce conflicts between development and the military mission.

Objective 4.3: Coordinate natural resources activities with local community, conservation organizations, and private groups.

Strategy 4.3.1: Wildlife Management and Habitat Enhancement

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.
Project No. 10 – Game Animal Survey; see Appendix A.

Initiatives: (1) Conduct censuses of wildlife populations as necessary to monitor the effectiveness of management activities in reaching management goals. These surveys should document the relative abundance of selected species that are indicators of healthy, self-sustaining ecosystems.
(2) Provide habitat enhancement for wildlife, including habitat that supports RTE species as well as migratory birds, in consideration of BASH Program requirements.
(3) Coordinate with the USFWS and TPWD regional biologists to develop specific plans addressing Tamaulipan thornscrub habitat on NALFOG.
(4) Establish conservation partnerships.

Strategy 4.3.2: Migratory Bird Management

Projects: Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.

Project No. 8 – Natural Resources Outreach; see Appendix A.

Project No. 10 – Game Animal Survey; see Appendix A.

Initiatives:

- (1) Reduce pesticide use on the Installation.
- (2) Implement habitat enhancement and maintain habitat diversity for migratory bird species, consistent with BASH Program requirements. Recommendations for habitat enhancement should be made to attract birds and other wildlife away from the flight operations areas. Additionally, modification to habitat should also take into consideration bird nesting and breeding seasons so as not to conflict with the MBTA.
- (3) Conduct bird surveys to monitor the bird populations at NASK.
- (4) Control invasive bird species that compete with native migratory bird species and their habitats.
- (5) Maintain a Migratory Bird Depredation Permit from the USFWS to allow harm to migratory birds as part of BASH Program requirements, and to maintain airfield safety.
- (6) Locate military readiness activities to avoid or minimize impacts on migratory birds, where possible. If NASK notes clear evidence of a take as a result of military readiness activities, the NASK NRM will document the take, evaluate these activities, and where practicable, reduce or eliminate the take of migratory birds.
- (7) Maintain compliance with the MBTA for all non-military readiness activities.
- (8) Request assistance from the DoD PIF Work Group, as needed, to assist and support military installations in migratory bird conservation while protecting the military mission.
- (9) Develop partnerships with federal, state, and local agencies, universities, and NGOs such as the National Audubon Society to enter into conservation partnerships, allow for bird research on the Installation, conduct monitoring surveys, and participate in International Migratory Bird Day.

Strategy 4.3.3: RTE Wildlife Species Management

Projects:

- Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
Project No. 2 – RTE Habitat Management; see Appendix A.
Project No. 3 – Invasive Species Control; see Appendix A.
Project No. 5 – Prescribed Fire Management; see Appendix A.
Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
Project No. 7 – Habitat Management and Restoration; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.

- Initiatives:**
- (1) Continue to evaluate management practices and their effects on ecosystems and wildlife habitat, and continue programs to protect RTE wildlife species and their habitats known to occur at NASK.
 - (2) Review management recommendations identified in wildlife survey reports to determine if additional management measures should be implemented for protection of RTE wildlife species known to occur at NASK.
 - (3) Seek additional management guidance and recommendations from federal, state, and Navy wildlife biologists for protection of RTE wildlife species and their habitats known to occur at NASK.
 - (4) Continue to conduct monitoring programs for wildlife and natural communities at NASK, to keep these inventories up-to-date.
 - (5) Coordinate with the Environmental Section of the PWD during the planning process for all construction projects at NASK. Review the location and footprint of the project and an analysis of the project against known occurrences of RTE species.
 - (6) Coordinate with the USFWS and/or TPWD as appropriate to determine if Installation actions are likely to jeopardize the continued existence of any endangered or threatened species, or result in the destruction or adverse modification of critical habitat of such species.

Strategy 4.3.4: Hunting Management

- Projects:**
- Project No. 1 – Biological Resources Survey and Inventory; see Appendix A.
 - Project No. 4 – NASK INRMP Update; see Appendix A.
 - Project No. 6 – Neotropical Migratory Bird Survey; see Appendix A.
 - Project No. 7 – Habitat Management and Restoration; see Appendix A.
 - Project No. 8 – Natural Resources Outreach; see Appendix A.
 - Project No. 10 – Game Animal Survey; see Appendix A.

- Initiatives:**
- (1) Maintain hunting logs for the Main Station and Dixie Annex.
 - (2) Determine if a shorter big game hunting season than that allowed by the state is needed due to volunteer manpower and mission constraints. It is recommended that the big game hunting season at NASK correspond with the annual rut to make hunting success more effective. An example of this would be to allow hunting only from the day after Thanksgiving to New Year's Day.
 - (3) Evaluate the potential to provide additional hunting opportunities for big game in the South Field area of NAS Kingsville as a (rifled) shot-gun only area.
 - (4) Evaluate the potential to provide additional bird hunting opportunities within agricultural outlease areas located east of South Field (old grazing lease) outside of the chain-link perimeter fence at NAS Kingsville.

(5) Conduct an annual helicopter survey of Dixie Annex in February each year to determine harvest numbers for the coming year.

(6) Establish hunting harvesting limits by species for Dixie Annex, based on the number of animals removed each year, and based on the results of annual helicopter surveys.

(7) Coordinate with TPWD and Navy biologists to establish hunting harvest limits based on available data.

Strategy 4.3.5: Public Access

Projects: Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.

Initiatives: (1) Provide for public access that is necessary or appropriate for sustainable use by the public of natural resources to the extent that the use is not inconsistent with the needs of fish and wildlife resources, and subject to requirements necessary to ensure safety and military security.

(2) Review issues that currently affect public access to outdoor recreational resources, and modify access to provide for greater recreational opportunities to the extent possible based on security and mission requirements.

Strategy 4.3.6: Educational Outreach

Projects: Project No. 4 – NASK INRMP Update; see Appendix A.
Project No. 8 – Natural Resources Outreach; see Appendix A.

Initiatives: (1) Continue to coordinate the development and implementation of the outdoor recreation and educational program covered by this INRMP with the MWR Department.

(2) Develop an outdoor education program to showcase the Navy's stewardship of natural resources, and to emphasize that this stewardship is important to the military mission and habitat conservation.

(3) Develop an information kiosk to identify and highlight the unique characteristics of South Texas ambrosia populations at NASK.

(4) Seek out partnerships with USFWS, TPWD, USDA NRCS, TCEQ, Texas A&M University – Kingsville, Texas Ornithological Society, Coastal Bend Audubon Society, DoD PIF, and other local agencies and organizations, to provide educational opportunities at NASK.

Strategy 4.3.6: Natural Resources Law Enforcement

Projects: There are no INRMP projects directly related to natural resources law enforcement; however, by providing training for natural resources personnel, will also improve natural resources law enforcement at NASK.

Initiatives:

- (1) Develop a wildlife law enforcement program and ensure that personnel are qualified and trained to carry out all assigned duties and responsibilities.
- (2) Enforce federal, state, and Installation laws and regulations pertaining to fish and wildlife.
- (3) Build interagency relationships with National Military Fish and Wildlife Association and USFWS to support the natural resources law enforcement program.
- (4) Identify staffing needs to manage hunting and GIS and natural resources management programs.

5.0 Program Elements

This section discusses ecosystem management at NASK by dividing ecosystem management into four components: land management, forest management, fish and wildlife, and outdoor recreation. These components are further divided into sub-components; for example, land management addresses wetlands, noxious, invasive, and exotic species and pests, soil conservation and erosion control, storm-water and water quality control, landscaping and grounds maintenance, floodplain management, urban forestry, and agricultural outleasing.

Sub-components are defined in this section. For each sub-component, this section discusses the issue(s), long-term management of the issue(s), and the relationship of issues to ecosystem management within NASK, the relationships among ecosystem management sub-components, legal requirements, and sources for additional management information. This section also correlates the goals, objectives, and strategies (see Section 4) pertaining to ecosystem management issues.

The sub-components constitute natural resource management actions, and benefit the plants, animals, and ecosystems occurring on this installation. Special attention is given to RTE species, and their habitats, through management actions referenced in Table 5-1. These actions are long-term conservation measures that provide benefits for terrestrial and aquatic habitats on the installation. Management actions such as soil conservation and storm water management, for example, control sediment and pollutant runoff to protect water quality for species such as the golden orb mussel.

The “Wildlife Habitat Management and Threatened and Endangered Species, and Natural Communities” section of this INRMP (Section 5.4.2) includes additional goals, objectives, strategies, and projects for the benefit and long-term conservation of RTE species found, or potentially found, on the Installation. Animal and plant species explicitly accounted for in this INRMP are:

Audubon’s oriole (*Icterus graduacauda audubonii*)
Black-spotted newt (*Notophthalmus meridionalis*)
Brown pelican (*Pelecanus occidentalis*)
Cave myotis bat (*Myotis velifer*)
Desert massasauga (*Sistrurus catenatus edwardsii*)
Dickcissel (*Spiza americana*)
Golden orb (*Quadrula aurea*)
Gulf Coast jaguarundi (*Herpailurus yaguarondi cacomitli*)
Keeled earless lizard (*Holbrookia propinqua*)
Maritime pocket gopher (*Geomys personatus maritimus*)
Mexican blackhead snake (*Tantilla atriceps*)
Monarch butterfly (*Danaus plexippus plexippus*)
Northern aplomado falcon (*Falco femoralis septentrionalis*)

Ocelot (*Leopardus pardalis*)
Peregrine falcon (*Falco peregrinus*)
Plains spotted skunk (*Spilogale putorius interrupta*)
Reticulate collared lizard (*Crotaphytus reticulatus*)
Rio Grande lesser siren (*Siren intermedia texana*)
Sennett's hooded oriole (*Icterus cucullatus sennitti*)
Sheep frog (*Hypopachus variolosus*)
South Texas ambrosia (*Ambrosia cheiranthifolia*)
Southern yellow bat (*Lasiurus ega*)
Sprague's pipit (*Anthus spragueii*)
Spot-tailed earless lizard (*Holbrookia lacerate*)
Texas horned lizard (*Phrynosoma cornutum*)
Texas indigo snake (*Drymarchon melanurus*)
Texas tortoise (*Gopherus berlandieri*)
Tricolored bat (*Perimyotis subflavus*)
Western burrowing owl (*Athene cunicularia hypugaea*)
Yellow-billed cuckoo (*Coccyzus americanus*)
White-tailed hawk (*Geranoaetus albicaudatus*)
Wood stork (*Mycteria americana*)

Table 5-1 Habitat Management Actions at the Main Station Complex

Habitat Management Actions	Section
Coastal Zone Management	5.2.1
Wetland Management	5.2.2
Soil Conservation and Erosion Control	5.2.3
Storm-water and Water Quality Control	5.2.4
Floodplain Management	5.2.5
Landscaping and Grounds Maintenance	5.2.6
Invasive, Exotic and Noxious Species and Pests	5.2.7
Urban Forestry	5.2.8
Agricultural Outleasing	5.2.9
Forest Management	5.3
Forest Protection: Wildland Fire Management	5.3.1
Fish and Wildlife	5.4
Migratory Birds	5.4.1
Threatened and Endangered Species	5.4.2
Nuisance Wildlife and BASH	5.4.3
Wildlife Diseases: Zoonosis Prevention	5.4.4
Outdoor Recreation	5.5
Hunting	5.5.1
Wildlife Officer	5.5.2
Training	5.6
Natural Resource Training	5.6.1
Global Information Systems (GIS)	5.6.2

5.1 LAND MANAGEMENT

Land management is the development of programs and techniques for managing lands. The land management issues of this INRMP are wetlands, noxious, invasive, and exotic species and pests, soil conservation and erosion control, stormwater and water quality control, landscaping and grounds maintenance, floodplains protection, urban forestry, and agricultural outleasing.

The land management issues in 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 (e.g., regarding soil conservation, stormwater management) to protect and enhance the natural environment, while continuing to provide for the needs associated with the military mission of NASK.

5.2 WATER RESOURCES MANAGEMENT

Water resources are an important part of natural ecosystems due to the diverse biological and ecological functions they support and hydrologic functions they perform, such as improving water quality, groundwater recharge, pollutions treatment, nutrient cycling, provision of wildlife habitat and niches for flora and fauna, stormwater storage, and erosion protection (Benton et al. 2008).

The Texas State Soil and Water Conservation Board (TSSWCB) is a statutorily mandated member of the Texas Groundwater Protection Committee, the Coastal Coordination Council, the Drought Preparedness Council, and the Water Conservation Advisory Council. The TSSWCB is the state agency responsible for administering Texas' soil and water conservation law and coordinating conservation and NPS abatement programs. The TSSWCB provides assistance to 216 soil and water conservation districts (SWCDs) located throughout the state. Local SWCDs provide many services including assistance with operation and maintenance of flood control structures, and sponsoring pesticide workshops.

The TSSWCB administers the Texas Brush Control Program in coordination with various state and federal entities. This Program was developed to assist in addressing the water needs, which has become one of the most limiting natural resources in Texas. Brush control is recognized as a method of vegetation control that can help to increase the availability of water. Currently, the TSSWCB does not have an active role in management of the water resources at NASK.

The Navy recognizes the importance of the nation's water resources, and as such is committed to supporting their conservation. NASK is located within Nueces-Rio Grande Coastal Basin (NAS Kingsville) and the Greater Nueces River Basin (NALFOG and Dixie Target Range), both of which eventually drain into the Gulf of Mexico and Atlantic Ocean. Surface waters at NASK include ponds, perennial and intermittent streams, creeks, drainages, and freshwater wetlands.

5.2.1 Coastal Zone Management

The coastal zone provides important habitat, especially for migratory birds, marine mammals and sea turtles, and acts as a necessary buffer zone. Protection of the coastal zone is mandated through the CZMA.

Issues

The Main Station is located in the Texas Coastal Zone, a federally approved coastal zone that includes a portion of 18 counties in southeastern Texas, extending offshore to 9 nautical miles (17 km) (Texas General Land Office 2010). Land use activities may negatively impact sensitive habitats in the coastal zone.

Goals and Objectives

- Protect and maintain natural resources within NASK by continuing and enhancing ecologically appropriate and beneficial land uses and management practices, while ensuring the continuation of the military mission;
- Protect, maintain, and restore native vegetative communities and plant and wildlife populations;
- Protect and conserve the ecological value and diversity of natural resources by fostering knowledge of, and participation in, adaptive ecosystem management;
- Continue existing, and establish new programs and procedures to monitor, maintain, and enhance wetlands and water quality;
- Improve and enhance water quality by ensuring P2 Plans and SWPPPs are consistent with the installation's natural resources management program.
- Achieve no net loss of wetlands.
- Maintain the ecological integrity of wetland and upland communities for the protection of native plant and animal species, including numerous federally and state listed species;
- Maintain the attenuation capacity of the remaining undisturbed acreage within the 100-year floodplain;
- Ensure that land management and land use decisions comply with all applicable laws, executive orders, regulations, directives, and instructions, and that adverse impacts to the natural environment are minimized;
- Provide adequate staffing, equipment, technology, and training to the Natural Resources Program to ensure proper implementation of this INRMP; and
- Incorporate the concept of ecosystem management into all planning and management processes.

Projects

- Biological Resources Survey and Inventory (Project 1 in Appendix A)
- RTE Habitat Management (Project 2 in Appendix A)
- Invasive Species Control (Project 3 in Appendix A)
- NASK INRMP Update (Project 4 in Appendix A)
- Prescribed Fire Management (Project 5 in Appendix A)
- Neotropical Migratory Bird Survey (Project 6 in Appendix A)
- Habitat Management and Restoration (Project 7 in Appendix A)
- Natural Resources Outreach (Project 8 in Appendix A)

Management Strategies

- Minimize impacts of construction activities in the coastal zone through use of appropriate BMPs.
- Consider and be aware of any Installation activities that could impact the Texas Coastal Zone, including but not limited to sedimentation problems, and activities that could affect wetlands and habitats for RTE species, which are covered under the Texas Coastal and Estuarine Land Conservation Program (TCELCP), and if necessary coordinate with the Texas Land Office.
- Conduct a federal consistency review for any activity that may affect the natural resources in the Texas Coastal Zone, and include coordination with the Texas Land Office to ensure consistency with CZMA and the TCELCP.

Long-term Management

The Texas Coastal Management Program, established in 1978, is funded by NOAA, managed by the Texas Land Commissioner, and is a partnership among local, regional, and state agencies for the purpose of ensuring the long-term environmental and economic health of the Texas coast through management of coastal natural resource areas. The Management Program was developed pursuant to the CZMA, which was passed by Congress in 1972 in response to concerns about the rapid deterioration of coastal areas throughout the nation. Administered by the NOAA, the CZMA law authorized funding for state coastal programs around the country to improve the environmental and economic health of America's coastal areas by establishing federal-state partnerships, and providing the legal framework related to management of the nation's coastal resources (Texas General Land Office 2010).

The process by which a state decides whether a federal action meets its enforceable policies is called federal consistency review and is conducted by the Texas Land Office when construction occurs within the Texas Coastal Zone Boundary. Federal consistency applies to any activity that is in, or affects land use, water use or any natural resource in the coastal zone, if the activity is conducted by or on behalf of a federal government agency, requires a federal license or permit, receives federal funding, or is a plan for exploration, development or production from any area leased under the Outer Continental Shelf Lands Act. Through the review process, the Land Office ensures that project plans meet the goals and policies of the Coastal Zone Management Program to the maximum extent practicable (Texas General Land Office n.d.b.).

The Texas Coastal Management Plan (CMP) was accepted into the Coastal Zone Management Program in 1997. The goals of the CMP are to protect, preserve, restore, and enhance the diversity, quality, quantity, functions, and values of coastal natural resources areas and to ensure sound management of all coastal resources by allowing for compatible economic development and multiple human uses of the coastal zones (Texas General Land Office 2010). The TCELCP was approved by NOAA in 2010, pursuant to the adoption of the Appropriations Act of 2002 (Public Law 107-77). The purpose of the TCELCP is the protection of important coastal and estuarine areas that have significance conservation, recreation, ecological, historical, or aesthetic values, or are threatened by conversion from their natural or recreational state to other uses.

While the Texas CMP boundary only covers a portion of Kleberg County, the TCELCP boundary includes all the geographic area of the 18 coastal counties, including Kleberg (NOAA 2010).

The TSSWCB works with other state and federal agencies on NPS issues as they relate to Water Quality Standards and Criteria, Total Maximum Daily Loads, Watershed Protection Plans, and the Coastal Management Plan.

Integration with Other Natural Resources Management Activities

- Wetland Management, Section 5.2.2 – maintain healthy wetland habitats in support of coastal zone management;
- Soil Conservation and Erosion, Section 5.2.3 – sedimentation into coastal areas;
- Stormwater and Water Quality, Section 5.2.4 – maintain water quality of surface waters within the coastal zone in support of coastal zone management;
- Floodplains, Section 5.2.5 – maintain coastal vegetation, i.e. mangroves, marshes, sea-oats, upland vegetation to reduce flood impacts;
- Landscaping and Grounds Maintenance, Section 5.2.6 – maintain vegetative buffers and coastal uplands;
- Invasive, Exotic, and Noxious Species, Section 5.2.7 – potential pesticide contamination of coastal areas;
- Urban Forestry, Section 5.2.8 – consider vegetative buffers and water quality during urban forestry;
- Agricultural Outleasing, Section 5.2.9 – potential pesticide and fertilizer contamination of coastal areas;
- Forest Protection, Section 5.3.1 – maintain regular burn cycles to ensure natural dune and upland conditions in coastal areas;
- Migratory Birds, Section 5.4.1 – coastal areas are vital forage habitat for birds, particularly shorebirds, seabirds and wading birds;
- Threatened and Endangered Species, Section 5.4.2 – coastal areas provide vital habitat for many protected species;
- Nuisance Wildlife and BASH, Section 5.4.3 – consider propensity for coastal areas to attract BASH animals;
- Wildlife Diseases, Section 5.4.4 – consider the potential of disease transmission from animal to human contact, reduce human-wildlife interactions, prohibit feeding of feral cats
- Outdoor Recreation, Section 5.5 – restricted uses within coastal areas;
- Hunting, Section 5.5.1 - Use hunting to manage feral animal populations in coastal areas;
- Wildlife Officer, Section 5.5.2 - promote collaborative management and enhancement of coastal zone resources;
- Natural Resources Training, Section 5.6.1 – ensure personnel are current on coastal zone laws, regulations, and management practices; and
- GIS, Section 5.6.2 – utilize GIS tools to monitor important natural resources located within the coastal zone; improve coastal zone management.

Ecosystem Management

The coastal zone should be managed with an ecosystem-based approach because it provides important habitat for migratory birds and other wildlife and supports ecosystem services that protect natural resources.

Military Mission

NASK activities, considered detrimental to coastal functions, can affect the military mission by placing the Installation at odds with state regulators. Proper coastal zone management improves water quality for aquatic species and outdoor recreational activities and provides habitat for a variety of animal species. Proper coastal zone management also helps mitigate the effects of storms, including hurricanes, which can damage buildings, destroy coastlines, and cause flooding. Such associated damage could pose a threat to the continuation and location of training activities. Management of these areas benefit to the local economy, ecology and operations of the complex.

Laws, Executive Orders, Regulations, Directives, and Memoranda Relevant to Coastal Zone Management

- Federal Water Pollution Control Act, as amended by Clean Water Act of 1977, 33 USC 1251, prohibits the discharge of dredged or filled materials into waters of the U.S., including wetlands, without first obtaining a permit from the USACE (Section 404 of the CWA).
- Coastal Zone Management Act, Section 6217, Coastal Nonpoint Pollution Control Program, 16 USC 1451, et seq., requires states with Coastal Zone Management Programs to develop Nonpoint Pollution Control Programs with approval from NOAA and USEPA.
- Coastal Wetlands Planning, Protection and Restoration Act, 16 USC 3951-3956, enacted to identify, prepare, and fund construction of Texas coastal wetlands restoration projects.
- Oil Pollution Act, 1990, 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.
- 15 CFR 923, Coastal Zone Management Program Regulations, establishes requirements for review of approved management programs and grant application procedures for program funds.
- 15 CFR 930, Federal Consistency with Approved Coastal Management Programs, describes the obligations of all parties who are required to comply with the federal consistency requirements of the Coastal Zone Management Act.
- Texas Natural Resources Code, Title 2, Chapter 33, Coastal Public Lands Management Act, 1973, establishes that the natural sources of coastal public lands shall be preserved and that the public interest in the use of public coastal lands shall be protected.
- Texas Administrative Code, Title 301, Chapter 501, Coastal Management Program, establishes the Coastal Management Program to provide for more effective and efficient use of public funds to manage coastal natural resource areas.

- EO 12088 (13 October 1978), Federal Compliance with Pollution Control Standards, as amended, ensures that all necessary actions are taken to prevent, control, and abate environmental pollution with respect to federal facilities and activities under control of the Agency.
- OPNAVINST 5090.1D, 12-3.8(f), discusses natural resources management relating to NPS pollution and establishes requirements, guidelines, and standards for the assessment of damages arising from the release of oil or hazardous substances.

Additional Sources of Information

NOAA, Ocean and Coastal Management in Texas
Texas General Land Office, Coastal Management Program
TPWD, Conservation of Texas Bays and Estuaries
Texas State Historical Association, Coastal Zone

5.2.2 Wetlands

Wetlands are lands on which water covers the soil or is present either at or near the surface of the soil or within the root zone all year or for varying periods of time during the year, including during the growing season. The USACE (33 CFR 328.3(b), 1991) and the USEPA (40 CFR 230.3(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 defines wetlands based upon the presence of hydrophytic vegetation, hydric soil characteristics, and hydrologic indicators, which must all occur and meet the defined characteristics in order for a location to be classified as a wetland. Wetlands are transitional zones between the terrestrial and aquatic environment, and are characterized by physical, chemical, and biological features that indicate hydrological conditions. Wetlands are an important part of natural ecosystems due to the diverse biological and hydrologic functions they perform, such as improving water quality, groundwater recharge, pollution treatment, nutrient cycling, provision of wildlife habitat and niches for unique flora and fauna, stormwater storage, and erosion protection (Benton et al. 2008). The NASK Complex has 74 acres of known wetland areas.

Issues

A formal wetlands delineation is needed to allow for proper management of NASK wetlands. A wetland reconnaissance survey conducted at the Main Station identified 74 ac (30 ha) of wetlands. A wetland reconnaissance survey conducted at NALFOG identified emergent wetland vegetation in association with a former pond (that has since been filled in with dirt) located south of the intersection of the two runways; however, no wetland data are available for inclusion on the water resources map for this parcel. A wetland survey has not been conducted at Dixie Target Range; however, a review of available wetland data from USFWS did not identify any wetland habitat within the boundaries. Wetlands provide valuable wildlife habitat and water quality

protection. The Installation is required to balance wetland protection with support of the military mission.

Protection and management of the wetlands present at NASK must be addressed according to state and federal regulations. EO 11990, Protection of Wetlands, and OPNAVINST 5090.1D, 12-3.8(b), instruct Navy facilities to manage lands with the goal of no net loss of wetlands. All federal agencies are required by EO 11990 to use reasonable efforts to preserve and enhance the natural and beneficial values of wetlands under their stewardship. The DoD Natural Resources Conservation Program also requires military installations to inventory and manage significant or sensitive environmental features, including wetlands. The SAIA, as amended, calls for improving wetlands for the benefit of plants and animals when it is consistent with the military mission and readiness.

Goals and Objectives

- Protect and maintain natural resources within NASK by continuing and enhancing ecologically appropriate and beneficial land uses and management practices, while ensuring the continuation of the military mission;
- Protect, maintain, and restore native vegetative communities and plant and wildlife populations;
- Protect and conserve the ecological value and diversity of natural resources by fostering knowledge of, and participation in, adaptive ecosystem management;
- Continue existing, and establish new programs and procedures to monitor, maintain, and enhance wetlands and water quality;
- Improve and enhance water quality by ensuring P2 Plans and SWPPPs are consistent with the installation's natural resources management program.
- Achieve no net loss of wetlands.
- Maintain the ecological integrity of wetland and upland communities for the protection of native plant and animal species, including numerous federally and state listed species;
- Maintain the attenuation capacity of the remaining undisturbed acreage within the 100-year floodplain;
- Ensure that land management and land use decisions comply with all applicable laws, executive orders, regulations, directives, and instructions, and that adverse impacts to the natural environment are minimized;
- Provide adequate staffing, equipment, technology, and training to the Natural Resources Program to ensure proper implementation of this INRMP; and
- Incorporate the concept of ecosystem management into all planning and management processes.

Projects

- Biological resources survey and inventory (Project 1 in Appendix A)
- RTE Habitat Management (Project 2 in Appendix A)
- Invasive Species Control (Project 3 in Appendix A)

- NASK INRMP Update (Project 4 in Appendix A)
- Prescribed Fire Management (Project 5 in Appendix A)
- Neotropical Migratory Bird Survey (Project 6 in Appendix A)
- Habitat Management and Restoration (Project 7 in Appendix A)
- Natural Resources Outreach (Project 8 in Appendix A)
- South Texas Ambrosia Management Plan and Survey (Project 9 in Appendix A)
- Game Animal Survey on the Main Station and Dixie Annex (Project 10 in Appendix A)

Management Strategies

- Identify and locate jurisdictional waters of the U.S., including wetlands that have the potential to be impacted by activities associated with the military mission, as directed by the CWA. Complete a survey of wetlands and associated habitats in accordance with the USFWS recommendations for NASK to assist the NRM in proper management of wetlands and to identify management measures that will enhance wetland functions and/or the military mission (Navy 2008).
- Inventory wetlands and assess their function and quality on a routine basis;
- Promote at least 50-foot buffers for all wetlands, and ensure land use and land management practices that will not adversely affect wetland resources;
- Continue to develop a soil erosion control plan and reduce the rate of soil erosion through the implementation of long-term measures and projects;
- Continue to inventory the use of pesticides and fertilizers to assess alternatives to their use and a reduction in pesticide and fertilizer use;
- Continue to implement BMPs to minimize stormwater pollution and erosion;
- Implement environmentally beneficial landscaping, grounds maintenance, and urban forestry practices;
- Continually verify that natural resources personnel obtain proper training and certifications; and
- Continue the use of Computer-Aided Drafting and a GIS for construction, environmental, engineering, and natural resources mapping.
- Use bioengineering techniques where restoration or enhancement opportunities exist to improve wetland function and stabilize compromised streambanks, and plant using native species. Consider BASH Program requirements for all enhancement/restoration actions identified for the Main Station and NALFOG when identifying sites for shoreline and habitat improvement.
- Avoid wetland and riparian areas during future construction of structures and other facilities, including roads, unless essential to the military mission. Locate new roads outside riparian areas, whenever possible. Design stream crossings to minimize the area disturbed, and unimproved stream crossings are prohibited.
- Implement appropriate wetland mitigation for unavoidable wetland impacts, as authorized and required by the federal and state permit process and the CWA.

Long-Term Management

Proper management of wetlands, understanding their functions and values, and meeting regulatory requirements when conducting activities within wetlands requires knowledge of their extent and distribution. The USACE regulates and protects wetland resources in the U.S. Delineating jurisdictional wetlands is accomplished using the *1987 Corps of Engineers Wetland Delineation Manual* and the *2008 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region*. Areas that meet the regulatory definition of a wetland are protected by Section 404 of the CWA, and any activity that may deposit fill into a wetland requires a permit from the USACE.

Ensuring regulatory compliance and managing wetland resources to enhance their value are the primary management issues for NASK wetlands. Wetland management generally is conducted within and around natural and man-made wetlands to protect, restore, and improve degraded wetlands. Issues associated with wetland management on the Installation include the following.

1. Protecting natural wetlands from loss, or degradation by actions not related to the military mission.
2. Meeting regulatory requirements for activities that unavoidably impact wetlands.
3. Creating, enhancing, and restoring wetlands as mitigation for unavoidable impacts and to meet requirements of the SAIA.

Due to the important functions and values provided by wetlands, potential impacts to all wetlands, regardless of jurisdictional determination, will be avoided to the greatest extent practicable. As required by USACE, any unavoidable impacts to wetlands will be subject to appropriate compensatory mitigation to achieve no net loss of wetlands. Impacts to wetlands at NASK can occur directly or indirectly from daily operations, including maintaining drainage channels, vegetation management, or from directly altering the areas (fill, drain, or a change in hydrology) or altering upland areas surrounding wetlands. Mission needs and requirements may necessitate an unavoidable clearing of land and filling of wetlands to build additional facilities. The need to comply with other environmental regulations, as well as the needs of the mission, may result in an unavoidable loss of some wetlands.

The high degree of variability in characteristics (habitat value and function) among wetlands at the Main Station make management decisions more complex and require thorough consideration regarding compliance with current environmental laws and regulations, while supporting the military mission. Careful management of wetlands located in proximity to NASK airfields also is needed to reduce their potential to attract wildlife and contribute to BASH.

Section 404 of the CWA (33 USC 320-330) prohibits the discharge of dredged or fill material into waters of the U.S., including wetlands, unless authorized by a USACE permit. While the USACE has primary responsibility for implementing the CWA, other agencies, including the USEPA, USFWS, TPWD, Texas Natural Resource Conservation Commission, and USDA NRCS play important regulatory and advisory roles. If a project will impact wetlands or other specially

designated aquatic sites, the USACE has the authority to require mitigation in the form of avoidance, minimization or compensation, to minimize the adverse effects of the project.

Development of roads, installation of new culverts, and grading or fill activities are examples of impacts that have the potential to impact wetlands and waters of the U.S., and a permit may be required before implementing these activities in accordance with Section 404 of the CWA. Certain actions that have minimal adverse impact on wetlands and other water resources may qualify for a Nationwide Permit (NWP). The NWP Program was designed to streamline the Section 404 permitting process, and covers activities conducted in waters of the U.S., including maintenance activities such as repairing, rehabilitating, or replacing existing structures, and removing accumulated fill or debris from within or around existing structures. Activities associated with aquatic habitat restoration, establishment, or enhancement may also qualify for streamlined authorization under a NWP.

Impacts to wetlands (including their function) and other surface waters by planned future projects at NASK will be minimized or eliminated in accordance with EO 11990 and current Navy regulations. A formal jurisdictional wetland and water resources delineation will be needed to verify resource boundaries before undertaking activities that disturb regulated wetlands or waterbodies, and a CWA Section 404 permit may be required. If wetland impacts are unavoidable and a permit is required to authorize the activity, appropriate impact minimization and mitigation will be required and will be determined through consultation with the appropriate federal and state agencies (USACE, USFWS, and TPWD). Additionally, Section 404 may require restoration of wetlands damaged by project activities, and although in-kind replacement of wetlands is the preferred mitigation strategy, other types of mitigation that may be applied including conservation easements, mitigation banking, and other mitigation as dictated by the federal and state agencies involved in the permitting and consultation process.

NASK adheres to the requirement of 'no net loss' of wetlands on federal lands, as mandated by EO 11990. This order protects and restores wetland function by buffering wetlands from direct human pressures and maintaining important external natural processes that act upon wetlands. Physical buffers minimize the effects of the abrupt transition between two different habitats (edge effects) on the numbers and kinds of organisms, reduce the amount of marginal habitat for species, and mitigate water quality impacts. A buffer typically consists of a suitably wide (i.e., at least 50 feet) band of vegetation along the perimeter of a wetland or water body. An effective buffer must consider wetland functional value (e.g., level of degradation and sensitivity to disturbance), intensity of adjacent land use, buffer characteristics (i.e., vegetation density, structural complexity, and soil condition), and specific buffer functions required as described in Castelle et al. 1994:

- sediment removal and erosion control;
- nutrient transformation and removal;
- reduce metals and other pollutants;
- stormwater runoff reduction through infiltration;
- reduce water temperature;

- reduce human impacts by limiting easy access and minimizing edge effects from noise, light, temperature, and other changes; and
- protect interior wetland species.

Natural wetlands are not to be used for water quality treatment of point or NPS pollution (Fields 1993). Untreated point source discharges to wetlands have been eliminated through the National Pollutant Discharge Elimination System (NPDES) program in Section 402 of the CWA. Remaining point source discharges are of secondarily treated effluent, which is typified by greater biochemical oxygen demand, amounts of suspended solids, and nutrient levels as compared to natural inputs. Proper management dictates that wetlands and surface waters be protected from such inputs using water quality standards promulgated by each state. Although significant NPS loading to wetlands is undesirable, this issue will take time to address, and management measures will likely result in reduced, but not eliminated, loadings to wetlands.

It is important to develop and implement strategies for the long-term protection of wetlands on the Installation. Incorporating wetland management and protection would involve classifying the Installation's wetland resources according to their relative function and value, and identifying specific management tasks based upon those findings. Issues pertaining to wetland protection and management include the following.

- Gathering biological baseline data to assess function and value of wetland resources. Decisions regarding how to manage natural wetlands, enhance degraded wetlands, and analyze potential impacts can be made from this baseline data.
- Addressing erosion problems that exist along many of the drainage canals and sparsely vegetated areas, and that contribute to habitat loss and degradation of water quality.
- Regularly reviewing grounds maintenance, pest management, and construction BMPs to ensure that wetland water quality is not impacted by runoff (NAVFAC 2012).
- Balancing wetland protection and enhancement with BASH precautions.
- Reducing NPS pollution from erosion, vehicles, dumping, pest management, grounds maintenance, and weed control. NPS pollution from runoff can degrade wetland quality and function.
- Developing recreational and aesthetic opportunities within and adjacent to wetlands, such as nature trails and wildlife observation areas to increase awareness of wetland importance.

A detailed delineation of the installation's wetlands is not planned. Delineations are only performed as required by major military construction projects or similar actions. A wetland inventory has been performed and is considered sufficient to provide the Natural Resources Manager with a broad understanding of the type and location of wetlands on the property.

Integration with Other Natural Resources Management Activities

- Coastal Zone Management, Section 5.2.1 – wetlands filter contaminants from surface water before it reaches the ocean;

- Soil Conservation and Erosion, Section 5.2.3 – sedimentation into wetlands reduces water storage capacity of wetland;
- Stormwater and Water Quality, Section 5.2.4 – stormwater runoff into wetland areas might carry pesticides, fertilizers, and solid waste;
- Floodplains, Section 5.2.5 – maintain wetland vegetation, i.e. cypress, willow, gum, tupelo, to reduce flood impacts; plant wetland plants near depressed areas that flood regularly to aid in water absorption;
- Landscaping and Grounds Maintenance, Section 5.2.6 – maintain vegetative buffers and do not remove vegetation within wetlands;
- Invasive, Exotic, and Noxious Species, Section 5.2.7 – potential pesticide contamination of wetland areas;
- Urban Forestry, Section 5.2.8 – consider vegetative buffers and erosion potential quality during urban forestry;
- Agricultural Outleasings, Section 5.2.9 – potential pesticide or fertilizer contamination of wetlands; sedimentation of wetlands through erosion from outlease activities;
- Forest Protection, Section 5.3.1 – maintain regular burn cycles to ensure understory of wetlands doesn't become too thick or infested with invasive species;
- Migratory Birds, Section 5.4.1 – wetlands are vital forage habitat for birds, particularly for wading birds;
- Threatened and Endangered Species, Section 5.4.2 – wetlands provide vital habitat for many protected species;
- Nuisance Wildlife and BASH, Section 5.4.3 – consider propensity for wetland areas to attract BASH animals;
- Wildlife Diseases, Section 5.4.4 – consider the potential of disease transmission from animal to human contact, reduce human-wildlife interactions;
- Outdoor Recreation, Section 5.5 – restricted uses within wetlands;
- Hunting, Section 5.5.1 – Employ hunting to control feral animal populations within wetlands;
- Wildlife Officer, Section 5.5.2 – Use wildlife officer to increase communication about wetland issues and wetland usage while out in the field and report any activity that seems to cause an issue or impact.
- Natural Resources Training, Section 5.6.1 – ensure personnel are current on wetland laws, regulations, and management practices; and
- GIS, Section 5.6.2 – utilize GIS tools to improve wetland management.

Ecosystem Management

Wetlands management is an essential component of ecosystem management because proper management will preserve, enhance, and create habitat for a variety of wildlife species, while providing aesthetic and educational values. Changes to hydrology, geochemistry, substrate, or species composition may impair the ability of a wetland to function properly. Vegetative buffers between wetland and upland communities help maintain water quality by filtering sediments and other pollutants from runoff prior to discharge into the wetland. Vegetative buffers also provide habitat for a diversity of wetland and upland species.

Military Mission

NASK activities, considered detrimental to wetland functions, can affect the military mission by placing the Installation at odds with state regulators. Proper wetland management improves water quality for MWR and outdoor recreational activities, which helps maintain the morale of personnel assigned to the Complex. Proper wetland management also helps mitigate the effects of flooding, which could pose a threat to the continuation and location of training activities.

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

- 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).
- Executive Order 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 U.S.C. 1341, requires that states certify compliance of federal permits or licenses with state water quality requirements and other applicable state laws. Under Section 401, states have authority to review any federal permit or license that may result in a discharge to wetlands or other waters under state jurisdiction to ensure that the actions would be consistent with the state's water quality requirements.
- Executive Order 13112, 3 February 1999, requires executive agencies to restrict the introduction of exotic organisms into natural ecosystems.
- OPNAVINST 5090.1D, 12-3.8(b), discusses natural resources management relating to wetland management.
- Coastal Zone Management Act, 16 U.S.C. 1451, Establishes goals and a mechanism for states to control use and development of their coastal zone. Authorizes states to administer approved coastal non-point source pollution programs.
- CWA Section 404, Permits for Dredged or Fill Materials, 1986, 33 USC 1344, establishes a program to regulate the discharge of dredged or fill material into waters of the U.S., including wetlands.
- Coastal Wetlands Planning, Protection and Restoration Act, 16 USC 3951-3956, enacted to identify, prepare, and fund construction of Texas coastal wetlands restoration projects.
- Energy Policy Act Section 384, Coastal Impact Assistance Program, 2005, 42 USC 13201 et seq., assists coastal producing states and their political subdivisions (parishes, counties, and boroughs) in mitigating the impacts from Outer Continental Shelf oil and gas production.
- Rivers and Harbors Act, 33 USC 401 et seq., requires authorization from the USACE for the construction of any structure in or over any navigable waters of the U.S. and the excavation/dredging or deposition of material in these waters or any obstruction or alteration in a navigable water.

- Clean Water Action Plan (15 October 2009), an initiative introduced by President Bill Clinton in 1998 to restore and protect America's waters. Implementation of the plan is overseen by USEPA, and is intended to revamp enforcement of clean water laws. The plan identifies the nation's challenges for improving enforcement efforts to improve water quality and describes the actions that will be implemented to overcome them.

Additional Sources of Information

USACE, Regulatory Division, Wetlands and Waters of the U.S. USEPA, Wetlands, Oceans, and Watersheds

USFWS, National Wetlands Inventory USDA NRCS Society of Wetland Scientists Society for Ecological Restoration

TPWD

TSSWCB, Coastal Nonpoint Source Pollution Control Program

5.2.3 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. This information 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.

Erosion is the detachment and movement of soil, usually by water, which results in sedimentation and physical damage. Water quality is diminished by increased sedimentation, which is a form of water pollution. Sedimentation is particularly detrimental to benthic organisms and many fish species; it can eliminate habitat by covering food sources and spawning sites, smother bottom-dwelling organisms, and increase turbidity to the point that photosynthesis is hindered or prevented. Reductions in photosynthesis decrease dissolved oxygen levels to the detriment of fish and benthic invertebrates. Soil erosion also undermines roadways, shoreline facilities, and other military structures, and increases maintenance costs associated with stormwater facilities.

Issues

Soil erosion can undermine roadways, shoreline facilities, and other military structures, and often results in water quality problems (e.g., increased turbidity). It also increases maintenance costs associated with stormwater facilities. NASK and its OLFs have above average potential for severe erosion because of their soil types. Actions contributing to the susceptibility of the soil to erosion include:

- Pedestrian traffic on grassy areas of low sustainability due to poor soil conditions, resulting in a turf of thin grass interspersed with bare sandy areas;
- Excessive and improper mowing activities and practices;

- Human-made alterations to the natural vegetative cover and topography, including the channeling of water flow (e.g., ditches) which decreases infiltration and increases the quantity and rate of flow, the exposure of soils and increased soil slopes, and the creation of impervious surfaces;
- Forestry practices (e.g., prescribed burns, thinning, and reforestation) that expose soils to rainfall and stormwater runoff;
- Combination of sandy soils, drought, and rainfall events that occur at the NASK Complex; and
- Failure to maintain a healthy ground cover in areas of low fertility and heavy use.

Areas at the NASK Complex that are either susceptible to erosion or have an erosion problem include road shoulders, stream banks, or areas adjacent to runways that receive airfield surface runoff. Proper grounds maintenance, which emphasizes vigorous growth of vegetation, is the best and most economical means of erosion control.

Goals and Objectives

- Protect and maintain natural resources within the NASK Complex by continuing and enhancing ecologically appropriate and beneficial land uses and management practices, while ensuring the continuation of the military mission;
- Protect, maintain, and restore native vegetative communities and plant and wildlife populations;
- Protect and conserve the ecological value and diversity of natural resources by fostering knowledge of, and participation in, adaptive ecosystem management;
- Continue existing, and establish new programs and procedures to monitor, maintain, and enhance wetlands and water quality;
- Maintain the ecological integrity of wetland and upland communities for the protection of native plant and animal species, including numerous federally and state listed species;
- Maintain the attenuation capacity of the remaining undisturbed acreage within the 100-year floodplain;
- Ensure that land management and land use decisions comply with all applicable laws, executive orders, regulations, directives, and instructions, and that adverse impacts to the natural environment are minimized;
- Provide adequate staffing, equipment, technology, and training to the Natural Resources Program to ensure proper implementation of this INRMP; and
- Incorporate the concept of ecosystem management into all planning and management processes.

Projects

- Biological resources survey and inventory (Project 1 in Appendix A)
- RTE Habitat Management (Project 2 in Appendix A)
- Invasive Species Control (Project 3 in Appendix A)
- NASK INRMP Update (Project 4 in Appendix A)

- Prescribed Fire Management (Project 5 in Appendix A)
- Habitat Management and Restoration (Project 7 in Appendix A)
- Natural Resources Outreach (Project 8 in Appendix A)
- South Texas Ambrosia Management Plan and Survey (Project 9 in Appendix A)
- Game Animal Survey on the Main Station and Dixie Annex (Project 10 in Appendix A)

Management Strategies

- Continue to develop a soil erosion control plan and reduce the rate of soil erosion through the implementation of long-term measures and projects;
- Inventory wetlands and assess their function and quality on a routine basis;
- Promote at least 50-foot buffers for all wetlands, and ensure land use and land management practices that will not adversely affect wetland resources;
- Maintain the attenuation capacity of the remaining undisturbed acreage within the 100-year floodplain;
- Implement environmentally beneficial landscaping, grounds maintenance, and urban forestry practices;
- Ensure implementation of policies that minimize adverse impacts to ecosystem resources from land disturbance activities (e.g., construction, clearing, and training);
- Apply xeriscaping principles using native species for new landscaping, and will phase in these principles for existing landscapes;
- Ensure that land management and land use decisions comply with all applicable laws, executive orders, regulations, directives, and instructions, and that adverse impacts to the natural environment are minimized;
- Continue to implement BMPs to minimize stormwater pollution and erosion;
- Continually verify that natural resources personnel obtain proper training and certifications.

Long-Term Management

Long-term management for soil conservation and erosion control will include identifying and understanding the suitability and sustainability of a soil unit for a proposed action. The USDA NRCS soil surveys may be used to identify the potential applicability and limitations of each soil unit for land use activities. Land uses may include forestry, building construction, recreation, wildlife habitat, and agriculture.

The NASK Complex will adhere to best management practices to protect wetlands and water quality from sedimentation and erosion during activities on installation properties.

Additional guidelines to minimize soil erosion on the NASK Complex include:

- Implement the following six principles for soil conservation and erosion management:
 1. Minimize areas of disturbance,
 2. Stabilize and protect disturbed areas from raindrop and runoff energies as soon as practical,

3. Minimize runoff velocities,
 4. Protect disturbed areas from adjacent area runoff,
 5. Retain sediment within construction sites, and
 6. Reduce exposure time (Smoot and Smith, 1999);
- Evaluate areas on the Installation for erosion control problems;
 - Reduce mowing and increase grass height and coverage, where practicable;
 - Control potential erosion control problems by:
 1. Using vegetative and structural protective covers (e.g. permanent seeding, groundcover),
 2. Using sediment barriers (e.g. straw bales, silt fence, brush),
 3. Creating sediment detention ponds and basins (e.g. sediment traps and basins),
 4. Implementing stream and pond bank protection (e.g. natural vegetation),
 5. Constructing pervious surface walkways in areas of high pedestrian traffic,
 6. Constructing water conveyances (e.g. slope drains, check dam inlet and outlet protection),
 7. Implementing temporary construction and road stabilization (e.g. placement of stone and geotextile fabrics [Smoot and Smith 1999]),
 8. Repairing bare and slightly eroded areas quickly, and
 9. Maintain healthy ground cover in improved and semi-improved areas with low fertility by applying natural or chemical fertilizers and/or soil additives.

Integration with Other Natural Resources Management Activities

- Coastal Zone Management, Section 5.2.1 – control sedimentation into coastal areas;
- Wetland Management, Section 5.2.2 – control sedimentation into wetlands;
- Stormwater and Water Quality, Section 5.2.4 – control stormwater to reduce erosion;
- Floodplains, Section 5.2.5 – identify soil types to reduce flood damage;
- Landscaping and Grounds Maintenance, Section 5.2.6 – ensure mowing plans and landscaping do not compromise soil conservation;
- Invasive, Exotic, and Noxious Species, Section 5.2.7 – ensure removal of undesired plants does not enhance erosion;
- Urban Forestry, Section 5.2.8 – consider soil conservation during urban forestry planning;
- Agricultural Outleasing, Section 5.2.9 – control agricultural activities that could promote erosion;
- Forest Protection, Section 5.3.1 – burns promote the health of herbaceous ground cover to prevent erosion;
- Migratory Birds, Section 5.4.1 – control erosion into wading areas;
- Threatened and Endangered Species, Section 5.4.2 – control erosion to maintain habitat and water quality for protected species;
- Nuisance Wildlife and BASH, Section 5.4.3– controlling nuisance species that root (e.g., feral pigs) enhances erosion control;
- Wildlife Diseases, Section 5.4.4 – consider the potential of disease transmission from exposed soil and suspended soil particles within the water, to human contact. Limit muddy

water contact with mucous membranes such as nose, eyes, and mouth, especially during warm seasons. Use goggles, ear and nose plugs to reduce exposure to nematodes;

- Outdoor Recreation, Section 5.5 – educate resource users to minimize erosion;
- Hunting, Section 5.5.1 - Use hunting to control feral animal populations that disturb the soil;
- Wildlife Officer, Section 5.5.2 – Employ wildlife officer to minimize nuisance species that disturb soil such as feral pigs;
- Natural Resources Training, Section 5.6.1 – ensure personnel are current on BMPs; laws, regulations, and management practices; and
- GIS, Section 5.6.2 – utilize GIS tools to improve soil mapping and management.

Ecosystem Management

Soil conservation is an essential component of the ecosystem management concept. Soils are particularly susceptible to erosion from uncontrolled stormwater runoff and may discharge into water bodies from point and nonpoint sources. Sediments in stormwater runoff have the capacity to obstruct drainage infrastructure and to reduce the volume capacity of wetlands, potentially resulting in damaging flood conditions. Turbidity pollution, derived from soil erosion, may also affect surface water quality in adjacent freshwater, estuarine, and marine environments.

Military Mission

Erosion can undermine roads and runways, potentially affecting the military mission. It can also increase sediment loading in stormwater runoff, which increases turbidity and reduces water quality in surrounding waters, violating environmental laws and placing the Complex at odds with TPWD.

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

- Soil Conservation Act, 16 U.S.C. 590(a) et seq., provides for soil conservation practices on federal lands.
- Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977, 33 U.S.C. 1251, regulates the dredging and filling of wetlands and establishes procedures for identifying and regulating nonpoint sources of polluted discharge, including turbidity, into waterways.
- Clean Water Act (CWA), Section 402: National Pollutant Discharge Elimination System (NPDES) Program, 2002, 33 USC 1251, controls direct discharges into navigable waters. NPDES permits, issued by either the USEPA or an authorized state or tribe, contain industry-specific technology-based limits and establish pollutant monitoring and reporting requirements.
- CWA Section, Section 401, requires an applicant for a federal license or permits to provide a certification that any discharges from the facility will comply with the CWA, including water quality standard requirements.
- CWA Section, Section 404, establishes programs to regulate the discharge of dredged or fill material into waters of the United States, including wetlands.

- Rivers and Harbors Act, requires authorization from the USACE for the construction of any structure in or over any navigable water of the United States and the excavation, dredging, and deposition of material in these waters or any obstruction or alteration in navigable waters.
- Executive Orders 11989 and 12608, close areas to off-road vehicles where soil, wildlife, or other natural resources may be adversely affected.
- Executive Order 13112, 3 February 1999, requires executive agencies to restrict the introduction of exotic organisms into natural ecosystems. Vegetative buffers and landscaping to control soil erosion must comply with this executive order.
- OPNAVINST 5090.1D, 12-3.8(c), discusses natural resources management relating to soil conservation management.

Additional Sources of Information

USDA Natural Resources Conservation Service in Texas
NPDES Stormwater Pollution Prevention Plans
USDA Soil Survey Geographic (SSURGO) Database
The National Soil Erosion Research Laboratory

5.2.4 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 collects volume and velocity as it flows off. Stormwater runoff management addresses measures to reduce stormwater runoff and pollutants in stormwater runoff, and to control discharge from point and nonpoint sources. Nonpoint source pollution is the polluting of surface water and groundwater resources by diffuse sources, rather than by discreet, identifiable point sources. Point and nonpoint source pollutants are commonly associated with land use. These pollutants routinely include sediments from land disturbance, pesticides and nutrients from urban lawns and landscaping, and oil, grease, heavy metals, and other toxic materials from streets, rooftops, and parking lots. Stormwater runoff is the most common transport mechanism for nonpoint source pollution. The majority of pollutant loading occurs during and immediately after storm events.

Issues

The CWA legislates protection of the quality of surface and groundwaters of the U.S., and requires states to develop a program to identify and reduce NPS of pollution to surface and groundwater. Federal agencies, including the Navy, are required to be consistent with state NPS water pollution management programs under the CWA, Section 319. Texas has developed surface water quality standards that define the maximum acceptable levels of specific metals and organic compounds, including pesticides and herbicides, in surface waters. The standards were set with consideration of the level of each pollutant that would cause chronic and acute injury to aquatic organisms. Guidance and funding from the CWA Section 310 program is available to promote water pollution prevention programs and projects.

Stormwater discharges have been increasingly identified as a significant source of water pollution in numerous nationwide studies on water quality. As development increases, the control of stormwater drainage is an increasingly important aspect of water quality control. More impermeable surface area (less land available for absorption and filtration) translates to faster runoff rates and increased pollution loads. More development means more land clearing and landscaping activities that require appropriate stormwater management practices. It is especially important to have proper stormwater management when developed areas are in close proximity to surface waterbodies.

The TSSWCB is the state agency responsible for administering Texas' soil and water conservation law and coordinating conservation and NPS pollution abatement programs. The TSSWCB is the lead state agency for the planning, management, and abatement of agricultural and silvicultural (forestry) NPS pollution, and administers the Texas Brush Control Program. The TSSWCB works with other state and federal agencies on NPS issues as they relate to Water Quality Standards and Criteria, Total Maximum Daily Loads, Watershed Protection Plans, and the Coastal Management Plan.

Goals and Objectives

- Protect and maintain natural resources within NASK by continuing and enhancing ecologically appropriate and beneficial land uses and management practices, while ensuring the continuation of the military mission;
- Protect, maintain, and restore native vegetative communities and plant and wildlife populations;
- Protect and conserve the ecological value and diversity of natural resources by fostering knowledge of, and participation in, adaptive ecosystem management;
- Continue existing, and establish new programs and procedures to monitor, maintain, and enhance wetlands and water quality;
- Maintain the ecological integrity of wetland and upland communities for the protection of native plant and animal species, including numerous federally and state listed species;
- Maintain the attenuation capacity of the remaining undisturbed acreage within the 100-year floodplain;
- Improve and enhance water quality by ensuring P2 Plans and SWPPPs are consistent with the installation's natural resources management program.
- Preserve, protect, and enhance water resources (e.g. wetlands, surface water, groundwater), including protection of undisturbed acreage located with 100-year floodplain areas and management of coastal zone resources;
- Reduce and control noxious, invasive, and exotic species;
- Ensure that land management and land use decisions comply with all applicable laws, executive orders, regulations, directives, and instructions, and that adverse impacts to the natural environment are minimized;
- Implement environmentally beneficial landscaping, grounds maintenance, and urban forestry practices;

- Provide adequate staffing, equipment, technology, and training to the Natural Resources Program to ensure proper implementation of this INRMP; and
- Incorporate the concept of ecosystem management into all planning and management processes.

Projects

- Biological resources survey and inventory (Project 1 in Appendix A)
- RTE Habitat Management (Project 2 in Appendix A)
- Invasive Species Control (Project 3 in Appendix A)
- NASK INRMP Update (Project 4 in Appendix A)
- Prescribed Fire Management (Project 5 in Appendix A)
- Neotropical Migratory Bird Survey (Project 6 in Appendix A)
- Habitat Management and Restoration (Project 7 in Appendix A)
- Natural Resources Outreach (Project 8 in Appendix A)
- South Texas Ambrosia Management Plan and Survey (Project 9 in Appendix A)
- Game Animal Survey on the Main Station and Dixie Annex (Project 10 in Appendix A)

Management Strategies

- Continue to develop a soil erosion control plan and reduce the rate of soil erosion through the implementation of long-term measures and projects;
- Inventory wetlands and assess their function and quality on a routine basis;
- Promote at least 50-foot buffers for all wetlands, and ensure land use and land management practices that will not adversely affect wetland resources;
- Maintain the attenuation capacity of the remaining undisturbed acreage within the 100-year floodplain;
- Implement environmentally beneficial landscaping, grounds maintenance, and urban forestry practices;
- Ensure implementation of policies that minimize adverse impacts to ecosystem resources from land disturbance activities (e.g., construction, clearing, and training);
- Apply xeriscaping principles using native species for new landscaping, and will phase in these principles for existing landscapes;
- Ensure that land management and land use decisions comply with all applicable laws, executive orders, regulations, directives, and instructions, and that adverse impacts to the natural environment are minimized;
- Continue to implement BMPs to minimize stormwater pollution and erosion;
- Maintain routine monitoring in accordance with specifications outlined in the existing NPDES Stormwater Permit.
- Minimize the impacts of fertilizers and pesticides on water quality using management practices that balance the desire to have aesthetically pleasing grounds while protecting water quality.
- Maintain proper function of stormwater control and conveyance structures by frequently removing debris. Litter and yard wastes can clog inlets, catch basins and outlets, lead to

overflows, erosion, and unintended flooding, and make these devices ineffective for stormwater pollutant removal.

- Continually verify that natural resources personnel obtain proper training and certifications.

Long-Term Management

EO 12088, *Federal Compliance with Pollution Control Standards*, requires that the heads of each Executive Agency ensure that all necessary actions are taken for the prevention, control, and abatement of environmental pollution with respect to federal facilities and activities under the control of the agency. Soil erosion is a source of water pollution (sediment loadings), and will be controlled in compliance with this EO. A continuous cover of vegetation is the most effective way to prevent soil erosion and to minimize impacts to the environment.

Ground disturbing projects should be covered by a site-specific SWPPP or an ESCP that identifies measures to reduce pollution of receiving water from stormwater runoff from a project site. NASK prepares project-specific SWPPPs and ESCPs on an as-needed, project-specific basis, and in accordance with state regulations, which will identify potential sources of erosion and sedimentation prevention controls. The Main Station has an effective SWPPP in place (NAVFAC 2012), although there may be small areas present that are not vegetated adequately to prevent soil erosion, and are contributing to NPS water pollution. The use of off-road vehicles is prohibited off of the established roadways unless they are involved in military training or they are an emergency or security vehicle. The SWPPP addresses pollutants in these industrial drainage basins and identifies BMPs to help prevent stormwater pollution. The SWPPP focuses on three objectives:

1. Identify sources of pollution potentially affecting the quality of stormwater discharges associated with industrial activity from the facility;
2. Describe and ensure implementation of practices to minimize and control pollutants in stormwater discharges associated with industrial activity from the facility; and
3. Ensure compliance with the terms and conditions of the NPDES permit.

Sediment is the primary pollutant associated with Dixie Target Range. Within Dixie Target Range are areas where there has not been enough emphasis given to erosion, and washed out areas have formed that could lead to extensive erosion if not controlled. Washouts cause damage to the vehicles used by range personnel and also add to the sediment load carried by the stormwater. These areas are mainly centered on the roads located throughout the property and require periodic scraping and maintenance to keep the soil in place or redistributed. The use of small earthen check dams placed across the dirt roads can help to keep some of this soil in the areas of greatest concern. In addition to sediment loads, stormwater quality is also affected by dissolved nutrients, pesticides, herbicides, and petroleum residues that find their way into stormwater runoff.

Potential pollutants associated with mission activities include hydrocarbons associated with the airfield maintenance facilities at NAS Kingsville, chemicals and pesticides applied to lands

included in the agricultural outlease program. Land use practices at NASK currently allow for the use of chemical fertilizers, herbicides and pesticides that can be dissolved by surface runoff and carried into surface waters, thereby degrading the quality of these waters. Pollutants originating from NASK parcels have the potential to pollute waterbodies located downstream.

To protect water quality at NASK and within surrounding areas, existing and potential erosion problem areas must be identified so that appropriate measures, including sedimentation control and shoreline stabilization projects, can be implemented. NASK environmental staff must also review erosion and sedimentation control plans for construction sites and provide oversight to ensure BMPs are being applied properly and consistently for all ground-disturbing activities.

Integration with Other Natural Resources Management Activities

- Coastal Zone Management, Section 5.2.1 – control runoff and sedimentation into coastal areas;
- Wetland Management, Section 5.2.2 – control runoff and sedimentation into wetlands;
- Soil Conservation and Erosion, Section 5.2.3 – sedimentation into waterbodies or drainage features;
- Floodplains, Section 5.2.5 – maintain intact riparian areas that act as buffers and to attenuate NPS pollution from runoff into adjacent surface waters and wetlands; proper stormwater drainage helps reduce flood damage;
- Landscaping and Grounds Maintenance, Section 5.2.6 – landscape to reduce runoff velocity and maximize absorption;
- Invasive, Exotic, and Noxious Species, Section 5.2.7 – ensure removal of undesired plants does not accentuate the effects of runoff;
- Urban Forestry, Section 5.2.8 – consider runoff during urban forestry planning;
- Agricultural Outleasing, Section 5.2.9 – potential pesticide and fertilizer contamination of canals, drainage ditches used in farming; consider runoff during agricultural activities;
- Forest Protection, Section 5.3.1 - burns promote the health of herbaceous ground cover to prevent erosion from stormwater;
- Migratory Birds, Section 5.4.1 – control water quality in wading areas;
- Threatened and Endangered Species, Section 5.4.2 – maintain water quality for protected species;
- Nuisance Wildlife and BASH, Section 5.4.3 – control pesticide to reduce runoff in stormwater;
- Wildlife Diseases, Section 5.4.4 – consider the potential of disease or parasite transmission from contaminated water to human contact, limit water contact with mucous membranes, do not expose wounds. Use personal protective equipment when working with stormwater;
- Outdoor Recreation, Section 5.5 – use resources to attenuate the effects of runoff;
- Hunting, Section 5.5.1 – Ask that hunters report any issues observed with runoff or stormwater retention areas;
- Wildlife Officer, Section 5.5.2 – Wildlife officer can report any observed issues with stormwater and help to educate public;

- Natural Resources Training, Section 5.6.1 – ensure personnel are current on stormwater and water quality BMPs; and
- GIS, Section 5.6.2 – utilize GIS tools to improve management of stormwater runoff.

Military Mission

Improper stormwater management could lead to increased flooding on the NASK Complex, altering the timing and location of training. It can also lead to increased erosion, pollution, and sedimentation into water bodies, which increase turbidity and reduce water quality, violating environmental laws and placing the Installation at odds with state regulators and potentially violating federal permits.

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

- Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977, 33 U.S.C. 1251, regulates the dredging and filling of wetlands and establishes procedures for identifying and regulating nonpoint sources of polluted discharge, including turbidity, into waterways.
- Coastal Zone Management Act of 1972, 16 U.S.C. 1451 et seq., establishes authority (Section 6217) for states to administer coastal nonpoint pollution programs when approved by NOAA and USEPA. The NASK Complex will coordinate with the State of Texas for nonpoint source compliance with the Texas Coastal Nonpoint Source Pollution Control Program.
- Executive Order 11990, 24 May 1977, as amended, directs the preservation and enhancement of wetlands.
- Oil Pollution Act of 1990 (OPA 90), 33 U.S.C. 2701, requires planning for, rescue of, minimization of injury to, and assessment of damages or injury to fish and wildfire resources from the discharge of oil.
- Comprehensive, Environmental Response, Compensation and Liability Act, 42 U.S.C. 9601 et seq., authorizes Natural Resources Trustees to recover damages for injury to, destruction of or loss of natural resources resulting from the release of a hazardous substance.
- CWA, Section 402 NPDES Program, 2002, 33 USC 1251, controls direct discharges into navigable waters. NPDES permits, issued by either the USEPA or an authorized state or tribe, contain industry-specific, technology-based and water-quality-based limits and establish pollutant monitoring and reporting requirements.
- CWA, Section 401, requires an applicant for a federal license or permit to provide a certification that any discharges from the facility will comply with the CWA, including water quality standard requirements.
- CWA, Section 404, establishes a program to regulate the discharge of dredge and fill material into waters of the United States, including wetlands.
- OPNAVINST 5090.1D, 12-3.8(f), discusses natural resources management relating to nonpoint source pollution.

- OPNAVINST 5090.1D, Chapter 27, establishes requirements, guidelines and standards for the assessment of damages arising from the release of oil or hazardous substances.
- CWA Section 303, Water Impairment Identification, requires States to identify waters that do not or are not expected to meet applicable water quality standards with technology-based controls alone and to develop programs to achieve the State standards.
- Safe Drinking Water Act, 1974, 42 USC 300f et seq., protects the quality of drinking water in the U.S. whether from above ground or underground sources.
- National Invasive Species Act, 16 USC 4321, prescribes policies to prevent the introduction and spread of non-indigenous species into U.S. waters.
- EO 12088 (13 October 1978), Federal Compliance with Pollution Control Standards, as amended, ensures that all necessary actions are taken to prevent, control, and abate environmental pollution with respect to federal facilities and activities under control of the Agency.
- Clean Water Action Plan (15 October 2009), an initiative introduced by President Bill Clinton in 1998 to restore and protect America's waters. Implementation of the plan is overseen by USEPA, and is intended to revamp enforcement of clean water laws. The plan identifies the nation's challenges for improving enforcement efforts to improve water quality and describes the actions that will be implemented to overcome them.

Additional Sources of Information

USEPA, Water Quality Standards for Surface Waters USEPA, Ground Water and Drinking Water

TPWD, Water QualityTSSWCB, Coastal Nonpoint Source Pollution Control Program

Texas Water Development Board

Environmental Law Institute

USEPA, Nonpoint Source Pollution of Surface Waters

5.2.5 Floodplain Management

Floodplain management is the operation of an overall program of corrective and preventive measures for reducing flood damage. In addition to storing water during flood events, floodplains provide many ecological functions, such as the transport and cycling of nutrients and provision of productive and essential habitats. Floodplains receive protection through EO 11988, *Floodplain Management*, which directs federal agencies to reduce the risk of flood loss by not building in floodplains, and to restore and preserve the natural and beneficial values served by floodplains. Development within floodplains is regulated at the municipal level where local ordinances detail the rules and requirements for floodplain development and permits are issued accordingly. The Texas Water Development Board (TWDB) has been designated by state law as the state's National Flood Insurance Program coordinating agency, which administers state and federal grant programs and the implementation of flood mitigation projects. The program works with other organizations and state agencies, such as the Texas Floodplain Management Association and the Texas Division of Emergency Management, to offer flood mitigation workshops and training and provide resources to communities and builders on risks, best practices, and other useful information. Development within floodplains is regulated at the municipal level where local

ordinances detail the rules and requirements for floodplain development and permits are issued accordingly.

Issues

A review of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) floodplain mapping data determined that portions of the Main Station and NALFOG are located with a 100-year floodplain. A portion of three 100-year floodplains is located within NAS Kingsville, including the 100-year floodplain for Tranquitas Creek in the northern perimeter, the 100-year floodplain for San Fernando Creek along the eastern boundary, and the 100-year floodplain for Santa Gertrudis Creek along the southern-most section of the property. Portions of two 100-year floodplains are located within NALFOG, including the 100-year floodplain for Tecolote Creek along the northern boundary and the 100-year floodplain for El Caro Creek.

Goals and Objectives

- Protect and maintain natural resources within NASK by continuing and enhancing ecologically appropriate and beneficial land uses and management practices, while ensuring the continuation of the military mission;
- Protect, maintain, and restore native vegetative communities and plant and wildlife populations;
- Protect and conserve the ecological value and diversity of natural resources by fostering knowledge of, and participation in, adaptive ecosystem management;
- Continue existing, and establish new programs and procedures to monitor, maintain, and enhance wetlands and water quality;
- Maintain the ecological integrity of wetland and upland communities for the protection of native plant and animal species, including numerous federally and state listed species;
- Maintain the attenuation capacity of the remaining undisturbed acreage within the 100-year floodplain;
- Ensure that land management and land use decisions comply with all applicable laws, executive orders, regulations, directives, and instructions, and that adverse impacts to the natural environment are minimized;
- Provide adequate staffing, equipment, technology, and training to the Natural Resources Program to ensure proper implementation of this INRMP; and
- Incorporate the concept of ecosystem management into all planning and management processes.

Projects

There are no INRMP projects directly related to floodplain management; however, other management actions that protect water resources, such as controlling erosion and implementing remedial measures as needed, will also provide benefit to NASK floodplain areas. Examples of such projects are listed below.

- Biological resources survey and inventory (Project 1 in Appendix A)
- RTE Habitat Management (Project 2 in Appendix A)
- Invasive Species Control (Project 3 in Appendix A)

- NASK INRMP Update (Project 4 in Appendix A)
- Prescribed Fire Management (Project 5 in Appendix A)
- Neotropical Migratory Bird Survey (Project 6 in Appendix A)
- Habitat Management and Restoration (Project 7 in Appendix A)
- Natural Resources Outreach (Project 8 in Appendix A)
- South Texas Ambrosia Management Plan and Survey (Project 9 in Appendix A)
- Game Animal Survey on the Main Station and Dixie Annex (Project 10 in Appendix A)

Management Strategies

- Inventory wetlands and assess their function and quality on a routine basis;
- Promote at least 50-foot buffers for all wetlands, and ensure land use and land management practices that will not adversely affect wetland resources;
- Avoid activities, particularly vegetation clearing and ground-disturbing activities that would adversely affect flood attenuation.
- Clear stream or drainage blockages such as beaver dams or obstructed culverts that could result in increased flood levels or prevent flood waters from subsiding. This effort is the responsibility of the Public Works Department, with assistance provided by the NRM.
- Continue to develop a soil erosion control plan and reduce the rate of soil erosion through the implementation of long-term measures and projects;
- Continue to inventory the use of pesticides and fertilizers to assess alternatives to their use and a reduction in pesticide and fertilizer use;
- Continue to implement BMPs to minimize stormwater pollution and erosion;
- Implement environmentally beneficial landscaping, grounds maintenance, and urban forestry practices;
- Continually verify that natural resources personnel obtain proper training and certifications; and
- Continue the use of Computer-Aided Drafting and a GIS for construction, environmental, engineering, and natural resources mapping.

Long-Term Management

The long-term management of NASK floodplain areas includes careful project planning and maintaining updated floodplain maps for planning purposes. New construction projects should be located outside of the designated 100-year floodplain areas at NASK. This is especially important in long-term planning that takes into consideration climate change impacts that may result in an increased number and level of flooding events. Water quality management actions described in Section 5.2.4 will ensure protection of water quality within the NASK watersheds.

Integration with Other Natural Resources Management Activities

- Coastal Zone Management, Section 5.2.1 – manage coastal areas to ensure
- Wetland Management, Section 5.2.2 – manage to maintain viability of floodplains;
- Soil Conservation and Erosion, Section 5.2.3 – identify soil types in floodplain;

- Stormwater and Water Quality, Section 5.2.4 – proper stormwater drainage helps reduce flood damage;
- Landscaping and Grounds Maintenance, Section 5.2.6 – use appropriate landscape practices in floodplains;
- Invasive, Exotic, and Noxious Species, Section 5.2.7 – ensure removal of undesired plants is consistent with maintaining floodplain function;
- Urban Forestry, Section 5.2.8 – ensure urban forestry is consistent with maintaining floodplain function;
- Agricultural Outleasing, Section 5.2.9 – consider agricultural effects on the floodplain;
- Forest Protection, Section 5.3.1 – burns promote the health of herbaceous ground cover to prevent erosion during flooding;
- Migratory Birds, Section 5.4.1 – undeveloped floodplains provide bird habitat away from infrastructure;
- Threatened and Endangered Species, Section 5.4.2 – controlling development in floodplains enhances habitat and water quality for protected species;
- Nuisance Wildlife and BASH, Section 5.4.3 – consider floodplain function when modifying habitat on the airfield;
- Wildlife Diseases, Section 5.4.4– consider the potential of disease transmission from animal to human contact, reduce human-wildlife interactions, Prohibit feeding of feral cats
- Outdoor Recreation, Section 5.5 – controlling development in floodplains enhances outdoor recreational opportunities;
- Hunting, Section 5.5.1 – Use hunting to control feral animal populations in floodplains;
- Wildlife Officer, Section 5.5.2 – Use wildlife officer to help with floodplain management, reporting issues observed in the field;
- Natural Resources Training, Section 5.6.1 – ensure personnel are current on floodplain laws; and
- GIS, Section 5.6.2 – utilize GIS tools to improve management of floodplains.

Ecosystem Management

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

Military Mission

Inappropriate floodplain management practices have the potential to decrease the flood attenuation capacity of the floodplain and increase the amount and rate at which flooding occurs. Flooding has the potential to adversely affect necessary infrastructure components of the military mission.

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

- Executive Order 11988, Floodplain Management, 24 May 1977, requires federal service agencies to avoid construction or management practices that will adversely affect floodplains, unless it is found that there is no practical alternative and the proposed action has been designed to minimize harm to or within the floodplain.
- OPNAVINST 5090.1D, 12-3.8(c), discusses natural resources management relating to floodplain management.
- Clean Water Act (CWA) Section 303, Water Impairment Identification, requires States to identify waters that do not or are not expected to meet applicable water quality standards with technology-based controls alone and to develop programs to achieve the State standards.
- CWA Section 404, Permits for Dredged or Fill Materials, 1986, 33 USC 1344, establishes a program to regulate the discharge of dredged or fill material into waters of the U.S., including wetlands.
- Coastal Zone Management Act of 1972 (CZMA) Section 6217, Coastal Nonpoint Pollution Control Program, 16 USC 1451 et seq., requires states with Coastal Zone Management Programs to develop Nonpoint Pollution Control Programs with approval from the National Oceanic and Atmospheric Administration (NOAA) and USEPA.
- Magnuson–Stevens Fisheries Conservation and Management Act, 16 USC 1801 et seq., establishes policies for the sustainable management of fishery resources and the protection of essential fish habitats.
- Rivers and Harbors Act, 33 USC 401 et seq., requires authorization from the USACE for the construction of any structure in or over any navigable waters of the U.S. and the excavation/dredging or deposition of material in these waters or any obstruction or alteration in a navigable water.
- Clean Water Action Plan (15 October 2009), an initiative introduced by President Bill Clinton in 1998 to restore and protect America’s waters. Implementation of the plan is overseen by USEPA, and is intended to revamp enforcement of clean water laws. The plan identifies the nation’s challenges for improving enforcement efforts to improve water quality and describes the actions that will be implemented to overcome them.

Additional Sources of Information

USEPA Wetlands, Oceans, and Watersheds
TSSWCB, Watershed Protection Plan Program
Texas Water Resources Institute, Texas Watershed Planning
TPWD *Texas Watersheds* Newsletter

Riparian Management

Maintaining well-vegetated riparian buffers along streams and other waterbodies are an important part of a healthy environment, and provide benefits to humans and wildlife. Riparian buffer functions include maintaining habitat for fish and wildlife, nutrient cycling, streambank stability, natural stream flow, and water quality (Muhlberg and Moore 1998). Conserving and restoring riparian buffers minimizes erosion and subsequent loss of streambank habitat.

Issues

Riparian and wetland habitats on military lands may provide important habitat for migratory birds and provide valuable habitat for a variety of wildlife. In accordance with the Memorandum of Understanding (MOU) established between DoD and the USFWS to promote the conservation of migratory birds (71 FR 168) DoD will strive to prevent the destruction or degradation of wetlands and riparian vegetation, and will also restore those habitats, when feasible, where they have been degraded.

Goals and Objectives

- Protect and maintain natural resources within NASK by continuing and enhancing ecologically appropriate and beneficial land uses and management practices, while ensuring the continuation of the military mission;
- Protect, maintain, and restore native vegetative communities and plant and wildlife populations;
- Protect and conserve the ecological value and diversity of natural resources by fostering knowledge of, and participation in, adaptive ecosystem management;
- Continue existing, and establish new programs and procedures to monitor, maintain, and enhance wetlands and water quality;
- Maintain the ecological integrity of wetland and upland communities for the protection of native plant and animal species, including numerous federally and state listed species;
- Maintain the attenuation capacity of the remaining undisturbed acreage within the 100-year floodplain;
- Ensure that land management and land use decisions comply with all applicable laws, executive orders, regulations, directives, and instructions, and that adverse impacts to the natural environment are minimized;
- Provide adequate staffing, equipment, technology, and training to the Natural Resources Program to ensure proper implementation of this INRMP; and
- Incorporate the concept of ecosystem management into all planning and management processes.

Projects

Participation in the following projects will support the goals and objectives established for riparian areas management.

- Biological resources survey and inventory (Project 1 in Appendix A)
- RTE Habitat Management (Project 2 in Appendix A)
- Invasive Species Control (Project 3 in Appendix A)
- NASK INRMP Update (Project 4 in Appendix A)
- Prescribed Fire Management (Project 5 in Appendix A)
- Neotropical Migratory Bird Survey (Project 6 in Appendix A)
- Habitat Management and Restoration (Project 7 in Appendix A)
- Natural Resources Outreach (Project 8 in Appendix A)
- South Texas Ambrosia Management Plan and Survey (Project 9 in Appendix A)

- Game Animal Survey on the Main Station and Dixie Annex (Project 10 in Appendix A)

Management Strategies

- Inventory wetlands and assess their function and quality on a routine basis;
- Promote at least 50-foot buffers for all wetlands, and ensure land use and land management practices that will not adversely affect wetland resources;
- Avoid and minimize impacts to vegetated buffer areas along streams and other waterbodies during disturbance activities through use of appropriate BMPs;
- Implement riparian enhancement projects in consideration of BASH Program requirements;
- Avoid activities, particularly vegetation clearing and ground-disturbing activities that would adversely affect flood attenuation.
- Clear stream or drainage blockages such as beaver dams or obstructed culverts that could result in increased flood levels or prevent flood waters from subsiding. This effort is the responsibility of the Public Works Department, with assistance provided by the NRM.
- Continue to develop a soil erosion control plan and reduce the rate of soil erosion through the implementation of long-term measures and projects;
- Continue to inventory the use of pesticides and fertilizers to assess alternatives to their use and a reduction in pesticide and fertilizer use;
- Continue to implement BMPs to minimize stormwater pollution and erosion;
- Implement environmentally beneficial landscaping, grounds maintenance, and urban forestry practices;
- Continually verify that natural resources personnel obtain proper training and certifications; and
- Continue the use of Computer-Aided Drafting and a GIS for construction, environmental, engineering, and natural resources mapping.

Long-Term Management

Impacts to vegetated buffer areas, including riparian buffers along streams and other waterbodies, should be avoided or minimized to maintain habitat for fish and wildlife, to protect water quality, and to provide streambank stability. Restoration and enhancement opportunities for riparian buffer habitat should be identified, and bioengineering techniques and native plantings should be used to stabilize compromised streambanks. The application of fertilizers, herbicides, and pesticides should be avoided, to the extent practicable, to protect water quality. Riparian areas will be avoided during future construction of structures and other facilities, including roads. New roads will be located outside riparian areas, whenever possible.

Integration with Other Natural Resources Management Activities

- Coastal Zone Management, Section 5.2.1 – manage riparian habitat to reduce impact to coastal areas
- Wetlands, Section 5.2.2 – manage to maintain viability of riparian areas;
- Soil Conservation and Erosion, Section 5.2.3 – identify soil types in riparian areas;

- Stormwater and Water Quality, Section 5.2.4 – proper stormwater drainage helps reduce flood damage;
- Landscaping and Grounds Maintenance, Section 5.2.6 – use appropriate landscape practices in riparian areas;
- Invasive, Exotic, and Noxious Species, Section 5.2.7 – ensure removal of undesired plants is consistent with maintaining riparian area function;
- Urban Forestry, Section 5.2.8 – ensure urban forestry is consistent with maintaining riparian area function;
- Agricultural Outleasing, Section 5.2.9 – consider agricultural effects on the riparian areas;
- Forest Protection, Section 5.3.1 – burns promote the health of herbaceous ground cover to prevent erosion during flooding;
- Migratory Birds, Section 5.4.1 – undeveloped riparian areas provide bird habitat away from infrastructure;
- Threatened and Endangered Species, Section 5.4.2 – controlling development in floodplains enhances habitat and water quality for protected species;
- Nuisance Wildlife and BASH, Section 5.4.3 – consider propensity for coastal areas to attract BASH animals;
- Wildlife Diseases, Section 5.4.4 – consider the potential of disease transmission from animal to human contact, reduce human-wildlife interactions, Prohibit feeding of feral cats
- Outdoor Recreation, Section 5.5 – controlling development in riparian areas enhances outdoor recreational opportunities;
- Hunting, Section 5.4.1 – Limit hunting in sensitive riparian areas;
- Wildlife Officer, Section 5.5.2 – Allow wildlife officer to check on riparian areas for issues;
- Natural Resources Training, Section 5.6.1 – ensure personnel are current on riparian laws, regulations, and management practices; and
- GIS, Section 5.6.2 – utilize GIS tools to improve management of riparian areas.

Ecosystem Management

Maintaining well-vegetated riparian buffers along streams and other waterbodies is an important part of a healthy environment, and support humans and wildlife by providing habitat and nutrient cycling and supporting streambank stability, natural stream flow, and water quality.

Military Mission

Inappropriate Riparian management practices have the potential to decrease the flood attenuation capacity of the floodplain and increase the amount and rate at which flooding occurs. Flooding has the potential to adversely affect necessary infrastructure components of the military mission.

Laws, Executive Orders, Regulations, Directives, and Memoranda Riparian Areas Management

- CWA 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), *Invasive Species*, requires executive agencies to restrict the introduction of exotic organisms into natural ecosystems.
- OPNAVINST 5090.1D, 12-3.8(b), discusses natural resources management relating to wetland management.
- ESA, 26 USC 1531 et seq., provides for affirmative protection for riparian areas if they occur on federal lands and provide habitat to any listed species or any species proposed for listing, or if they are within designated Critical Habitat for certain mammals, birds, herpetofauna, and fish.
- CZMA, 16 USC 1451 et seq., requires riparian area protection and restoration as a means of meeting the pollution-abatement goals of the Act.

Additional Sources of Information

TPWD, Riparian Wetlands

USDA NRCS

USEPA, Riparian Zone and Stream Restoration USFWS, A System for Mapping Riparian Areas in the Western United States

Texas Riparian Association

Texas Water Resources Institute

Society for Ecological Restoration

Texas State Soil and Water Conservation Board

5.2.6 Landscaping and Grounds Maintenance

Landscaping and grounds maintenance is defined here as landscaping design and construction practices intended to benefit the environment and to generate long-term cost savings. Such practices include using native species, which will reduce the need for irrigation and fertilization, stabilize soil, and improve wildlife habitat. Grounds maintenance is provided by the Base Operations Support (BOS) contractor under direction of the PWD.

Issues

Management issues related to grounds maintenance at NASK include reducing expenditures needed for grounds maintenance activities, and reducing NPS water pollution. The hot South Texas summers create extreme pressures on plants used in landscaping. In addition, many of the Installation soils have low water availability and are calcareous or alkaline in nature (USDA, NRCS 2009b, 2009c, and 2009d). This combination can lead to low availability of plant nutrients, thus requiring frequent and sometimes heavy addition of chemical fertilizers to maintain an acceptable cover of ornamental vegetation, and routine waterings.

Goals and Objectives

- Protect and maintain natural resources within NASK by continuing and enhancing ecologically appropriate and beneficial land uses and management practices, while ensuring the continuation of the military mission;
- Protect, maintain, and restore native vegetative communities and plant and wildlife populations;
- Provide facilities and develop policies that allow for recreational and educational uses of natural resources, and result in positive effects to these natural resources while improving the quality of life.
- Protect and conserve the ecological value and diversity of natural resources by fostering knowledge of, and participation in, adaptive ecosystem management;
- Continue existing, and establish new programs and procedures to monitor, maintain, and enhance wetlands and water quality;
- Maintain the ecological integrity of wetland and upland communities for the protection of native plant and animal species, including numerous federally and state listed species;
- Maintain the attenuation capacity of the remaining undisturbed acreage within the 100-year floodplain;
- Ensure that land management and land use decisions comply with all applicable laws, executive orders, regulations, directives, and instructions, and that adverse impacts to the natural environment are minimized;
- Implement environmentally beneficial landscaping, grounds maintenance, and urban forestry practices;
- Control nuisance wildlife and wildlife diseases that may adversely affect human health or welfare, the health of the ecosystem, and the military mission;
- Provide adequate staffing, equipment, technology, and training to the Natural Resources Program to ensure proper implementation of this INRMP; and
- Incorporate the concept of ecosystem management into all planning and management processes.

Projects

- Biological resources survey and inventory (Project 1 in Appendix A)
- RTE Habitat Management (Project 2 in Appendix A)
- Invasive Species Control (Project 3 in Appendix A)
- NASK INRMP Update (Project 4 in Appendix A)
- Prescribed Fire Management (Project 5 in Appendix A)
- Neotropical Migratory Bird Survey (Project 6 in Appendix A)
- Habitat Management and Restoration (Project 7 in Appendix A)
- Natural Resources Outreach (Project 8 in Appendix A)
- South Texas Ambrosia Management Plan and Survey (Project 9 in Appendix A)
- Game Animal Survey on the Main Station and Dixie Annex (Project 10 in Appendix A)

Management Strategies

- Continue to implement general landscape management practices consistent with the concepts presented in this INRMP;
- Continue to apply xeriscaping principles using native species for new landscaping, and will phase in these principles for existing landscapes;
- Continue to follow its working Urban Forestry Plan and implement projects to enhance wildlife habitat and aesthetics in developed areas;
- Implement environmentally beneficial landscaping, grounds maintenance, and urban forestry practices;
- Continue to implement BMPs to minimize stormwater pollution and erosion;
- Promote at least 50-foot buffers for all wetlands, and ensure land use and land management practices that will not adversely affect wetland resources;
- Continue to develop a soil erosion control plan and reduce the rate of soil erosion through the implementation of long-term measures and projects;
- Continue to inventory the use of pesticides and fertilizers to assess alternatives to their use and a reduction in pesticide and fertilizer use;
- Implement grounds maintenance practices consistent with the BASH Plan;
- Continue to implement programs and activities for the protection and enhancement of threatened and endangered plant and animal species and their habitats; and
- Continually verify that natural resources personnel obtain proper training and certifications.
- Use regionally native plant species and beneficial landscaping practices to the extent practicable. Use supplemental plantings of native trees and shrubs in maintained open areas and around building and recreational areas where consistent with current and planned land uses and the NASK BASH Program, to help enhance habitat diversity, control erosion, and meet wildlife management objectives. Native trees, shrubs, and herbaceous species should be selected that are adaptable, drought tolerant and conserve water.
- Avoid application of fertilizers because increased nutrients may result in colonization by more aggressive, nutrient demanding species. When nutrients are added to the system either by exposing new soil or through fertilization, optimum growing conditions for the specialized target flora are compromised.
- Preserve ground cover and natural drainage, using drainage channels and retention ponds instead of a closed, expensive system.
- Use native plant material instead of manmade controls for controlling erosion.
- Use native groundcover and shrubs instead of turf wherever possible to reduce maintenance and irrigation requirements.
- Revegetate disturbed areas with indigenous plant materials that promote wildlife habitat and minimize erosion and runoff. Although Bermuda grass is listed in seed mixtures, this species and other introduced species should be avoided as much as possible.

Long-Term Management

Executive Order 13148 of 21 April 2000, Section 207 calls for landscaping practices that benefit the environment and generate long-term cost savings at federal facilities. The EO provides the following guidelines to be followed when cost-effective and to the extent practicable:

- Use regionally native plants for landscaping;
- Design, use, or promote construction practices that minimize adverse effects on the natural habitat;
- Take measures to prevent pollution (i.e. reduce fertilizer and pesticide use);
- Implement water-efficient practices; and
- Promote awareness of environmental and economic benefits of native landscaping.

The potential exists for disturbances to wildlife habitat and NPS pollution during grounds maintenance and landscaping. This potential can be reduced by designing grounds maintenance and landscaping management strategies that help to minimize capital costs, maintain an ecological balance within the region, minimize engineering, and enhance the living environment and the aesthetic qualities of NASK. Xeriscaping offers a viable alternative to the typically high-volume water requirements of other landscaping approaches by conserving water through creative landscaping. Xeriscaping uses native plants, which are adapted to local climatic conditions and variations, generally resistant to drought, disease, and pests, and require less water than non-native species. The potential benefits of xeriscaping include reduced water use (typically from 30 to 80 percent), reduced heating and cooling costs from placement of appropriate tree species, decreased stormwater and irrigation runoff, fewer pesticide and fertilizer applications, less yard waste, increased habitat for plants and animals, and lower labor and maintenance effort and thus costs. Xeriscaping incorporates seven principles (Xeriscape Colorado, Inc., 1999):

- Planning and design for water conservation and beauty;
- 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 reduce soil temperatures;
- 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. Grass mowing should not be excessive and should be based on height rather than by arbitrarily

Grounds maintenance at NASK will be accomplished using the following guidelines:

- Avoid excessive mowing. Grass mowing should be scheduled on the basis of height, rather than by arbitrarily specified time intervals, if practicable;

- Maintain good ground cover through proper fertilization to prevent erosion. If erosion occurs, it will be addressed and corrected as soon as possible;
- Maintain healthy lawns to prevent insect infestations and disease;
- Minimize hand trimming; and
- Implement grounds maintenance activities in the vicinity of airfields to reduce BASH-related incidents. Grounds maintenance in the vicinity of airfield operations require significantly different management than in other developed areas; guidelines are provided in the NASKINGSINST 3750.16C (BASH Plan).

Grounds maintenance personnel will contact the NRM for technical advice prior to tree and shrub pruning, fertilization, grass replacement, species selection, new landscape projects, and new irrigation projects. Pesticide and fertilizer applications during landscaping and grounds maintenance will be consistent with the long-term management concepts pertaining to pesticides and fertilizers in Sections 5.1.7 and 5.3.3.

Integration with Other Natural Resources Management Activities

- Coastal Zone Management, Section 5.2.1 – limit landscaping in coastal areas to trimming and pruning as coastal vegetation is essential for storm protection;
- Wetland Management, Section 5.2.2 – maintain at least a 50-foot buffer around wetlands;
- Soil Conservation and Erosion, Section 5.2.3 – landscape to reduce erosion;
- Stormwater and Water Quality, Section 5.2.4 – use proper amounts of herbicide and fertilizers to avoid excessive runoff in stormwater;
- Floodplain Management, Section 5.2.5 – ensure landscaping in floodplains does not alter floodplain function;
- Invasive, Exotic, and Noxious Species, Section 5.2.7 – replace removed exotic species with native vegetation; and minimize use of herbicides;
- Urban Forestry, Section 5.2.8 – utilize urban forestry principles during landscaping and grounds maintenance, and vice-versa;
- Agricultural Outleasing, Section 5.2.9 – consider aesthetics of outleasing areas;
- Forest Protection, Section 5.3.1 – maintain grounds to reduce fuel loads;
- Migratory Birds, Section 5.4.1 – use proper amounts of herbicide and fertilizers to avoid runoff into wading areas;
- Threatened and Endangered Species, Section 5.4.2 -- landscape and maintain grounds to maintain and enhance habitat for protected wildlife, pay attention to South Texas Ambrosia colonies and be sure not to negatively impact areas where colonies are located. Also, time landscaping of trees used for bat roosting, around breeding season and winter, if possible;
- Nuisance Wildlife and BASH, Section 5.4.3 – control nuisance animals to prevent landscape damage, maintain grass heights in the vicinity of NASK airfields to reduce BASH potential;
- Wildlife Diseases, Section 5.4.4 – consider the potential of disease transmission from animal to human contact, reduce human-wildlife interactions, Prohibit feeding of feral cats
- Outdoor Recreation, Section 5.5 – maintain aesthetically-pleasing grounds for recreation;

- Hunting, Section 5.5.1 – Ensure grounds-workers locations are known while in hunting areas to avoid injury;
- Wildlife Officer, Section 5.5.2 – Ensure wildlife officer is aware of upcoming landscaping in restricted areas to avoid security issues;
- Natural Resources Training, Section 5.6.1 – ensure personnel are aware of landscaping and grounds issues and practices; and
- GIS, Section 5.6.2 – utilize GIS tools to improve landscaping plans.

Ecosystem Management

Proper grounds maintenance and landscaping through construction and design practices is consistent with an ecosystem approach since it reduces the need for irrigation, pesticides, and fertilizers, and relies on the functions and characteristics of native plant species. Reducing the demand for irrigation, fertilizers, and pesticides reduces the costs associated with grounds maintenance and reduces pollutant loading into runoff and surrounding surface waters and aquatic communities. Additionally, mowing regimes associated with grounds maintenance and landscaping management actions at NASK will provide direct benefit to the federally endangered South Texas ambrosia at NAS Kingsville.

Military Mission

Inappropriate landscaping and grounds maintenance practices (e.g., excessive use or application of inappropriate pesticides) may potentially affect water quality and federally and state-designated endangered or threatened species, resulting in regulatory actions by agencies such as the USFWS, TDPW, or USACE, which could threaten the military mission of NASK. In addition, appropriate landscaping and maintenance practices improve quality of life.

Laws, Executive Orders, Regulations, Directives, and Memoranda Relevant to Landscaping and Grounds Maintenance

- Executive Order 13148, 21 April 2000, Section 207, 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.
- 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.
- 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 CWA of 1977, 33 U.S.C. 1251, prohibits the discharge of dredged or filled materials into waters of the United States, including wetlands, without first obtaining a permit from USACE (Section 404 of the CWA).
- OPNAVINST 5090.1D, 12-3.8(e), discusses natural resources management relating to environmentally and economically beneficial landscaping.

- DoDI 4715.03, Natural Resources Conservation Program, states that each installation shall, to the extent practicable, use regionally native plants for landscaping and other beneficial techniques, including planting regionally native plants, using construction practices that minimize adverse effects on the natural habitat, reducing fertilizers and pesticides, using IPM techniques, recycling green waste, minimizing runoff, using water-efficient practices, and creating outdoor demonstrations to promote awareness of the benefits of implementing this directive.
- 60 FR 40837, the President's April 16, 1994 Executive Memorandum on Environmentally and Economically Beneficial Landscape Practices on Federal Landscaped Grounds, provides guidance developed by the interagency workgroup under the direction of the Federal Environmental Executive to assist federal agencies in the implementation of environmentally and economically beneficial landscape practices, and requires implementing landscaping practices that are intended to benefit the environment and generate long-term cost savings.
- FAA AC 150/5200-33B, Hazardous Wildlife Attractants on or Near Airports, provides guidance on certain land uses that have the potential to attract hazardous wildlife on or near airports as well as airport development projects that affect aircraft movement near hazardous wildlife attractants.

Additional Sources of Information

Society for Ecological Restoration
Native Texas Nurseries

Vegetation and Habitat Management

Vegetation management is an important component of natural resources management at NASK. Maintaining vegetation around the Main Station and NALFOG airfields is an essential component of the BASH Program. Grasslands and other habitats in the airfield areas and safety zones must be managed to reduce their potential to attract wildlife. Oversight of the grounds maintenance program provides opportunities to enhance the visual appeal of the environment, implement beneficial landscaping concepts, improve wildlife habitat as practicable and consist with the NASK BASH Program, and reduce the costs of grounds maintenance. This may include adopting an integrated vegetation management approach by encouraging establishment of certain vegetation communities. Beneficial landscape and turf management practices, such as planting native species to reduce water and nutrient demands, and increased use of shade trees and protective vegetation, are encouraged.

The broad community type data that is available for the NASK Complex will provide a cursory level of baseline data that will aid in implementing responsible management practices; however, GIS data should be collected and ground-truthed to update the NASK Complex plant species inventory and natural community types. Management priorities should be directed toward protecting the ecological communities that are largely unaffected by current activities necessary to support the operational mission. General habitat management includes avoiding negative impacts to and encouraging the proliferation of natural communities.

Management of Vegetation to Reduce BASH Potential

The Installation BASH Plan was approved in February 2012 (Appendix C). This plan follows the Navy BASH Program Implementing Guidance (Navy 2011b). The purpose of the BASH program is to manage the hazard associated with collisions between wildlife and aircraft. The program should promote the use of BMPs to ensure aviation safety through a proactive approach of managing potential wildlife hazards and raising awareness of potential collisions.

The NASK BASH Plan (NASKINGSINST 3750.16C) covers the Main Station and NALFOG, and includes information for implementing a bird hazard warning system, wildlife hazard reporting protocols, wildlife detection and dispersal team procedures, BASH dispersal equipment, land management procedures, and guidance for managing off-base land use and agricultural outleases.

Per DoDI 4165.67 Clear Zones are required to be maintained at the end of all runways. This includes cutting or topping trees, shrubs, brush, or other forms of obstructions to ground level, where DoD determines these obstructions would interfere with the operation of aircraft, including emergency landings.

Issues

NASK has a large and potentially dangerous bird and mammal population. Daily animal movements in the vicinity of the airfields create various hazards to aircraft. The conditions that attract birds and wildlife, and the potential for strikes varies between the two NASK airfields. For instance, birds may flock to an airfield or may cause hazards en route; hazards may be seasonal or year round; bird activity may change as area crop production and rotations change, as sanitary landfills are opened or expanded, or as wildlife refuges are established or improved. Management of vegetation to reduce the attractiveness to wildlife species that may pose a BASH risk is a primary component of the Installation's BASH Program.

As directed by SAIA, natural resources must not conflict with the installation's military mission. A major goal of this INRMP is to provide a plan for enhancement of the natural resources on the NASK Complex. Many options for natural resources enhancement exist, but many of these techniques, if done without consideration of aircraft operations, could increase the potential for BASH. It may initially appear that the BASH Program is counterproductive to the environmental stewardship demanded in the SAIA and other environmental enactments; however, for safety reasons the BASH Program must decrease an airfield's attractiveness to birds and wildlife that have the potential for becoming involved in an aircraft strike.

Goals and Objectives

- Protect and maintain natural resources within NASK by continuing and enhancing ecologically appropriate and beneficial land uses and management practices, while ensuring the continuation of the military mission;

- Protect, maintain, and restore native vegetative communities and plant and wildlife populations, while improving the quality of life and ensuring continuation of the military mission and reducing BASH potential;
- Provide facilities and develop policies that allow for recreational and educational uses of natural resources, and result in positive effects to these natural resources while improving the quality of life.
- Protect and conserve the ecological value and diversity of natural resources by fostering knowledge of, and participation in, adaptive ecosystem management that considers BASH requirements;
- Implement environmentally beneficial landscaping, grounds maintenance, and urban forestry practices;
- Continue existing, and establish new programs and procedures to monitor, maintain, and enhance wetlands and water quality;
- Maintain the ecological integrity of wetland and upland communities for the protection of native plant and animal species, including numerous federally and state listed species;
- Maintain the attenuation capacity of the remaining undisturbed acreage within the 100-year floodplain;
- Ensure that land management and land use decisions comply with all applicable laws, executive orders, regulations, directives, and instructions, and that adverse impacts to the natural environment are minimized;
- Control nuisance wildlife and wildlife diseases that may adversely affect human health or welfare, the health of the ecosystem, and the military mission;
- Provide adequate staffing, equipment, technology, and training to the Natural Resources Program to ensure proper implementation of this INRMP; and
- Incorporate the concept of ecosystem management into all planning and management processes.

Projects

- Biological resources survey and inventory (Project 1 in Appendix A)
- RTE Habitat Management (Project 2 in Appendix A)
- Invasive Species Control (Project 3 in Appendix A)
- NASK INRMP Update (Project 4 in Appendix A)
- Prescribed Fire Management (Project 5 in Appendix A)
- Neotropical Migratory Bird Survey (Project 6 in Appendix A)
- Habitat Management and Restoration (Project 7 in Appendix A)
- Natural Resources Outreach (Project 8 in Appendix A)
- South Texas Ambrosia Management Plan and Survey (Project 9 in Appendix A)
- Game Animal Survey on the Main Station and Dixie Annex (Project 10 in Appendix A)

Management Strategies

- Conduct careful management of wetlands and open water located in proximity to NASK airfields in order to reduce their potential to attract wildlife and contribute to BASH.

- Schedule mowing around the airfield when grass height approaches high end and mow grass to low end of height threshold. Integrate the mowing schedule into the grounds maintenance contract.
- Map habitat types around the airfield using a global positioning system (GPS) unit and enter information into the GIS database.
- Coordinate implementation of any INRMP projects that have the potential to conflict with BASH Program requirements with the USDA wildlife biologist responsible for implementing the BASH Program.
- Establish procedures for the BASH contact person to inform the Navy personnel responsible for the Installation's database of incidents.
- Conduct a BASH training workshop for staff members, and provide refresher training as needed.
- Procure and maintain BASH response equipment (i.e., propane cans, electronic scare devices, calls).

Long-Term Management

The Bird Hazard Working Group (BHWG) was established to implement and monitor the BASH Program; collect, compile, and review wildlife hazard data; and to recommend actions in land and wildlife management and/or operational procedures to reduce wildlife hazards to aircraft. BHWG is a local committee of base representatives, community citizens, and unit offices concerned with bird hazards, which executes and makes recommendations for the NASK BASH Program; its members include civilian and military personnel from various departments. In accordance with the requirements of the NASK 2011 BASH Plan, the BHWG shall meet monthly to review wildlife hazard data and discuss possible solutions. The BHWG is also responsible for updating the 2011 BASH Plan as necessary and for disseminating information concerning wildlife hazards.

Land management strategies, such as those that manage vegetation, surface water, and other natural features, will aid in the long-term reduction of BASH risks. Likewise, BASH risks will decline over time by effectively managing wildlife and obtaining, storing, and utilizing information on the distribution and abundance of BASH hazards to form effective wildlife management actions.

Integration with Other Natural Resources Management Activities

- Coastal Zone Management, Section 5.2.1 – manage vegetation within coastal areas;
- Wetlands, Section 5.2.2 – maintain at least a 50-foot buffer around wetlands, and use consideration with height of vegetative buffer to reduce attracting waterfowl;
- Soil Conservation and Erosion, Section 5.2.3 – limit sedimentation from vegetation management activities from entering waterways;
- Stormwater and Water Quality, Section 5.2.4 – stormwater runoff into coastal areas;
- Floodplains, Section 5.2.5 – maintain floodplain vegetation to keep functional;
- Landscaping and Grounds Maintenance, Section 5.2.6 – maintain appropriate grass heights around airfields to reduce BASH potential;

- Invasive, Exotic, and Noxious Species, Section 5.2.7 – replace removed exotic trees with native trees;
- Urban Forestry, Section 5.2.8 – consider native vegetation management methods during urban forestry;
- Agricultural Outleasing, Section 5.2.9 – monitor crop selection in agricultural outlease areas to ensure FAA regulations are being followed in regards to crop selection, and as identified in agricultural outlease contracts;
- Migratory Birds, Section 5.4.1 – Maintain foraging and nesting habitat for migratory bird species, as far away from airfield as possible, to reduce likelihood of BASH;
- Threatened and Endangered Species, Section 5.4.2 – maintain and enhance habitat for protected wildlife to reduce their likelihood of being involved in a strike;
- Nuisance Wildlife and BASH, Section 5.4.3 – manage wildlife habitats to reduce BASH potential around airfields, and enhance wildlife habitat in consideration of BASH Program requirements.
- Wildlife Diseases, Section 5.4.4 – consider the potential of disease transmission from animal to human contact, reduce human-wildlife interactions, Prohibit feeding of feral cats
- Outdoor Recreation, Section 5.5 – establish outdoor recreation activities in consideration of BASH Program requirements;
- Hunting, Section 5.5.1 – Limit trampling of native vegetation during hunting activities;
- Wildlife Officer, Section 5.5.2 – Identify and report any vegetation management needs or issues;
- Natural Resources Training, Section 5.6.1 – ensure personnel are aware of vegetation management protocol and how it relates to BASH issues and practices; and
- GIS, Section 5.6.2 – utilize GIS tools to identify fish and wildlife habitats and other natural resources that need to be managed in consideration of BASH Program requirements.

Ecosystem Management

The BASH potential will be reduced by managing wildlife on undeveloped, semi-developed, and developed areas of the Installation and habitats around the airfield. By tracking BASH-related airfield incidents using a georeferenced data set, including information on habitat types at and near each incident's location, a more complete understanding of risks and potential causes of strikes can be developed, leading to more effective management actions.

Military Mission

Vegetation management practices can be implemented to help protect and enhance native habitats that support native wildlife, but reduce BASH occurrence; thereby reducing the potential for adverse impacts that could threaten the military mission. By helping with water absorption and soil stabilization, it can also reduce flooding and sedimentation which helps supporting the military mission by reducing logistical and transportation issues associated with flooding and erosion.

Laws, Executive Orders, Regulations, Directives, and Memoranda Relevant to Management of Vegetation to Reduce BASH Potential

- DoDI 4165.67, requires clear zones be maintained at the end of all runways. This includes cutting or topping trees, shrubs, brush, or other forms of obstructions to ground level, where DoD determines these obstructions would interfere with the operation of aircraft, including emergency landings.
- DoDI 4715.03, Natural Resources Conservation Program, implements policy, assigns responsibilities, and prescribes procedures for the integrated management of natural and cultural resources on property under DoD control.
- SAIA, USC 670a-f, promotes effectual planning, development, maintenance, and coordination of wildlife, fish, and game conservation and rehabilitation on military lands.
- Commander, Navy Installations Command (CNIC) CNICINST 3700, Navy BASH Program Implementing Guidance, establishes policy and procedures for implementing the CNIC BASH Program, establishes mandatory BASH event reporting and remains collection procedures, and establishes BASH program procedures.
- Commander, Navy Installations Command, BASH Manual, presents additional recommended policies, procedures, and instructional material to serve as an aid to CNIC shore aviation commands in developing local BASH policies and related personnel training programs; and identifies key BASH statutory and regulatory requirements, and provides advisory information for management of Navy airfields.
- OPNAVINST 3750.6, Naval Aviation Safety Program, issues policies and provisions of the Naval Aviation Safety Program.
- OPNAVINST 5090.1D, 12-3.5, discusses laws that govern natural resources management relating to the protection and management of fish and wildlife resources.
- FAA, Advisory Circular 150/5200-32A, Reporting Aircraft Wildlife Strikes, explains the importance of reporting collisions between aircraft and wildlife (i.e., wildlife strikes), and examines recent improvements in the FAA's Bird/Other Wildlife Strike Reporting system; how to report a wildlife strike; what happens to the wildlife strike report data; how to access the FAA National Wildlife Aircraft Strike Database; and the FAA's Feather Identification program.
- FAA, Advisory Circular 150/5200-33B, Hazardous Wildlife Attractants on or Near Airports, provides guidance on certain land uses that have the potential to attract hazardous wildlife on or near airports as well as airport development projects that affect aircraft movement near hazardous wildlife attractants.

Additional Sources of Information

FAA, Airport Safety and Operations Division
FAA Wildlife Strike Database
FAA Wildlife Hazard Mitigation
DoD PIF BASH Planning
NASK BASH Program
Air Force Safety Center

5.2.7 Invasive, Exotic, and Noxious Species

Species can be categorized as native, exotic, exotic and invasive, or native and invasive. A native species is a species already occurring at the time of European contact in 1500. An exotic species is a non-indigenous (non-native) species that was either purposefully or accidentally introduced into an area outside its natural range. Invasive species are alien species whose introduction does, or is likely to, cause harm to the economy, environment, or human health. Invasive species in natural areas include aggressive plants that produce a significant change in terms of species composition, ecosystem structure, or ecosystem function (Cronk and Fuller 1995). Although introduced grasses can provide suitable forage for livestock and some species of wildlife with proper management, introduced grass species typically develop into monotypic stands of vegetation that do not provide high quality grassland habitat or short grass prairie habitat that can support a diversity of wildlife species.

Executive Order 13112 requires Federal agencies to (1) identify actions that may affect invasive species, (2) use relevant programs to prevent introduction of invasive species, (3) detect, respond, and control such species, (4) monitor invasive species populations, (5) provide for restoration of native species, (6) conduct research on invasive species, and (7) promote public education (Executive Order 13112, 1999). 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, poultry, and agricultural irrigation navigation, the fish and wildlife resources of the United States, and the public health (7 U.S.C. 2802 (c)).

The higher temperatures and changes in precipitation patterns associated with climate change are anticipated to cause shifts in species composition and geographic range. Among the species shifts anticipated are movement of wildlife to more favorable habitat, shifts in vector-borne diseases, and expansion of invasive grasses and shrubs. Invasive plants contribute fuel load for wildfires, which in turn increases the likelihood, range, and intensity of wildfire. Ongoing management of exotic and invasive species is therefore vital to offset the potential vulnerability of properties and native communities on the NASK Complex.

Flora surveys conducted for the NASK Complex have identified 21 species at NAS Kingsville, 11 species at NALFOG, and 26 species at Dixie Target Range that are considered introduced or invasive. Table 2-11 provides information on surveys conducted for the NASK Complex that included collection of nuisance and invasive plant species data.

Nuisance plants, which may be either native or non-native species, cause inconvenience, annoyance or irritation to the general human population or damage to property. The level of inconvenience or annoyance can range from relatively minor, such as reducing the aesthetic

qualities of an area, to causing actual physical or economic damage to buildings or to habitats. The human impact these species exert is usually on the aesthetic quality of life.

Invasive plants are native and non-native species that may spread into, or are introduced to an area, and disturb the habitat of a similar native species or a non-similar species that is dependent upon the habitat required by the invasive species. An invasive species is likely to cause economic or environmental harm, or harm to human health (Executive Order [EO] 13112). One example of an invasive species common to the NASK Complex is the chinaberry tree (*Melia azedarach*). This fast-growing tree crowds-out native species and disturbs habitat, and has poisonous berries, which could pose a risk to animals and humans if ingested. Plants considered by USFWS to be invasive species for the NASK Complex are listed in Appendix H, Table H-1, which also includes expanded information for each of the species listed.

Issues

Invasive species have the potential to interfere with military and recreational activities, wildlife habitats, forests, wetlands, and other natural areas. Invasive species often interfere with ecosystem functions. Some of them can form expansive monocultures when left uncontrolled and, in extreme case, will lead to complete loss of native plant communities and reduction in regional biodiversity. Flora surveys conducted for the NASK Complex have identified 21 species at NASK, 11 species at NALFOG, and 26 species at Dixie Target Range that are considered introduced or invasive.

Goals and Objectives

- Protect and maintain natural resources within NASK by continuing and enhancing ecologically appropriate and beneficial land uses and management practices, while ensuring the continuation of the military mission;
- Protect, maintain, and restore native vegetative communities and plant and wildlife populations;
- Protect and conserve the ecological value and diversity of natural resources by fostering knowledge of, and participation in, adaptive ecosystem management;
- Control nuisance wildlife and wildlife diseases that may adversely affect human health or welfare, the health of the ecosystem, and the military mission;
- Maintain the ecological integrity of wetland and upland communities for the protection of native plant and animal species, including numerous federally and state listed species;
- Continue existing, and establish new programs and procedures to monitor, maintain, and enhance wetlands and water quality;
- Ensure that land management and land use decisions comply with all applicable laws, executive orders, regulations, directives, and instructions, and that adverse impacts to the natural environment are minimized;
- Implement environmentally beneficial landscaping, grounds maintenance, and urban forestry practices;
- Provide adequate staffing, equipment, technology, and training to the Natural Resources Program to ensure proper implementation of this INRMP; and

- Incorporate the concept of ecosystem management into all planning and management processes.

Projects

- Biological resources survey and inventory (Project 1 in Appendix A)
- RTE Habitat Management (Project 2 in Appendix A)
- Invasive Species Control (Project 3 in Appendix A)
- NASK INRMP Update (Project 4 in Appendix A)
- Prescribed Fire Management (Project 5 in Appendix A)
- Neotropical Migratory Bird Survey (Project 6 in Appendix A)
- Habitat Management and Restoration (Project 7 in Appendix A)
- Natural Resources Outreach (Project 8 in Appendix A)
- South Texas Ambrosia Management Plan and Survey (Project 9 in Appendix A)
- Game Animal Survey on the Main Station and Dixie Annex (Project 10 in Appendix A)

Management Strategies

- Continue existing efforts, and further, establish a program/plan using prescribed burns and/or thinning to improve habitat quality, reduce the potential for wildfires, control diseases and insect pests, and ensure the continuation of fire-dependent plant communities;
- Continue monitoring program for natural communities (as well as RTE), and implement programs to enhance natural communities and wildlife habitat;
- Continue to implement programs and activities for the protection and enhancement of threatened and endangered plant and animal species and their habitats;
- Continue to implement general landscape management practices consistent with the concepts presented in this INRMP;
- Continue to apply xeriscaping principles using native species for new landscaping, and will phase in these principles for existing landscapes;
- Implement environmentally beneficial landscaping, grounds maintenance, and urban forestry practices;
- Continue to inventory the use of pesticides and fertilizers to assess alternatives to their use and a reduction in pesticide and fertilizer use; and
- Continually verify that natural resources personnel obtain proper training and certifications.
- Management of nuisance species, including trapping of wild hog, should be allowed to continue at the NASK Complex under an invasive species project action.

Long-Term Management

The NRM at NASK will use an adaptive approach to manage exotic and invasive plants and will explore alternative ways to meet management objectives, predict the outcomes of each alternative based on the current state of knowledge, implement one or more of these alternatives, and use the results to increase knowledge and adjust management actions. In cases where

resources such as time, money, and staff are limited, management planning will ensure that NASK uses resources wisely to manage exotic and invasive plants for the long term.

Invasive and exotic species will be managed through the removal of the species and restrictions on the introduction of the species to NASK in accordance with Executive Order 13112. The Installation will survey the extent of invasive and exotic species on all properties and schedule removal. This plan will be implemented to control invasive and exotic species to acceptable levels. The NRM will screen all lists of landscaping plants proposed for NASK to ensure invasive and exotic species are not used.

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 USEPA, 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 Federal Insecticide, Fungicide and Rodenticide Act (FIFRA; 7 U.S.C. 136), pesticides are registered at the federal level and by individual states. Therefore, a particular pesticide product that is federally registered by the USEPA 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.

Pesticides will be applied by skilled, DOD-certified workers and according to label instructions to ensure their application does not contaminate surface waters or affect flora and fauna. 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.

Integration with Other Natural Resources Management Activities

- Coastal Zone Management, Section 5.2.1 – conduct regular surveys for, and treat for invasive species in coastal areas;
- Wetland Management, Section 5.2.2 – prevent contamination of wetlands by pesticides;
- Soil Conservation and Erosion, Section 5.2.3 – control nuisance animals that contribute to erosion;
- Stormwater and Water Quality, Section 5.2.4 – prevent contamination of water quality by pesticides;
- Floodplains, Section 5.2.5 – ensure exotic species do not compromise attenuation properties of floodplains;
- Landscaping and Grounds Maintenance, Section 5.2.6 – landscape with native plants to reduce the opportunity for exotics to become established;
- Urban Forestry, Section 5.2.8 – ensure only native trees are planted;
- Agricultural Outleasing, Section 5.2.9 – prevent the introduction of invasive and exotic plant species and pests;
- Forest Protection, Section 5.3.1 – burn to accentuate the environmental conditions of native plants and wildlife;

- Migratory Birds, Section 5.4.1 – conserve native vegetation used by migratory birds;
- Threatened and Endangered Species, Section 5.4.2 – control exotic plants and wildlife that would otherwise compete with protect species for resources;
- Nuisance Wildlife and BASH, Section 5.4.3 – reduce nuisance species concurrent with control of invasives and exotics;
- Wildlife Diseases, Section 5.4.4 – consider the potential of disease transmission from animal to human contact, reduce human-wildlife interactions, Prohibit feeding of feral cats;
- Outdoor Recreation, Section 5.5 – eliminate exotic vegetation to enhance outdoor recreation;
- Hunting, Section 5.5.1 – Enlist hunters to assist with removal of invasive, exotic, or nuisance species;
- Wildlife Officer, Section 5.5.2 – Wildlife officer can record and report invasive or exotic locations;
- Natural Resources Training, Section 5.6.1 – ensure personnel are current on exotic and invasive control procedures and laws; and
- GIS, Section 5.6.2 – utilize GIS tools to improve management of exotic and invasive species.

Ecosystem Management

Invasive plant and noxious weed management is consistent with an ecosystem approach since it relies on the functions and characteristics of native plant species to reduce the demand for irrigation, fertilizers, and pesticides on the Installation. Control and reduction of invasive plants and noxious weeds will help to restore wildlife habitat and ground cover at NASK and will limit the spread of these species to areas in the region. Additionally, control of invasive plants and noxious weeds will directly benefit the federally endangered South Texas ambrosia at NAS Kingsville.

Military Mission

Invasive species have a propensity to spread rapidly, potentially creating hazardous situations when they interfere with infrastructure systems (e.g., along and around roadway intersections and electric distribution lines and substations).

Laws, Executive Orders, Regulations, Directives, and Memoranda Relevant to Invasive, Exotic, and Noxious 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. USEPA is responsible under FIFRA for the registration of all pesticide active ingredients used in the United States.
- OPNAVINST 6250.4B, 27 August 1998, DOD Pest Management Programs, 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 dependents; 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 5090.1D, 12-3.10., discusses natural resources management relating to the control of invasive species.
 - DoDI 4715.03, Natural Resources Conservation Program, requires the control and removal of exotic species where appropriate and encourages the use of beneficial techniques such as using regionally native plants; using construction practices that minimize adverse effects on the natural habitat; preventing pollution by reducing fertilizers and pesticides, using Integrated Pest Management (IPM) techniques, recycling green waste, and minimizing runoff; using water-efficient practices; and creating outdoor demonstrations incorporating native plants, as well as pollution prevention and water conservation techniques, to promote awareness of the environmental and economic benefits of implementing this directive.
 - National Invasive Species Act, 16 USC 4321, prescribes policies to prevent the introduction and spread of non-indigenous species into U.S. waters.
 - 1994 President's Executive Memorandum on Environmentally and Economically Beneficial Landscape Practices on Federal Landscaped Grounds, 60 FR 40837, emphasizes the use of beneficial landscape practices as defined above.
 - EO 13148 (21 April 2000), *Greening the Government through Leadership in Environmental Management*, mandates that environmental management considerations must be a fundamental and integral component of federal government policies, operations, planning, and management and that sustainable management is pursued through the implementation of cost-effective, environmentally sound landscaping practices and programs to reduce adverse impacts to the natural environment.

Additional Sources of Information

USDA, National Invasive Species Information Center, Texas State Resources
TPWD, Exotic and Invasive Species
TPWD, Nuisance Aquatic Vegetation Society for Ecological Restoration Center for Plant Conservation
Native Texas Nurseries
Texas Invasives
Native Plant Society of Texas
The Nature Conservancy, Protecting Native Plants and Animals
Lady Bird Johnson Wildflower Center

5.2.8 Urban Forestry

Urban forestry is the management of forests and related natural resources within human communities. Urban forests include trees, groups of trees, and stands of trees on improved or

semi-improved lands, exclusive of forests managed by NASK. Successful urban forestry programs manage these resources to enhance both natural and human-built features.

Issues

Trees and vegetation in urban areas, when properly managed, contribute to ecological health and quality of life at NASK. Certain areas, such as industrial and residential areas, would benefit from urban forestry practices that contribute to:

- Reduced noise levels, stormwater runoff, and soil erosion;
- Increased habitat for wildlife;
- Air quality improvements, dust control, purer air and dust control, reduced pollution, and controlled wind speeds;
- Moderated temperatures in paved areas and around buildings;
- Aesthetic improvements, including color, views, and seasonal changes; and
- Defined space, buffers, and barriers.

Urban landscaping has been shown to contribute to individuals' physical and mental health and quality of life. Urban landscaping also improves the public image of the Installation and directly relates to positive public opinion in the community.

Goals and Objectives

- Protect and maintain natural resources within NASK by continuing and enhancing ecologically appropriate and beneficial land uses and management practices, while ensuring the continuation of the military mission;
- Protect, maintain, and restore native vegetative communities and plant and wildlife populations;
- Provide facilities and develop policies that allow for recreational and educational uses of natural resources, and result in positive effects to these natural resources while improving the quality of life.
- Protect and conserve the ecological value and diversity of natural resources by fostering knowledge of, and participation in, adaptive ecosystem management;
- Implement environmentally beneficial landscaping, grounds maintenance, and urban forestry practices;
- Continue existing, and establish new programs and procedures to monitor, maintain, and enhance wetlands and water quality;
- Maintain the ecological integrity of wetland and upland communities for the protection of native plant and animal species, including numerous federally and state listed species;
- Maintain the attenuation capacity of the remaining undisturbed acreage within the 100-year floodplain;
- Ensure that land management and land use decisions comply with all applicable laws, executive orders, regulations, directives, and instructions, and that adverse impacts to the natural environment are minimized;

- Control nuisance wildlife and wildlife diseases that may adversely affect human health or welfare, the health of the ecosystem, and the military mission;
- Provide adequate staffing, equipment, technology, and training to the Natural Resources Program to ensure proper implementation of this INRMP; and
- Incorporate the concept of ecosystem management into all planning and management processes.

Projects

- Biological resources survey and inventory (Project 1 in Appendix A)
- RTE Habitat Management (Project 2 in Appendix A)
- Invasive Species Control (Project 3 in Appendix A)
- NASK INRMP Update (Project 4 in Appendix A)
- Prescribed Fire Management (Project 5 in Appendix A)
- Neotropical Migratory Bird Survey (Project 6 in Appendix A)
- Habitat Management and Restoration (Project 7 in Appendix A)
- Natural Resources Outreach (Project 8 in Appendix A)
- South Texas Ambrosia Management Plan and Survey (Project 9 in Appendix A)
- Game Animal Survey on the Main Station and Dixie Annex (Project 10 in Appendix A)

Management Strategies

- Continue to follow its working Urban Forestry Plan and implement projects to enhance wildlife habitat and aesthetics in developed areas;
- Implement environmentally beneficial landscaping, grounds maintenance, and urban forestry practices;
- Continue to implement general landscape management practices consistent with the concepts presented in this INRMP;
- Continue to apply xeriscaping principles using native species for new landscaping, and will phase in these principles for existing landscapes;
- Continue to implement BMPs to minimize stormwater pollution and erosion;
- Promote at least 50-foot buffers for all wetlands, and ensure land use and land management practices that will not adversely affect wetland resources;
- Continue to develop a soil erosion control plan and reduce the rate of soil erosion through the implementation of long-term measures and projects;
- Continue to inventory the use of pesticides and fertilizers to assess alternatives to their use and a reduction in pesticide and fertilizer use;
- Implement grounds maintenance practices consistent with the BASH Plan;
- Continue to implement programs and activities for the protection and enhancement of threatened and endangered plant and animal species and their habitats; and
- Continually verify that natural resources personnel obtain proper training and certifications.

Long-Term Management

Long-term management for urban forestry will involve the central management of urban forest maintenance, tree planting, and tree protection to enhance the quality of life on the Complex. NASK will identify areas where the benefits of urban forestry can be applied, develop a plan for planting trees and shrubs, recruit and train volunteers, and develop partnerships to support urban forestry.

An urban forestry program primarily includes planting, removal, maintenance, and protection of urban trees and forests. The primary components of a working urban forestry plan are listed below.

- Selection of the appropriate tree species;
- Use of appropriate maintenance measures (pruning, fertilizing, watering) for new plantings and established trees;
- Mulching and tree protection from mowers and weed eaters;
- Completion of inventories and annual work plans to implement the overall urban forestry plan; and
- Use of volunteer organizations for assistance with planting and maintenance activities.

Integration with Other Natural Resources Management Activities

- Coastal Zone Management, Section 5.2.1 – Maintain upland trees in coastal areas;
- Wetland Management, Section 5.2.2 – maintain at least a 50-foot buffer around wetlands;
- Soil Conservation and Erosion, Section 5.2.3 – urban forestry can help reduce erosion;
- Stormwater and Water Quality, Section 5.2.4 – use proper amounts of herbicide and fertilizers to avoid excessive runoff in stormwater;
- Floodplains, Section 5.2.5 – ensure urban forestry does not compromise the function of floodplains;
- Landscaping and Grounds Maintenance, Section 5.2.6 – ensure urban forestry projects are consistent with landscaping and grounds maintenance tasks;
- Invasive, Exotic, and Noxious Species, Section 5.2.7 – replace removed exotic trees with native trees;
- Agricultural Outleasing, Section 5.2.9 – ensure urban forestry projects are consistent with agricultural outleasing objectives;
- Forest Protection, Section 5.3.1 – maintain urban forests to reduce fuel loads;
- Migratory Birds, Section 5.4.1 – use proper amounts of herbicide and fertilizers to avoid runoff into wading areas;
- Threatened and Endangered Species, Section 5.4.2 – maintain and enhance habitat for protected wildlife;
- Nuisance Wildlife and BASH, Section 5.4.3 – be aware of creating potential habitat for BASH birds and wildlife;
- Wildlife Diseases, Section 5.4.4 – consider the potential of disease transmission from animal to human contact, reduce human-wildlife interactions, Prohibit feeding of feral cats
- Outdoor Recreation, Section 5.5 – maintain aesthetically-pleasing grounds for recreation;

- Hunting, Section 5.5.1 - Enlist hunters to report signs of trees that need attention by urban forester;
- Wildlife Officer, Section 5.5.2 – Enlist wildlife officer to report signs of sick/dead trees that need attention by urban forester;
- Natural Resources Training, Section 5.6.1 – ensure personnel are aware of urban forestry issues and practices; and
- GIS, Section 5.6.2 – utilize GIS tools to improve urban forestry plans.

Ecosystem Management

Urban forestry supports the ecosystem management concept by providing wildlife habitat through the development of new greenways and managing urban areas for the enhancement of wildlife. Urban forests help reduce stormwater runoff and soil erosion, and will be used as a component of xeriscaping. Urban trees can also play an important role in temperature modification in developed areas.

Military Mission

Urban forestry practices can be implemented to help protect and enhance water quality and wildlife; thereby reducing the potential for adverse impacts to these resources that could threaten the military mission. It can also play an important part in improving quality of life for those supporting the military mission.

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

- 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.

Additional Sources of Information

Alliance for Community Trees
Arbor Day Foundation
International Society of Arboriculture
National Association of State Foresters
Society of American Foresters
Society of Municipal Arborists
USDA Forest Service
Treelink

5.2.9 Agricultural Outleasing

Agricultural outleasing is the use of non-excess DoD lands, as allowed by 10 U.S.C. 2667, under a lease to an agency, organization, or person for growing crops or grazing domestic animals. The term “agriculture” includes activities related to producing, harvesting, processing, or marketing an agricultural, maricultural, or horticultural commodity. Agricultural outlease areas are those areas on which an agricultural lease may exist. These areas may be designated for

production of hay or row crops, or for livestock grazing. There is the potential to use these areas as additional hunting areas, as long as hunting activities do not interfere with agricultural practices that occur. Agricultural outlease areas have the potential to provide food for many types of birds during different seasons and conditions of the fields. The control of the types of crops planted in the outleasing program is important to both the migratory birds and the primary mission and safety at the Installation. A 1986 study evaluating the BASH in relation to the agricultural outlease program at the Main Station and NALFOG called for the elimination of both grain farming and grazing. Recommendations were to replace these crops and uses with soybeans, cotton or potatoes (Lefebvre 1986). Other options would include placing hay fields that are currently in the agricultural outleasing program into the Installation mowing contract.

Agricultural leases are for 1 year, but may be renewed for four additional 1-year periods unless special needs dictate a longer lease period. Normally, agricultural leases are re-bid at least every 5 years. Lessees are required to comply with the conservation provisions of the Food Security Act of 1985, which is administered by the USDA NRCS and the conservation plan development for the lease area by NAVFAC SE Natural Resources Branch. Agricultural outleasing is strongly advocated by the DoD as a means of showing good stewardship of government lands. Agricultural outleases must be competitively bid and the government must get fair value. A major benefit of such leases is the savings realized by the Installation in grounds maintenance costs. The conservation plan can also include additional conservation and maintenance work that the lessee can do in lieu of cash rent.

Table 5-2 Main Station Agricultural Outleases

Acreage	Utilization
25	Row crop production (southern)
90	Grazing
120	Row crop production (northern)

Issues

The 235 acres of agricultural outleases at NASK are limited to row crop production and grazing purposes and are located away from the active airfield on the Main Station (Figure 5-1). There are no agricultural outleases within the NALFOG and Dixie Target Range parcels.

To ensure protection of water quality and compliance with BASH Program requirements, development of conservation protection standards and evaluation of agricultural outleases for compliance with these requirements and standards is needed. If necessary to protect natural resources and ensure airfield safety, the agricultural outlease agreements associated with NASK should be modified to ensure compliance with the BASH Program and conservation protection standards should be developed. Modifications to these outlease agreements may include crop restrictions and requirements, and limitations on the use of agricultural herbicides and pesticides. If necessary to provide airfield safety, the use of agricultural outlease areas could be transitioned

to phase out the planting of crops in these areas, and manage these areas as part of the Installation's mowing contract.

DoDI 4715.03 requires that all installations shall assess lands for agricultural outlease suitability. Any such uses shall support the military mission, be addressed in and be compatible with the INRMP, and be consistent with long-term ecosystem-based management goals that place ecological sustainability objectives above revenue optimization goals. The NASK agricultural outlease has a valid Conservation Plan that has been developed by the installation NRM with input from NAVFAC SE EV22 and NAVFAC SE AM. In addition, the NRM performs quarterly inspections to ensure the lessee is in compliance with the Conservation Plan and annual inspections before each lease renewal.

Goals and Objectives

- Protect and maintain natural resources within NASK by continuing and enhancing ecologically appropriate and beneficial land uses and management practices, while ensuring the continuation of the military mission;
- Improve and enhance water quality by ensuring P2 Plans and SWPPPs are consistent with the installation's natural resources management program;
- Maintain vegetation to reduce BASH potential.
- Maintain and enhance native vegetation, including forest habitats, to promote community diversity; and to control and monitor noxious, invasive, and exotic plant species.
- Implement environmentally beneficial and cost-effective landscaping and grounds maintenance practices.
- Ensure that land management and land use decisions, including agricultural outleases, comply with all applicable laws, executive orders, regulations, directives, and instructions, and that adverse impacts to the natural environment are minimized.
- Develop partnerships with USDA NRCS, TCEQ, Texas A&M University–Kingsville, Texas Ornithological Society, Coastal Bend Audubon Society, DoD PIF, Kleberg County (encroachment partnering), and other local agencies and organizations to implement wildlife monitoring and protection programs.
- Control nuisance wildlife and wildlife diseases that may adversely affect human health or welfare, the health of the ecosystem, and the military mission;
- Provide adequate staffing, equipment, technology, and training to the Natural Resources Program to ensure proper implementation of this INRMP; and
- Incorporate the concept of ecosystem management into all planning and management processes.

Projects

- Biological resources survey and inventory (Project 1 in Appendix A)
- RTE Habitat Management (Project 2 in Appendix A)
- Invasive Species Control (Project 3 in Appendix A)
- NASK INRMP Update (Project 4 in Appendix A)

- Prescribed Fire Management (Project 5 in Appendix A)
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Management Strategies

- Regularly review all existing and future agricultural outleases to ensure that there are no conflicts between natural resources management recommendations made in this INRMP and the agricultural outlease contracts, especially in regards to crop selection and the use of pesticides/herbicides.
- Ensure that all agricultural outleases are updated as required by FAA guidelines or DoD instructions.
- Consider haying versus planting of certain types of row crops in the agricultural outlease areas with regard to the BASH Program requirements. Evaluate whether to take the agricultural outlease areas out of production and include them in a mowing contract.
- Continue to inventory the use of pesticides and fertilizers to assess alternatives to their use and a reduction in pesticide and fertilizer use;
- Implement grounds maintenance practices consistent with the BASH Plan;
- Continue to implement programs and activities for the protection and enhancement of threatened and endangered plant and animal species and their habitats; and
- Continually verify that natural resources personnel obtain proper training and certifications.

Long-Term Management

In managing agricultural outleases, NASK will continue to prioritize ecological sustainability objectives above revenue optimization goals as directed by DoDI 4715.03. This is consistent with long-term ecosystem-based management of natural resources since it emphasizes conservation and restoration through reduction in demand for irrigation and pesticides and reduces BASH potential.

Land area currently being utilized for agricultural outleases will continue to be utilized for this purpose during this 10-year period. No additional lands are scheduled to be utilized for agricultural outlease unless market conditions make leasing additional areas desirable. Any newly acquired land will be considered for agricultural outlease. The long-term management of outleased land will be consistent with conservation principles. Leases or other actions that may result in significant changes in land use (e.g. hay production to sod farming) will require additional environmental documentation to comply with NEPA requirements. Lessees are required to comply with the conservation provisions of the Food Security Act of 1985, which is administered by the USDA NRCS. The Food Security Act applies primarily to the fields which have been

determined as having high erosion potential by NRCS. In general, compliance with the Food Security Act will involve but is not limited to the following:

- Conservation Cropping Sequence – Rotation of designated crops in a specified sequence;
- Conservation Tillage – Farming techniques must be utilized to leave a specified percentage of crop residue on the soil surface after planting; and
- Terrace & Grassed Waterway Systems – Movement of soil to form terraces and waterways and establishment of grass in waterways where designated by NRCS.
- In addition, the following conservation management practices will be implemented:
- Erosion Control – Erosion control measures will be implemented to reduce the loss of soil due to the actions of wind and water;
- Proper Farm Equipment – Hydraulic connections on all power-driven equipment will be made in a manner to prevent oil leaks. The storage of fuel for equipment will be in accordance with Government regulations. The use of crawler tractors or spike-wheeled vehicles that could injure, impair, or cut into the surface on any pavement within the Installation will be prohibited;
- Fire Prevention – All farming practices shall be performed in a manner to prevent and/or reduce fire hazards; and
- Pesticides – All applications of pesticides shall be accomplished in compliance of DoD requirements for safety, effectiveness and environmental protection.

Integration with Other Natural Resources Management Activities

- Coastal Zone Management, Section 5.2.1 – manage coastal areas to ensure
- Wetland Management, Section 5.2.2 – maintain at least a 50-foot buffer around wetlands;
- Soil Conservation and Erosion, Section 5.2.3 – minimize erosion during agricultural activities;
- Stormwater and Water Quality, Section 5.2.4 – reduce use of herbicides, pesticides, and fertilizers to minimize impacts to water quality; prevent sedimentation as a result of agricultural activities;
- Floodplains, Section 5.2.5 – ensure agricultural activities does not compromise the function of floodplains;
- Landscaping and Grounds Maintenance, Section 5.2.6 – maintain appropriate grass heights around agricultural areas located in the vicinity of NASK airfields to reduce BASH potential and ensure agricultural activities are consistent with landscaping and grounds maintenance tasks;
- Invasive, Exotic, and Noxious Species, Section 5.2.7 – do not introduce exotic or invasive plants to the Complex as a result of agriculture;
- Urban Forestry, Section 5.2.8 – ensure agricultural activities are consistent with urban forestry tasks;
- Agricultural Outleasing, Section 5.2.9 – monitor crop selection in agricultural outlease areas to ensure FAA regulations are being followed, and as identified in agricultural outlease contracts; and maintain grass heights around NASK airfields to reduce BASH potential;

- Forest Protection, Section 5.3.1 – Ensure prescribed burns do not negatively impact crops or animals at agricultural outleases;
- Migratory Birds, Section 5.4.1 – use proper amounts of herbicide and fertilizers to avoid runoff into wading areas; monitor crop selection in agricultural outlease areas to ensure FAA regulations are being followed, and as identified in agricultural outlease contracts; and maintain grass heights around NASK airfields to reduce BASH potential;
- Threatened and Endangered Species, Section 5.4.2 – maintain and enhance habitat for protected wildlife;
- Nuisance Wildlife and BASH, Section 5.4.3 – be aware of creating potential habitat or forage for BASH birds and wildlife;
- Wildlife Diseases, Section 5.4.4 – consider the potential of disease transmission from animal to human contact, reduce human-wildlife interactions, Prohibit feeding of feral cats
- Outdoor Recreation, Section 5.5 – maintain aesthetically-pleasing grounds for recreation;
- Hunting, Section 5.5.1 – Use hunting to reduce feral animal populations on agricultural outleases, if approved beneficial;
- Wildlife Officer, Section 5.5.2 – Enlist wildlife officer to coordinate with agricultural outlease properties, when needed;
- Natural Resources Training, Section 5.6.1 – ensure personnel are aware of agricultural outleasing issues and practices; and
- GIS, Section 5.6.2 – utilize GIS tools to improve utilization of agricultural outleases.

Ecosystem Management

Managing agricultural outleases to limit the use of pesticides/herbicides, include conservation protection standards, and decrease the likelihood of BASH incidents, is consistent with an ecosystem approach since it promotes long-term ecological sustainability above revenue optimization. Agricultural practices on outleased lands will be consistent with soil conservation and erosion control measures so that adjacent ecosystems will not be adversely impacted.

Military Mission

Potential impacts to the military mission could arise from erosion problems near runways. In addition, agricultural lands could potentially attract nuisance wildlife that could interfere with the military mission.

Laws, Executive Orders, Regulations, Directives, and Memoranda Relevant to Agricultural Outleasing

- Federal Water Pollution Control Act, as amended by the CWA of 1977, 33 USC 1251, describes guidelines for the control of NPS pollution.
- Armed Forces, Leases; non-excess property of military departments and Defense Agencies, 10 USC 2667, provides general requirements for leasing certain lands that will promote national defense or be in the public interest.
- EO 12088 (13 October 1978), *Federal Compliance with Pollution Control Standards*, as amended, ensures that all necessary actions are taken to prevent, control, and abate

environmental pollution with respect to federal facilities and activities under control of the Agency.

- DoDI 4715.03, Natural Resources Conservation Program, requires that all agricultural outleases support the military mission and place ecological sustainability objectives above revenue optimization goals.
- Commander, Navy Installations Command CNICINST 3700, Navy BASH Program Implementing Guidance, establishes policy and procedures for implementing the CNIC BASH Program, establishes mandatory BASH event reporting and remains collection procedures, and establishes BASH program procedures.
- Commander, Navy Installations Command, BASH Manual, presents additional recommended policies, procedures, and instructional material to serve as an aid to CNIC shore aviation commands in developing local BASH policies and related personnel training programs; and identifies key BASH statutory and regulatory requirements, and provides advisory information for management of Navy airfields.
- OPNAVINST 3750.6, Naval Aviation Safety Program, issues policies and provisions of the Naval Aviation Safety Program.
- FAA, Advisory Circular 150/5200-33B, Hazardous Wildlife Attractants on or Near Airports, provides guidance on certain land uses that have the potential to attract hazardous wildlife on or near airports as well as airport development projects that affect aircraft movement near hazardous wildlife attractants.
- Military Construction and Authorization Act – Leases, Non-excess property, 10 U.S.C. 2667, provides for the out-leasing of public lands.
- Farm Land Protection Policy, 7 CFR 658, defines criteria that ensure farmland protection.
- Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C. 136, governs the use and application of pesticides in natural resources management programs.
- 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.
- Soil Conservation Act, 16 U.S.C. 3B, provides for application of soil conservation practices on Federal lands.
- OPNAVINST 5090.1D, 12-3.(i), discusses natural resources management relating to agriculture.

Additional Sources of Information

FAA, Airport Safety and Operations Division
FAA Wildlife Hazard Mitigation
FAA Wildlife Strike Database
USDA, National Conservation Practice Standards
Conserving Biodiversity on Military Lands
Sustainable Agriculture Network
USDA, Animal and Plant Health Inspection Service (APHIS) Wildlife Services

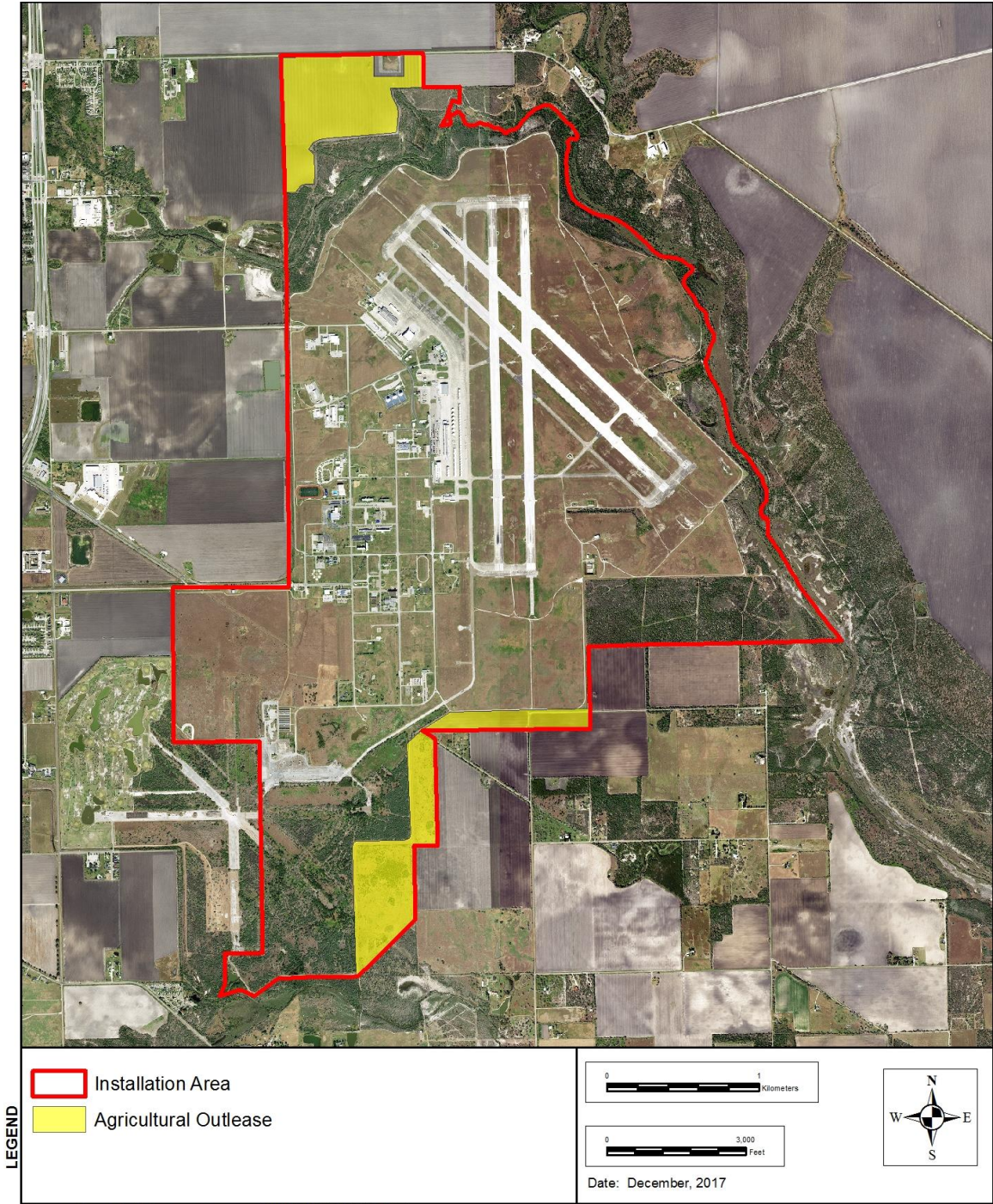


Figure 5-1 Naval Air Station Kingsville Agricultural Outleasements

5.3 FOREST MANAGEMENT

NASK will protect and enhance forest resources by practicing ecologically-sound forest management leading to watershed protection, and wildlife habitat protection and management. Ecologically-sound stewardship involves managing forestland for various components, including forest products, wildlife habitat, aesthetics, and recreation. Forest Management may be divided into two major components: silviculture and forest protection. Silvicultural practices include timber harvesting, pine straw harvesting, prescribed burning, establishment of firebreaks, herbicide application, forest fertilization, site preparation, and regeneration. Silviculture is not available at the NASK Complex because the landscape does not support any merchantable timber. Forest protection includes protection from wildfire, diseases, and insects. Ongoing and continued forest management and protection measures are therefore vital to offset the potential vulnerability of properties on the NASK Complex.

5.3.1 Forest Protection

NASK protects its forest stands against wildfires, insects, and diseases, and endeavors to maintain desirable environmental and aesthetic forest qualities. Wildfires are uncontained fires in forested or open areas. Wildfires may result from human activities or weather events. The potential for severe wildfires may be decreased by implementing prescribed burning programs, which decrease fuel loads in forest stands (see Section 5.3.1).

Wildland Fire Management

Prescribed fires are a management tool used to reduce forest fuels that could generate a high intensity fire and destroy natural resources. Prescribed fires conducted in the growing season (summer) are typically used to reduce midstory hardwood trees and encourage the reproduction and growth of herbaceous vegetation. Prescribed fires conducted to reduce fuel loads are generally conducted during the dormant season (winter) when temperatures are lower and the weather is more predictable. Dormant season burns also minimize damage to desirable vegetation. Management of any wildfire and/or human-caused ignition will be evaluated on a case-by-case basis to determine if the fire should be controlled or allowed to burn out.

DoD has recently adopted the National Wildfire Coordination Group's (NWCG) Federal Wildland Fire Policy to govern all wildland fire activities carried out by DoD personnel. DoD is presently exploring the possibility of seeking membership in the NWCG. The NWCG is made up of all Federal agencies (except DoD) with wildland fire responsibilities and the National Association of State Foresters. The Federal Wildland Fire Policy requires that all personnel involved in prescribed fire and/or wildfire activities meet certain training and physical qualifications. DoD is presently reviewing how it will implement this requirement. Some military installations have already implemented this requirement with most of them making it mandatory for new hires and positions and voluntary for current employees.

Issues

To decrease the risk of wildland fires and maintain the vegetation and habitat necessary to reduce the BASH potential, it is recommended that NASK develop a burn plan that includes conducting prescribed burns on a 3- to 5-year cycle. In addition to reducing the potential for

wildland fires, prescribed burns could also be used to support vegetation management in support of the BASH Program, enhance native plant diversity through control of unwanted vegetation, and improve wildlife habitat in appropriate areas. An example burn plan has been prepared for Dixie Annex that can be used to supplement the development of a burn plan for the NASK Complex.

Goals and Objectives

- Protect and enhance natural resources by practicing ecologically sound forest management leading to sustained watershed protection and wildlife habitat;
- Protect and maintain natural resources within NASK by continuing and enhancing ecologically appropriate and beneficial land uses and management practices, while ensuring the continuation of the military mission;
- Protect, maintain, and restore native vegetative communities and plant and wildlife populations, while improving the quality of life and ensuring continuation of the military mission;
- Maintain vegetation to reduce BASH potential;
- Maintain vegetation to reduce wildland fire hazards;
- Protect and conserve the ecological value and diversity of natural resources by fostering knowledge of, and participation in, adaptive ecosystem management;
- Practice the ecosystem management concept for sustained yield of forest products and forest health;
- Maintain the attenuation capacity of the remaining undisturbed acreage within the 100-year floodplain;
- Maintain the ecological integrity of wetland and upland communities for the protection of native plant and animal species, including numerous federally and state listed species;
- Preserve and protect RTE and species of special concern to ensure no reduction in population sizes;
- Provide adequate staffing, equipment, technology, and training for the NRP at NASK to ensure proper implementation of this INRMP; Implement training, education, and stewardship initiatives for ecosystem management;
- Control nuisance wildlife and wildlife diseases that may adversely affect human health and welfare, the health of the ecosystem, and the military mission; and
- Ensure that land management and land use decisions comply with all applicable laws, executive orders, regulations, directives, and instructions, and that adverse impacts to the natural environment are minimized; Incorporate the concept of ecosystem management into all planning and management processes.

Projects

- Biological resources survey and inventory (Project 1 in Appendix A)
- RTE Habitat Management (Project 2 in Appendix A)
- Invasive Species Control (Project 3 in Appendix A)
- NASK INRMP Update (Project 4 in Appendix A)
- Prescribed Fire Management (Project 5 in Appendix A)

- Neotropical Migratory Bird Survey (Project 6 in Appendix A)
- Habitat Management and Restoration (Project 7 in Appendix A)
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- Game Animal Survey on the Main Station and Dixie Annex (Project 10 in Appendix A)

Management Strategies

1. Continue managing forest stands through herbicide applications, and prescribed burns as needed; Maintain vegetation to reduce wildland fire hazards and BASH potential;
- Support the training and certification of one individual in prescribed burn management, in addition to the Regional Forester;
 - Control wildland fires with fire breaks and understory vegetation management;
 - Implement prescribed burns where consistent with the mission, sound ecological practices, and safety considerations;
 - Implement prescribed burns in consideration of locations of South Texas ambrosia at NAS Kingsville;
 - Continually evaluate forest management practices and their effects on ecosystems and wildlife habitat, and continue programs to protect RTE plant and animal species;
 - Promote at least 50-foot buffers for all wetlands, and ensure land use and land management practices that will not adversely affect wetland resources;
 - Continue to develop a soil erosion control plan and reduce the rate of soil erosion through the implementation of long-term measures and projects;
 - Continue to inventory the use of pesticides and fertilizers to assess alternatives to their use and a reduction in pesticide and fertilizer use;
 - Implement grounds maintenance practices consistent with the BASH Plan;
 - Continue to implement programs and activities for the protection and enhancement of threatened and endangered plant and animal species and their habitats; and
 - Continually verify that natural resources personnel obtain proper training and certifications.

Long-Term Management

NASK will be managed using wildland fire management to decrease wildfire risk and maintain vegetation and habitat necessary to reduce the BASH potential on the Installation, NALFOG, and Dixie Target Range.

Integration with Other Natural Resources Management Activities

- Coastal Zone Management, Section 5.2.1 – manage coastal area trees for disease and pests;
- Wetland Management, Section 5.2.2 – maintain wetlands to prevent flooding;
- Soil Conservation and Erosion, Section 5.2.3 – consider and control erosion during forest protection activities such as thinning;

- Stormwater and Water Quality, Section 5.2.4 – use proper amounts of pesticides to avoid excessive runoff in stormwater;
- Floodplains, Section 5.2.5 – ensure forest protection activities do not compromise the function of floodplains;
- Landscaping and Grounds Maintenance, Section 5.2.6 – ensure forest protection activities are consistent with landscaping and grounds maintenance tasks;
- Invasive, Exotic, and Noxious Species, Section 5.2.7 – reduce and control destructive pests in forest stands;
- Urban Forestry, Section 5.2.8 – protection measures will likely benefit urban forestry;
- Agricultural Outleasing, Section 5.2.9 – prevent plant diseases that may be introduced via agriculture;
- Forest Protection, Section 5.3.1 – maintain forestry resources to reduce the risk of wildland fires and to maintain Clear Zones around the NASK airfields; maintain regular burn cycles to ensure vegetation succession;
- Migratory Birds, Section 5.4.1 – use proper amounts of pesticides to avoid runoff into wading areas;
- Threatened and Endangered Species, Section 5.4.2 – protect forest health and habitat for protected wildlife; improve wildlife habitat that supports RTE wildlife species through the appropriate use of controlled burns, and in consideration of BASH Program requirements; conduct prescribed burns in consideration of RTE plant species locations, especially at the Main Station where South Texas ambrosia populations occur;
- Nuisance Wildlife and BASH, Section 5.4.3 – be aware of creating potential habitat for BASH birds and wildlife; maintain appropriate grass heights around NASK airfields to reduce BASH risks through mowing and use of controlled burns;
- Wildlife Diseases, Section 5.4.4 – consider the potential of disease transmission from animal to human contact, reduce human-wildlife interactions, Prohibit feeding of feral cats
- Outdoor Recreation, Section 5.5 – maintain aesthetically-pleasing forests for recreation;
- Hunting, Section 5.5.1 – Forest protection benefits hunting program;
- Wildlife Officer, Section 5.5.2 - Wildlife officer can help identify needs for forest protection;
- Natural Resources Training, Section 5.6.1 ensure personnel receive wildland fire training to enable participation in prescribed burns and to respond to naturally occurring wildland fires as needed; and
- GIS, Section 5.6.2 – utilize GIS tools to identify areas targeted for prescribed burns.

Ecosystem Management

Prescribed fires, implemented through the NASK burn plan, are an ecosystem-based management tool that can prevent wildfires, improve wildlife habitat, restore natural ground cover, and assist in reduction of BASH potential. Additionally, prescribed burns can potentially benefit populations of the federally endangered South Texas ambrosia at NAS Kingsville, and wintering populations of Sprague's pipit at NASK.

Military Mission

Forest protection helps prevent wildfires which could threaten NASK assets, military mission, activities and facilities.

Laws, Executive Orders, Regulations, Directives, and Memoranda Relevant to Wildland Fire Management

- The Forest Service Directive System, consists of the Forest Service Manual and Handbooks, which codify the agency's policy, practice, and procedure. The system serves as the primary basis for the internal management and control of all programs and the primary source of administrative direction to Forest Service employees.
- The Guidance for Implementation of Federal Wildland Fire Management Policy (USDA and U.S. Department of the Interior 2009), provides for consistent implementation of the 1995/2001 Federal Fire Policy, as directed by the Wildland Fire Leadership Council. This guidance also calls for increased dialogue and collaboration between federal agencies and tribal, local, and state agencies as plans are updated and implemented to manage wildfires in order to accomplish resource and protection objectives.
- DoDI 6055.6, DoD Fire and Emergency Services Program establishes a comprehensive Fire and Emergency Services Program and prescribes policies to prevent and minimize loss of DoD lives and damage to property and the environment.

Additional Sources of Information

U.S. Forest Service, Fire and Aviation Management
U.S. Forest Service, Fire Effects Information System
National Interagency Fire Center
TNC Fire Management Manual
Texas A&M University Forest Service, Wildlife Preparedness
A Guide for Prescribed Fire in Southern Forests
American Forests
National Association of State Foresters
Society of American Foresters

5.4 FISH AND WILDLIFE

OPNAVINST 5090.1D, 12-3.5, defines fish and wildlife management as those actions designed to preserve, enhance, and regulate indigenous wildlife and its habitats, including conservation of protected species and non-game species, management and harvest of game species, BASH reduction, and animal damage control. This section addresses the development and implementation of techniques and programs for managing fish and wildlife.

Fish and wildlife management at the Main Station and NALFOG are primarily driven by BASH Program requirements, whereas fish and wildlife management at Dixie Target Range Annex, is primarily driven by implementation of the Natural Resources Program. The Natural Resources Program leverages MWR for fiscal support. The brush covered lands and grasslands at Dixie Target Range provide excellent habitat diversity for many wildlife species. The intermittent and

perennial surface waterbodies provide habitat for waterfowl and shorebirds, increase species diversity and help improve surface water quality within the watershed. Factors that limit the types and level of natural resource management activities include variances in terrain, the availability of personnel to work on the construction of the various enhancement projects, and BASH requirements.

In 2001 and 2002, Congress established the Wildlife Conservation and Restoration Program and State Wildlife Grant Program. These programs were developed to provide financial assistance to state and tribal fish and wildlife entities for the conservation of a multitude of wildlife species, including RTE species. Prior to these programs, there was little financial assistance available to states for conservation efforts targeting non-game wildlife species. In order to be eligible for federal grants and to adhere to the requirements for participating in the State Wildlife Grant program, each state was required to develop and submit for approval a statewide wildlife action plan or similar plan by October of 2005. The purpose of these plans was to summarize the abundance and distribution of each state's wildlife resources, identify Species of Greatest Conservation Need (SGCN), threats to SGCN, and key habitats. In addition, the plans were to include conservation actions designed to address the threats to SGCN.

A state wildlife action plan for Texas was adopted in 2005, and a major revision to the plan was completed in 2012. The Texas Conservation Action Plan (formerly the Texas Comprehensive State Wildlife Management Plan) is a Comprehensive Wildlife Conservation Strategy that has been developed to assist TPWD and its conservation partners with the development of nongame initiatives and goals that will address the needs of animal species and habitats (TPWD 2005). The 2012 revision included development of several smaller functional handbooks (versus the four large volumes of information that were associated with the 2005 version), all of which are available online (see text box for access to plan information). Handbooks developed include an Overview document, State-Wide and Multi-Regional handbooks, and eleven ecoregion handbooks (TPWD 2012). The Texas Conservation Action Plan meets the eight required elements, as identified by Congress, of the State Wildlife Grant program that are outlined by USFWS (Association of Fish and Wildlife Agencies 2012). These elements include species, habitats, threats, conservation actions, monitoring species and effectiveness, review and revision, partnerships with land management agencies and tribes, and public participation. Details on the eight required elements are available on the Association of Fish and Wildlife Agency website (see text box). The Texas Conservation Action Plan includes handbooks for each of the 11 ecoregions identified for Texas. The Main Station and NALFOG are located in the Gulf Coast Prairies and Marshes ecoregion, and Dixie Target Range is located in the Southern Texas Plains ecoregion (TPWD 2012). Natural resource management actions occurring on the NASK Complex should take into consideration the initiatives and goals set forth in this plan to adequately address nongame species and habitats. The INRMP management measures identified in this document will provide both direct and indirect benefits to state-listed wildlife species that have been identified at NASK.

The relatively undisturbed regrowth of the wooded areas of South Field at the Main Station provides important habitat to game species, non-game species, resident and migratory birds, small mammals, and herpetofauna that are sensitive to disturbances. Management activities must be conducted with this sensitivity in mind. Wetlands can be enhanced for waterfowl within NAS Kingsville, but the enhancements that are implemented cannot attract large numbers of birds or other wildlife that would create conflict with the military mission, the BASH Program, or become a nuisance. Enhancements to bird habitats must be made in coordination with BASH Program staff. Recommendations for habitat enhancement should be made to attract birds and other wildlife away from the flight operations areas.

Potential for habitat enhancement within NALFOG exists but must be weighed in the light of attracting migratory birds and increasing the potential for bird strikes by aircraft. Previous studies have indicated that as a result of the large agricultural fields surrounding NALFOG, the potential for bird strikes is significant, although it is not as high as the Main Station (Lefebvre 1986). The options for habitat enhancement actions for larger mammals are constrained because of the relatively small amount of habitat available in relationship to the size of the parcel. The surrounding agricultural fields and mesquite-brush areas provide both food and shelter for many game species. The NRM will coordinate with USFWS and TPWD regional biologists to develop specific plans to address Tamaulipan thornscrub habitat on NALFOG.

The Dixie Target Range is used for bombing missions, and although the limitations of the BASH Program are a consideration, they do not drive the requirements for this area of Dixie Annex.

Unlike the Dixie Target Range, the focus at Dixie Annex is on MWR, and therefore is an ideal area for wildlife habitat enhancement. Since Dixie Annex is used as a hunting preserve by eligible patrons, efforts should be focused on enhancing the wildlife habitat for game species (such as white-tailed deer, javelina, and quail)

The Regional TPWD Wildlife Biologist for Dixie Target Range is Dustin Windsor. Mr. Windsor can be reached at (361) 825-3242 or dustin.windsor@tpwd.texas.gov

and controlling those areas damaged by invasive and nuisance species. There are areas of Dixie Annex that have become thick with mesquite and other South Texas brush species to the point of restricting the growth of other native species. The brush needs to be controlled with a combination of mechanical, chemical and prescribed fire treatments that would allow for more diversity of species and the creation of edge effects. Deer browse on the tender ends some of the brush species when the leaves first emerge, but as the season progresses the deer find this browse less satisfactory. A combination of mechanical, chemical and prescribed fire treatments would keep brush and other vegetation at different age classes and structure to provide the best use by wildlife. This coordination will ensure that habitat management goals are consistent with existing wildlife management plan developed by TPWD for Dixie Annex, and that these efforts complement the other.

5.4.1 Migratory Birds

Migratory birds face serious challenges that have resulted in species declines, including reductions in habitat quality and quantity, direct bird mortality attributable to human activities, invasive species, 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.

The 2004 NDAA exempts the Armed Forces from the incidental taking of migratory birds during military readiness activities. Military readiness activities include all training and operations of the Armed Forces that relate to combat and the adequate testing of military equipment, vehicles, weapons and sensors for proper operation and suitability for combat use. The MBTA also requires that the Secretaries of Defense and Interior identify ways to minimize, mitigate and monitor the take of migratory birds during military readiness activities.

In 2004, Congress mandated the DoD Migratory Bird conservation revision to the MBTA through language in the 2004 NDAA. The Secretary of Interior was charged with developing an incidental take process for migratory birds on DoD lands involving military mission activities (e.g., training, research and development). DoD and the USFWS (on behalf of the Secretary of Interior) developed a MOU for Migratory Bird Conservation in 2006; shortly thereafter, the USFWS published the 2007 Final Rule for Migratory Bird Conservation on Military Lands, and DoD followed up by establishing guidance for NRMs to work cooperatively with the USFWS to implement the MOU. The Final Rule governs the incidental take on military installations in mission areas where training, research and development occur, whereas the MOU governs the mission-essential and non-mission-essential areas (e.g., family housing, post exchanges, laundry facilities). The Final Rule requires that military installations evaluate any proposed action in the mission areas that may impact any migratory bird population (through NEPA analysis) and consult with the USFWS if the military determines that a potential effect may occur.

Protection of ecologically sensitive areas is provided by SAIA under the provisions of wildlife and fish habitat enhancement in support of managing these populations. Texas, especially southern Texas, is world renowned for the variety of bird species that reside or migrate through the state to spend the winter months in Central and South America. Coastal forests, grasslands and wetlands are valuable feeding, nesting and resting areas for passerines, waterfowl, wading birds and shorebirds, for both resident and migrant species throughout the year. The diversity of habitats is extremely important to migratory birds because these habitats provide the necessary food and resting sites needed to replenish energy stores before continuing their migration. The parcels under the ecological management of NASK provide a diverse array of habitats to both migratory and resident species. Throughout these parcels there is a diverse assemblage of plant communities providing excellent habitat for a variety of mammals, birds, herpetofauna, fish, and insects. The sensitivity of the areas and their importance to avian populations requires the proper management of this complex of communities, and is central to the wildlife management program at NASK. All of these areas are sensitive to human activities, and must be carefully managed to prevent degradation or loss of valuable ecosystems.

Issue

The MBTA of 1918, as amended and EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, protects migratory birds. The MBTA makes it illegal to take any migratory bird, except as allowed by the implementing regulations. EO 13186 requires that federal agencies avoid or minimize the impacts of their activities on migratory birds and make efforts to protect birds and their habitat. DoD guidance also requires each military installation with an INRMP to ensure that they incorporate migratory bird conservation into the INRMP and implement such elements as necessary.

Large congregations of birds of any size can increase the BASH potential. An MBTA Depredation permit is required to kill migratory birds; however, a permit is not required to harass migratory birds. Harassment is not considered “take” under MBTA. A listing of birds not protected by the MBTA can be found in the FR (70 FR 12710-12716). Examples of these birds would include pigeons, house sparrows and Eurasian collared doves (*Streptopelia decaocto*).

Goals and Objectives

- Protect and maintain natural resources within NASK by continuing and enhancing ecologically appropriate and beneficial land uses and management practices, while ensuring the continuation of the military mission;
- Protect, maintain, and restore native vegetative communities and plant and wildlife populations;
- Protect and conserve the ecological value and diversity of natural resources by fostering knowledge of, and participation in, adaptive ecosystem management;
- Protect, conserve, and promote habitat for native terrestrial and aquatic fauna, consistent with BASH Program requirements;
- Continue existing, and establish new programs and procedures to monitor, maintain, and enhance wetlands and water quality;
- Maintain the ecological integrity of wetland and upland communities for the protection of native plant and animal species, including numerous federally and state listed species;
- Preserve and protect RTE species and species of special concern to ensure no reduction in population sizes;
- Maintain the attenuation capacity of the remaining undisturbed acreage within the 100-year floodplain;
- Control nuisance wildlife and wildlife diseases that may adversely affect human health or welfare, the health of the ecosystem, and the military mission;
- Ensure that land management and land use decisions comply with all applicable laws, executive orders, regulations, directives, and instructions, and that adverse impacts to the natural environment are minimized;
- Provide adequate staffing, equipment, technology, and training to the Natural Resources Program to ensure proper implementation of this INRMP;
- Maintain interagency cooperation with USFWS and TPWD;

- Develop partnerships with USDA NRCS, TCEQ, Texas A&M University–Kingsville, Texas Ornithological Society, Coastal Bend Audubon Society, DoD PIF, Kleberg County (encroachment partnering), and other local agencies and organizations to implement wildlife monitoring and protection programs;
- Coordinate natural resources activities with local community, conservation organizations, and private groups; and
- Incorporate the concept of ecosystem management into all planning and management processes.

Projects

- Biological resources survey and inventory (Project 1 in Appendix A)
- RTE Habitat Management (Project 2 in Appendix A)
- Invasive Species Control (Project 3 in Appendix A)
- NASK INRMP Update (Project 4 in Appendix A)
- Prescribed Fire Management (Project 5 in Appendix A)
- Neotropical Migratory Bird Survey (Project 6 in Appendix A)
- Habitat Management and Restoration (Project 7 in Appendix A)
- Natural Resources Outreach (Project 8 in Appendix A)
- South Texas Ambrosia Management Plan and Survey (Project 9 in Appendix A)
- Game Animal Survey on the Main Station and Dixie Annex (Project 10 in Appendix A)

Management Strategies

- Maintain a Migratory Bird Depredation Permit from the USFWS to allow harm to migratory birds as part of BASH Program requirements, and to maintain airfield safety; Maintain compliance with the MBTA for all non-military readiness activities;
- Reduce pesticide use on the Installation;
- Implement habitat enhancement and maintain habitat diversity for migratory bird species, consistent with BASH Program requirements. Recommendations for habitat enhancement should be made to attract birds and other wildlife away from the flight operations areas. Additionally, modification to habitat should also take into consideration bird nesting and breeding seasons so as not to conflict with the MBTA;
- Control invasive bird species that compete with native migratory bird species and their habitats;
- Locate military readiness activities to avoid or minimize impacts on migratory birds, where possible. If NASK notes clear evidence of a take as a result of military readiness activities, the NASK NRM will document the take, evaluate these activities, and where practicable, reduce or eliminate the take of migratory birds;
- Request assistance from the DoD PIF Work Group, as needed, to assist and support military installations in migratory bird conservation while protecting the military mission;
- Develop partnerships with federal, state, and local agencies, universities, and NGOs such as the National Audubon Society to enter into conservation partnerships, allow for

- bird research on the Installation, conduct monitoring surveys, and participate in International Migratory Bird Day;
- Complete surveys for neotropical migratory birds by using the recommendations provided in the DOD Coordinated Bird Monitoring Plan to guide survey design and data management;
 - Notify the NRM of installation support actions that may affect migratory bird species so that impacts to birds may be avoided and minimized in accordance with the MBTA;
 - Continue monitoring program for natural communities (as well as RTE species), and implement programs to enhance natural communities and wildlife habitat;
 - Further establish a program/plan using prescribed burns and thinning to improve habitat quality, reduce the potential for wildfires, control diseases and insect pests, and ensure the continuation of fire-dependent plant communities;
 - Continue program to conduct (i.e., update) surveys of RTE species every 5 years (next survey scheduled for 2009), and to monitor other rare species as needed;
 - Continue to implement programs and activities for the protection and enhancement of threatened and endangered plant and animal species and their habitats;
 - Continue to monitor the health and size of animal populations, and control populations as needed;
 - Implement grounds maintenance practices consistent with the BASH Plan. The BASH Plan will be continuously updated and monitored to meet the needs of the Complex;
 - Continue to implement BMPs to minimize stormwater pollution and erosion;
 - Inventory wetlands and assess their function and quality on a routine basis;
 - Promote at least 50-foot buffers for all wetlands, and ensure land use and land management practices that will not adversely affect wetland resources; and
 - Continually verify that natural resources personnel obtain proper training and certifications.

Long-Term Management

Migratory birds are protected under the MBTA against take for normal and routine operations such as Installation support functions. Under the MBTA, take could include mortality, pesticide application, nest and egg removal, and occasionally, tree removal. However, nest removal outside nesting season would not constitute a take. Before routine Installation support action is initiated that may affect any migratory bird species at NASK, the NRM will be informed.

Large congregations of birds of any size can increase the BASH potential. An MBTA Depredation permit is required to kill migratory birds; however, a permit is not required to harass migratory birds. Harassment is not considered "take" under MBTA. Additionally, birds nesting, roosting, or loafing on exterior and interior surfaces of all buildings and structures are generally considered nuisance birds, and although species that exhibit this behavior are generally species as pigeons (Family Columbidae), starlings, house sparrows, and gulls, birds protected under the MBTA may also be associated with this activity. These species are known to be attracted to habitat near airstrips including ephemeral pools of water and low-cut grasses. Bird management programs may include trapping, harassment, lethal removal, non-lethal repellents, physical barriers, and toxic baits or perches. A listing of birds not protected by the MBTA can be found in the FR (70 FR

12710-12716). The NRM and BASH Program Manager would determine if the possible impacts associated with routine actions that support the military mission would impact migratory bird species and, if necessary, would initiate discussions or negotiate a permit with the USFWS. NASK has received a migratory bird depredation permit from USFWS for management of birds at the Main Station and NALFOG airfields as part of the BASH Program (Appendix C). This permit is renewed annually to allow continuation of techniques that remove (through live-trapping or lethal measures), or scare birds aware from these airfields.

Integration with Other Natural Resources Management Activities

- Coastal Zone Management, Section 5.2.1 – Coastal areas provide a place for migratory birds to rest and feed while following their migration paths;
- Wetland Management, Section 5.2.2 – wetlands provide forage habitat for various bird species;
- Soil Conservation and Erosion, Section 5.2.3 – minimize sedimentation into coastal areas;
- Stormwater and Water Quality, Section 5.2.4 – control sedimentation into bird foraging areas;
- Floodplains, Section 5.2.5 – limited development in floodplains provides habitat for migratory birds away from Complex infrastructure; manage riparian habitats in support of migratory bird management;
- Landscaping and Grounds Maintenance, Section 5.2.6 – ensure nests are not removed in season during grounds maintenance activities; manage vegetation around airfields to reduce their attractiveness to migratory birds and to reduce the BASH potential, including maintaining appropriate grass heights near airfields;
- Invasive, Exotic, and Noxious Species, Section 5.2.7 – exotic species can provide unwanted nesting areas and materials for birds near infrastructure;
- Urban Forestry, Section 5.2.8 – consider potential for bird nesting near infrastructure and training areas when planning urban forests;
- Agricultural Outleasing, Section 5.2.9 – control runoff of pesticides and fertilizer into bird foraging areas;
- Forest Protection, Section 5.3.1 – maintain forests to prevent disease and monitor dead trees that provide nesting habitat for BASH species;
- Threatened and Endangered Species, Section 5.4.2 – manage RTE species, to include maintaining appropriate depredation permits to ensure airfield safety, and locating military readiness activities to minimize take of migratory bird to the extent possible; migratory bird management aids the status and survival of rare bird species;
- Nuisance Wildlife and BASH, Section 5.4.3 - maintain bird and wildlife depredation permits issued by USFWS to reduce BASH risk consistent with BASH Program requirements and to improve airfield safety; the NRM, Bash control agent, and USFWS should communicate before nests are removed for BASH purposes; manage and control invasive and nuisance wildlife to promote native wildlife diversity and for human health and safety;
- Wildlife Diseases, Section 5.4.4 – consider the potential of disease transmission from animal to human contact, reduce human-wildlife interactions, Prohibit feeding of feral cats
- Outdoor Recreation, Section 5.5 – enlist avid bird watchers in bird inventories;

- Hunting, Section 5.5.1 – Ensure hunters do not take migratory birds and only hunt game species during appropriate seasons;
- Wildlife Officer, Section 5.5.2 – Employ wildlife officer to ensure nesting and resting migratory bird species are not harassed or disturbed;
- Natural Resources Training, Section 5.6.1 – ensure personnel are current on MBTA and related laws; and
- GIS, Section 5.6.2 – utilize GIS tools to map migratory bird observations and habitats, and to identify bird habitats that pose a BASH risk in and around NASK airfields.

Ecosystem Management

Bird surveys should be conducted to monitor the bird populations and to minimize, mitigate, and monitor the take of migratory birds at NASK, and to collect data on Sprague's pipit. Habitat improvements that will attract birds, such as preservation of grassland habitat that support wintering populations of Sprague's pipit, will be undertaken in consideration of BASH Program requirements. Where possible, military readiness activities will be located to avoid and minimize impacts on migratory birds. If clear evidence of bird take is noted, such as the sight of numerous dead or injured birds, NASK would consider modifying its activities, as practicable, to reduce take of migratory birds. NASK will also seek out opportunities for entering into conservation partnerships with federal, state, and local agencies and NGOs to improve habitat and allow for bird research at NASK.

Military Mission

Appropriate landscaping and management of migratory birds will help alleviate potential hindrances to the military mission of the MBTA. The integration of the various management actions described in this INRMP and an understanding of how they all relate to migratory bird management will enable NASK to accomplish all its training objectives within the framework of the MBTA.

Laws, Executive Orders, Regulations, Directives, and Memoranda Relevant to Migratory Birds

- Migratory Bird Treaty Act, as amended 16 U.S.C. 703-712, prohibits the taking or harming of a migratory bird, its eggs, nests, or young without the appropriate permit.
- Bald and Golden Eagle Protection Act, 16 U.S.C. 668-668c, prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs.
- Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, describes specific actions to advance migratory bird conservation, avoid or minimize the take of migratory birds, and ensure DoD operations, other than military readiness activities, are consistent with the MBTA.
- 2003 National Defense Authorization Act, exempts the Armed Forces from the incidental taking of migratory birds during military readiness activities.
- Endangered Species Act, 16 U.S.C. 35, 32 CFR 190, provides for the identification and protection of RTE species of fish, wildlife, and plants and their critical habitats. It requires

federal agencies to ensure that no agency action is likely to jeopardize the continued existence of a threatened or endangered species.

- Sikes Act, as amended 16 U.S.C. 670a-o, requires each military department to manage fish and wildlife resources in accordance with a tripartite cooperative plan agreed to by the USFWS and state wildlife agency.
- Fish and Wildlife Conservation Act, 16 U.S.C. 2901, encourages all federal departments and agencies to utilize their statutory and administrative authority, to the maximum extent practicable and consistent with each agency's statutory responsibilities, to conserve and promote conservation of nongame fish and wildlife and their habitats.
- Fish and Wildlife Conservation Act, 16 U.S.C. 2901, encourages all federal departments and agencies to utilize their statutory and administrative authority, to the maximum extent practicable and consistent with each agency's statutory responsibilities, to conserve and promote conservation of nongame fish and wildlife and their habitats.
- OPNAVINST 5090.1D, 12-3.5(b)(1), discusses natural resources management relating to migratory birds.
- OPNAVINST 5090.1D, 12-3.5(b)(2), discusses natural resources management relating bald and golden eagles.
- 50 CFR Part 22, Bald and Golden Eagle Protection Act, protects eagles from commercial exploitation and safeguards their survival in the U.S.
- 70 FR 12710-12716, Final List of Bird Species to Which the MBTA Does Not Apply, provides a list of bird species to which the MBTA does not apply.

Additional Sources of Information

USDA NRCS Migratory Bird Habitat Initiative
USFWS Migratory Bird Program
USFWS Birds of Conservation Concern
DoD PIF
TPWD Bird Migration
Audubon Texas
Gulf Coast Joint Venture
TNC Migratory Bird Program
Smithsonian National Zoological Park, Migratory Bird Center
USFWS Division of Migratory Bird Management
Birds of Conservation Concern
East Gulf Coastal Plain Priority Bird Populations and Habitats
Migratory Bird Treaty Act
The Nature Conservancy, Migratory Bird Program

5.4.2 Threatened and Endangered Species

The ecological integrity of wetland and upland communities will be maintained for the protection of native plant and animal species, including numerous federally and state-listed species. Threatened and endangered species, and species of special concern, will be preserved and protected to ensure there is no reduction in species numbers or population sizes. Wildlife habitat

management is the approach used by the NASK Complex; management activities at the NASK Complex have been described in this INRMP for wetlands, floodplains, coastal areas, urban areas, and forests, and these activities are intended to enhance habitat for fish, birds, and wildlife on and adjacent to the Complex, including threatened and endangered species.

Species are listed as endangered or threatened if, based upon scientific and commercial data, there is a current or threatened habitat loss, disease, over-exploitation, or other factors affecting its existence. The Endangered Species Act (ESA) of 1973 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.

Issues

Federally and state-listed species inhabit the NASK Complex. These species are protected under various laws, including the Endangered Species Act (ESA). Section 7(a)(1) of the ESA provides that all federal agencies, in consultation with USFWS and NMFS, shall use their authorities to further the purpose of ESA by carrying out programs for the conservation of endangered and threatened species. Section 7(a)(2) requires federal agencies to ensure, in consultation with USFWS and/or NMFS, that any action authorized, funded, or carried out is not likely to jeopardize the continued existence of any endangered or threatened species or result in destruction or adverse modification of critical habitat.

Natural communities at the NASK Complex provide habitat for many protected species and require special protection and management. There are no areas designated as critical habitat for threatened and endangered species at the NASK Complex.

Climate change is anticipated to result in ecosystem changes and, consequently, many species are expected to become increasingly vulnerable to extinction. This scenario is of particular concern for threatened, endangered, rare, and at-risk species. The response of species to climate change is uncertain and is subject to complex interactions and processes. Ectotherms including reptiles, amphibians, and fish are cold-blooded and more vulnerable to climate change than endotherms, warm-blooded individuals, due to their ability to adapt to a changing environment. Niche evolution happens at a faster rate in endotherms and it has even been demonstrated that diversity of species is directly affected by niche evolution rate, with ectotherms having fewer latitudinal shifts. However, due to fairly recent climate fluctuations, endotherms are being affected as well (Rolland et. al. 2018). More frequent and intense heat extremes and changes in precipitation patterns could alter wet prairies and wetlands, threatening vulnerable vegetation, such as pitcher plants, and facilitating their replacement by invasive grasses.

Goals and Objectives

- Protect and maintain natural resources within the NASK Complex by continuing and enhancing ecologically appropriate and beneficial land uses and management practices, while ensuring the continuation of the military mission;
- Protect, maintain, and restore native vegetative communities and plant and wildlife populations;
- Protect and conserve the ecological value and diversity of natural resources by fostering knowledge of, and participation in, adaptive ecosystem management;
- Continue existing, and establish new programs and procedures to monitor, maintain, and enhance wetlands and water quality;
- Maintain the ecological integrity of wetland and upland communities for the protection of native plant and animal species, including numerous federally and state listed species;
- Preserve and protect threatened and endangered species and species of special concern to ensure no reduction in population sizes;
- Maintain the attenuation capacity of the remaining undisturbed acreage within the 100-year floodplain;
- Control nuisance wildlife and wildlife diseases that may adversely affect human health or welfare, the health of the ecosystem, and the military mission;
- Ensure that land management and land use decisions comply with all applicable laws, executive orders, regulations, directives, and instructions, and that adverse impacts to the natural environment are minimized;
- Provide adequate staffing, equipment, technology, and training to the Natural Resources Program to ensure proper implementation of this INRMP; and
- Incorporate the concept of ecosystem management into all planning and management processes.

Projects

- Biological resources survey and inventory (Project 1 in Appendix A)
- Rare, threatened and endangered species habitat management (Project 2 in Appendix A)
- Invasive Species Control (Project 3 in Appendix A)
- NASK INRMP Update (Project 4 in Appendix A)
- Prescribed Fire Management (Project 5 in Appendix A)
- Neotropical Migratory Bird Survey (Project 6 in Appendix A)
- Habitat Management and Restoration (Project 7 in Appendix A)
- Natural Resources Outreach (Project 8 in Appendix A)
- South Texas Ambrosia Management Plan and Survey (Project 9 in Appendix A)
- Game Animal Survey on the Main Station and Dixie Annex (Project 10 in Appendix A)

Management Strategies

- Continue monitoring program for natural communities (as well as rare, threatened and endangered species), and implement programs to enhance natural communities and wildlife habitat;
- Further establish a program/plan using prescribed burns and thinning to improve habitat quality, reduce the potential for wildfires, control diseases and insect pests, and ensure the continuation of fire-dependent plant communities;
- Continue program to conduct (i.e., update) surveys of RTE species every 5 years, and to monitor other rare species as needed;
- Continue to implement programs and activities for the protection and enhancement of threatened and endangered plant and animal species and their habitats;
- Continue to monitor the health and size of animal populations, and control populations as needed;
- Implement grounds maintenance practices consistent with the BASH Plan. The BASH Plan will be continuously updated and monitored to meet the needs of the Complex;
- Continue to implement BMPs to minimize stormwater pollution and erosion;
- Inventory wetlands and assess their function and quality on a routine basis;
- Promote at least 50-foot buffers for all wetlands, and ensure land use and land management practices that will not adversely affect wetland resources; and
- Continually verify that natural resources personnel obtain proper training and certifications.

Long-Term Management

The NASK Complex will actively manage areas and natural communities to provide habitat for RTE species that are known to occur on the properties. Other federally or state-listed threatened and endangered species will also be managed as conditions warrant. The NASK Complex will continue to monitor populations of the South Texas ambrosia, black-spotted newt, the Texas tortoise, sheep frog, reticulate collared lizard, and the dickcissel. The NRM will undertake measures, as appropriate, to ensure activities and actions conducted within the NASK Complex are not detrimental to RTE species or habitats upon which they depend.

Species dependent upon wetlands and fire-dependent communities are the focus of most management activities at the NASK Complex. Natural communities and other wildlife habitats will be managed to sustain and enhance fish and wildlife resources on the Complex consistent with the military mission.

Well-informed, resources-based ecosystem management will enable the NASK Complex to serve the military mission while playing an important role in the protection of Texas's native biodiversity. Most habitat development will occur in conjunction with forest management. The NASK Complex will sustain existing natural communities and forests for wildlife and enhance other ecosystems for urban and non-urban species using a combination of the following management concepts. These management concepts will be implemented under the discretion of the NRM.

- Preserve portions of stands to provide suitable large snags and trees for den and cavity activities.
- Provide nest boxes/platforms for birds and bats.
- Leave brush material along woodland edges following necessary clearing (e.g. military mission).
- Plant trees and shrubs, or seed open areas for soil stabilization and to provide wildlife habitat.
- Prescribe burn on rotation through fire-dependent communities to increase food production and maintain desired habitat structure.
- Avoid habitat fragmentation. Although fragmentation increases edge, arbitrarily locating human-made linear and nonlinear features within wildlife areas undermines ecological processes through the separation of wildlife populations and may render the fragmented parcel unsustainable for wildlife.
- Create or enhance connections between habitats to facilitate wildlife movement between areas. The necessary characteristics of connections will vary depending on the species; for instance, amphibians need water or moist areas to move between ponds and wet areas, and most vertebrates require protective cover such as trees, shrubs, dense ground cover, downed trees, and existing burrows.
- Maintain vegetative buffers around ponds and wetland areas and along stream edges.
- Leave snags and downed logs for nesting, roosting, foraging, cover, perching, and/or territorial displays.
- Maintain hardwood areas for foraging activities.
- Seed cleared areas (associated with silvicultural activities, i.e., logging decks) with wildlife food plants to prevent erosion and provide forage.
- Avoid impacts to wetlands.

The following species sub-sections describe management recommendations and benefits of this INRMP for threatened and endangered species known to occur at the NASK Complex (Table 5-3). Changes in management practices may result from: (1) the listing or removal of a species under the ESA or (2) a change in species presence at the NASK Complex. The NASK Complex will continue to conduct species survey updates to identify changes in populations and habitat on the properties. Species information provided in the surveys will be used to modify management practices. Modification to management practices will be administered by the NRM in consultation with NAVFAC SE foresters and fish and wildlife biologists, as well as other federal, state, and county agencies.

Species of Interest: Federally-Listed, State- Listed, or Species of Concern

Audubon's oriole (*Icterus graduacauda audubonii*)

Federal Status: Not Listed

State Status: Not Listed

The Audubon's oriole is found only in southern Texas and Mexico. Most individuals breed between April and July. Nests are usually hidden in dense foliage. The female lays three to five eggs. The eggs are a pale gray to bluish white, with brown and purple markings usually concentrated at the larger end. This species frequently raises bronzed cowbirds (*Molothrus aeneus*) instead of its own young. This suggests that Audubon's Oriole may be one of the species hardest hit by brood parasitism in southern Texas, especially in the Lower Rio Grande Valley where bronzed cowbird populations are extremely high (Brush 1995 and Kaufman 2005).

The Audubon's oriole was documented at Dixie Target Range in 2012 (Langschieid 2013). This INRMP protects habitat for the Audubon's oriole through active management of factors such as, noxious, invasive, and exotic species and pests (Section 5.2.7), forest protection: wildland fire management (Section 5.3.1), threatened and endangered species (Section 5.4.2), nuisance wildlife and BASH (Section 5.4.3), wildlife diseases (Section 5.4.4). Specific INRMP Projects that will directly benefit this species include Biological Resources Survey and Inventory (Project No. 1); RTE Species Habitat Management (Project No. 2); Invasive Species Control (Project No. 3); NASK INRMP Updates (Project No. 4); Prescribed Fire Management (Project No. 5); Habitat Management and Restoration (Project No. 7); and Natural Resources Outreach (Project No. 8).

Black-spotted newt (*Notophthalmus meridionalis*)

Federal Status: Under review

State Status: Threatened

The black-spotted newt can be found in permanent and temporary ponds, roadside ditches, and quiet stream pools among submerged vegetation such as musk grass (*Chara* spp.) as well as and under rocks when ponds are dry. The 2010 Survey for the Black-Spotted Newt identified no black-spotted newts on NASK. However, the Herpetofauna Survey of the United States Navy - Escondido Ranch conducted by the USFWS from February 2007 to August 2012 confirmed the presence of the black spotted newt on the Dixie Target Range (Clements and Giggelman 2012).

This INRMP protects habitat for black-spotted newts through active management of factors such as wetland management (Section 5.2.2), soil conservation and erosion control (Section 5.2.3), storm-water and water quality control (Section 5.2.4), floodplain management (Section 5.2.5), landscaping and grounds maintenance (Section 5.2.6), noxious, invasive, and exotic species and pests (Section 5.2.7), agricultural outleasing (Section 5.2.9), forest protection: wildland fire management (Section 5.3.1), threatened and endangered species (Section 5.4.2), nuisance

Table 5-3 INRMP Management Activities and Projects that Benefit Rare, Threatened, and Endangered Species Potentially Occurring on the NAS Kingsville Complex

Species (alphabetical order by common name)	Status	Category	Potential to Occur	Cross- reference to Text	Management Activities that Benefit the Species and its Habitat													INRMP Projects that Benefit the Species and its Habitat									
					Coastal Zone Management	Wetland Management	Soil Conservation & Erosion	Storm-water & Water Quality Control	Floodplain Management	Landscaping and Grounds Maintenance	Noxious, Invasive, & Exotic Species & Pests	Urban Forestry	Agricultural Outleasing	Forest Protection: Wildland Fire Management	Threatened and Endangered Species	Nuisance Wildlife & BASH	Wildlife Diseases	Outdoor Recreation	Biological Resources Survey and Inventory	RTE Species Habitat Management	Invasive Species Control	NASK INRMP Update	Prescribed Fire Management	Neotropical Migratory Bird Survey	Habitat Management and Restoration	Natural Resources Outreach	South Texas Ambrosia Management Plan & Survey
Audubon's oriole <i>Icterus graduacauda audubonii</i>	NL	Mesquite bird	NASK Complex	p. 5-82			√			√	√				√	√		√	√	√	√	√	√	√			
Black-spotted newt <i>Notophthalmus meridionalis</i>	ST	Shallow depressions amphibian	NASK Complex	pp. 2-42, 2-46, 2-51, 5-80, 5-82		√	√	√	√	√	√			√	√	√	√	√	√	√	√	√	√	√	√		
Brown pelican <i>Pelecanus occidentalis</i>	R SE	Estuarine and coastal marine bird	Main Station	p. 5-85	√	√			√		√				√	√		√	√	√	√		√	√	√		
Cave myotis bat <i>Myotis velifer</i>	NL	Desert scrub and riparian bat	NALFOG Dixie Target Range	p. 5-85						√		√				√		√	√	√	√	√	√	√	√		
Desert massasauga <i>Sistrurus catenatus edwardsii</i>	UP	Dry grassland/ desert snake	Dixie Target Range	pp. 2-51, 5-86		√		√	√	√	√			√	√	√	√	√	√	√	√	√	√	√	√		
Dickcissel <i>Spiza americana</i>	NL	Grasslands bird	NASK Complex	pp. 5-80, 5-86						√	√			√	√	√	√	√	√	√	√	√	√	√	√		
Golden orb <i>Quadrula aurea</i>	FC ST	Mussel	Dixie Target Range	pp. 2-43, 2-53, 5-1, 5-87		√	√	√	√	√	√			√	√	√	√	√	√	√	√	√	√	√	√		
Jaguarundi <i>Herpailurus yaguarondi cacomitti</i>	FE	Brushlands large cat	Main Station	pp. 2-48, 5-88		√		√	√	√	√			√	√	√	√	√	√	√	√	√	√	√	√		
Keeled earless lizard <i>Holbrookia propinqua</i>	SSC	Sand dune reptile	Main Station	p. 5-88	√		√		√		√				√			√	√	√	√		√	√			
Maritime pocket gopher <i>Geomys personatus maritimus</i>	NL	Deep sandy soils mammal	Main Station	p. 5-89			√		√	√	√					√		√	√	√	√	√	√	√	√		
Mexican blackhead snake <i>Tantilla atriceps</i>	NL	Moist refuge reptile	Main Station NALFOG	p. 5-89		√	√	√	√		√			√		√		√	√	√	√	√	√	√	√		
Monarch butterfly <i>Danaus plexippus plexippus</i>	UR	Migratory butterfly	NASK Complex	p. 5-90	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√		
Northern aplomado falcon <i>Falco femoralis septentrionalis</i>	FE	Savanna/ woodland raptor	Main Station NALFOG	p. 5-91		√		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√		
Ocelot <i>Leopardus pardalis</i>	FE	Chaparral large cat	NASK Complex	pp. 2-48, 5-92		√		√	√	√	√			√	√	√	√	√	√	√	√	√	√	√	√		
Peregrine falcon <i>Falco peregrinus</i>	ST	Bird of prey	Main Station NALFOG	pp. 2-51, 5-92		√			√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√		
Plains spotted skunk <i>Spilogale putorius interrupta</i>	UR	Great Plains mammal	NASK Complex	p. 5-93			√				√				√	√		√	√	√	√	√	√	√	√		
Reticulate collared lizard <i>Crotaphytus reticulatus</i>	ST	Brush/ grasslands reptile	NALFOG Dixie Target Range	pp. 5-80, 5-93		√		√	√	√	√			√	√	√	√	√	√	√	√	√	√	√	√		

Table 5-3 INRMP Management Activities and Projects that Benefit Rare, Threatened, and Endangered Species Potentially Occurring on the NAS Kingsville Complex

Species (alphabetical order by common name)	Status	Category	Potential to Occur	Cross- reference to Text	Management Activities that Benefit the Species and its Habitat													INRMP Projects that Benefit the Species and its Habitat										
					Coastal Zone Management	Wetland Management	Soil Conservation & Erosion	Storm-water & Water Quality Control	Floodplain Management	Landscaping and Grounds Maintenance	Noxious, Invasive, & Exotic Species & Pests	Urban Forestry	Agricultural Outleasing	Forest Protection: Wildland Fire Management	Threatened and Endangered Species	Nuisance Wildlife & BASH	Wildlife Diseases	Outdoor Recreation	Biological Resources Survey and Inventory	RTE Species Habitat Management	Invasive Species Control	NASK INRMP Update	Prescribed Fire Management	Neotropical Migratory Bird Survey	Habitat Management and Restoration	Natural Resources Outreach	South Texas Ambrosia Management Plan & Survey	Game Animal Survey at NAS Kingsville & Escondido Ranch
Rio Grande lesser siren <i>Siren intermedia texana</i>	ST	Amphibian	Dixie Target Range	pp. 2-53, 5-94		√	√	√	√	√	√		√	√	√	√	√	√	√	√	√	√	√	√	√			
Sennett's hooded oriole <i>Icterus cucullatus sennitti</i>	NL	Mesquite bird	Main Station NALFOG	p. 5-94			√		√	√	√	√		√		√	√		√	√	√	√	√	√	√	√		
Sheep frog <i>Hypopachus variolosus</i>	ST	Moist grassland amphibian	Main Station NALFOG	pp. 5-80, 5-95		√	√	√	√		√			√	√	√		√	√	√	√	√	√	√	√	√		
South Texas ambrosia <i>Ambrosia cheiranthifolia</i>	FE	Grassland/shrubland plant	Main Station NALFOG	pp. 1-3, 1-11, 2-35, 2-50, 3-4, 3-13, 5-95, Fig 2-17		√	√	√	√	√	√		√	√	√	√		√	√	√	√	√	√	√	√	√	√	
Southern yellow bat <i>Lasiurus ega</i>	ST	Palm tree roosting mammal	Main Station	p. 5-96						√	√	√		√	√	√	√	√	√	√	√	√	√	√	√	√		
Spot-tailed earless lizard <i>Holbrookia lacerata</i>	UP	Open prairie reptile	NASK Complex	p. 5-97		√		√	√	√	√		√	√	√	√	√	√	√	√	√	√	√	√	√	√		
Sprague's pipit <i>Anthus spragueii</i>	NL	Open grassland bird	NASK Complex	pp. 1-11, 2-49, 5-67, 5-76, 5-97		√		√		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√		
Texas Horned Lizard <i>Phrynosoma cornutum</i>	ST	Arid/semiarid reptile	NASK Complex	pp. 5-98, 5-109		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√		
Texas indigo snake <i>Drymarchon melanurus</i>	ST	Mesquite savannah, grassland reptile	NASK Complex	pp. 2-51, 2-54, 5-99		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√		
Texas tortoise <i>Gopherus berlandieri</i>	ST	Open brush reptile	NASK Complex	pp. 2-51, 5-80, 5-99		√	√	√	√	√	√		√	√	√	√	√	√	√	√	√	√	√	√	√	√		
Tricolored bat <i>Perimyotis subflavus</i>	UR	Bat	NASK Complex	p. 5-100						√	√	√		√	√	√	√	√	√	√	√	√	√	√	√	√		
Western burrowing owl <i>Athenecunicularia hypugaea</i>	NL	Prairie and savanna raptor	NASK Complex	p. 5-100			√	√	√	√	√		√	√		√	√	√	√	√	√	√	√	√	√	√		
White-tailed hawk <i>Geranoaetus albicaudatus</i>	NL	Brush and grassland bird	NASK Complex	p. 5-101		√			√	√	√	√		√	√	√	√	√	√	√	√	√	√	√	√	√		
Wood stork <i>Mycteria americana</i>	FT	Wetlands	NASK and Dixie	p. 5-102	√	√			√	√	√	√		√	√	√	√	√	√	√	√	√	√	√	√	√		
Yellow-billed cuckoo <i>Coccyzus americanus</i>	FT	Scrub bird	NASK Complex	p. 5-102		√		√		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√		

FT = Federally Threatened, FE = Federally Endangered, FC = Federal Candidate, ST = State Threatened, SE = State Endangered, SSC = State Species of Concern UP = Under Petition, UR = Under Review, NL = Not Listed, R = Delisted due to Recovery
√ = The denoted management activity or project benefits the species and its habitat.

wildlife and BASH (Section 5.4.3), wildlife diseases (Section 5.4.4), and outdoor recreation (Section 5.5). Specific INRMP Projects that will directly benefit this species include Biological Resources Survey and Inventory (Project No. 1); RTE Species Habitat Management (Project No. 2); Invasive Species Control (Project No. 3); NASK INRMP Updates (Project No. 4); Prescribed Fire Management (Project No. 5); Habitat Management and Restoration (Project No. 7); and Natural Resources Outreach (Project No. 8).

Brown pelican (*Pelecanus occidentalis*)

Federal Status: Delisted due to Recovery

State Status: Endangered

Brown pelicans nest irregularly, usually beginning in late fall and extending through June. Brown pelicans are high social all year and breed in colonies of up to several thousand pairs – usually on small islands where they are free from terrestrial predators.

The brown pelican has not been documented at NASK Properties but potential habitat for the species exists at NASK. This INRMP protects habitat for the brown pelican through active management of factors such as wetland management (Section 5.2.2), noxious, invasive, and exotic species and pests (Section 5.2.7), threatened and endangered species (Section 5.4.2), nuisance wildlife and BASH (Section 5.4.3), and wildlife diseases (Section 5.4.4). Specific INRMP Projects that will directly benefit this species include Biological Resources Survey and Inventory (Project No. 1); RTE Species Habitat Management (Project No. 2); Invasive Species Control (Project No. 3); NASK INRMP Updates (Project No. 4); Habitat Management and Restoration (Project No. 7); and Natural Resources Outreach (Project No. 8).

Cave myotis (*Myotis velifer*)

Federal status: Not Listed

State Status: Not Listed

Cave myotis occurs from Kansas, Oklahoma and central Texas to southern Nevada, and southeastern California (along the Colorado River only), south through Mexico to Honduras. Some populations are known to be migratory. In Texas, Cave Myotis occupy the High Plains, Rolling Plains, Trans-Pecos, Edwards Plateau, and South Texas Plains during the summer. This species roosts in mines, buildings, bridges, culverts, crevices, pockets, and holes in the ceilings of its underground retreats. This species is also known to roost in swallow nests.

The cave myotis has not been documented at NASK Properties but potential habitat for the species exists at all NASK properties. This INRMP protects habitat for the cave myotis through active management of factors such as wetland management (Section 5.2.2), noxious, invasive, and exotic species and pests (Section 5.2.7), forest protection: wildland fire management (Section 5.3.1), threatened and endangered species (Section 5.4.2), nuisance wildlife and BASH (Section 5.4.3), and wildlife diseases (Section 5.4.4). Specific INRMP Projects that will directly

benefit this species include Biological Resources Survey and Inventory (Project No. 1); RTE Species Habitat Management (Project No. 2); Invasive Species Control (Project No. 3); NASK INRMP Updates (Project No. 4); Prescribed Fire Management (Project No. 5); Habitat Management and Restoration (Project No. 7); and Natural Resources Outreach (Project No. 8).

Desert massasauga (*Sistrurus catenatus edwardsii*)

Federal Status: Under Petition

State Status: Not Listed

The desert massasauga rattlesnake occurs in a variety of grassland and shrubland habitats and occasionally sand dune habitats. The species' range includes central-western and southern Texas, southeastern Colorado, southern New Mexico, southeastern Arizona, and northern Mexico. The primary threats to this species are habitat degradation and loss as a result of agricultural land use and heavy livestock grazing and mortality from vehicular strikes as well as human persecution (77 FR 47583-47587).

The desert massasauga has not been documented at NASK but potential habitat for the species exists at all NASK properties. This INRMP protects habitat for the desert massasauga through active management of factors such as wetland management (Section 5.2.2), storm-water and water quality control (Section 5.2.4), floodplain management (Section 5.2.5), landscaping and grounds maintenance (Section 5.2.6), noxious, invasive, and exotic species and pests (Section 5.2.7), agricultural outleasing (Section 5.2.9), forest protection: wildland fire management (Section 5.3.1), threatened and endangered species (Section 5.4.2), nuisance wildlife and BASH (Section 5.4.3), wildlife diseases (Section 5.4.4), and outdoor recreation (Section 5.5). Specific INRMP Projects that will directly benefit this species include Biological Resources Survey and Inventory (Project No. 1); RTE Species Habitat Management (Project No. 2); Invasive Species Control (Project No. 3); NASK INRMP Updates (Project No. 4); Prescribed Fire Management (Project No. 5); Habitat Management and Restoration (Project No. 7); and Natural Resources Outreach (Project No. 8). Routine monitoring of biological resources, including habitat assessments at NASK will provide valuable information on the presence of desert massasauga and habitats to support this species, which could result in the development of more species-specific management measures directed towards conservation of desert massasauga. Other management actions that will benefit desert massasauga include conducting internal and agency consultation (formal or informal) during project planning for actions as required for projects that may impact federally-listed species.

Dickcissel (*Spiza Americana*)

Federal Status: Not Listed

State Status: Not Listed

The Dickcissel breeds and migrates through Texas between the Midwestern US and South and Central America. The dickcissel forages mostly on the ground and in low vegetation on insects

and seeds. Sporadic, irregular year-to-year changes in breeding areas and abundance make mapping the dickcissel a challenge.

This INRMP protects habitat for the dickcissel through active management of factors such as, landscaping and grounds maintenance (Section 5.2.6), noxious, invasive, and exotic species and pests (Section 5.2.7), forest protection: wildland fire management (Section 5.3.1), threatened and endangered species (Section 5.4.2), nuisance wildlife and BASH (Section 5.4.3), and wildlife diseases (Section 5.4.4). Specific INRMP Projects that will directly benefit this species include Biological Resources Survey and Inventory (Project No. 1); RTE Species Habitat Management (Project No. 2); Invasive Species Control (Project No. 3); NASK INRMP Updates (Project No. 4); Prescribed Fire Management (Project No. 5); Habitat Management and Restoration (Project No. 7); and Natural Resources Outreach (Project No. 8).

Golden orb mussel (*Quadrula aurea*)

Federal Status: Candidate (81 FR 87246 87272)

State Status: Threatened

Habitats the golden orb mussel appear to be restricted to flowing waters with sand, gravel, and cobble bottoms at depths from 1-3 cm to over 3 m. The only known impounded population is largely focused on a wave- and wind-swept area. It was listed as a Candidate species by USFWS due to being restricted to 5 surviving populations in Texas. Each of the two lower Guadalupe River populations occupy several miles of river and the population in the upper Guadalupe River is restricted to an area about 10,000 square feet. Dead shells suggest a few probably endure in the Nueces River as well. Threats include severe storms and subsequent flooding, drought, water drawdown, and poor land and water management practices that have apparently driven the remaining populations to the limits of their tolerance. Because of the limited distribution of this endemic species and its lack of mobility, these threats are likely to lead to the extinction of the golden orb in the foreseeable future (TPWD 2016).

While no live golden orb have been documented at the NASK Complex, two recent long dead shells were collected during the 2016 survey (USFWS 2016) and potential habitat for the species exists. This INRMP protects habitat for golden orbs through active management of factors such as wetland management (Section 5.2.2), soil conservation and erosion (Section 5.2.3), storm-water and water quality control (Section 5.2.4), floodplain management (Section 5.2.5), landscaping and grounds maintenance (Section 5.2.6), noxious, invasive, and exotic species and pests (Section 5.2.7), agricultural outleasing (Section 5.2.9), forest protection: wildland fire management (Section 5.3.1), threatened and endangered species (Section 5.4.2), nuisance wildlife and BASH (Section 5.4.3), wildlife diseases (Section 5.4.4), and outdoor recreation (Section 5.5). Specific INRMP Projects that will directly benefit this species include Biological Resources Survey and Inventory (Project No. 1); RTE Species Habitat Management (Project No. 2); Invasive Species Control (Project No. 3); NASK INRMP Updates (Project No. 4); Prescribed

Fire Management (Project No. 5); Habitat Management and Restoration (Project No. 7); and Natural Resources Outreach (Project No. 8).

Gulf Coast jaguarundi (*Herpailurus yaguarondi cacomitli*)

Federal Status: Endangered

State Status: Endangered

Habitats for the Gulf Coast jaguarundi include hardwood forest, savanna, shrubland/chaparral, hardwood woodland and patchy or continuous thick brushlands, preferring to be near water. It is much less nocturnal than most cats and hunts in the morning and evening. The Gulf Coast jaguarundi is listed as endangered throughout its range, which was historically limited to the Lower Rio Grande Valley in southern Texas in the United States, with a vastly larger portion of its range extending into Mexico. Primary threats are habitat destruction, degradation, and fragmentation associated with agriculture and urbanization. Other threats include mortality from collisions with vehicles, and competition with bobcats may be a potential limiting factor in the northern portion of the jaguarundi's range and climate change may also affect populations through impacts on their habitat (USFWS 2013).

This INRMP protects habitat for jaguarundis through active management of factors such as wetland management (Section 5.2.2), storm-water and water quality control (Section 5.2.4), floodplain management (Section 5.2.5), landscaping and grounds maintenance (Section 5.2.6), noxious, invasive, and exotic species and pests (Section 5.2.7), agricultural outleasing (Section 5.2.9), forest protection: wildland fire management (Section 5.3.1), threatened and endangered species (Section 5.4.2), nuisance wildlife and BASH (Section 5.4.3), wildlife diseases (Section 5.4.4), and outdoor recreation (Section 5.5). Specific INRMP Projects that will directly benefit this species include Biological Resources Survey and Inventory (Project No. 1); RTE Species Habitat Management (Project No. 2); Invasive Species Control (Project No. 3); NASK INRMP Updates (Project No. 4); Prescribed Fire Management (Project No. 5); Neotropical Migratory Bird Survey (Project No. 6); Habitat Management and Restoration (Project No. 7); and Natural Resources Outreach (Project No. 8).

Keeled earless lizard (*Holbrookia propinqua*)

Federal Status: Not Listed

State Status: Species of Concern/Not Listed

The keeled earless lizard is found in south Texas and along the Gulf Coast of Mexico. It prefers sandy environments and is common on sand dunes and barrier beaches within its range. The keeled earless lizard is diurnal and forages for insects among the sand dunes and open sandy habitats with little vegetation. This species retreats quickly and disappears among the dunes when threatened (Cannatella and LaDuc 2010a).

This INRMP protects habitat for the keeled earless lizard through active management of factors such as soil conservation and erosion (Section 5.2.3), landscaping and grounds maintenance (Section 5.2.6), noxious, invasive, and exotic species and pests (Section 5.2.7), forest protection: wildland fire management (Section 5.3.1), threatened and endangered species (Section 5.4.2), and wildlife diseases (Section 5.4.4). Specific INRMP Projects that will directly benefit this species include Biological Resources Survey and Inventory (Project No. 1); RTE Species Habitat Management (Project No. 2); Invasive Species Control (Project No. 3); NASK INRMP Updates (Project No. 4); Prescribed Fire Management (Project No. 5); Habitat Management and Restoration (Project No. 7); and Natural Resources Outreach (Project No. 8).

Maritime Texas pocket gopher (*Geomys personatus maritimus*)

Federal Status: Not Listed

State Status: Not Listed

The maritime Texas pocket gopher can be found in South Texas as far north as Val Verde County on the west and San Patricio County on the east in deep sandy soils. It is entirely absent from the silt loams of the flood plains of the Rio Grande and from gravelly, stony, or clayey soils scattered throughout its general range. Breeding habits are not well known but suspected to occur year-round. Litter size ranged from one to five, averaging three. It is suspected that no more than two litters are reared yearly (Bradley 1997).

This INRMP protects habitat for the maritime Texas pocket gopher through active management of factors such as soil conservation and erosion (Section 5.2.3), storm-water and water quality control (Section 5.2.4), floodplain management (Section 5.2.5), noxious, invasive, and exotic species and pests (Section 5.2.7), forest protection: wildland fire management (Section 5.3.1), threatened and endangered species (Section 5.4.2), nuisance wildlife and BASH (Section 5.4.3), wildlife diseases (Section 5.4.4), and outdoor recreation (Section 5.5). Specific INRMP Projects that will directly benefit this species include Biological Resources Survey and Inventory (Project No. 1); RTE Species Habitat Management (Project No. 2); Invasive Species Control (Project No. 3); NASK INRMP Updates (Project No. 4); Prescribed Fire Management (Project No. 5); Habitat Management and Restoration (Project No. 7); and Natural Resources Outreach (Project No. 8).

Mexican blackhead snake (*Tantilla atriceps*)

Federal Status: Not Listed

State Status: Not Listed

The Mexican blackhead snake inhabits wooded and grassland/thorn brush communities. The species ranges from desert flats to wooded mountain canyons. It prefers habitats that are moist, seeking refuge under boards and stones and is found in mountain canyons and desert washes, habitats which have a preponderance of moist refuges. The Mexican blackhead snake is not a protected species in Texas and can be legally collected with a hunting license.

This INRMP protects habitat for the Mexican blackhead snake through active management of factors such as wetland management (Section 5.2.2), soil conservation and erosion (Section 5.2.3), stormwater and water quality control (Section 5.2.4), floodplain management (Section 5.2.5), noxious, invasive, and exotic species and pests (Section 5.2.7), wildlife diseases (Section 5.4.4), and outdoor recreation (Section 5.5). Specific INRMP Projects that will directly benefit this species include Biological Resources Survey and Inventory (Project No. 1); RTE Species Habitat Management (Project No. 2); Invasive Species Control (Project No. 3); NASK INRMP Updates (Project No. 4); Prescribed Fire Management (Project No. 5); Habitat Management and Restoration (Project No. 7); and Natural Resources Outreach (Project No. 8).

Monarch Butterfly (*Danaus plexippus plexippus*)

Federal Status: Petitioned

State Status: Not Listed

The monarch butterfly is found throughout the United States during warm months, but migrates to Mexico during winter. Monarch caterpillars exclusively eat milkweed leaves, so the presence of milkweed (*Asclepias* spp.) is a crucial habitat requirement. Milkweed protection is therefore a key component of monarch butterfly conservation. The state of Texas is currently working with partners to restore larval, nectaring, and foraging habitat for the butterfly, and is engaged in outreach and education activities (Association of Fish and Wildlife Agencies 2015). The state has dedicated a web page related to conservation (TPWD no date c).

Monarch butterflies migrate in large numbers all over the United States and Mexico throughout the year. During the Spring migration, they travel from the central Mexico, south Florida, and coastal California overwintering areas to as far north as Canada, the northern range of the milkweed (*Asclepias* spp.). Milkweed is a necessary host plant for which they lay their eggs and receive nectar. Some species utilized include the butterfly milkweed (*Asclepias tuberosa*), swamp milkweed (*Asclepias incarnata*), common milkweed (*Asclepias syriaca*), purple milkweed (*Asclepias purpurascens*), poke milkweed (*Asclepias exaltata*), and the whorled milkweed (*Asclepias verticillata*). During the Fall migration, they travel from the north and central U.S. back to the central Mexico, south Florida, and coastal California overwintering areas. The Summer breeding areas cover most of the west, central, and northeast U.S. USFWS Regions include Pacific, Pacific Southwest, Northeast and the Mountain Prairie and Midwest which contains the Corn Belt, an area of high monarch production. The Spring breeding areas span most of the southeast U.S., the USFWS Southwest and Southeast Regions (TPWD 2016).

This INRMP protects habitat for monarch butterflies through active management of factors such as wetland management (Section 5.2.2), landscaping and grounds maintenance (Section 5.2.6), noxious, invasive, and exotic species and pests (Section 5.2.7), agricultural outleasing (Section 5.2.9), forest protection: wildland fire management (Section 5.3.1), and threatened and endangered species (Section 5.4.2). Projects described in this INRMP that benefit and conserve

monarch butterfly habitat include Biological Resources Survey and Inventory (Project No. 1); RTE Species Habitat Management (Project No. 2); Invasive Species Control (Project No. 3); NASK INRMP Updates (Project No. 4); Prescribed Fire Management (Project No. 5); Habitat Management and Restoration (Project No. 7); and Natural Resources Outreach (Project No. 8).

Northern aplomado falcon (*Falco femoralis septentrionalis*)

Federal Status: Endangered

State Status: Endangered

The northern aplomado falcon requires open grassland or savannah habitat with scattered trees or shrubs and is found in south Texas and the Trans-Pecos regions. The northern aplomado falcon is a federally and state endangered avian species (51 FR 6686-6690). A recovery plan was developed by USFWS for northern aplomado falcon in 1990 with a goal of establishing a minimum self-sustaining population of 60 pairs in the U.S. in order to reclassify the northern aplomado falcon from endangered to threatened. The plan recommended the discontinuation of the use of certain pesticides and the protection of optimal habitat such as coastal prairies and desert grasslands. The plan also called for greater research on the impact of pesticides, the amount of remaining suitable habitat, as well as a broader attempt to re-establish populations of the northern aplomado falcon through captive-rearing and restoration to the wild (DoD and USFWS 2007).

The northern aplomado falcon has not been documented at NASK but potential habitat for the species exists at all NASK properties. This INRMP protects habitat for Northern aplomado falcons through active management of factors such as wetland management (Section 5.2.2), storm-water and water quality control (Section 5.2.4), floodplain management (Section 5.2.5), landscaping and grounds maintenance (Section 5.2.6), noxious, invasive, and exotic species and pests (Section 5.2.7), urban forestry (Section 5.2.8) agricultural outleasing (Section 5.2.9), forest protection: wildland fire management (Section 5.3.1), threatened and endangered species (Section 5.4.2), nuisance wildlife and BASH (Section 5.4.3), wildlife diseases (Section 5.4.4), and outdoor recreation (Section 5.5). Specific INRMP Projects that will directly benefit this species include Biological Resources Survey and Inventory (Project No. 1); RTE Species Habitat Management (Project No. 2); Invasive Species Control (Project No. 3); NASK INRMP Updates (Project No. 4); Prescribed Fire Management (Project No. 5); Neotropical Migratory Bird Survey (Project No. 6); Habitat Management and Restoration (Project No. 7); and Natural Resources Outreach (Project No. 8). Other management actions that will benefit northern aplomado falcons include conducting internal and agency consultation during project planning for actions as required for projects that may impact federally-listed species. Routine monitoring of migratory birds by the BASH Program will also provide valuable information on the population of northern aplomado falcon at NASK, should it occur. Projects and management actions that may indirectly impact northern aplomado falcon are related to habitat management and bird control measures conducted in support of the BASH Program.

Ocelot (*Leopardus pardalis*)

Federal Status: Endangered

State Status: Endangered

Habitats for the ocelot include forested wetland, riparian, hardwood forest, savanna, shrubland/chaparral, and hardwood woodland, and it prefers abundant cover so that they can keep hidden in dense brush. Dens are in caves, hollow trees, thickets, or the spaces between the closed buttress roots of large trees.

This INRMP protects habitat for ocelots through active management of factors such as wetland management (Section 5.2.2), storm-water and water quality control (Section 5.2.4), floodplain management (Section 5.2.5), landscaping and grounds maintenance (Section 5.2.6), noxious, invasive, and exotic species and pests (Section 5.2.7), agricultural outleasing (Section 5.2.9), forest protection: wildland fire management (Section 5.3.1), threatened and endangered species (Section 5.4.2), nuisance wildlife and BASH (Section 5.4.3), wildlife diseases (Section 5.4.4), and outdoor recreation (Section 5.5). Specific INRMP Projects that will directly benefit this species include Biological Resources Survey and Inventory (Project No. 1); RTE Species Habitat Management (Project No. 2); Invasive Species Control (Project No. 3); NASK INRMP Updates (Project No. 4); Prescribed Fire Management (Project No. 5); Neotropical Migratory Bird Survey (Project No. 6); Habitat Management and Restoration (Project No. 7); and Natural Resources Outreach (Project No. 8).

Peregrin falcon (*Falco peregrinus*)

Federal Status: Not listed

State Status: Threatened

The Texas Gulf Coast is the only known spring staging area for Peregrine migration in the Western Hemisphere. They often nest adjacent to waterways and impoundments because of the abundant avian prey drawn to those locations. Appropriate management of nesting and feeding habitat will help to achieve and maintain an upward trend in peregrine falcon numbers in Texas.

Protection, conservation, and management of the peregrine falcon is provided for in this INRMP through active management of factors such as wetland management (Section 5.2.2), soil conservation and erosion (Section 5.2.3), storm-water and water quality control (Section 5.2.4), floodplain management (Section 5.2.5), landscaping and grounds maintenance (Section 5.2.6), noxious, invasive, and exotic species and pests (Section 5.2.7), urban forestry (Section 5.2.8), agricultural outleasing (Section 5.2.9), forest protection: wildland fire management (Section 5.3.1), nuisance wildlife and BASH (Section 5.4.3), wildlife diseases (Section 5.4.4), and outdoor recreation (Section 5.5). Specific INRMP Projects that will directly benefit this species include Biological Resources Survey and Inventory (Project No. 1); RTE Species Habitat Management (Project No. 2); Invasive Species Control (Project No. 3); NASK INRMP Updates (Project No. 4); Prescribed Fire Management (Project No. 5); Neotropical Migratory Bird Survey (Project No. 6);

Habitat Management and Restoration (Project No. 7); and Natural Resources Outreach (Project No. 8).

Plains spotted skunk (*Spilogale putorius interrupta*)

Federal Status: Under review

State Status: Not Listed

Although formerly considered a common mesocarnivore in the Midwestern United States, the eastern spotted skunk, and more specifically the plains subspecies, has experienced pronounced population declines throughout its range since the 1940s. One hypothesis of a major contribution to the decline of the plains spotted skunk population is the modernization of farming methods, which have resulted in the destruction of dilapidated farm buildings, fence rows, creek bottoms, and wood piles (habitats historically abundant with spotted skunks; Dowler et al. 2017).

This INRMP protects habitat for the plains spotted skunk through active management of factors such as soil conservation and erosion (Section 5.2.3), noxious, invasive, and exotic species and pests (Section 5.2.7), threatened and endangered species (Section 5.4.2), nuisance wildlife and BASH (Section 5.4.3), wildlife diseases (Section 5.4.4), and outdoor recreation (Section 5.5). Specific INRMP Projects that will directly benefit this species include Biological Resources Survey and Inventory (Project No. 1); RTE Species Habitat Management (Project No. 2); Invasive Species Control (Project No. 3); NASK INRMP Updates (Project No. 4); Prescribed Fire Management (Project No. 5); Habitat Management and Restoration (Project No. 7); and Natural Resources Outreach (Project No. 8).

Reticulate collared lizard (*Crotaphytus reticulatus*)

Federal Status: Not listed

State Status: Threatened

Reticulate collared lizard habitats include bare rock/talus/scree and shrubland/chaparral with thorn-scrub vegetation, usually on well-drained rolling terrain of shallow gravel, caliche, or sandy soils. It often occurs on scattered flat rocks below escarpments or isolated rock outcrops among scattered clumps of prickly-pear and mesquite, but also commonly ranges into mesquite flats far from the nearest rocky habitat. It has a small range in southern Texas and adjacent Mexico with spotty distribution and low density. Exotic grasses degrade or destroy the preferred habitat. Buffelgrass is planted for cattle forage in the lower Rio Grande Valley of southern Texas and is very successful at colonizing open ground between mesquite (*Prosopis* spp.) and ironwood (*Oleña tesota*) trees. The lizard depends on open spaces and running for foraging and escape, and buffelgrass clogs their habitat, rendering it unsuitable.

This INRMP protects habitat for reticulate collared lizard through active management of factors such as wetland management (Section 5.2.2), storm-water and water quality control (Section 5.2.4), floodplain management (Section 5.2.5), landscaping and grounds maintenance (Section

5.2.6), noxious, invasive, and exotic species and pests (Section 5.2.7), agricultural outleasing (Section 5.2.9), forest protection: wildland fire management (Section 5.3.1), threatened and endangered species (Section 5.4.2), nuisance wildlife and BASH (Section 5.4.3), wildlife diseases (Section 5.4.4), and outdoor recreation (Section 5.5). Specific INRMP Projects that will directly benefit this species include Biological Resources Survey and Inventory (Project No. 1); RTE Species Habitat Management (Project No. 2); Invasive Species Control (Project No. 3); NASK INRMP Updates (Project No. 4); Prescribed Fire Management (Project No. 5); Habitat Management and Restoration (Project No. 7); and Natural Resources Outreach (Project No. 8).

Rio Grande lesser siren (*Siren intermedia texana*)

Federal Status: Not listed

State Status: Threatened

Habitats for the Rio Grande lesser siren include any water body, preferably quiet and permanent, with or without submergent vegetation and a soft, mucky bottom. Eggs are laid in water in a small pocket or debris-covered cavity in bottom mud. Most of the siren's natural habitat has been altered or destroyed, and is subject to pesticide contamination. The Rio Grande lesser siren is listed as threatened by the state of Texas, and has been documented and confirmed present at Dixie Annex during a survey of the site conducted in 2007–2012. One Rio Grande lesser siren was recorded during this survey. It was not recorded in any of the previous surveys conducted at Dixie Target Range, nor was it ever documented in McMullen County (Clements and Giggelman 2012).

This INRMP protects habitat for Rio Grande lesser sirens through active management of factors such as wetland management (Section 5.2.2), soil conservation and erosion (Section 5.2.3), storm-water and water quality control (Section 5.2.4), floodplain management (Section 5.2.5), landscaping and grounds maintenance (Section 5.2.6), noxious, invasive, and exotic species and pests (Section 5.2.7), agricultural outleasing (Section 5.2.9), forest protection: wildland fire management (Section 5.3.1), threatened and endangered species (Section 5.4.2), nuisance wildlife and BASH (Section 5.4.3), wildlife diseases (Section 5.4.4), and outdoor recreation (Section 5.5). Specific INRMP Projects that will directly benefit this species include Biological Resources Survey and Inventory (Project No. 1); RTE Species Habitat Management (Project No. 2); Invasive Species Control (Project No. 3); NASK INRMP Updates (Project No. 4); Prescribed Fire Management (Project No. 5); Habitat Management and Restoration (Project No. 7); and Natural Resources Outreach (Project No. 8).

Sennett's hooded oriole (*Icterus cucullatus sennitti*)

Federal Status: Not Listed

State Status: Not Listed

The Sennett's hooded oriole is one of five subspecies of the hooded oriole, a medium-sized New World oriole. Members of this species generally build their nests in hanging moss from mesquite

trees, turning up at the ends and lining the pocket with moss. During May or June, they lay from three to five eggs of a white color, spotted with purplish brown and gray (Reed 1914).

This INRMP protects habitat for the Sennett's hooded oriole through active management of factors such as, noxious, invasive, and exotic species and pests (Section 5.2.7), forest protection: wildland fire management (Section 5.3.1), threatened and endangered species (Section 5.4.2), nuisance wildlife and BASH (Section 5.4.3), wildlife diseases (Section 5.4.4),. Specific INRMP projects that will directly benefit this species include Biological Resources Survey and Inventory (Project No. 1); RTE Species Habitat Management (Project No. 2); Invasive Species Control (Project No. 3); NASK INRMP Updates (Project No. 4); Prescribed Fire Management (Project No. 5); Habitat Management and Restoration (Project No. 7); and Natural Resources Outreach (Project No. 8).

Sheep Frog (*Hypopachus variolosus*)

Federal Status: Not Listed

State Status: Threatened

The sheep frog range is from south Texas to Costa Rica. It feeds mainly on ants and termites. The sheep frog remains in subterranean burrows most of the year, but may emerge at night or with heavy rains in late summer. Breeding takes place from March to September with rain, in Texas typically August and September. Males call while floating in water with their forelimbs resting on a stem or twig (Cannatella and LaDuc 2010b).

This INRMP protects habitat for the sheep frog through active management of factors such as wetland management (Section 5.2.2), soil conservation and erosion (Section 5.2.3), storm-water and water quality control (Section 5.2.4), floodplain management (Section 5.2.5), landscaping and grounds maintenance (Section 5.2.6), noxious, invasive, and exotic species and pests (Section 5.2.7), agricultural outleasing (Section 5.2.9), forest protection: wildland fire management (Section 5.3.1), threatened and endangered species (Section 5.4.2), nuisance wildlife and BASH (Section 5.4.3), wildlife diseases (Section 5.4.4), and outdoor recreation (Section 5.5). Specific INRMP Projects that will directly benefit this species include Biological Resources Survey and Inventory (Project No. 1); RTE Species Habitat Management (Project No. 2); Invasive Species Control (Project No. 3); NASK INRMP Updates (Project No. 4); Prescribed Fire Management (Project No. 5); Habitat Management and Restoration (Project No. 7); and Natural Resources Outreach (Project No. 8).

South Texas ambrosia (*Ambrosia cheiranthifolia*)

Federal Status: Endangered

State Status: Endangered

South Texas ambrosia habitats include grasslands and mesquite dominated shrublands on various soils ranging from clay loams to sandy loams. The species historical range included

Texas and the species is known or believed to occur in Cameron, Jim Wells, Kleberg and Nueces counties. It was determined endangered under the ESA in 1994 due to an estimated 20 surviving population centers, and since most populations are clonal, these may represent very few genetically different individual plants. The species' geographic range is limited to coastal south Texas and northeastern Mexico. Much of its original habitat has been converted to agricultural fields and pastures. The remnant, fragmented native prairies and savannahs are threatened by continued habitat destruction and agricultural chemicals (USFWS 2010).

This INRMP protects habitat for the South Texas ambrosia through active management of factors such as wetland management (Section 5.2.2), soil conservation and erosion (Section 5.2.3), storm-water and water quality control (Section 5.2.4), floodplain management (Section 5.2.5), landscaping and grounds maintenance (Section 5.2.6), noxious, invasive, and exotic species and pests (Section 5.2.7), agricultural outleasing (Section 5.2.9), forest protection: wildland fire management (Section 5.3.1), threatened and endangered species (Section 5.4.2), nuisance wildlife and BASH (Section 5.4.3), and outdoor recreation (Section 5.5). Specific INRMP Projects that will directly benefit this species include Biological Resources Survey and Inventory (Project No. 1); RTE Species Habitat Management (Project No. 2); Invasive Species Control (Project No. 3); NASK INRMP Updates (Project No. 4); Prescribed Fire Management (Project No. 5); Habitat Management and Restoration (Project No. 7); and Natural Resources Outreach (Project No. 8); South Texas Ambrosia Management Plan and Survey (Project No. 9); and Game Animal Survey on the Main Station and Dixie Annex (Project No. 10).

Southern yellow bat (*Lasiurus ega*)

Federal Status: Not Listed

State Status: Threatened

The southern yellow bat has been recorded in Cameron, Kleberg, and Nueces counties. In Texas, the southern yellow bat roosts primarily beneath the hanging dead fronds of palm trees year-round. The practice of removing old palm fronds deprives southern yellow bats of roosting space in many locations. Pesticides used in mosquito control are also an important cause for concern (TPWD no date).

This INRMP protects habitat for the southern yellow bat through active management of factors such as wetland management (Section 5.2.2), soil conservation and erosion (Section 5.2.3), storm-water and water quality control (Section 5.2.4), floodplain management (Section 5.2.5), landscaping and grounds maintenance (Section 5.2.6), noxious, invasive, and exotic species and pests (Section 5.2.7), agricultural outleasing (Section 5.2.9), forest protection: wildland fire management (Section 5.3.1), threatened and endangered species (Section 5.4.2), nuisance wildlife and BASH (Section 5.4.3), wildlife diseases (Section 5.4.4), and outdoor recreation (Section 5.5). Specific INRMP Projects that will directly benefit this species include Biological Resources Survey and Inventory (Project No. 1); RTE Species Habitat Management (Project No. 2); Invasive Species Control (Project No. 3); NASK INRMP Updates (Project No. 4);

Prescribed Fire Management (Project No. 5); Habitat Management and Restoration (Project No. 7); and Natural Resources Outreach (Project No. 8).

Spot-tailed earless lizard (*Holbrookia lacerate*)

Federal Status: Under review

State Status: Pending 90-day finding

Spot-tailed earless lizards inhabit desert, sand/dune, shrubland/chaparral and mixed woodlands in moderately-open prairie-brushland regions, particularly fairly flat areas free of vegetation or other obstructions. Greatest threats are agricultural herbicides and insecticides and large amounts of agricultural conversion.

This INRMP protects habitat for the spot-tailed earless lizard through active management of factors such as wetland management (Section 5.2.2), storm-water and water quality control (Section 5.2.4), floodplain management (Section 5.2.5), landscaping and grounds maintenance (Section 5.2.6), noxious, invasive, and exotic species and pests (Section 5.2.7), agricultural outleasing (Section 5.2.9), forest protection: wildland fire management (Section 5.3.1), threatened and endangered species (Section 5.4.2), nuisance wildlife and BASH (Section 5.4.3), wildlife diseases (Section 5.4.4), and outdoor recreation (Section 5.5). Specific INRMP Projects that will directly benefit this species include Biological Resources Survey and Inventory (Project No. 1); RTE Species Habitat Management (Project No. 2); Invasive Species Control (Project No. 3); NASK INRMP Updates (Project No. 4); Prescribed Fire Management (Project No. 5); Habitat Management and Restoration (Project No. 7); and Natural Resources Outreach (Project No. 8).

Sprague's pipit (*Anthus spragueii*)

Federal Status: Former Candidate for Listing and USFWS Bird of Conservation Concern, determined not to qualify for listing on April 5, 2016 (81 FR 19527 19542)

State Status: Not Listed

Sprague's pipit is a former federal candidate species for listing but was determined not to qualify for listing on April 5, 2016 (81 FR 19527 19542); however, they are protected by the MBTA. Sprague's pipit is dependent upon native prairie habitat and breeds in the north-central U.S. in Minnesota, Montana, North Dakota and South Dakota as well as south-central Canada. Its wintering habitat is in southern states, including Arizona, Texas, Oklahoma, Arkansas, Mississippi, Louisiana, and New Mexico (USFWS 2011).

Habitat loss, degradation, and fragmentation, inappropriate management, nest predation and parasitism, energy development, climate change, and drought are the primary threats that currently or potentially affect populations of this species (Jones 2010). Sprague's pipit has been documented in grasslands habitat at all NASK properties (Appendix F). This INRMP protects habitat for Sprague's pipits through active management of factors such as wetland management (Section 5.2.2), storm-water and water quality control (Section 5.2.4), landscaping and grounds

maintenance (Section 5.2.6), noxious, invasive, and exotic species and pests (Section 5.2.7), urban forestry (Section 5.2.8), agricultural outleasing (Section 5.2.9), forest protection: wildland fire management (Section 5.3.1), nuisance wildlife and BASH (Section 5.4.3), wildlife diseases (Section 5.4.4), and outdoor recreation (Section 5.5). Specific INRMP Projects that will directly benefit this species include Biological Resources Survey and Inventory (Project No. 1); RTE Species Habitat Management (Project No. 2); Invasive Species Control (Project No. 3); NASK INRMP Updates (Project No. 4); Prescribed Fire Management (Project No. 5); Neotropical Migratory Bird Survey (Project No. 6); Habitat Management and Restoration (Project No. 7); Natural Resources Outreach (Project No. 8); and Game Animal Survey on the Main Station and Dixie Annex (Project No. 10). Other management actions that will benefit Sprague's pipit include, conducting internal and agency consultation during project planning for actions as required for projects that may impact federally-listed species. Routine monitoring of migratory birds by the BASH Program will also provide valuable information on the population of Sprague's pipit at NASK and its preferred habitat locations at the Installation. Projects and management actions that may indirectly impact Sprague's pipit are related to habitat management and bird control measures conducted in support of the BASH Program.

While grounds maintenance and landscaping activities have the potential to impact grassland habitat that supports this species, the NRM will coordinate with the PWD and other personnel involved with grounds maintenance and landscaping activities to identify practices that can be implemented to preserve grassland habitat in the urban environment. Educational outreach should also be conducted to showcase the measures the Navy has adopted for protection of this species and other migratory birds at NASK (Project No. 8). These measures will ensure proper management of this species at the Installation and will allow for improved management measures to be implemented, as needed.

Texas horned lizard (*Phrynosoma cornutum*)

Federal Status: Not Listed

State Status: Threatened

Texas horned lizards are found in arid and semiarid habitats in open areas with sparse plant cover. Texas horned lizards are commonly found in loose sand or loamy soils because they dig for hibernation, nesting, and insulation purposes. They often sit close to anthills and pick off individual ants that walk by.

Protection, conservation, and management of the Texas horned lizard is provided for in this INRMP. This INRMP protects habitat for the Texas horned lizard through active management of factors such as soil conservation and erosion (Section 5.2.3), landscaping and grounds maintenance (Section 5.2.6), noxious, invasive, and exotic species and pests (Section 5.2.7), forest protection: wildland fire management (Section 5.3.1), threatened and endangered species (Section 5.4.2), and wildlife diseases (Section 5.4.4). Specific INRMP Projects that will directly benefit this species include Biological Resources Survey and Inventory (Project No. 1); RTE

Species Habitat Management (Project No. 2); Invasive Species Control (Project No. 3); NASK INRMP Updates (Project No. 4); Prescribed Fire Management (Project No. 5); Habitat Management and Restoration (Project No. 7); and Natural Resources Outreach (Project No. 8).

Texas indigo snake (*Drymarchon melanurus erebennus*)

Federal Status: Not Listed

State Status: Threatened

Texas indigo snakes are large (6 feet long), black snakes that prefer lightly-vegetated areas not far from permanent water sources. They are also found in mesquite savannah, open grassland areas, and coastal sand dunes. They den in burrows created by other animals. The primary threat to Texas indigo snakes is habitat loss due to development, as they require a large home range to forage. Roads bisect their territory, and many snakes each year are run over by cars.

This INRMP protects habitat for the Texas indigo snake through active management of factors such as soil conservation and erosion (Section 5.2.3), landscaping and grounds maintenance (Section 5.2.6), noxious, invasive, and exotic species and pests (Section 5.2.7), forest protection: wildland fire management (Section 5.3.1), threatened and endangered species (Section 5.4.2), and wildlife diseases (Section 5.4.4). Specific INRMP Projects that will directly benefit this species include Biological Resources Survey and Inventory (Project No. 1); RTE Species Habitat Management (Project No. 2); Invasive Species Control (Project No. 3); NASK INRMP Updates (Project No. 4); Prescribed Fire Management (Project No. 5); Habitat Management and Restoration (Project No. 7); and Natural Resources Outreach (Project No. 8).

Texas tortoise (*Gopherus berlandieri*)

Federal Status: Not Listed

State Status: Threatened

The Texas tortoise inhabits grassland/herbaceous, savanna, shrubland/chaparral and woodland-hardwood. Preferred habitats are open scrub woods, arid brush, lomas, grass-cactus association; often in areas with sandy well-drained soils. Unlike other species of gopher tortoise, is not an adept burrower and, when inactive, it occupies shallow depressions dug at base of bush or cactus or occasionally in underground burrows or under objects. Individuals may move several hundred meters in one day, or may pass several days without movement. Long distance nomadic movements sometimes occur and home ranges broadly overlap (NatureServe 2017).

This INRMP protects habitat for Texas tortoises through active management of factors such as wetland management (Section 5.2.2), soil conservation and erosion (Section 5.2.3), storm-water and water quality control (Section 5.2.4), floodplain management (Section 5.2.5), landscaping and grounds maintenance (Section 5.2.6), noxious, invasive, and exotic species and pests (Section 5.2.7), agricultural outleasing (Section 5.2.9), forest protection: wildland fire management (Section 5.3.1), threatened and endangered species (Section 5.4.2), nuisance

wildlife and BASH (Section 5.4.3), wildlife diseases (Section 5.4.4), and outdoor recreation (Section 5.5). Specific INRMP Projects that will directly benefit this species include Biological Resources Survey and Inventory (Project No. 1); RTE Species Habitat Management (Project No. 2); Invasive Species Control (Project No. 3); NASK INRMP Updates (Project No. 4); Prescribed Fire Management (Project No. 5); Habitat Management and Restoration (Project No. 7); and Natural Resources Outreach (Project No. 8).

Tricolored bat (*Perimyotis subflavus*)

Federal Status: Under Petition

State Status: Not Listed

The tricolored bat has a distinct coloration of pelage, which is black at the base, yellow in the middle and brown at the tips. They can be found in the eastern half of Texas including the Rolling Plains west of Armstrong County and central Texas as far west as Val Verde County, and a recent record from Lubbock county. The tricolored bat is often found in forested landscapes with standing snags and hollow trees. Caves, mines, and rock crevices may be used as night roosts between foraging forays. Colonies may inhabit man-made structures, such as, buildings or bridges or tree cavities. The tricolored bat is one of the first bats to enter hibernation, typically in September or October, and one of the last to emerge in the spring. The tricolored bats historical population presumably large but declined greatly over much of the range due to WNS.

This INRMP protects habitat for the tricolored bat through active management of factors such as wetland management (Section 5.2.2), soil conservation and erosion (Section 5.2.3), storm-water and water quality control (Section 5.2.4), floodplain management (Section 5.2.5), landscaping and grounds maintenance (Section 5.2.6), noxious, invasive, and exotic species and pests (Section 5.2.7), agricultural outleasing (Section 5.2.9), forest protection: wildland fire management (Section 5.3.1), threatened and endangered species (Section 5.4.2), nuisance wildlife and BASH (Section 5.4.3), wildlife diseases (Section 5.4.4), and outdoor recreation (Section 5.5). Specific INRMP Projects that will directly benefit this species include Biological Resources Survey and Inventory (Project No. 1); RTE Species Habitat Management (Project No. 2); Invasive Species Control (Project No. 3); NASK INRMP Updates (Project No. 4); Prescribed Fire Management (Project No. 5); Habitat Management and Restoration (Project No. 7); and Natural Resources Outreach (Project No. 8).

Western burrowing owl (*Athene cunicularia hypugaea*)

Federal Status: Not Listed

State Status: Not Listed

The Western burrowing owl is a small ground-dwelling diurnal owl found throughout western North America, west of the Mississippi River and south into Mexico. Burrowing owls excavate their own homes. If available, however, they prefer to take use other burrowing animals' dens. They typically nest in vacated prairie dog burrows where they may live sociably in colonies. They

eat mostly insects, rodents and occasionally birds, which they hunt either by day or night. Both sexes reach sexual maturity at one year of age. They breed once per year. Before nesting, the male owl will prepare the nest site by enlarging the burrow, if necessary, and lining the burrow with dried horse or cattle feces, apparently for egg insulation and/or possibly to camouflage the owls' scent from predators. Owlets hatch between March and July. An amazing defense mechanism that owlets possess is their ability to perfectly mimic the rattling sound of a prairie rattlesnake

Protection, conservation, and management of the western burrowing owl is provided for in this INRMP through active management of factors such as wetland management (Section 5.2.2), soil conservation and erosion (Section 5.2.3), storm-water and water quality control (Section 5.2.4), floodplain management (Section 5.2.5), landscaping and grounds maintenance (Section 5.2.6), noxious, invasive, and exotic species and pests (Section 5.2.7), urban forestry (Section 5.2.8), agricultural outleasing (Section 5.2.9), forest protection: wildland fire management (Section 5.3.1), nuisance wildlife and BASH (Section 5.4.3), wildlife diseases (Section 5.4.4), and outdoor recreation (Section 5.5). Specific INRMP Projects that will directly benefit this species include Biological Resources Survey and Inventory (Project No. 1); RTE Species Habitat Management (Project No. 2); Invasive Species Control (Project No. 3); NASK INRMP Updates (Project No. 4); Prescribed Fire Management (Project No. 5); Neotropical Migratory Bird Survey (Project No. 6); Habitat Management and Restoration (Project No. 7); and Natural Resources Outreach (Project No. 8).

White-tailed hawk (*Geranoaetus albicaudatus*)

Federal Status: Not listed

State Status: Not listed

Coastal Texas represents the extreme northern extend of the white-tailed hawk's range. It prefers open or semi-open areas with few trees. It is not a migratory bird, though some populations may make regional movements when food is scarce. White-tailed hawks usually perch on bushes, trees, and telephone poles, generally preferring arid habitat and rarely occurring in rainy locales.

Protection, conservation, and management of the white-tailed hawk is provided for in this INRMP through active management of factors such as wetland management (Section 5.2.2), soil conservation and erosion (Section 5.2.3), storm-water and water quality control (Section 5.2.4), floodplain management (Section 5.2.5), landscaping and grounds maintenance (Section 5.2.6), noxious, invasive, and exotic species and pests (Section 5.2.7), urban forestry (Section 5.2.8), agricultural outleasing (Section 5.2.9), forest protection: wildland fire management (Section 5.3.1), nuisance wildlife and BASH (Section 5.4.3), wildlife diseases (Section 5.4.4), and outdoor recreation (Section 5.5). Specific INRMP Projects that will directly benefit this species include Biological Resources Survey and Inventory (Project No. 1); RTE Species Habitat Management (Project No. 2); Invasive Species Control (Project No. 3); NASK INRMP Updates (Project No. 4); Prescribed Fire Management (Project No. 5); Neotropical Migratory Bird Survey (Project No. 6);

Habitat Management and Restoration (Project No. 7); and Natural Resources Outreach (Project No. 8).

Wood stork (*Mycteria americana*)

Federal Status: Threatened

State Status: Not listed

Wood storks inhabit tropical and subtropical climates with fluctuating water levels. They nest colonially in trees that are isolated from other trees either by marsh, water, or grasslands, but leave their roosts to forage in shallow water.

This INRMP protects habitat for wood storks through active management of factors such as wetland management (Section 5.2.2), noxious, invasive, and exotic species and pests (Section 5.2.7), threatened and endangered species (Section 5.4.2), nuisance wildlife and BASH (Section 5.4.3), and wildlife diseases (Section 5.4.4). Specific INRMP Projects that will directly benefit this species include Biological Resources Survey and Inventory (Project No. 1); RTE Species Habitat Management (Project No. 2); Invasive Species Control (Project No. 3); NASK INRMP Updates (Project No. 4); Habitat Management and Restoration (Project No. 7); and Natural Resources Outreach (Project No. 8).

Yellow-billed cuckoo (*Coccyzus americanus*)

Federal Status: Not Listed (Eastern Distinct Population Segment (DPS)), Threatened (Western DPS)

State Status: Not listed

The Western population of the yellow-billed cuckoo is morphologically and behaviorally different than the eastern population which makes them significant per USFWS Distinct Population Segment (DPS) Policy. The western population is listed threatened, while the eastern population is not. The NASK Complex is located in the eastern DPS. USFWS considers the cuckoos that occur west of the Rocky Mountain crest a Distinct Population Segment (USFWS 2011), where it has declined to a tiny fraction of its population a century ago. Main threats are habitat fragmentation, degradation of riparian woodland due to agricultural and residential development, stochastic extinctions and low colonization rates, flood control measures and invasion of riparian habitats by salt cedar. During long-distance, nocturnal migrations they are also vulnerable to collisions with tall buildings, cell towers, radio antennas, wind turbines, and other structures (USFWS 2014).

Habitats include scrub-shrub wetland, riparian, hardwood forest, mixed forest, old fields, shrubland/chaparral, suburban/orchard, hardwood woodland and mixed woodland. Breeding habitats are open woodland (especially where undergrowth is thick), parks, deciduous riparian woodland. In the West, nests in tall cottonwood and willow riparian woodland. Nests in deciduous woodlands, moist thickets, orchards, overgrown pastures; in tree, shrub, or vine, at approximately

1-3 meters above ground. Diet mainly comprised of caterpillars, also other insects, some fruits and occasionally small lizards and frogs and bird eggs.

This INRMP protects habitat for yellow-billed cuckoos through active management of factors such as wetland management (Section 5.2.2), storm-water and water quality control (Section 5.2.4), landscaping and grounds maintenance (Section 5.2.6), noxious, invasive, and exotic species and pests (Section 5.2.7), urban forestry (Section 5.2.8), agricultural outleasings (Section 5.2.9), forest protection: wildland fire management (Section 5.3.1), threatened and endangered species (Section 5.4.2), nuisance wildlife and BASH (Section 5.4.3), wildlife diseases (Section 5.4.4), and outdoor recreation (Section 5.5). Specific INRMP Projects that will directly benefit this species include Biological Resources Survey and Inventory (Project No. 1); RTE Species Habitat Management (Project No. 2); Invasive Species Control (Project No. 3); NASK INRMP Updates (Project No. 4); Prescribed Fire Management (Project No. 5); Neotropical Migratory Bird Survey (Project No. 6); Habitat Management and Restoration (Project No. 7); Natural Resources Outreach (Project No. 8); and Game Animal Survey on the Main Station and Dixie Annex (Project No. 10).

Integration with Other Natural Resources Management Activities

- Coastal Zone Management, Section 5.2.1 – Coastal areas provide habitat for many rare species;
- Wetland Management, Section 5.2.2 – wetland provide habitat for many rare species;
- Soil Conservation and Erosion, Section 5.2.3 – control sedimentation into wetland habitat;
- Stormwater and Water Quality, Section 5.2.4 – control water quality for rare aquatic species;
- Floodplains, Section 5.2.5 – maintaining floodplain conditions benefits rare species;
- Landscaping and Grounds Maintenance, Section 5.2.6 - be aware of habitat utilization by rare species during grounds maintenance;
- Invasive, Exotic, and Noxious Species, Section 5.2.7 – control exotic species, especially those that compete with native rare species;
- Urban Forestry, Section 5.2.8 – utilize native tree species that provide habitat for rare animal species;
- Agricultural Outleasings, Section 5.2.9 -control pesticide and fertilizer runoff into aquatic and wetland habitats;
- Forest Protection, Section 5.3.1 – controlling wildfires prevents damage to rare species;
- Migratory Birds, Section 5.4.1- combine migratory bird surveys with efforts to inventory protected species;
- Nuisance Wildlife and BASH, Section 5.4.3 - ensure BASH controllers are aware of rare species and reduce predation by nuisance carnivores;
- Wildlife Diseases, Section 5.4.4 – Monitor RTE populations for signs of stress or disease so that treatment can prevent population decline;
- Outdoor Recreation, Section 5.5 – properly educate recreational participants in stewardship of the resource and aquatic environment;

- Hunting, Section 5.5.1 – Educate hunters about species status changes;
- Wildlife Officer, Section 5.5.2 – Use wildlife officer to ensure RTE wildlife are taken or harassed;
- Natural Resources Training, Section 5.6.1 – ensure personnel are current on protected species rules and regulations; and
- GIS, Section 5.6.2 – utilize GIS tools to improve management of rare species and their habitats.

Ecosystem Management

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

Military Mission

Federal law prohibits harassment and all other forms of take for federally-protected species. The NASK Complex must maintain a working knowledge of the protected species and their required habitats on its properties and take prudent steps to protect those species and habitats. Failure to do so could result in regulatory action by the USFWS and TWP, which could delay or otherwise hinder military training operations at the Complex.

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

- Endangered Species Act, 16 U.S.C. 35, 32 CFR 190, provides for the identification and protection of RTE species of fish, wildlife, and plants and their critical habitats. It requires federal agencies to ensure that no agency action is likely to jeopardize the continued existence of a threatened or endangered species.
- Migratory Bird Treaty Act, as amended 16 U.S.C. 703-712, prohibits the taking or harming of a migratory bird, its eggs, nests, or young without the appropriate permit.
- Sikes Act, as amended 16 U.S.C. 670a-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.
- Marine Mammal Protection Act of 1972, 16 U.S.C. 1361-1407, prohibits the taking or harming of marine mammals without the appropriate permit.
- Bald and Golden Eagle Protection Act, 16 U.S.C. 668-668c, prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs.
- Magnuson-Stevens Fishery Conservation and Management Act (1996 Reauthorization), 16 U.S.C. 1855(b), federal agencies must consult with the Secretary of Commerce on all activities, or proposed activities, authorized, funded, or undertaken by the agency, that may adversely affect EFH.

- Fish and Wildlife Conservation Act, 16 U.S.C. 2901, encourages all federal departments and agencies to utilize their statutory and administrative authority, to the maximum extent practicable and consistent with each agency's statutory responsibilities, to conserve and promote conservation of nongame fish and wildlife and their habitats.
- Executive Order 13112, 3 February 1999, requires executive agencies to restrict the introduction of exotic organisms into natural ecosystems.
- OPNAVINST 5090.1D, 12-3.5, discusses laws that govern natural resources management relating to the protection and management of fish and wildlife resources.

Additional Sources of Information

Habitat Conservation Planning Handbook

U.S. Fish and Wildlife Service

Effects of Fire on Threatened and Endangered Plants

Fire Effects on Plants and Wildlife

Prevention and Control of Wildlife Damage and Wildlife Diseases and Humans

5.4.3 Nuisance Wildlife and BASH

Nuisance wildlife causes inconveniences to humans, threatens health and safety of human populations, and has the potential to cause property damage. Effects can be relatively minor, such as reducing the aesthetic qualities of an area, or major, such as damaging landscaped areas, damaging property, and causing personal injury. Nuisance wildlife also may act as vectors for human disease.

Integrated Pest Management (IPM) is an acceptable, environmentally responsible, and economically practical method of controlling pest animal populations. IPM incorporates a variety of cultural, biological, and chemical methods to efficiently manage pest populations while lowering dependence on chemical controls. A number of animal pests occur on NASK, including fire ants, cockroaches, termites, and other invertebrates, and the control of these pests is an integral part of ecosystem management practices.

Mammal and bird populations, especially in the vicinity of runways, pose a BASH risk to aircraft and must be minimized and controlled to prevent costly and potentially-deadly incidents. The objective of a BASH Program is to reduce the potential for collisions, and encompass all actions that may identify, reduce or eliminate bird and animal hazards to aviation. NAVFAC P-73, OPNAVINST 3750.6R, (The Naval Aviation Safety Program), FAA Regulations and NASK Instruction NASKINGSINST 3750.16C Code N30 all direct that every effort be taken to reduce or eliminate interaction between bird/wildlife and aircraft.

Several introduced as well as native species may be considered nuisance wildlife in an urban setting such as NAS Kingsville, including feral cats (*Felis catus*), red imported fire ants (*Solenopsis invicta*), Norway rat, house mouse, striped skunk, raccoon, and Virginia opossum. A

list of wildlife considered by the USFWS to be invasive species for the NASK Complex is provided in Appendix H, Table H-1.

The list of invasive species present or potentially occurring at the NASK Complex will continue to increase as more plants and animals migrate into new areas under normal biological migratory patterns (e.g., Africanized honeybee [*Apis mellifera scutellata*]) and as more exotic plants and animals are purposely or accidentally introduced into the environment. Several of the species listed in Appendix H, Table H-1 already reside or traverse properties managed by the NASK Complex and represent both a nuisance as well as an invasive species. Red fire ants, house sparrow (*Passer domesticus*), and rock pigeons (*Columba livia*) are examples of common invasive species that can present both aesthetic and health problems. Expanded information on the invasive species listed by USFWS is contained in Appendix H.

Feral and free-ranging cats have been observed at NAS Kingsville. Feral cats are animals that are no longer under human control, but live and reproduce in the wild, usually in close association with humans. Humans have neglected these animals, which live exposed to disease, hunger, weather and attack from dogs, humans or other cats and animals. These cats may survive for several years before succumbing to starvation, disease, dogs, other animals or motor vehicles. Failure to prevent or control a feral cat population amounts to inhumane treatment of animals.

Issues

Termites, rodents, feral cats, and some species of birds and other small mammals have caused structural damage at buildings on NASK. Fire ants create nuisances and control costs by building ant mounds across the landscape. The climate and environment around the Installation are ideal for the proliferation of insects such as mosquitoes and ticks which act as vectors for blood-borne diseases. Many people suffer from allergens to dander and certain insect bites or stings. These habitats also attract numerous bird species in large populations, so the risk of BASH is always present.

Goals and Objectives

- Protect, conserve, and enhance the ecological value and diversity of natural resources by building productive relationships with regulatory agencies and the public in support of the military mission.
- Maintain interagency cooperation with USFWS and TPWD.
- Protect and maintain natural resources within NASK by continuing and enhancing ecologically appropriate and beneficial land uses and management practices, while ensuring the continuation of the military mission;
- Protect, maintain, and restore native vegetative communities and plant and wildlife populations;
- Protect and conserve the ecological value and diversity of natural resources by fostering knowledge of, and participation in, adaptive ecosystem management;

- Control nuisance wildlife and wildlife diseases that may adversely affect human health or welfare, the health of the ecosystem, and the military mission;
- Continue existing, and establish new programs and procedures to monitor, maintain, and enhance wetlands and water quality;
- Maintain the ecological integrity of wetland and upland communities for the protection of native plant and animal species, including numerous federally and state listed species;
- Preserve and protect RTE species and species of special concern to ensure no reduction in population sizes;
- Ensure that land management and land use decisions comply with all applicable laws, executive orders, regulations, directives, and instructions, and that adverse impacts to the natural environment are minimized;
- Provide adequate staffing, equipment, technology, and training to the Natural Resources Program to ensure proper implementation of this INRMP;
- Prevent and control invasive and nuisance wildlife species, and wildlife diseases that may adversely affect human health and welfare, the health of the ecosystem, and the military mission.
- Protect, conserve, and promote habitat for native terrestrial and aquatic fauna, consistent with BASH Program requirements, maintain vegetation to reduce BASH potential; and
- Incorporate the concept of ecosystem management into all planning and management processes.

Projects

- Biological Resources Survey and Inventory (Project 1 in Appendix A)
- RTE Habitat Management (Project 2 in Appendix A)
- Invasive Species Control (Project 3 in Appendix A)
- NASK INRMP Update (Project 4 in Appendix A)
- Prescribed Fire Management (Project 5 in Appendix A)
- Neotropical Migratory Bird Survey (Project 6 in Appendix A)
- Habitat Management and Restoration (Project 7 in Appendix A)
- Natural Resources Outreach (Project 8 in Appendix A)
- South Texas Ambrosia Management Plan and Survey (Project 9 in Appendix A)
- Game Animal Survey on the Main Station and Dixie Annex (Project 10 in Appendix A)

Management Strategies

- Implement grounds maintenance practices consistent with the BASH Plan;
- The BASH Plan will be continuously updated and monitored to meet the needs of the NASK Complex;
- Establish an awareness program to educate the public on indicators of wildlife population problems and diseases. Use pamphlets, flyers, and command units to disseminate information;

- Continue to monitor the health and size of animal populations, and control populations as needed;
- Monitor and forecast pest populations to determine whether insect infestations are present, and if so, the type of pests, degree of infestation (small, medium, or large), and the size of the area or number of plants under attack;
- Educate residents of NASK about the ecological and health benefits of keeping pet cats indoors and eliminating resident populations of feral cats;
- Ensure grounds maintenance personnel receive a copy of the BASH plan and are aware of the locations in which to manage in accordance with the Plan;
- Institute wildlife education and stewardship programs;
- Ensure implementation of policies that minimize adverse impacts to ecosystem resources from land disturbance activities;
- Maintain mowing schedule and grass height around the airfields to optimize BASH controls;
- Compile GIS data coverages and maintain and update data coverages of populations and habitats of nuisance wildlife problems and BASH issues; and
- Continually verify that natural resources personnel obtain proper training and certifications.
- Discourage ponding of water within areas in proximity to the airfield to minimize attracting migratory birds and other wildlife, and to minimize the BASH potential for this parcel.
- Prevent larger game species from accessing the airfield through the installation of a security fence around NALFOG.
- Maintain a Migratory Bird Depredation Permit from the USFWS to allow harm to migratory birds as part of BASH Program requirements, and to maintain airfield safety.
- Review agricultural outleases and work with lessees to ensure compliance with provisions to reduce BASH potential through crop selection.
- Establish procedures for the BASH contact person to inform the Navy personnel responsible for the Installation's database of incidents.
- Procure and maintain BASH response equipment (i.e., propane cans, electronic scare devices, calls).
- Maintain a hunting program for large game animals to minimize BASH potential at NAS Kingsville. Management of nuisance species, including trapping of wild hog, should be allowed to continue at NALFOG under an invasive species project action.

Long-Term Management

The NRM at NASK will use an adaptive approach to manage exotic and invasive wildlife and will explore alternative ways to meet management objectives, predict the outcomes of each alternative based on the current state of knowledge, implement one or more of these alternatives, and use the results to increase knowledge and adjust management actions. In cases where resources such as time, money, and staff are limited, management planning will ensure that NASK uses resources wisely to manage exotic and invasive wildlife for the long term.

A good example of an invasive species is the red fire ant. This ant invades an area and immediately drives out other ant species while making itself a nuisance and potential health hazard for humans and animals (dogs, cats and wildlife) that may be involved in activities in the same area. During this invasion, the ant removes the food source for other animals in the habitat that depended on the presence of the species displaced. An example of this is the loss of harvester ants due to fire ant invasion, causing the Texas horned lizard, a Texas threatened species, to lose its food source. Wildlife considered by the USFWS to be invasive species for the NASK Complex are listed in Appendix H, Table H-1.

Wild hogs are considered an invasive nuisance species and are a serious BASH issue at NALFOG due to poor exclusion at the station. Wild hogs are routinely removed from the site.

Control of feral cat populations at the NASK Complex is an important component of natural resources management. Feral cats can pose a threat to native avifauna. Feral cats can also harbor and transmit fatal and non-fatal diseases to humans, including rabies, plague, ringworm, internal and external parasites, toxoplasmosis, bartonellosis (formerly known as cat scratch fever), allergies to cat hair, and secondary bacterial infections from cat scratches and bites.

Feral cats living in close association with humans can also damage buildings, contaminate food supplies, and kill birds and other wildlife. Parasites such as fleas are often a problem in areas inhabited by feral cats. Because feral cats adversely affect human and pet health and welfare, they must be controlled. If there is a need for feral cat control on a military installation, a feral cat control plan should be developed and approved by the installation commander. Acceptable methods of control include live trapping, hand catching, repellants, tranquilizer dart guns, and shooting.

The CNO Policy Letter of January 2002 on Preventing Feral Cat and Dog Populations on Navy Property states installations must adopt proactive pet management procedures that prevent the establishment of free-roaming cat and dog populations. Additionally, installations must ensure the humane capture and removal of feral cats and dogs, and efforts should be made to find homes for adoptable animals (Navy 2002). The Armed Forces Pest Management Board Technical Guide No. 37, Integrated Management of Stray Animals on Military Installations (DoD, Armed Forces Pest Management Board 2012) provides additional guidance for installations in addressing feral cat control issues. The NRM is responsible for providing pet and wildlife information to Installation personnel. As a proactive measure for reducing the number of feral animals at the Installations, NASK also encourages responsible pet ownership and limiting feral pet access to food and shelter. Vaccination, registrations, and tags are required for every pet that resides on the Installation. Spay and neuter programs are promoted and all pets must be kept under strict supervision and control. Feeding of stray animals is prohibited and all dumpsters are required to be secured to prevent scavenging.

The IPM Plan for NASK provides a comprehensive document that captures all pest management operations and pesticide-related activities conducted at NASK. The plan incorporates relevant BMPs and local, State, Federal, and DoD regulations. Feral cat management and recommends includes measures to eliminate available food by securing garbage cans and dumpsters and prohibiting feeding of stray cats. Pet owners are encouraged to microchip their pets to improve pet identification (NAVFAC Atlantic 2011).

The pest control contract for NASK, which is monitored by the Facilities Engineering and Acquisition Division, provides for unscheduled miscellaneous pest control. Removal of wild and feral animals from the Installation includes skunks, opossums, snakes, cats, and dogs. Non-lethal methods of removal are recommended (i.e., cage-type live traps, Snake Guard® glue traps) and maintenance of the traps includes replacement of bait as required and timely removal of all trapped animals to prevent death by starvation or dehydration. Leg-hold traps are not permitted. Cats and dogs captured at the Main Station are to be transported to animal shelters in the cities of Kingsville or Corpus Christi. Skunks are to be destroyed humanely and disposed of off NASK property; all other animals will be returned to the wild away from human habitation.

NASK will continue to monitor the health and size of animal populations and control nuisance species as needed. A long-term management policy of public awareness (e.g., informing employees and visitors) for wildlife-related diseases focuses on, but is not 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 or feral animal, especially one that looks sick or abnormal;
- The use of protective measures against fungal diseases where there is an accumulation of animal feces (e.g., under a bird roost);
- Protection from vector-borne disease in high-risk areas using measures such as mosquito or tick repellent, and wearing special clothing; and
- Reduction in host populations and their ectoparasites.

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

1. **Problem definition** to determine the species and number of animals causing the problem, the amount of loss or nature of the conflict, and other biological and social factors related to the problem;
2. **Ecology of the problem species** to understand the life history of the species, especially in relationship to the conflict;

3. **Control method** takes the information gained from parts 1 and 2 and develops an appropriate management program to alleviate or reduce the conflict; and
4. **Evaluation of control** assesses the reduction in damage in relation to costs and impact of the control on target and non-target populations and the environment.

NASK would use recommended IPM practices to control pests occurring on properties. The NRM is responsible for annually reviewing the IPM plan and practices to ensure they are consistent with the installation's natural resources management program. The primary pests include fire ants, mosquitoes, cockroaches, termites, and biting flies. Because of the technical nature of this program, NASK would utilize sources of technical information, such as university researchers, to remain advised of current IPM techniques. Additionally, Installation grounds managers would be provided with continual training and education on the most recent IPM techniques and potential issues, such as impacts to natural resources. Integrated pest management practices together form a total management system which includes chemical, cultural, biological, genetic, and mechanical controls.

Birds nesting, roosting, or loafing on exterior and interior surfaces of all buildings and structures are generally considered nuisance birds. Generally, this includes such species as pigeons (Family Columbidae), starlings, house sparrows, and gulls. These species are known to be attracted to habitat near airstrips including ephemeral pools of water and low-cut grasses. Bird management programs may include trapping, harassment, lethal removal, non-lethal repellents, physical barriers, and toxic baits or perches. A Migratory Bird Depredation Permit from the USFWS is needed to harm migratory birds. While NASK has obtained a Migratory Bird Depredation Permit from USFWS, this permit is only applicable to removal of birds that cause a safety issue on or around the airfields. A listing of birds not protected by the MBTA can be found in the FR (70 FR 12710-12716).

Medium to large mammals can increase the BASH potential when entering runway or taxiway areas. Other than birds, javelina pose the biggest wildlife hazard, but other species such as deer, wild hogs, coyotes, and possibly scimitar-horned oryx are also of BASH concern. The hunting program attracts javelina and other game animals to the installation by maintaining corn feeders. This contributes to BASH potential. Continued removal of javelina at NASK and NALFOG by USDA Wildlife Biologists will help to reduce the potential for animal/aircraft mishaps.

The City of Kingsville and Kleberg County enacted the JLUS recommendation to create the Joint Airport Zoning Board in 2010, as authorized by Local Government Code 241. This board has regulation creating authority and enacted the Main Station Compatible Land Use and Hazard Zoning Regulations (2010). These regulations mirror the Navy's Clear Zone (OPNAV 11010.36C) recommendations and provide the Main Station with protection from incompatible development.

Agricultural practices have the potential to attract large numbers of birds and/or adversely impact wildlife habitat and degrade water quality. The current agricultural outleasing contracts at NASK

contain provisions for minimizing the potential environmental effectiveness of the lessee's use of the land. However, compliance with these provisions and the effectiveness of these measures is unknown. The types of row crops produced in the areas adjacent to each runway and the airfield Clear Zones at the Main Station can vary and the lease specifies what types of crops are permitted. Lease holders are not to increase the BASH hazard or cause environmental degradation through either leaking equipment or erosion.

NASK has received a migratory bird depredation permit from USFWS for management of birds at the Main Station and NALFOG airfields as part of the BASH Program (Appendix C). This permit expires on 31 March 2019, and will need to be renewed annually to allow continuation of techniques that remove (through live-trapping or lethal measures), or scare birds away from these airfields.

Aviator safety is among the Navy's highest priorities. BASH is one of the greatest threats to safety during flight training operations. The Navy therefore entered into a Memorandum of Understanding (MOU) with USDA Animal and Plant Health Inspection Service, Wildlife Services, on 1 October 2017 to establish and continue an Integrated Wildlife Damage Management (IWDM) program at various installations, including NASK. The MOU ends on September 30, 2018. The primary objective of this program is to assist and provide technical recommendations regarding wildlife hazards to aircraft and the protection of human health and safety. A secondary objective of the MOU is to reduce damage to property and natural resources caused by wildlife hazards. Additional objectives include:

- Coordinate with NRM to ensure the IWDM program is compliant with the INRMP and/or IPMP;
- Assist AirOps Officer, Airfield Manager, and NRM in the conduct of annual airfield BASH self-assessment;
- Supplement and enhance the overall Natural Resources Program;
- Monitor wildlife activity while evaluating the effectiveness of IWDM program efforts;
- Facilitate the acquisition and renewal of an annual migratory bird depredation/salvage permit and state depredation permits, as necessary;
- Assist in wildlife-strike reporting and monthly briefings on the status of the BASH program;
- Assist with the review and revision of the NASK BASH Plan to ensure updated, effective techniques are in place to reduce the threat of wildlife strikes to aircraft;
- Assist in the collection, preparation and shipment of wildlife strike remains to the Smithsonian Institution for positive identification;
- Serve as a member of the NASK Bird Hazard Working Group;
- Evaluate off-station airfields frequented by military aircraft where repeated BASH strikes have occurred, as directed by NASK points of contact.
- Consider wildlife activity monitoring data and information collected by the NRP as part of overall BASH management strategy;

- Train Bird Detection and Dispersal Team (BDDT) members on the use of active scare techniques and placement of static wildlife deterrent devices; and
- Train local squadrons detailing bird and animal strike hazards.

A number of strategies may be employed to minimize BASH problems. However, modification of the habitat surrounding an airfield is the most effective long-term solution, since long-term results can be expected, resulting in a lower frequency of implementing additional habitat modification measures once completed. Other techniques are available to be used in conjunction with habitat modification to remove the attractiveness of the airfields to birds and wildlife, such as encouraging use of habitats by birds and wildlife that are located away from the aerodrome portion of the parcels.

NASK has environmental staff that are directly involved with the management of natural resources to ensure the safety of the airfields as required by the BASH Program, including the NRM and USDA wildlife biologists. USDA APHIS WS has assigned one full-time wildlife biologist, subject to the MOU, who will employ appropriate methods for IWDM, including approved traps, pyrotechnics, firearms, and bird toxicants (e.g., Alpha Chloralose, Avitrol, and DRC-1339). IWDM will compliment activities of the Natural Resources Program and will coordinate activities with the NRM and Airfield Operations Officer, as well as local, state and federal officials. These professionals are continually evaluating and implementing solutions to reduce the BASH potential.

For INRMP projects that could potentially affect BASH Program requirements, the NRM will coordinate implementation of these with the USDA wildlife biologist who is responsible for implementing the BASH Program. NASK completed a Wildlife Hazard Assessment (WHA) for The Main Station and NALFOG, which defines the major BASH issues at these parcels and identifies strategies and recommendations for long-term protection of operational capabilities of NASK's airfields, as well as protecting the health, safety and welfare of civilians and military personnel, both on and off the Installation (USDA 2012). The NASK BASH Program Wildlife Hazard Management Plan (WHMP) shall integrate the WHA, INRMP, Integrated Pest Management Plan (IPMP), Airfield Environment Management (AEM), Wildlife Management (WM), and the OPNAVINST 3750.6S Safety Management System (SMS) principles to mitigate safety risks posed by wildlife hazards to airfield operations. The WHMP is currently in development (NASK BASH Program, no date).

The BASH Plan for NASK is subject to CNIC Instruction 3700, *Navy BASH Program Implementing Guidance*, of 7 July 2011. This instruction holds the Environmental Department and NRM responsible for ensuring the BASH program is compliant with all applicable environmental laws and regulations and DoD and Navy policies, directives, and instructions. Section 5(c)(2)(g) of the Instruction requires oversight of the USDA Wildlife Biologist and regular coordination of efforts and strike identification with the NRM.

NASK will manage all habitats surrounding an airfield, natural or man-made, in such a way as to discourage bird and wildlife hazards. Thorough and periodically updated ecological studies of airfields and their vicinity are vital to reduce BASH. NASK will determine the management practices that will best discourage birds/animals from flying/congregating in areas likely to cause problems, and implement those management practices. Wildlife occurs at or near airfields generally because of food, water, or shelter, and because of local migrations. By managing areas to be less attractive to nuisance wildlife, it is possible to reduce hazards.

Integration with Other Natural Resources Management Activities

- Coastal Zone Management, Section 5.2.1 – Control nuisance wildlife within coastal areas;
- Wetland Management, Section 5.2.2 – ensure pesticides do not contaminate wetlands and manage wetlands near airfields to reduce BASH;
- Soil Conservation and Erosion, Section 5.2.3 – control sedimentation into wetland habitat;
- Stormwater and Water Quality, Section 5.2.4 – prevent contamination of water quality by pesticides;
- Floodplains, Section 5.2.5 – ensure continued attenuation capacity of the floodplain;
- Landscaping and Grounds Maintenance, Section 5.2.6 – utilize IPM practices during landscaping and grounds maintenance;
- Urban Forestry, Section 5.2.8 – consider BASH risks when selecting trees and locations for urban forestry;
- Agricultural Outleasing, Section 5.2.9 – consider BASH risks when selecting crops to cultivate near airfields;
- Forest Protection, Section 5.3.1 burn to accentuate the environmental conditions of native plants and wildlife;
- Migratory Birds, Section 5.4.1 – ensure BASH control complies with the MBTA;
- Threatened and Endangered Species, Section 5.4.2 – control nuisance animals, such as feral cats, that predate on protect species;
- Nuisance Wildlife and BASH, Section 5.4.3 – manage invasive and nuisance wildlife populations to reduce BASH risk.
- Wildlife Diseases, Section 5.4.4 – control and/or remove invasive and nuisance wildlife to prevent spread of zoonosis.
- Outdoor Recreation, Section 5.5 – educate recreational users about precautions against disease-bearing insects and hazardous wildlife;
- Hunting, Section 5.5.1 – Hunt nuisance species;
- Wildlife Officer, Section 5.5.2 - coordinate with local law enforcement personnel to control and/or remove invasive and nuisance wildlife as needed.
- Natural Resources Training, Section 5.6.1 – ensure personnel are current on IPM and BASH procedures and laws; and
- GIS, Section 5.6.2 – map habitat types around airfields to identify BASH risks and solutions.

Ecosystem Management

An integrated ecosystem approach compliant with the SAIA, as amended, is used to manage habitats for wildlife. Safety, health, and BASH issued must be considered when developing management plans to control nuisance wildlife. Control and reduction of invasive and nuisance wildlife will help to restore wildlife habitat and ground cover at NASK, limit the spread of these species to areas in the region, limit the possibility of human infection, and reduce the BASH potential at NASK airfields.

The BASH potential at NASK will be reduced by managing wildlife on undeveloped, semi-developed, and developed areas of the Installation and habitats around the airfield. By tracking BASH-related airfield incidents using a georeferenced data set, including information on habitat types at and near each incident's location, a more complete understanding of risks and potential causes of strikes can be developed, leading to more effective management actions.

Military Mission

Nuisance wildlife and the outbreak of disease at NASK could pose a threat to implementation of the military mission through the infection of military personnel and the consequent limitation of access to areas of the Complex to control a problem. Structural damage to military infrastructure from infestation could also result in delays and costs to operations. BASH is a serious issue and can potentially threaten the military mission by causing accidents in the air and on the runway. Accidents may cause equipment damage as well as bodily harm to aircraft personnel.

Laws, Executive Orders, Regulations, Directives, and Memoranda Relevant to Nuisance Wildlife and BASH

- Endangered Species Act, 16 U.S.C. 35, 32 CFR 190, provides for the identification and protection of RTE species of fish, wildlife, and plants and their critical habitats. It requires federal agencies to ensure that no agency action is likely to jeopardize the continued existence of a threatened or endangered species.
- Migratory Bird Treaty Act, as amended 16 U.S.C. 703-712, prohibits the taking or harming of a migratory bird, its eggs, nests, or young without the appropriate permit.
- Bald and Golden Eagle Protection Act, prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs.
- EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, imposes substantive obligations on the United States for the conservation of migratory birds and their habitats.
- 2003 National Defense Authorization Act, exempts the Armed Forces from the incidental taking of migratory birds during military readiness activities.
- OPNAVINST 5090.1D, 12-3.12(b), discusses preparation and implementation of BASH plans.

- CNIC Instruction 3700, 7 July 2011, establishes policies and procedures for implementing the BASH plan, establishes mandatory BASH event reporting and remains collection procedure and establishes BASH program procedures.
- OPNAVINST 5090.1D, 12-3.10, discusses Navy policy regarding invasive species.
- FIFRA, 7 U.S.C.136, states that a pesticide that is federally registered by the USEPA is not legal for use until it is also registered by the individual state.
- 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.
- OPNAVINST 5090.1D, Chapter 12, discusses the use of pesticides on Navy installations.
- Armed Forces Pest Management Board, Technical Information Memorandum No. 37, presents guidelines for reducing feral cat populations on military installations in the U.S.
- CNO Policy Letter (Ser. N456M/1U595820), 10 Jan 2002, requires Navy commands to institute proactive pet management procedures to prevent the establishment of feral cat and dog populations.
- OPNAVINST 5090.1D, 12-3.10(b), discusses Navy policy regarding feral cat and dog control, and explicitly prohibits the use of Trap-Neuter-Release and similar programs.
- EO 13112 (3 February 1999), Invasive Species, requires executive agencies to restrict the introduction of exotic organisms into natural ecosystems.
- Texas Penal Code 42.09, Animal Cruelty, makes it a Class A Misdemeanor to abandon a pet dog or cat, punishable with up to a \$4,000 fine and/or a year in jail.
- 70 FR 12710-12716, Final List of Bird Species to Which the MBTA Does Not Apply, provides a list of bird species to which the MBTA does not apply.
- FAA Regulations, OPNAVINST 3750.6R, (The Naval Aviation Safety Program), NAVFAC P-73, and NASK Instruction NASKINGSINST 3750.16C Code N30 all direct that every effort be taken to reduce or eliminate interaction between bird/wildlife and aircraft.
- DoDI 4715.03, Natural Resources Conservation Program, implements policy, assigns responsibilities, and prescribes procedures for the integrated management of natural and cultural resources on property under DoD control.
- SAIA, 16 USC 670a-o, requires that, to the extent appropriate and applicable, military installations must provide for fish and wildlife management, fish and wildlife habitat enhancements and modifications, and wetland protection, enhancement, and restoration where necessary to support fish, wildlife, and plants.
- OPNAVINST 3750.6, Naval Aviation Safety Program, issues policies and provisions of the Naval Aviation Safety Program.
- FAA, Advisory Circular 150/5200-32A, Reporting Aircraft Wildlife Strikes, explains the importance of reporting collisions between aircraft and wildlife (i.e., wildlife strikes), and examines recent improvements in the FAA's BASH Reporting system; how to report a wildlife strike; what happens to the wildlife strike report data; how to access the FAA National Wildlife Aircraft Strike Database; and the FAA's Feather Identification program.

- [FAA, Advisory Circular 150/5200-33B](#), Hazardous Wildlife Attractants on or Near Airports, provides guidance on certain land uses that have the potential to attract hazardous wildlife on or near airports as well as airport development projects that affect aircraft movement near hazardous wildlife attractants.

Additional Sources of Information

TPWD, Exotic and Invasive Species
TPWD, Nuisance Aquatic Vegetation
Texas Invasives
The Nature Conservancy, Protecting Native Plants and Animals
FAA, Airport Safety and Operations Division
FAA Wildlife Strike Database
FAA Wildlife Hazard Mitigation
DoD PIF BASH Planning
NASK BASH Program
Air Force Safety Center
U.S. Naval Safety Center, Airfield Operations
Commander, Navy Installations Command, NASK

5.4.4 Zoonosis Prevention

The Texas Department of State Health Services Zoonosis Control division monitors zoonosis, which are diseases communicable from animals to humans under natural conditions.

Appendix J contains information on the main zoonosis concerns for NASK and includes preventative measures to reduce their spread and transmission. To help prevent the spread of these diseases, the Branch Health Clinic and Navy BUMED should post notices of disease outbreaks that may affect NASK personnel, and promote preventative measures to limit their spread and transmission.

Issue

The main zoonosis concerns for the NASK Complex are rabies, lyme borreliosis, Rocky Mountain spotted fever, human ehrlichiosis, murine typhus, plague, mosquito-borne encephalitis, brucellosis, salmonellosis, Chagas disease, dengue fever, chikungunya virus, Zika virus, and anthrax (Texas Department of State Health Services, Zoonosis Control Division 2003). In addition, salmonella has been identified by the Texas Department of State Health Services, Zoonosis Control Division as a continuing concern. A full list of zoonotic diseases of concern in Texas can be obtained from the Texas Department of State Health Services at the website listed above. None of these diseases are of epidemic proportions, however, there are a number of preventive measures, which can, and should, be taken to minimize the possibility of disease transmission.

Goals and Objectives

- Ensure public awareness of public health concerns related to zoonosis through distribution of public health alerts and posting of best practices for avoiding incidents;
- Provide for the conservation, management and enhancement of natural resources at NASK by continuing to implement ecologically appropriate and beneficial land uses and management practices, while ensuring the continuation of the military mission;
- Prevent and control invasive and nuisance wildlife species, and wildlife diseases that may adversely affect human health and welfare, the health of the ecosystem, and the military mission;
- Protect, maintain, and restore native vegetative communities and plant and wildlife populations;
- Protect and conserve the ecological value and diversity of natural resources by fostering knowledge of, and participation in, adaptive ecosystem management;
- Continue existing, and establish new programs and procedures to monitor, maintain, and enhance wetlands and water quality;
- Maintain the ecological integrity of wetland and upland communities for the protection of native plant and animal species, including numerous federally and state listed species;
- Maintain the attenuation capacity of the remaining undisturbed acreage within the 100-year floodplain;
- Improve and enhance water quality by ensuring P2 Plans and SWPPPs are consistent with the installation's natural resources management program;
- Preserve, protect, and enhance water resources (e.g. wetlands, surface water, groundwater), including protection of undisturbed acreage located with 100-year floodplain areas and management of coastal zone resources;
- Control nuisance wildlife and wildlife diseases that may adversely affect human health or welfare, the health of the ecosystem, and the military mission;
- Ensure that land management and land use decisions comply with all applicable laws, executive orders, regulations, directives, and instructions, and that adverse impacts to the natural environment are minimized;
- Maintain existing and develop additional outdoor recreational trails, interpretive centers, and/or facilities to support present and future natural resources-based outdoor recreation for the DOD and their families, as well as the general public when possible;
- Provide adequate staffing, equipment, technology, and training to the Natural Resources Program to ensure proper implementation of this INRMP; and
- Incorporate the concept of ecosystem management into all planning and management processes.

Projects

- Biological resources survey and inventory (Project 1 in Appendix A)
- RTE Habitat Management (Project 2 in Appendix A)
- Invasive Species Control (Project 3 in Appendix A)

- NASK INRMP Update (Project 4 in Appendix A)
- Prescribed Fire Management (Project 5 in Appendix A)
- Neotropical Migratory Bird Survey (Project 6 in Appendix A)
- Habitat Management and Restoration (Project 7 in Appendix A)
- Natural Resources Outreach (Project 8 in Appendix A)
- South Texas Ambrosia Management Plan and Survey (Project 9 in Appendix A)
- Game Animal Survey on the Main Station and Dixie Annex (Project 10 in Appendix A)

Management Strategies

- Develop a system for alerting Installation residents and employees of any public health alerts as they arise.
- Develop an informational pamphlet or fact sheet on the zoonosis diseases of concern for Texas and highlighting measures to prevent their spread.
- The NRM should look for educational outreach opportunities to disseminate information on preventing the spread of the zoonosis diseases of concern in Texas, and alerting Installation residents and employees of any public health alerts as they arise. The information provided in Appendix J can be used to develop a pamphlet or fact sheet for zoonosis prevention at NASK.

Long-Term Management

There have been no reports of diseases affecting wildlife or humans at the NASK Complex. However, the NASK Complex should have a long-term management policy for promoting public awareness regarding the issues of concern associated with zoonosis prevention. Management would focus on, but not be limited to, the following issues:

- Maintain up-to-date information on the zoonosis diseases of concern for the area, including the specific times of year and conditions that present the greatest risk of exposure.
- Maintain knowledge of, and recognition of, early symptoms of diseases and the condition of exposure.
- Disseminate information regarding the dangers associated with approaching and/or handling wild animals, especially those that appear sick or act abnormally.
- Disseminate information on the use of measures that provide protection from contracting fungal diseases associated with the accumulation of feces (e.g., under bird and bat roosts).
- Disseminate information on the use of measures that provide protection from vector-borne diseases in high-risk areas, such as use of mosquito or tick repellent and protective clothing.
- Disseminate information on the measures that can reduce host populations and their ectoparasites.

Integration with Other Natural Resources Management Activities

- Coastal Zone Management, Section 5.2.1 – manage coastal areas for disease outbreak;
- Wetland Management, Section 5.2.2 – wetland health relates to fishery health;
- Soil Conservation and Erosion, Section 5.2.3 – control sedimentation into aquatic areas;
- Stormwater and Water Quality, Section 5.2.4 – water quality relates to fishery health;
- Floodplains, Section 5.2.5 – floodplain maintenance relates to fishery health; maintain riparian habitats in support of fish and aquatic species management and to protect water quality within adjacent surface waters;
- Landscaping and Grounds Maintenance, Section 5.2.6 – educate grounds maintenance and landscaping personnel on the dangers associated with wildlife that can carry diseases and other zoonosis prevention measures associated with grounds maintenance and landscaping activities;
- Invasive, Exotic, and Noxious Species, Section 5.2.7 – control and/or remove invasive and nuisance wildlife species that pose a zoonosis risk;
- Urban Forestry, Section 5.2.8 – properly apply pesticides during urban forestry;
- Agricultural Outleaking, Section 5.2.9 – control flow of fertilizer and pesticide into aquatic areas;
- Migratory Birds, Section 5.4.1 – wading birds and osprey prey upon fish.
- Nuisance Wildlife and BASH, Section 5.4.3 – ensure aquatic areas do not increase the BASH risk;
- Outdoor Recreation, Section 5.5 – properly educate recreational participants in stewardship of the resource and aquatic environment;
- Hunting, Section 5.5.1 – provide hunting opportunities as appropriate and consistent with the BASH Program, and to ensure sustainable harvests of fish and wildlife resources;
- Wildlife Officer, Section 5.5.2 – Notify recreational users about any outbreaks;
- Natural Resources Training, Section 5.6.1 – ensure personnel are current on Texas hunting rules and regulations;
- GIS, Section 5.6.2 – utilize GIS tools to identify and manage areas where zoonosis risks are elevated or confirm locations of outbreaks.

Ecosystem Management

By controlling wildlife pests and diseases, NASK is protecting the healthy sustainable population of humans and wildlife on the Installation and within the region.

Military Mission

Increased productivity could potentially cause an increase in bird populations using the stormwater retention ponds. Birds have a potential to negatively impact the military mission through BASH-related incidents.

Laws, Executive Orders, Regulations, Directives, and Memoranda Relevant to Zoonosis Prevention

- Texas Administrative Code, Chapter 169, Subchapter A, Rabies Control and Eradication, provides details on vaccine requirements and protocols as mandated by the state of Texas, and requires that all dogs and cats be vaccinated against rabies by 4 months of age and on a 1-year or 3-year basis thereafter.
- Texas Administrative Code, 169.121, Reptile-Associated Salmonellosis; and Texas Health and Safety Code, Sections 81.351-353, Subchapter I, Animal-Borne Diseases; requires retail stores that sell reptiles to post warning signs and distribute written warnings regarding reptile-associated salmonellosis to purchasers in accordance with the form and content designated by the Texas Department of State Health Services.
- Texas Administrative Code, Chapter 97, Communicable Diseases, provides details on control of communicable diseases.

Additional Sources of Information

Center for Disease Control

USDA APHIS, National Wildlife Disease Program

USGS National Wildlife Health Center

Texas Department of State Health Services Zoonosis Control Division

5.5 OUTDOOR RECREATION

Outdoor recreation is the use of natural resources, including indoor interpretive centers, where the primary focus is on the understanding and application of the natural environment. Outdoor recreation includes nature trails, picnic and camping areas, consumptive and non-consumptive uses of natural resources, establishment and management of recreational trails, scenic rivers, equestrian areas, the use of off-road vehicles, as well as other uses of natural resources. It does not include other highly developed outdoor uses such as golf courses, tennis courts, ball/athletic fields, or swimming pools. Outdoor recreation opportunities are dependent upon the natural environment and can be classified as concentrated or dispersed.

The MWR Department is the primary entity responsible for maintaining and developing recreational activities at NASK, with the exception of natural resources-based outdoor recreational activities such as nature trails and primitive camping. The NASK NRM is responsible for most natural resources-based outdoor recreation at NASK.

The military mission of NASK limits public access to most areas of the Installation; however, controlled public access is allowed on a case-by-case basis. At the Main Station, escorted visits by educational groups or for controlled recreational activities can be arranged to allow the public to view natural resources. Public access to the Installation for participation in outdoor recreation activities is limited to authorized DoD personnel and their guests.

Due to the military mission, safety, and security requirements of NALFOG, public access to this site is limited. The Dixie Target Impact Range and the ROTH areas of Dixie Target Range also are restricted to authorized personnel, and do not allow public access. Access to Dixie Annex is restricted to active military (including guard and reserve), retired military, or DoD civilian equivalents. Due to the circumstances under which Dixie Annex was obtained, and the associated potential for unexploded practice ordnance to be present within the confines of the property, public safety cannot be assured. Additionally, public access would require staffing requirements beyond what is currently available at Dixie Target Range.

Issues

Navy policy is to permit access to outdoor recreation resources to the greatest degree possible, consistent with the installation's safety and security requirements and its available manpower and natural resources to support such activities without degradation or impairment of environmental qualities. The degree of public access for recreational purposes will be dependent on which of the NASK properties is being considered. Any limitation or regulation required will be based on mission, security and safety requirements. Controlled public access is permitted at NASK as part of the outdoor recreation program and educational outreach program.

Goals and Objectives

- Provide facilities and develop policies that allow for recreational and educational uses of natural resources, and result in positive effects to these natural resources while improving the quality of life;
- Protect and maintain natural resources within the NASK Complex by continuing and enhancing ecologically appropriate and beneficial land uses and management practices, while ensuring the continuation of the military mission;
- Protect, maintain, and restore native vegetative communities and plant and wildlife populations;
- Protect and conserve the ecological value and diversity of natural resources by fostering knowledge of, and participation in, adaptive ecosystem management;
- Maintain existing and develop additional outdoor recreational trails, interpretive centers, and/or facilities to support present and future natural resources-based outdoor recreation at NASK;
- Implement existing and further develop (where needed) natural resources-based outdoor recreation programs to support present and future outdoor recreation at the NASK;
- Control nuisance wildlife and wildlife diseases that may adversely affect human health or welfare, the health of the ecosystem, and the military mission;
- Continue existing, and establish new programs and procedures to monitor, maintain, and enhance wetlands and water quality;
- Maintain the ecological integrity of wetland and upland communities for the protection of native plant and animal species, including numerous federally and state listed species;

- Preserve and protect RTE species and species of special concern to ensure no reduction in population sizes;
- Ensure that land management and land use decisions comply with all applicable laws, executive orders, regulations, directives, and instructions, and that adverse impacts to the natural environment are minimized;
- Provide adequate staffing, equipment, technology, and training to the Natural Resources Program to ensure proper implementation of this INRMP;
- Incorporate the concept of ecosystem management into all planning and management processes;
- Develop partnerships with USDA NRCS, TCEQ, Texas A&M University–Kingsville, Texas Ornithological Society, Coastal Bend Audubon Society, DoD PIF, Kleberg County (encroachment partnering), and other local agencies and organizations to implement wildlife monitoring and protection programs; and
- Coordinate natural resources activities with local community, conservation organizations, and private groups.

Projects

- Biological resources survey and inventory (Project 1 in Appendix A)
- RTE Habitat Management (Project 2 in Appendix A)
- Invasive Species Control (Project 3 in Appendix A)
- NASK INRMP Update (Project 4 in Appendix A)
- Prescribed Fire Management (Project 5 in Appendix A)
- Neotropical Migratory Bird Survey (Project 6 in Appendix A)
- Habitat Management and Restoration (Project 7 in Appendix A)
- Natural Resources Outreach (Project 8 in Appendix A)
- South Texas Ambrosia Management Plan and Survey (Project 9 in Appendix A)
- Game Animal Survey on the Main Station and Dixie Annex (Project 10 in Appendix A)

Management Strategies

- Continue updating the baseline information pertaining to present usage of natural resources-based outdoor recreation activities;
- Continue to develop recreational trails and/or interpretive centers in areas exhibiting unique cultural, natural, historical, or archeological resources;
- Expand, improve, and provide additional facilities for outdoor recreational opportunities;
- Promote at least 50-foot buffers for all wetlands, and ensure land use and land management practices that will not adversely affect wetland resources;
- Continue to implement programs and activities for the protection and enhancement of threatened and endangered plant and animal species and their habitats;
- Continue to monitor the health and size of animal populations, and control populations as needed;

- Continually verify that natural resources personnel obtain proper training and certifications.
- Provide for public access that is necessary or appropriate for sustainable use by the public of natural resources to the extent that the use is not inconsistent with the needs of fish and wildlife resources, and subject to requirements necessary to ensure safety and military security.
- Review issues that currently affect public access to outdoor recreational resources, and modify access to provide for greater recreational opportunities to the extent possible based on security and mission requirements.

Long-Term Management

The Sikes Act requires that sustainable use by the public of natural resources take place to the extent that the use is not inconsistent with the needs of the fish and wildlife resources. In general, access for outdoor recreation is limited to: active duty and reserve military personnel assigned to work at the Installation, their dependents and accompanied guests; federal civilian employees, their dependents and accompanied guests; and military retirees. Additionally, public access for the use of the natural resources for outdoor recreation should not result in degradation of installation natural resources. In addition to traditional outdoor recreation activities such as hiking, wildlife watching, and hunting, outdoor recreation activities can include educational programs that foster a sense of responsible stewardship for military personnel and the general public who are authorized access to an installation for these recreational purposes.

The military mission of the Installation restricts public access, and therefore long-term management of public access issues is concentrated on providing public access in relation to education and stewardship purposes. Examples of long-term management strategies that can encourage outdoor recreation within limited access areas include:

- Use the expertise of university students and staff to help identify Special Interest Areas in exchange for letting them use the Installation as a study area;
- Implement and maintain appropriate ecosystem management practices and continue efforts to protect areas with significant natural resources (i.e., protected plant or animal communities);
- Provide access to the unique natural communities on the Complex for the purpose of environmental interpretation, particular consideration should be given to NASK with significant natural communities;
- Develop a regular maintenance program for all trails;
- Look into establishing hiking, nature trail and/or multi-use trails;
- Establish a system to promote the existing, as well as future, outdoor recreation opportunities, such as bicycling, and hiking/nature trails. Develop special promotions, (i.e., mountain bike races). Make information on these areas readily available to possible users;

- Promote the existing jogging and fitness trails. Develop a map designating each trail and make it readily available to users and potential users. Place sign-in sheets at trail heads to get an estimate of use;

Integration with Other Natural Resources Management Activities

- Coastal Zone Management, Section 5.2.1 – manage coastal areas to allow for recreation without impact to sensitive species;
- Wetland Management, Section 5.2.2 – ensure recreational opportunities do not compromise wetlands;
- Soil Conservation and Erosion, Section 5.2.3 – control sedimentation during recreational activities;
- Stormwater and Water Quality, Section 5.2.4 – ensure recreational opportunities do not compromise water quality;
- Floodplains, Section 5.2.5 – maintain coastal vegetation, i.e., marshes, sea-oats, upland vegetation to reduce flood impacts;
- Landscaping and Grounds Maintenance, Section 5.2.6 – develop aesthetically pleasing landscapes for recreation;
- Invasive, Exotic, and Noxious Species, Section 5.2.7 – reduce invasive and exotic species to enhance the outdoor recreational experience;
- Urban Forestry, Section 5.2.8 – utilize urban forestry principles to enhance recreational experiences;
- Agricultural Outleasing, Section 5.2.9 – avoid runoff of fertilizers and pesticides into recreational areas;
- Migratory Birds, Section 5.4.1 – avid bird watchers may be able to provide information;
- Threatened and Endangered Species, Section 5.4.2 – ensure recreational activities do not harass protected species, and make wildlife observers aware of rare species; provide for public access to the Installation to showcase the Navy's stewardship associated with conservation and protection of RTE plant species, and to allow for research projects to be conducted, in consideration of the military mission and security requirements;
- Nuisance Wildlife and BASH, Section 5.4.3 – control nuisance wildlife to enhance the outdoor recreational experience;
- Wildlife Diseases, Section 5.4.4 – consider the potential of disease transmission from animal to human contact, reduce human-wildlife interactions, Prohibit feeding of feral cats
- Hunting, Section 5.5.1 – Consider offering special hunts such as archery-only hunts for specific situations;
- Wildlife Officer, Section 5.5.2 - enforce federal, state, and local laws and regulations related to public access to the Installation for educational and outdoor recreation purposes, in consideration of the military mission and security requirements.
- Natural Resources Training, Section 5.6.1 – ensure personnel are current on applicable laws and recreational policies and regulations; and
- GIS, Section 5.6.2 – utilize maps to the benefit of outdoor recreation.

Ecosystem Management

Ecosystem management practices are enhanced by environmental stewardship and by educating the general public about environmental conservation issues, problems, and solutions. By providing natural recreational and educational opportunities on the Installation, NASK would help promote public awareness of vital environmental resource issues, including federally protected resources, thus providing a regionally limited educational resource. In addition, the Installation will provide opportunities for educating the public on the values and characteristics of a healthy environment, identify some of the problems and solutions associated with human use of the environment, and showcase the measures the Navy has adopted for protection of natural resources under their jurisdiction, including federally listed plant and animal species known to occur at the Installation.

Military Mission

Outdoor recreational opportunities are dependent upon the environment and the security and safety constraints of the military mission. At the same time, outdoor recreation serves to enhance the well-being and morale of base tenants. Outdoor recreational opportunities must be developed and used consistently with the sustainability of the land. The over-utilization or improper location of an outdoor recreation area could impact natural resources and the military mission.

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

- Sikes Act and Improvement Act of 1997, 16 U.S.C. 670a(b)(1)(G), requires public access to a military Installation for the necessary, appropriate, and sustainable use of natural resources by the public to the extent that the use is not inconsistent with the needs of the fish and wildlife resources or with safety and military security.
- SAIA of 1997, 16 USC 460 P-3, defines a program for developing facilities for outdoor recreation in cooperation with federal and state agencies.
- Outdoor Recreation – Federal/State Program Act, 16 U.S.C. 460c, defines a program for managing lands for outdoor recreation.
- OPNAVINST 5090.1D, 12-3.11, discusses natural resources management relating to the protection and management of outdoor recreational resources.
- National Historic Preservation Act, 16 U.S.C. 470-470m, establishes a program for the preservation of historic properties throughout the nation and for other purposes.
- Executive Order 11989, establishes policies and procedures to ensure the use of off-road vehicles on public lands will be controlled and directed so as to protect the resources of those lands.
- NAVFAC MO – 100.4, provides technical guidance for establishing goals and objectives and planning requirements for outdoor recreation.

- DODINST 4715.3 of May 1996, states DoD installations may engage in public awareness and outreach programs to educate the public regarding the resources on military lands and DoD efforts to conserve those resources.
- SECNAVINST 5090.8, requires integration of environmental protection, natural resources, and cultural resources programs into DoN operations and activities.

Additional Sources of Information

TPWD

Texas A&M University – Kingsville

5.5.1 Hunting Management

Hunting programs at NASK are administered by the Senior Huntmaster in coordination with NRM. Hunting is a natural resource program, and as stated in the SAIA, DoD Directive 4700.4, and OPNAVINST 5090.1D, 12-3.11, management of natural resources shall be carried out by professionally trained natural resource personnel. Prescribed burning and conservation benefits the hunting program by keeping fields open and accessible, and attracting native species of game. The program is administered by 12 off-duty, active sailors called “Huntmasters” that schedule, police, guide, and check licenses. Captain Spitzer established the Hunting Instructions and regulations for both the Main Station and Dixie Target Range. Methods to assign blinds to hunters include a drawing based on affiliation, and priority is given to active duty personnel followed by first-come, first-served. MWR administers permits and requires hunters to take hunting safety courses. Hunting at Dixie Annex will follow guidelines outlined by the TPWD Managed Lands Deer Program (MLDP) as long as the CO of NASK elects to participate in the program.

Hunting within the confines of NASK is allowed, although at NALFOG hunting is limited to birds and is allowed at the discretion of the CO. A summary of the hunting opportunities and data available for each of the NASK properties is described below.

Main Station

Hunting is allowed within the confines of the Main Station in accordance with the 2016 NASK Hunting Instructions (NASKINGSINST 1710.7MM). There are several places within the Installation where larger game, such as deer and javelina, are hunted from blinds and stands. Only blind hunting is permitted at the Main Station. Bird hunting is common in the South Field area of the Main Station and both quail and dove are hunted regularly during their open seasons. Hunting of big game species such as deer and javelina with center-fire rifles is allowed outside the airfield perimeter fence along Tranquitas and San Fernando creeks. Big game species are considered to be transient and therefore no harvest limits (e.g., number of animals, size, sex) are imposed on the hunters. Management for big game hunting is limited to maintenance of game feeders, blinds, controlling the number and location of hunters, as well as the hunting season. There are 13 blinds at the North Field big game area outside the fence line of the northern and

eastern edges of the maintained grass areas of the airfield, accessible by five gates. The South Field small game/bird hunting area located east of the abandoned airfield contains interior roadways and a game cleaning station. Captain’s Pond is located on the southwestern portion of the authorized hunting area.

A review of the Main Station hunting logs for December 2008 through January 2014 determined that 305 hunters participated in hunting activities during this time period (Table 5-4). In 2009–2011, for which hunting data are available for the entire year, the highest number of hunters (107) occurred in 2010. A low number of hunters (18) was recorded for 2011. The largest numbers of game harvested were small game and birds. Large game harvests consisted of white-tailed deer.

Table 5-4 Hunting Harvest Summary at the Main Station, December 2008–January 2017

Year	Date	# of Hunters	# of Buck	# of Doe	# of Small Game Birds	Did Not Report
2008	1 December 2008– 31 December 2008	61	2	2	6	6
2009	1 January 2009– 27 December 2009	92	0	2	63	9
2010	2 January 2010– 31 December 2010	107	0	0	131	6
2011	2 January 2011– 27 December 2011	18	1	0	8	9
2012	January 2012	3	0	0	0	0
2013	21 Sept 2013 – 26 January 2014	24	14	10	73	0

NALFOG

Hunting opportunities are not currently available at NALFOG.

Dixie Target Range

Due to the military mission and operations at Dixie Target Range there are no recreational opportunities in these parcels, and access is limited to authorized personnel. Animals are allowed to transit the facility but there is little in the way of supportive habitat available to them.

Hunting is allowed within the Dixie Annex in accordance with the 2016 Dixie Annex Hunting Instructions (NASKINGSINST 1710.27M). The native Texas terrain associated with the range provides the best conditions for outdoor recreation and education for NASK military personnel and their authorized guests. The range supports many types of wildlife and has natural habitats that is used by both migratory and resident species. Opportunities include limited hunting of white-tailed deer in November and December.

Hunters at Dixie Annex that are authorized to use the property are provided a briefing regarding the potential for unexploded ordnance to occur at the Annex. Dixie Annex is managed by the Senior Huntmaster designated by the CO and subordinate designated Huntmasters. Hunting opportunities at Dixie Annex include deer, javelina, dove, quail, ducks, rabbits, turkeys, nilgai, feral hogs, coyotes, foxes, and occasional red stag. Hunting for these species is authorized within the appropriate seasons. Only blind hunting is permitted for large game. There are 23 blinds, three fields, and two archery areas throughout the property. Senderos, paths used for hunting, are mowed and maintained on a 2- to 3-year rotation. This includes roller chopping to control persistent woody vegetation and burning maintain grassed areas for game birds such as turkey, quail, and bobwhite. Three blinds are located on the senderos paths, two located east of the senderos, one located on the southern tip of the property, and 17 located on the western portion of the property, west of the Annex Entrance.

Issues

The Sikes Act requires public access to a military installation for the necessary, appropriate, and sustainable use of natural resources by the public to the extent that the use is consistent with the needs of the wildlife resources, or with safety and military security requirements. Hunting is permitted at the Main Station and Dixie Annex but must be managed so that these activities do not conflict with the military mission or increase BASH potential. Current conflicts with BASH are caused by feeders that attract javelina, deer, and various birds. Fence improvements could help prevent wildlife from becoming a hazard to aircrafts.

Monies are deposited into the Installation's X5095 (Sikes Act) account at the Treasury where the installation must budget and request funds to expend on an annual basis. MWR sells the installation hunting permits and collects fees if the station is charging for hunting opportunities.

Goals and Objectives

- Provide outdoor recreational and educational uses of natural resources that will result in positive effects on those natural resources while improving quality of life for authorized users.
- Evaluate additional opportunities for natural resources-related outdoor recreation.
- Provide and promote outdoor recreation opportunities (e.g., hunting, wildlife observation, photography) to DoD personnel and their families.
- Provide and promote outdoor recreation opportunities to the public, subject to requirements necessary to ensure safety and military security.
- Protect, conserve, and enhance the ecological value and diversity of natural resources by building productive relationships with regulatory agencies and the public in support of the military mission.
- Maintain interagency cooperation with USFWS and TPWD.

- Develop partnerships with USDA NRCS, TCEQ, Texas A&M University–Kingsville, Texas Ornithological Society, Coastal Bend Audubon Society, DoD PIF, Kleberg County (encroachment partnering), and other local agencies and organizations to implement wildlife monitoring and protection programs.
- Coordinate natural resources activities with local community, conservation organizations, and private groups.

Projects

- Biological resources survey and inventory (Project 1 in Appendix A)
- RTE Habitat Management (Project 2 in Appendix A)
- Invasive Species Control (Project 3 in Appendix A)
- NASK INRMP Update (Project 4 in Appendix A)
- Prescribed Fire Management (Project 5 in Appendix A)
- Neotropical Migratory Bird Survey (Project 6 in Appendix A)
- Habitat Management and Restoration (Project 7 in Appendix A)
- Natural Resources Outreach (Project 8 in Appendix A)
- South Texas Ambrosia Management Plan and Survey (Project 9 in Appendix A)
- Game Animal Survey the Main Station and Dixie Annex (Project 10 in Appendix A)

Management Strategies

- Maintain hunting logs for the Main Station and Dixie Annex.
- Determine if a shorter big game hunting season than that allowed by the state is needed due to volunteer manpower and mission constraints. It is recommended that the big game hunting season at NASK correspond with the annual rut to make hunting success more effective. An example of this would be to allow hunting only from the day after Thanksgiving to New Year's Day.
- Evaluate the potential to provide additional hunting opportunities for big game in the South Field area of the Main Station as a (rifled) shot-gun only area.
- Conduct an annual helicopter survey of Dixie Annex before February each year to determine harvest numbers for the coming year.
- Coordinate with TPWD and Navy biologists to establish hunting harvest limits based on available data.

Long-Term Management

Hunting at NASK requires continual management. Harvest limits should be reviewed annually and regulations should be updated as needed to remain consistent with land use decisions and the BASH Program, as well as to provide for sustainable wildlife management.

Integration with Other Natural Resources Management Activities

- Coastal Zone Management, Section 5.2.1 – manage hunting within coastal areas;

- Wetland Management, Section 5.2.2 – ensure hunting opportunities do not compromise wetlands;
- Soil Conservation and Erosion, Section 5.2.3 – limit disturbance of soil and sedimentation during hunting activities;
- Stormwater and Water Quality, Section 5.2.4 – ensure hunting opportunities do not compromise water quality;
- Floodplains, Section 5.2.5 – development of new recreational facilities must not compromise attenuation capacity of the floodplain;
- Landscaping and Grounds Maintenance, Section 5.2.6 – develop aesthetically pleasing landscapes for recreation;
- Invasive, Exotic, and Noxious Species, Section 5.2.7 – reduce invasive and exotic species to enhance the outdoor recreational experience; conduct biological surveys to obtain accurate information on game species populations on the Installation to ensure sustainable harvest limits are provided to hunters participating in these activities at NASK, where permitted by BASH Program requirements;
- Urban Forestry, Section 5.2.8 – utilize urban forestry principles to enhance recreational experiences;
- Agricultural Outleasing, Section 5.2.9 – avoid runoff of fertilizers and pesticides into recreational areas;
- Migratory Birds, Section 5.4.1 – avid bird watchers may be able to provide bird occurrence information;
- Threatened and Endangered Species, Section 5.4.2 – prohibit hunting activities that would result in take of RTE wildlife species known to occur at NASK;
- Nuisance Wildlife and BASH, Section 5.4.3 – manage and control invasive and nuisance wildlife to promote native wildlife diversity and for human health and safety. permit hunting of large game where these species pose a BASH risk;
- Wildlife Diseases, Section 5.4.4 – consider the potential of disease transmission from animal to human contact, reduce human-wildlife interactions;
- Outdoor Recreation, Section 5.5 – provide access to the Installation for the purpose of public participation in hunting activities, as appropriate and authorized in consideration of military readiness and security requirements; provide educational outreach related to authorized hunting activities at NASK;
- Wildlife Officer, Section 5.5.2 - enforce Navy policies and local laws and regulations associated with hunting, including ensuring participants in these activities at NASK have obtained the appropriate permits and authorizations;
- Natural Resources Training, Section 5.5.1 – ensure personnel receive training on management of hunting resources, to include regulations, licenses, and permits that are required for participants of these activities;
- GIS, Section 5.6.2 – utilize GIS tools to improve hunting management.

Ecosystem Management

Ecosystem management practices are enhanced by environmental stewardship and by providing authorized personnel with outdoor recreational opportunities. By providing natural recreational opportunities on the Installation, NASK would help promote public awareness of vital environmental resource issues, including management measures in federally listed wildlife species, and improve the quality of life for DoD personnel.

Military Mission

Outdoor recreational opportunities are dependent upon the environment and the security and safety constraints of the military mission. At the same time, outdoor recreation serves to enhance the well-being and morale of base tenants. Outdoor recreational opportunities must be developed and used consistently with the sustainability of the land. The over-utilization or improper location of an outdoor recreation area could impact natural resources and the military mission.

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

- Sikes Act and Improvement Act of 1997, 16 U.S.C. 670a(b)(1)(G), requires public access to a military Installation for the necessary, appropriate, and sustainable use of natural resources by the public to the extent that the use is not inconsistent with the needs of the fish and wildlife resources or with safety and military security.
- SAIA of 1997, 16 USC 460 P-3, defines a program for developing facilities for outdoor recreation in cooperation with federal and state agencies.
- Outdoor Recreation – Federal/State Program Act, 16 U.S.C. 460c, defines a program for managing lands for outdoor recreation.
- OPNAVINST 5090.1D, 12-3.11, discusses natural resources management relating to the protection and management of outdoor recreational resources.
- National Historic Preservation Act, 16 U.S.C. 470-470m, establishes a program for the preservation of historic properties throughout the nation and for other purposes.
- Executive Order 11989, establishes policies and procedures to ensure the use of off-road vehicles on public lands will be controlled and directed so as to protect the resources of those lands.
- NAVFAC MO – 100.4, provides technical guidance for establishing goals and objectives and planning requirements for outdoor recreation.
- DODINST 4715.3 of May 1996, states DoD installations may engage in public awareness and outreach programs to educate the public regarding the resources on military lands and DoD efforts to conserve those resources.
- SECNAVINST 5090.8, requires integration of environmental protection, natural resources, and cultural resources programs into DoN operations and activities.

- EO 13422 (18 January 2007), *Facilitation of Hunting Heritage and Wildlife Conservation*, directs Federal agencies to facilitate the expansion and enhancement of hunting opportunities and the management of game species and their habitat.
- Texas Parks and Wildlife Code, Title 5 (Wildlife and Plant Conservation), Subtitle A (Hunting Licenses), Chapters 41-50, provides state regulations on hunting licenses and defines privileges and fees.
- Texas Parks and Wildlife Code, Title 5, Subtitle B (Hunting), Chapters 61-68, prescribes general provisions for hunting in Texas.
- Armed Forces, Military Reservations and Facilities: Hunting and Trapping, 10 USC 2671, provides general requirements for hunting and trapping on military reservations and facilities.
- DoD Directive 4700.4, Natural Resources Management Program, prescribes policies and procedures for an integrated program for multiple-use management of natural resources on DoD property.
- NASKINGSINST 1710.7MM, provides hunting requirements for the Main Station.
- NASKINGSINST 1710.27L, provides hunting requirements for Dixie Annex.

Additional Sources of Information

TPWD Hunting

TPWD Hunting Regulations

TPWD Hunting Seasons and Hunting Regulations

5.5.2 Wildlife Officer

Section 107 of the Sikes Act (16 USC 670e-2) requires sufficient numbers of professionally trained natural resources management personnel and natural resources law enforcement personnel to be available and assigned responsibility to perform tasks necessary to carry out Title I of the Sikes Act, including the preparation and implementation of INRMPs.

The control of the use of available natural resources within the NASK Complex should be stringent enough to monitor and regulate their safe and judicious use, but not restrictive to the point of deviating from the designated use of the facilities.

NASK does not have an established natural resources law enforcement position. The NASK Security Officer is responsible for enforcement of all hunting regulations at the Main Station. Hunters are required to log-in, in person, with NASK security, and log-out on completion of all activities. At NALFOG, hunting is at the discretion of the CO. No hunting is allowed on the Target Area at Dixie Target Range. Hunting regulations for the Main Station is outlined in NASKINGINST 1710.7MM (Appendix I).

Security at Dixie Annex is the responsibility of the Security Officer in coordination with the Senior Huntmaster and subordinate Huntmasters. Before and after hunting activities, all hunters must

check in and check out at the hunter check-in/out station. The designation of responsible properties and procedures for hunting at Dixie Annex is outlined in NASKINGSINST 1710.27L.

All federal and state game wardens are allowed to enter any appropriate portion of NASK properties for inspection of compliance with appropriate hunting requirements. State and federal game wardens may occasionally visit the NASK Complex, and are escorted throughout the property.

Issues

The NASK Complex does not have designated natural resources law enforcement personnel; however, NASK security officers provide oversight of compliance with the hunting regulations that have been developed for individuals participating in these activities at the Installation.

Goals and Objectives

- Protect, maintain, and restore the natural resources of NASK in support of the military mission through enforcement of federal, state, and Installation laws and regulations pertaining to fish and wildlife.
- Provide for the conservation, management and enhancement of natural resources at NASK by continuing to implement ecologically appropriate and beneficial land uses and management practices, while ensuring the continuation of the military mission.
- Manage, maintain, and enhance land areas with natural resources value, and maintain ecological function.
- Provide quality, outdoor recreational and educational opportunities to improve the quality of life for Navy personnel and authorized guests, if such opportunities are available and within DoD security standards.
- Evaluate additional opportunities for natural resources-related outdoor recreation.
- Provide and promote outdoor recreation opportunities (e.g., hunting, wildlife observation, photography) to DoD personnel and their families.
- Provide and promote outdoor recreation opportunities to the public, subject to requirements necessary to ensure safety and military security.
- Protect, conserve, and enhance the ecological value and diversity of natural resources by building productive relationships with regulatory agencies and the public in support of the military mission.
- Maintain interagency cooperation with USFWS and TPWD.
- Develop partnerships with USDA NRCS, TCEQ, Texas A&M University–Kingsville, Texas Ornithological Society, Coastal Bend Audubon Society, DoD PIF, Kleberg County (encroachment partnering), and other local agencies and organizations to implement wildlife monitoring and protection programs.
- Coordinate natural resources activities with local community, conservation organizations, and private groups.

Projects

- Biological resources survey and inventory (Project 1 in Appendix A)
- RTE Habitat Management (Project 2 in Appendix A)
- Invasive Species Control (Project 3 in Appendix A)
- NASK INRMP Update (Project 4 in Appendix A)
- Prescribed Fire Management (Project 5 in Appendix A)
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- Habitat Management and Restoration (Project 7 in Appendix A)
- Natural Resources Outreach (Project 8 in Appendix A)
- South Texas Ambrosia Management Plan and Survey (Project 9 in Appendix A)
- Game Animal Survey Main Station and Dixie Target Range (Project 10 in Appendix A)

Management Strategies

- Continue updating the baseline information pertaining to present usage of natural resources-based outdoor recreation activities;
- Continue to develop recreational trails and/or interpretive centers in areas exhibiting unique cultural, natural, historical, or archeological resources;
- Expand, improve, and provide additional facilities for outdoor recreational opportunities;
- Continue to implement BMPs to minimize stormwater pollution and erosion;
- Promote at least 50-foot buffers for all wetlands, and ensure land use and land management practices that will not adversely affect wetland resources;
- Continue to implement programs and activities for the protection and enhancement of threatened and endangered plant and animal species and their habitats;
- Continue to develop a soil erosion control plan and reduce the rate of soil erosion through the implementation of long-term measures and projects;
- Continue to monitor the health and size of animal populations, and control populations as needed;
- Continually verify that natural resources personnel obtain proper training and certifications;
- Provide for public access that is necessary or appropriate for sustainable use by the public of natural resources to the extent that the use is not inconsistent with the needs of fish and wildlife resources, and subject to requirements necessary to ensure safety and military security; and
- Review issues that currently affect public access to outdoor recreational resources, and modify access to provide for greater recreational opportunities to the extent possible based on security and mission requirements.

Long-Term Management

The Sikes Act requires that sustainable use by the public of natural resources take place to the extent that the use is not inconsistent with the needs of the fish and wildlife resources. In general, access for outdoor recreation is limited to: active duty and reserve military personnel

assigned to work at the Installation, their dependents and accompanied guests; federal civilian employees, their dependents and accompanied guests; and military retirees. Additionally, public access for the use of the natural resources for outdoor recreation should not result in degradation of installation natural resources. In addition to traditional outdoor recreation activities such as hiking, wildlife watching, and hunting, outdoor recreation activities can include educational programs that foster a sense of responsible stewardship for military personnel and the general public who are authorized access to an installation for these recreational purposes.

The military mission of the Installation restricts public access, and therefore long-term management of public access issues is concentrated on providing public access in relation to education and stewardship purposes. Examples of long-term management strategies that can encourage outdoor recreation within limited access areas include:

- Use the expertise of university students and staff to help identify Special Interest Areas in exchange for letting them use the Installation as a study area;
- Implement and maintain appropriate ecosystem management practices and continue efforts to protect areas with significant natural resources (i.e., protected plant or animal communities);
- Provide access to the unique natural communities on the Complex for the purpose of environmental interpretation, particular consideration should be given to NASK with significant natural communities;
- Develop a regular maintenance program for all trails;
- Look into establishing hiking, nature trail and/or multi-use trails;
- Establish a system to promote the existing, as well as future, outdoor recreation opportunities, such as bicycling, and hiking/nature trails. Develop special promotions, (i.e., mountain bike races). Make information on these areas readily available to possible users;
- Promote the existing jogging and fitness trails. Develop a map designating each trail and make it readily available to users and potential users. Place sign-in sheets at trail heads to get an estimate of use;
- Conduct a survey to determine if the existing picnic areas are adequately serving the demand on the Installation;
- Consider organizing an archery club on the Installation. The club could help with the up-keep of the archery range. Development of an archery course should also be looked into;
- Develop management for bicycling; potentially through appointing an Installation employee (possibly from the Natural Resources Division) to be responsible for special events and general maintenance of the existing and proposed trails.

Integration with Other Natural Resources Management Activities

- Coastal Zone Management, Section 5.2.1 – manage coastal areas to allow for recreation without impact to sensitive species;

- Wetland Management, Section 5.2.2 – ensure recreational opportunities do not compromise wetlands;
- Soil Conservation and Erosion, Section 5.2.3 – control sedimentation during recreational activities;
- Stormwater and Water Quality, Section 5.2.4 – ensure recreational opportunities do not compromise water quality;
- Floodplains, Section 5.2.5 – maintain coastal vegetation, i.e., marshes, sea-oats, upland vegetation to reduce flood impacts;
- Landscaping and Grounds Maintenance, Section 5.2.6 – develop aesthetically pleasing landscapes for recreation;
- Invasive, Exotic, and Noxious Species, Section 5.2.7 – reduce invasive and exotic species to enhance the outdoor recreational experience;
- Urban Forestry, Section 5.2.8 – utilize urban forestry principles to enhance recreational experiences;
- Agricultural Outleasing, Section 5.2.9 – avoid runoff of fertilizers and pesticides into recreational areas;
- Forest Protection, Section 5.3.1 – protect forest health to the benefit of pleasant recreational experiences;
- Migratory Birds, Section 5.4.1 – avid bird watchers may be able to provide information;
- Threatened and Endangered Species, Section 5.4.2 – ensure recreational activities do not harass protected species, and make wildlife observers aware of rare species; provide for public access to the Installation to showcase the Navy’s stewardship associated with conservation and protection of RTE plant species, and to allow for research projects to be conducted, in consideration of the military mission and security requirements;
- Nuisance Wildlife and BASH, Section 5.4.3 – control nuisance wildlife to enhance the outdoor recreational experience;
- Wildlife Diseases, Section 5.4.4 – consider the potential of disease transmission from animal to human contact, reduce human-wildlife interactions, Prohibit feeding of feral cats
- Outdoor Recreation, Section 5.5 – provide educational outreach to showcase the Navy’ stewardship of natural resources, including protection and management of RTE plant and wildlife species known to occur at NASK; partner with federal and state agencies, universities, and NGOs to allow public access to the Installation for outdoor recreation, educational outreach, and research opportunities, in consideration of the military mission and security requirements;
- Hunting, Section 5.5.1 – Consider offering special hunts such as archery-only hunts for specific situations;
- Wildlife Officer, Section 5.5.2 - enforce federal, state, and local laws and regulations related to public access to the Installation for educational and outdoor recreation purposes, in consideration of the military mission and security requirements.
- Natural Resources Training, Section 5.6.1 – ensure personnel are current on applicable laws and recreational policies and regulations; and

- GIS, Section 5.6.2 – utilize maps to the benefit of outdoor recreation.

Ecosystem Management

Ecosystem management practices are enhanced by environmental stewardship and by educating the general public about environmental conservation issues, problems, and solutions. By providing natural recreational and educational opportunities on the Installation, NASK would help promote public awareness of vital environmental resource issues, including federally protected resources, thus providing a regionally limited educational resource. In addition, the Installation will provide opportunities for educating the public on the values and characteristics of a healthy environment, identify some of the problems and solutions associated with human use of the environment, and showcase the measures the Navy has adopted for protection of natural resources under their jurisdiction, including federally listed plant and animal species known to occur at the Installation.

Military Mission

Outdoor recreational opportunities are dependent upon the environment and the security and safety constraints of the military mission. At the same time, outdoor recreation serves to enhance the well-being and morale of base tenants. Outdoor recreational opportunities must be developed and used consistently with the sustainability of the land. The over-utilization or improper location of an outdoor recreation area could impact natural resources and the military mission.

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

- Sikes Act and Improvement Act of 1997, 16 U.S.C. 670a(b)(1)(G), requires public access to a military Installation for the necessary, appropriate, and sustainable use of natural resources by the public to the extent that the use is not inconsistent with the needs of the fish and wildlife resources or with safety and military security.
- SAIA of 1997, 16 USC 460 P-3, defines a program for developing facilities for outdoor recreation in cooperation with federal and state agencies.
- Outdoor Recreation – Federal/State Program Act, 16 U.S.C. 460c, defines a program for managing lands for outdoor recreation.
- OPNAVINST 5090.1D, 12-3.11, discusses natural resources management relating to the protection and management of outdoor recreational resources.
- National Historic Preservation Act, 16 U.S.C. 470-470m, establishes a program for the preservation of historic properties throughout the nation and for other purposes.
- Executive Order 11989, establishes policies and procedures to ensure the use of off-road vehicles on public lands will be controlled and directed so as to protect the resources of those lands.
- NAVFAC MO – 100.4, provides technical guidance for establishing goals and objectives and planning requirements for outdoor recreation.

- DODINST 4715.3 of May 1996, states DoD installations may engage in public awareness and outreach programs to educate the public regarding the resources on military lands and DoD efforts to conserve those resources.
- SECNAVINST 5090.8, requires integration of environmental protection, natural resources, and cultural resources programs into DoN operations and activities.

Additional Sources of Information

TPWD

Texas A&M University – Kingsville

5.6 TRAINING

This section addresses the development and implementation of programs and techniques for training natural resources personnel. The training issues of this INRMP include training of GIS data integration, access, and reporting.

The natural resources program at NASK shall support military readiness and sustainability while continuing to protect and conserve the natural resources on its properties. Natural resources and land management planning should be integrated with other base planning processes. All projects occurring on NASK that potentially impact natural resources (e.g. wetlands, natural areas, urban forests, floodplains, water quality) will be evaluated prior to implementation. This will allow those projects to be reviewed by appropriate personnel so potential constraints (e.g. RTE species, wetlands, floodplains) can be identified.

Natural resources personnel will review pertinent literature to stay informed on current methodologies and techniques for natural resources management. Natural resources personnel should ensure that project plans, including military construction (MILCON) projects are consistent with the INRMP's management goals, objectives and strategies. NASK will implement adaptive management to accommodate new strategies resulting from monitoring, scientific findings and new management guidelines.

Partnerships are often necessary and effective in implementing an INRMP while maintaining cost-effectiveness. Cooperative agreements are often used in partnerships with states, local governments, non-governmental organizations, and individuals to provide for the benefit, maintenance, and improvement of natural resources on DoD Installations. Cooperative agreements are authorized to implement INRMP projects (OPNAVINST 5090.1D, 12-3.4(c)(8)(b)). NAVFAC SE is tasked with providing the technical and administrative guidance for the development of cooperative agreements to implement natural resources plans and execute cooperative agreements on behalf of Installation commanders upon request.

5.6.1 Training of Natural Resource Personnel

Navy regulations require that every person in a natural resources program receive comprehensive natural resources training specific to their job assignment and maintain continued professional training needed for the work (OPNAVINST 5090.1D, 12-3.15). Furthermore, the SAIA, as amended, requires that a sufficient number of professionally trained NRMs are available to implement this INRMP for NASK. Natural resources personnel on NASK should receive training in all areas of environmental management. Management of water resources, coastal zone, soil, vegetation, landscaping, forests, wildlife, outdoor recreation, and GIS are all interrelated. Specific training needs for natural resources personnel at NASK include:

- Erosion and sediment control, water quality protection, and use of effective BMPs (NAVFAC 2012)
- Identification of wetlands and other sensitive habitats and species
- Vegetation and wildlife management related to BASH
- Field techniques for invasive plant management
- Techniques for grounds maintenance, landscape, and agricultural outlease management
- Conservation biology
- GPS and GIS training

In addition, personnel engaged in wildland fire management and pesticide application must receive specific training, as described below:

Wildland Fire Personnel Training

DoD has recently adopted the National Wildfire Coordination Group's (NWCG) Federal Wildland Fire Policy to govern all wildland fire activities carried out by DoD personnel. DoD is presently exploring the possibility of seeking membership in the NWCG. The NWCG is made up of all Federal agencies (except DoD) with wildland fire responsibilities and the National Association of State Foresters. The Federal Wildland Fire Policy requires that all personnel involved in prescribed fire and/or wildfire activities meet certain training and physical qualifications. DoD is presently reviewing how it will implement this requirement. Some military installations have already implemented this requirement with most of them making it mandatory for new hires and positions and voluntary for current employees.

Pesticide Applicator Training

Pest Management is provided through implementation of the Integrated Pest Management Plan (IPMP). The IPMP provides a comprehensive, long-range document that captures all the pest management operations and pesticide-related activities conducted at NASK. All Installation personnel who apply pesticides shall have received and maintained DoD (government staff) or Texas (contractors) certification as pesticide applicators for the categories of pest control engaged.

Federal Personnel

Federal personnel applying any pesticide on Federal land need DoD certification in accordance with OPNAVINST 6250.4B. Only Federal employees under hiring programs with duties as pesticide applicators can participate in the on-the-job (OTJ) training program. During this time, the new employee works under the direct supervision (see paragraph 2 below) of a certified pesticide applicator until they are qualified (1-year OTJ experience) and satisfactorily complete the DoD Pest Management Certification Course and can work independently.

Civilian Contractors

Civilian contractors applying any pesticide on NASK require a Texas certification in the category or applicable sub-categories of work performed. All of the contractor's pest management staff who applies pesticides must be certified as pesticide applicators. Non-certified contractor employees are prohibited from applying pesticides.

Inspectors

Individuals who evaluate the quality of work of pest control contracts (QAEs) should also be trained in the pest management category or categories of work being performed.

Supervisor

Direct supervision is defined in DoD Instruction 4150.7 as supervision that includes being at the specific location where pest management work is conducted, providing instruction and control, and maintaining a line-of-sight view of the work performed. Certain circumstances may temporarily remove the line-of-sight view of the application of pesticide from the supervisor such as topographic, vegetation, or structural constraints. Under these temporary circumstances, the supervisor shall be responsible for the actions of the pesticide applicators.

Training and Certification

Training and certification will be conducted at government expense for DoD personnel. Certified pest control personnel shall be re-certified in accordance with Texas or DoD requirements as specified above. Employed pesticide applicators must be certified and the quality assurance evaluator must be trained in the following categories when appropriate. Certification and training is required when performing pest control operations that involve restricted-use or state-limited-use pesticides, to supervise other employees conducting pest control involving restricted-use or state-limited-use pesticides, or to evaluate contractor performance relating to pest control within these categories:

- Forest pest control (DoD & USEPA category 2);

- Ornamental and turf pest control (DoD & USEPA category 3);
- Aquatic pest control (DoD & USEPA category 5);
- Right-of-way pest control (DoD & USEPA category 6);
- Industrial, Institutional, Structural, and Health-related pest control (DoD & USEPA category 7);
- Public health (DoD & USEPA category 8); and
- Aerial Application (DoD & USEPA category 11) if planned to be used.

Continuing Education and Training

Personnel, who are involved in pesticide applications on a regular or seasonal basis, especially when mixing formulations is required, are encouraged to attend local pest management classes, workshops and seminars. This is important in order to keep abreast of pest problems and pest management techniques, which are unique to the area surrounding the installation. This is particularly true when dealing with vegetation control since many of the herbicide labels indicate that choices in strength and application technique should be based on local conditions.

The time and labor expended in this type of training is easily recouped through improved efficiency in pest management. Local pest management training may include on-site training in addition to any off-site re-certification training, such as the DoD course or state re-certification requirements. Other personnel who deal directly with pest control operations, but who may not need to be certified, are also encouraged to attend local seminars to better understand pest management needs.

Issues

Successful ecosystem management at NASK requires a coordinated effort among all programs, tenant command personnel, outside partners, and regulators to protect the interdependent components that define an ecosystem. This coordinated effort provides the NRM with the ability to address consequences of actions on interrelated resources, and improves conflict resolution between competing programs and plans for use of the Installation's natural resources. Receipt of adequate natural resources training that covers the broad range of natural resources issues associated with NASK will improve coordination and ensure natural resources conflicts can be resolved within the confines of regulatory requirements and the military mission.

NASK currently funds the NRM position to provide for oversight of natural resources management at the Installation. Currently limited GIS management, data integration, and reporting are performed by the NRM and other environmental personnel. However, the ability of the NRM to perform collection of natural resources GIS data, and maintenance of the natural resources database would allow for more direct in-house management of natural resources to take place. Personnel should also be knowledgeable of environmental laws pertaining to federal lands and DoD installations.

Goals and Objectives

- Protect and maintain natural resources at NASK by continuation and enhancement of ecologically appropriate and beneficial land use and management practices, while ensuring the continuation of the military mission;
- Protect and enhance forest resources by practicing ecologically sound forest management leading to sustained yield of quality forest products, watershed protection, and wildlife habitat;
- Protect, maintain, and restore native communities of plant and animal life;
- Provide facilities and develop policies that allow for recreational and educational uses of natural resources, and result in positive effects to these natural resources while improving the quality of life;
- Protect and conserve the ecological value and diversity of natural resources by fostering knowledge of, and participation in, adaptive ecosystem management;
- Ensure that land management and land use decisions comply with all applicable laws, executive orders, regulations, directives, and instructions, and that adverse impacts to the natural environment are minimized;
- Provide adequate staffing, equipment, technology, and training to the Natural Resources Program to ensure proper implementation of this INRMP;
- Incorporate the concept of ecosystem management into all planning and management processes;
- Implement training, education, and stewardship initiatives for ecosystem management;
- Preserve and protect RTE species, and species of special concern, to prevent reduction of individuals or populations; and
- Establish a planning team to review and update the INRMP in accordance with OPNAVINST 5090.1D, 12-3.4(c)(4) and 12-3.4(c)(12).

Projects

- Biological resources survey and inventory (Project 1 in Appendix A)
- RTE Habitat Management (Project 2 in Appendix A)
- Invasive Species Control (Project 3 in Appendix A)
- NASK INRMP Update (Project 4 in Appendix A)
- Prescribed Fire Management (Project 5 in Appendix A)
- Neotropical Migratory Bird Survey (Project 6 in Appendix A)
- Habitat Management and Restoration (Project 7 in Appendix A)
- Natural Resources Outreach (Project 8 in Appendix A)
- South Texas Ambrosia Management Plan and Survey (Project 9 in Appendix A)
- Game Animal Survey the Main Station and Dixie Annex (Project 10 in Appendix A)

Management Strategies

- Staffing needs shall be continuously reviewed for adequacy and filled to meet those needs;

- Continue to purchase equipment (i.e., an all-terrain vehicle (ATV)/utility vehicle) needed for access areas too difficult to reach, as well as other needed supplies;
- Continue to obtain tools and capabilities (e.g., GPS/GIS mapping and digital photography) that will assist in managing natural resources and meeting the goals of the INRMP;
- Continue an ecosystem management awareness and training/education program available to all interested NASK personnel;
- Continue the technical education and training program for all contract and installation personnel involved in activities that may directly or indirectly affect ecosystem management success;
- Continue to implement programs and initiatives that foster citizen participation in ecosystem education and stewardship; and

Long-Term Management

Adequate staffing and training are essential components of long-term natural resources management at NASK. Partnerships and cooperation with regulatory agencies, NAVFAC SE, university researchers, conservation groups, and non-government organizations are also vital to the continued success of management activities. The NRM and other natural resources personnel are encouraged to attend local classes, workshops, and seminars as appropriate, especially as new regulations and BMPs are developed for natural resources management.

Integration with Other Natural Resources Management Activities

- Coastal Zone Management, Section 5.2.1 – Provide training on coastal zone management and the legal drivers that warrant management;
- Wetland Management, Section 5.2.2 – Provide training on wetland management and the legal drivers that warrant management;
- Soil Conservation and Erosion, Section 5.2.3 – Provide training on soil conservation, erosion and the legal drivers that warrant management;
- Stormwater and Water Quality, Section 5.2.4 – Provide training on stormwater and water quality management and the legal drivers that warrant management;
- Floodplains, Section 5.2.5 – Provide training on floodplain management and the legal drivers that warrant management;
- Landscaping and Grounds Maintenance, Section 5.2.6 – Provide training on the importance and impact landscape and grounds maintenance might have on communities and species;
- Invasive, Exotic, and Noxious Species, Section 5.2.7 – Provide training on coastal zone management and the legal drivers that warrant management;
- Urban Forestry, Section 5.2.8 – consider vegetative buffers and water quality during urban forestry;
- Agricultural Outleasings, Section 5.2.9 – Provide training on agricultural outleasings and the benefit they provide;

- Forest Protection, Section 5.3.1 – Provide training on forest protection and the strategies involved in management;
- Migratory Birds, Section 5.4.1 – Provide training on migratory birds and the legal drivers that warrant management;
- Threatened and Endangered Species, Section 5.4.2 – Provide training on RTE species management and the legal drivers that warrant management;
- Nuisance Wildlife and BASH, Section 5.4.3 – Provide training on nuisance wildlife and bash and the legal drivers that warrant management;
- Wildlife Diseases, Section 5.4.4 – Provide training on wildlife diseases and the legal drivers that warrant management;
- Outdoor Recreation, Section 5.5 – Provide information about recreational opportunities to people who work and live on base;
- Hunting, Section 5.5.1 – Ensure hunters get regular training on laws and regulations regarding habitats and species' status;
- Wildlife Officer, Section 5.5.2 – Ensure wildlife officer stays current on environmental regulations and listed species' status;
- Natural Resources Training, Section 5.6.1 – ensure personnel are current on IPM and BASH procedures and laws; and
- GIS, Section 5.6.2 – Provide training on GIS and use of the GRX for basic mapping needs.

Ecosystem Management

Ecosystem management is a holistic, adaptive-management concept that transcends man-made boundaries. Management for a sustainable ecosystem requires awareness, education, training, and responsible participation of individuals potentially affecting the ecosystem, as well as adjustments in management principles and practices to respond to new knowledge and dynamic conditions.

Plans and programs for maintaining and managing natural resources at NASK need to fully consider the interrelationships among resources on the Installation and assure no net loss of the military mission. The input and cooperation of regulatory agencies and other experts will best facilitate the success of these plans and programs.

Military Mission

A properly-trained natural resources staff is NASK's first line of protection against activities that could result in violations of environmental laws and policies. Communication between the NRM and the chain of command and other departments is vital to ensure that NASK remains in compliance with environmental legislation, avoiding regulatory action that could delay or otherwise compromise the military mission.

Laws, Executive Orders, Regulations, Directives, and Memoranda Relevant to Training of Natural Resources Personnel

- 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.
- 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 nongame fish and wildlife and their habitats.
- OPNAVINST 6250.4B, 27 August 1998, DOD Pest Management Programs, 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 dependents; attach or damage real property, supplies, or equipment; adversely affect the environment; or are otherwise undesirable.
- DoD Instruction 4150.7, requires a supervisor to be at the specific location where pest management work is conducted, providing instruction and control, and maintaining a line-of-sight view of the work performed.
- OPNAVINST 5090.1D, Chapter 12, discusses natural resources management at Navy installations.

Additional Sources of Information

Environmental Law Institute
Texas Department of Agriculture, Pesticide Application
National Wildfire Coordination Group
Texas Department of Agriculture, Wildfire Prevention
Qualifications of a Forestry Technician GS 0462-04 and Greater
Naval Civil Engineering Officer's Corps School (CECOS)
Student Conservation Association

Table 5-5 provides an example of natural resources training opportunities that are offered by federal and state agencies, universities, and NGOs. This list is not meant to be all inclusive, but offers a representative example of training opportunities available to natural resources personnel.

Table 5-5 Natural Resources Training Opportunities

U.S. Government, DoD	
Defense Environmental Network and Information Exchange (DENIX) Training and Education	
U.S. Navy Civil Engineer Corps Officers School (CECOS) Environmental Training Program 3502 Goodspeed Street, Suite 1 Port Hueneme, CA 93043-4336 Tel: 805-982-2895 DSN: 551-2895 Fax: 805-982-2918	
Armed Forces Pest Management Board Training and Certification	
U.S. Army Corps of Engineers (USACE) Professional Development Support Center 550 Sparkman Drive Huntsville, AL 35816 Tel: 256-895-7401 Fax: 256-895-7465	
U.S. Government, non-DoD	
U.S. Fish and Wildlife Service, National Conservation Training Center	
Route 1, Box 166 Shepherdstown, WV 25440 Division of Training Tel: 304-876-7472 Aquatic Resources Tel: 304-876-7445	Environmental Conservation Tel: 304-876-7475 Wildlife Tel: 304-876-7434 Technical (e.g., GIS) Tel: 304-876-7456
NGOs	
Wetland Training Institute, Inc. P. O. Box 31 Glennwood, NM 88039 Tel and Fax: 877-792-6482	
The Shipley Group P. O. Box 908 Farmington, UT 84025 Tel: 888-270-2157	
Universities	
Duke University Nicholas School of the Environment and Earth Sciences Continuing Education Program Box 90328 Durham, NC 27708-0328 Tel: 919-613-8082 Fax: 919-684-8741	
University of Wisconsin-Madison Gaylor Nelson Institute for Environmental Studies Science Hall, 550 North Park Street Madison, WI 53706-1491 Tel: 608-263-1796	

5.6.2 Geographical Information Systems, Data Integration, and Reporting

Mapping and spatial analysis are integral components of natural resources management that are fulfilled through the use of Geographic Information Systems (GIS) data and software. Data provide documentation for the location and attributes of resources while software contains the tools necessary for the management, display, and analysis of these data. A major goal of any

GIS is the development of rigorous organization and accuracy standards. These standards provide for a sound base dataset needed for rigorous analysis used in managing natural resources.

GIS is an integral part of natural resources and environmental protection and planning. This powerful management tool provides NRMs with a comprehensive database that includes a spatial component. Information such as aerial photographs, survey and monitoring data, and various other natural resource information are all tied to a geographical coordinate system. Availability of this information enhances an installation's ability to effectively coordinate and ensure that current and planned mission activities do not adversely impact watersheds, wetlands, floodplains, natural landscapes, soils, forests, vegetation and wildlife, prime and unique farmland, and other natural resources that must be protected, conserved, and managed using an ecosystem approach. Additionally, efficient and effective land use planning supports readiness and sustainability, while protecting and enhancing the natural resources for multiple use, sustained yield, and biological integrity.

Examples of baseline environmental data layers include:

- Property boundaries
- Topography
- Soils
- Vegetation cover
- Forest stands
- Wetlands
- Floodplains
- Stormwater detention ponds
- Sensitive natural resources
- Hunting compartments
- Hiking trails

The map figures presented in this INRMP were developed using existing digital data files provided by the Navy and from other GIS databases available to the public. An ESRI map service was used, which includes i-cubed Nationwide Prime high-resolution (approximately 3 ft. [1 m] or greater) imagery for the contiguous U.S. The i-cubed Nationwide Prime service is a seamless, color mosaic of various commercial and government imagery sources, including Aerials Express (0.3–0.6) meter resolution imagery for metropolitan areas and the best available USDA National Agriculture Imagery Program imagery and enhanced versions of USGS Digital Ortho Quarter Quad imagery for other areas. The imagery is projected to Universal Transverse Mercator, Zone 14 North, North American Datum of 1983. All GIS data created or modified for use in this INRMP will be submitted to NAVFAC SE and NASK upon completion of this project.

Issue

In accordance with the OPNAVINST 5090.1D, 12-3.15, NRMs are encouraged to use GIS as the basis of their INRMP, and thus all data layers with a spatial component are provided in a GIS-compatible format. The Commander, NAVFAC Southeast GeoReadiness Center (GRC) is the single, authoritative source and distribution point for all geospatial information within the area of responsibility of NAVFAC Southeast. The GeoReadiness Center houses the most current geospatial information (including aerial photography) for the entire NAVFAC Southeast region and provides access to the comprehensive dataset and analysis tools to regional and DoD decision-makers/managers, sponsored contractors, and other sponsored individuals via a secure government Internet site.

Natural resources data gathered from surveys and studies should be integrated into NASK's GIS database and made available to planners and land managers to aid in decision making and ensure resource management techniques and planned land uses do not conflict with natural resources conservation. The NRM must ensure that newly-acquired and updated natural resources data is integrated into the Installation GIS database on a regular basis.

Goals and Objectives

With appropriate GIS training, GIS management, data integration, access, and reporting may be used more frequently for natural resources management at NASK.

- Protect and maintain natural resources within NASK by continuation and enhancement of ecologically appropriate and beneficial land use and management practices, while ensuring the continuation of the military mission;
- Protect and enhance forest resources by practicing ecologically sound forest management leading to sustained yield of quality forest products, watershed protection, and wildlife habitat;
- Protect, maintain, and restore native communities of plant and animal life;
- Provide facilities and develop policies that allow for recreational and educational uses of natural resources, and result in positive effects to these natural resources while improving the quality of life;
- Protect and conserve the ecological value and diversity of natural resources by fostering knowledge of, and participation in, adaptive ecosystem management;
- Ensure that land management and land use decisions comply with all applicable laws, executive orders, regulations, directives, and instructions, and that adverse impacts to the natural environment are minimized;
- Provide adequate staffing, equipment, technology, and training to the Natural Resources Program to ensure proper implementation of this INRMP; and
- Implement training, education, and stewardship initiatives for ecosystem management;
- Incorporate the concept of ecosystem management into all planning and management processes;

Projects

There are no INRMP projects directly related to GIS, data integration, access, and reporting; however, all of the INRMP projects have a GIS component, including collection of field data, desk top analyses, and mapping. Current projects addressed in this INRMP are listed below.

- Biological resources survey and inventory (Project 1 in Appendix A)
- RTE Habitat Management (Project 2 in Appendix A)
- Invasive Species Control (Project 3 in Appendix A)
- NASK INRMP Update (Project 4 in Appendix A)
- Prescribed Fire Management (Project 5 in Appendix A)
- Neotropical Migratory Bird Survey (Project 6 in Appendix A)
- Habitat Management and Restoration (Project 7 in Appendix A)
- Natural Resources Outreach (Project 8 in Appendix A)
- South Texas Ambrosia Management Plan and Survey (Project 9 in Appendix A)
- Game Animal Survey on the Main Station and Dixie Annex (Project 10 in Appendix A)

Management Strategies

- Continue to obtain tools and capabilities (e.g., GPS/GIS mapping and digital photography) that will assist in managing natural resources and meeting the goals of the INRMP;
- Continue to integrate the management concepts of the INRMP into all appropriate working programs and department plans (e.g., PMP, Urban Forestry Plan, Grounds and Surfaced Area Maintenance Plan, and SWPPP);
- Continue the use of Computer-Aided Drafting and a GIS for construction, environmental, engineering, and natural resources mapping. NASK will continue to build and/or acquire appropriate Installation and region-wide data coverages;
- Continue an ecosystem management awareness and training/education program available to all interested NASK personnel; and
- Continue the technical education and training program for all contract and installation personnel involved in activities that may directly or indirectly affect ecosystem management success.

Long-term Management

GIS databases and mapping capabilities will be used for daily decisions as well as long-term planning of natural resources management and its integration with the military mission. This work is driven by laws such as the NEPA, ESA, and CWA. For NEPA compliance, all impacts on federal land from a proposed project must be considered before the project can be implemented. These impacts may affect natural resources such as endangered species, water, and wildlife, so detailed maps are required to assess the potential impacts on resources. A list of data layers that should be developed and maintained includes:

- RTE species occurrences;
- Streams and wetlands;

- Archaeological sites;
- Forest stand inventory data;
- Fire breaks and prescribed burning areas;
- Solid waste management areas;
- Hazardous waste management;
- Groundwater and soil remediation areas;
- Stormwater pollution prevention; and
- Air pollution emission sources.

The NRM also have access to ancillary data such as infrastructure, installation boundaries, and geodetic reference points via the NAVFAC SE Geo-Readiness Center. The NAVFAC SE Geo-Readiness Center maintains a server where finalized data, intermediate working data, and all supporting files are stored. Data for the Navy's training mission, such as training area boundaries, short range fire ranges, and training impact areas, are maintained by NASK.

Integration with Other Natural Resources Management Activities

Geographical Information Systems is integrated into every natural resource management activity described in this INRMP, from wetland management (Section 5.2.2) and soil conservation (5.1.3) to grounds maintenance (Section 5.2.6), forest protection (Section 5.3.1), BASH (Section 5.4.3), and RTE species conservation (Section 5.4.2). Data from surveys, studies, and other projects completed for any of these management activities should be submitted to the NRM and NAVFAC SE to ensure inclusion in the applicable GIS databases. This will also facilitate integration between the management activities themselves.

- Coastal Zone Management, Section 5.2.1 – Use GIS to map coastal resources, infrastructure and ecologically sensitive habitats;
- Wetland Management, Section 5.2.2 – Use GIS to find wetland signatures on aerials photographs, depressions in topography on LIDAR, and to map water resources and connectivity to land activities;
- Soil Conservation and Erosion, Section 5.2.3 – Use GIS to map erosion areas, shoreline stabilization areas;
- Stormwater and Water Quality, Section 5.2.4 – Use GIS to map stormwater features, infrastructure, and algal blooms;
- Floodplains, Section 5.2.5 – Use GIS to map floodplains, and to aid in determining the best areas to for new construction;
- Landscaping and Grounds Maintenance, Section 5.2.6 – Use GIS to map vegetative buffers, ornamental and native species locations, natural areas, and green areas;
- Invasive, Exotic, and Noxious Species, Section 5.2.7 – Use GIS to map out invasive species location, the extent of non-native plants within habitats, and areas where pesticides and herbicides are being applied;
- Urban Forestry, Section 5.2.8 – Use GIS to track urban forestry areas or projects;

- Agricultural Outleasing, Section 5.2.9 – Map agricultural outlease areas and use GIS to store property data;
- Forest Protection, Section 5.3.1 – Map burn areas, disease spread and any associated data;
- Migratory Birds, Section 5.4.1 – Use GIS to record bird sightings, map nests, nesting colonies, and the protected area buffers around them; Use GIS to determine proximity to such features to aid in development and construction activities;
- Threatened and Endangered Species, Section 5.4.2 – Map RTE species habitats, ranges and location data;
- Nuisance Wildlife and BASH, Section 5.4.3 – Use GIS to track trap locations, BASH occurrence and deterrent areas;
- Wildlife Diseases, Section 5.4.4 – Track locations of animal attacks, the spread of infection, and insect trap data through GIS tools;
- Outdoor Recreation, Section 5.5 – Use GIS to make maps of recreational areas such as wildlife trails, campgrounds, parks;
- Hunting, Section 5.5.1 – Use GIS to map hunting areas, blinds, feed stands, etc;
- Wildlife Officer, Section 5.5.2 – Use GIS to map hunting areas, wildlife traps, nuisance animal reports;
- Natural Resources Training, Section 5.6.1 – Provide GRX training to natural resources personnel, continue to use GIS technology to improve efficiency and assist with decision making process, and;
- GIS, Section 5.6.2 – continually obtain and implement the most recent technology and tools associated with GIS, continue to add data to the NAVFAC SE GRC database.

Ecosystem Management

The use of GIS enhances ecosystem management by making data available and decipherable across all components of the ecosystem. Air quality, water quality, land use, species presence, forest stands, and urban development, among other factors, can more easily be consolidated into overall analyses of ecosystem function on NASK.

Military Mission

Uninterrupted performance of the military mission at NASK depends upon compliance with environmental laws and policies and delineating environmentally-sensitive areas such as wetlands and the occurrences of protected species and their habitats. GIS is a crucial tool in this delineation and the accessibility of GIS databases by various departments at NASK facilitates the avoidance and minimization of impacts to sensitive areas.

Laws, Executive Orders, Regulations, Directives, and Memoranda Relevant to Geographical Information Systems, Data Integration, and Reporting

- 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.

- 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 nongame fish and wildlife and their habitats.
- OPNAVINST 5090.1D, Chapter 12, discusses natural resources management at Navy installations.

Additional Sources of Information

USEPA Environmental Dataset Gateway
USFWS National GIS Datasets
USDA NRCS Geospatial Data Gateway
TPWD GIS Lab Data Downloads
NAVFAC GeoReadiness Center
Geo-Readiness Explorer
GIS.com

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6.0 Implementation

Over the course of its implementation, this INRMP will:

- Enable NASK to make progress towards achieving a sustainable natural resources base and a realistic training environment which is embodied in the diversity of its natural ecosystems;
- Establish appropriate stewardship policies that serve to protect both natural resources;
- Ensure compliance with environmental laws;
- Provide a continuity of direction and effort that can accommodate changes in personnel and leadership;
- Promote cost-effectiveness through better planning and coordination;
- Promote good public relations by demonstrating the Installation's commitment to stewardship, as well as a multiple-use concept for the general public; and
- Make use of innovative strategies to accomplish specific management objectives.

6.1 PLAN IMPLEMENTATION AND REVIEW

<https://conservation.cnic.navy.mil/nr/>

The annual INRMP reviews and metrics located at the Natural Resources Data Call Station website (<https://clients.emainc.com/dcs/navfac/>) will be used to assess implementation. A general summary of major actions/projects during the next 5 years and programs they support are provided in Appendix A. Projects will be developed during the budgetary process and coordinated with CNRSE natural resources personnel.

Implementation of this INRMP will follow an annual strategy that addresses legal requirements, DoD and Navy directive or policy requirements, funding, implementation responsibilities, technical assistance, labor resources, and technological enhancements. In order for this INRMP to be considered implemented, the following actions will need to be completed.

1. Funding is secured for completion of all "must fund" environmental compliance projects.
2. Installation is staffed with a sufficient number of professionally trained environmental staff needed to perform the tasks required by the INRMP.
3. Annual coordination with all cooperating offices is performed.
4. Specific INRMP action accomplishments that are undertaken are documented each year.

The following sections provide an overview of the role that implementation of this INRMP would play in supporting sustainability of the military mission and the natural environment, meeting natural resources consultation requirements, achieving no net loss, attaining NEPA compliance, understanding project development and classification, identifying funding sources, establishing commitment, and endorsing the use of cooperative agreements. The INRMP projects identified in

Sections 4 and 5 are summarized in Appendix A and include information on the implementation schedule, prime legal driver and initiative, class, Navy assessment level, cost estimate, and funding source for each of the projects proposed in this INRMP. Details for each of the INRMP projects, including project details, project purpose, goals and objectives, baseline, and monitoring requirements are also provided in Appendix A.

6-6.2 PLANNING AND MISSION SUSTAINABILITY

The goal at NASK is to maintain and enhance the capability of military lands to support the training mission while conserving natural resources. The implementation of projects, future revisions and updates of this INRMP will assist NASK in maintaining natural habitats, assessing the impacts of military training activities on flora and fauna populations, controlling erosion and sedimentation in stream channels, roads and unvegetated areas, implementing ecosystem management, managing the Installation's forest areas, and providing recreational opportunities.

Frequent and close coordination between the NASK NRM and the Airfield Operations office will be necessary to implement this plan and ensure minimal impacts and conflicts with military training. The Airfield Operations office will schedule and manage airfield use and must be aware of proposed management actions on the properties. All actions that involve contractors or workers must coordinate with NASK natural resources staff. These actions will include, but are not limited to, timber harvest, invasive species control, and plant and animal surveys. In addition, the natural resources staff must know when and where military training is occurring so work can be coordinated with those activities. Airfield Operations provides a list of the range and training areas scheduled for use on a regular basis to assist with work planning.

6.3 PARTNERSHIPS

In accordance with OPNAVINST 5090.1D, 12-3.4, the NASK CO is responsible for funding, preparation, and implementation of the INRMP. The CO will use all available technical assistance as needed, including NRMs at NAVFAC Southeast in developing and maintaining an effective, integrated program to protect, conserve, and utilize natural resources on NASK properties. The magnitude and complexity of the management requirements sometimes necessitate outside assistance. This assistance can vary, but usually takes the form of a partnership, which may include funding, technical and logistical support, GIS or use of FWC biologists, or an agreement between agencies to achieve common goals. Agencies with shared goals include:

- NRCS to provide expertise on soil erosion control;
- USACE to develop wetland restoration and mitigation credit banks;
- USFWS to assist in identifying conservation measures for enhancement of RTE species and their habitat;
- FWC to assist in developing and implementing hunting regulations, feral hog depredation, and fish pond stocking;

At NASK, grounds maintenance is provided by a contract administered by NASK and supplemented by Navy personnel. Under the direction of the NASK CO, the Public Works Officer is responsible for implementing the INRMP with the assistance of the NASK NRM. NASK

employs a USDA Wildlife Biologist who is responsible for implementing the BASH Program. Additional assistance will be obtained, as needed, from outside federal and state agencies, including USFWS, U.S. Army Corps of Engineers (USACE), U.S. Environmental Protection Agency (USEPA), USDA NRCS, USDA Animal and Plant Health Inspection Service, TPWD, TCEQ and NAVFAC Southeast. The MWR Department is responsible for developing and coordinating the outdoor recreation and educational program covered by this INRMP with the NRM.

A cooperative agreement is used to acquire goods or services, or stimulate an activity that will be implemented for the public good. Section 103a of the Sikes Act (16 USC 670c-1) provides the authority to enter into cooperative agreements with state and local governments, NGOs, and individuals to provide for the maintenance and improvement of natural resources on, or to benefit natural and historic research on, DoD installations. In addition to a standard cooperative agreement, examples of other agreements include MOUs, and Cooperative Assistance Agreement. Funds appropriated for multiyear agreements during a fiscal year may be obligated to cover the cost of goods and services provided under a cooperative agreement entered into or through an agency agreement during any 18-month period beginning in that fiscal year, without regard to whether the agreement crosses fiscal years (31 USC §1535). Cooperative agreements entered into are subject to the availability of funds.

EO 13352, Facilitation of Cooperative Conservation (26 August 2004) directs that the Secretaries of the Interior, Agriculture, Commerce, and Defense; and the Administrator of the USEPA shall, to the extent permitted by law and subject to the availability of appropriations and in coordination with each other as appropriate:

- carry out the programs, projects, and activities of the agency that they respectively head that implement laws relating to the environment and natural resources in a manner that facilitates cooperative conservation;
- take appropriate account of and respects the interests of persons with ownership or other legally recognized interests in land and other natural resources;
- properly accommodate local participation in federal decision making; and
- provides that the programs, projects, and activities are consistent with protecting public health and safety.

The Navy solicits input during the development and update of this INRMP from cooperating federal and state agencies, the USFWS and TPWD (Appendix B). Cooperative agreements with local or regional fish and wildlife agencies, conservation organizations, and education organizations have been initiated in the past and will continue to be supported. These agencies include, but are not limited to DoD PIF, USDA NRCS, TCEQ, Texas A&M University – Kingsville, Texas Ornithological Society, and Coastal Bend Audubon Society.

6.4 FUNDING

This INRMP is a public document that requires the mutual agreement of NASK, USFWS, and TPWD. It is crucial therefore, that these entities reach a common understanding as to which

projects are most likely to be funded through the sources identified in Section 5. An annual strategy must be adopted for INRMP funding that addresses NASK's legal requirements.

Funding for implementation of the INRMP will come from the CNRSE or NAVFAC SE natural resources fund. The natural resources programs and projects described in this INRMP are divided into mandatory and stewardship categories to reflect implementation priorities. Every effort will be made to acquire O&M(N) Environmental or other funding to implement DoD mandatory projects, in the timeliest manner possible. Stewardship projects will be funded through fish and wildlife licenses or other fund sources as funds and personnel become available.

Forestry funding is provided through NAVFAC SE from the sale of timber products. Funding for special projects in natural resources may be available from NAVFAC SE through surplus funding sources or forestry reserve accounts. Non-compliance funding may come from Legacy Act. Funding for compliance with environmental legislation and regulations is requested through the Navy Environmental Program Requirements Web (EPRWeb). Compliance projects falling under the EPRWeb include species surveys, assessments, management, protection, INRMPs, wetlands protection, conservation mapping, nonpoint source pollution, watershed management, cultural resource surveys, protection and plans, archaeological curation, conservation of soil and water or fish and wildlife, forest management and outdoor recreation (wildlife). All projects must be conducted in strict compliance with the Anti-Deficiency Act (13 USC 1341), which requires that all obligations or commitments made by the Federal government be funded at levels that do not exceed the Congressional appropriations.

Table A-1 in Appendix A summarizes the projects scheduled at NASK. One of the objectives of the INRMP is to plan for no net loss of military mission. Partnerships, proper funding, and compliance with NEPA requirements will ensure that the Navy will achieve its military mission.

Once INRMP projects have been validated, and entered into Environmental Program Requirements (EPR)-web, sources of funding should be sought for these projects. EPR-web project entries should include clear justification of funds being requested so that: (1) natural resource funds are distributed wisely, and (2) funding levels are not threatened by the use of funds in ways that are inconsistent with funding program rules (Navy 2006). The primary sources for funding Navy natural resource projects are:

- Operations and Maintenance, Navy (O&MN) Environmental Funds
- Legacy Resource Management Program (Legacy Program) Funds
- Forestry Revenues
- Agricultural Outleasing
- Fish and Wildlife Fees
- Recycling Funds
- Strategic Environmental Research and Development Program (SERDP) Funds
- Other Non-DoD Funds

O&MN Environmental Funds

A majority of natural resource projects are funded with O&MN environmental funds, and are primarily restricted to support “must-fund” environmental compliance projects. Other limitations for the use of O&MN funds include the following.

- Only the initial procurement, construction, and modification of a facility or project are considered valid environmental funding requirements. The subsequent operation, modification due to mission requirements, maintenance, repair, and eventual replacement is considered a Real Property Maintenance funding requirement.
- When natural resource requirements are tied to a specific construction project or other action, funds for the natural resource requirements should be included in the overall project costs.

O&MN Environmental Funds are expected to be the primary source of funding for NASK INRMP Environmental Compliance projects.

The Legacy Resource Management Program

The Legacy Program was part of a special Congressional mandated initiative for funding military conservation projects. Although the Legacy Program was originally funded from 1991 to 1996 only, funds for new projects have continued to be available through this program (Navy 2006). Legacy Program funds can be used for a variety of conservation projects, such as regional ecosystem management initiatives, habitat preservation efforts, archaeological investigations, invasive species control, monitoring and predicting migratory patterns of birds and animals, and National partnerships and initiatives, such as National Public Lands Day. More information on requirements for Legacy Program applications can be found at: <http://www.dodlegacy.org/>.

Requests for Legacy Program funds should consider the following:

- The availability of Legacy Program funds is generally uncertain early in the year.
- Pre-proposals for Legacy Program projects are due in March and submitted using the Legacy Program Tracker Website: <http://www.dodlegacy.org/>.
- Project proposals are reviewed by the Navy chain of command before being submitted to the DoD Legacy Resources Management Office for final project selection.
- The Legacy Program website provides further guidance on the proposal process and types of projects requested.

Legacy Program funds should be considered as a potential funding source for NASK INRMP projects.

Agricultural Outleasing

Agricultural Outleasing funds are collected through the leasing of Navy-owned property for agricultural use. This money is directed back into Navy’s Natural Resources Program by NAVFAC Headquarters. Agricultural Outleasing funds are primarily allocated for agricultural outlease improvements, but may also potentially be used for natural resources management and stewardship projects once the primary objective is met. In addition to projects related to

agricultural outleasing, these funds can be used for implementation of INRMP stewardship projects. Although funds available through Agricultural Outleasing varies from year to year, this funding source is one of the more consistent sources for implementing INRMP projects that do not have environmental stewardship requirements. Agricultural Outleasing funds should be considered as a potential funding source for NASK INRMP projects that are not classified as environmental compliance projects.

Fish and Wildlife Fees

Fish and Wildlife Fees are primarily collected as part of installation hunting or trapping programs. These fees are deposited and used in accordance with the Sikes Act and DoD financial management regulations. The Sikes Act specifies that user fees collected for hunting or trapping shall be used only on the installation where they are collected, and be used exclusively for fish and wildlife conservation and management at the installation where collected. The recreational hunting program is a component of Navy's MWR Division; therefore, the fees collected for daily and annual hunting permits are used to offset MWR program costs. Fish and Wildlife Fees collected as part of NASK's hunting programs should be considered in providing support of natural resource management projects.

Recycling Funds

Installations that have a Qualified Recycling Program (QRP) may use their proceeds for some types of natural resource projects. Any proceeds collected as part of the installation QRP must first be used to cover QRP costs, and then up to 50% of the net proceeds can be for pollution abatement, pollution prevention, composting, alternative fueled vehicle infrastructure support, vehicle conversion, energy conversion, or occupational safety and health projects, with first consideration given to projects included in the installation's pollution-prevention plans. Remaining funds may be transferred to the non-appropriated MWR account for approved programs, or retained to cover anticipated future program costs. NASK does not currently include a QRP so Recycling Funds are not expected to be used to support any of the natural resource project recommended in this INRMP.

Strategic Environmental Research and Development Program (SERDP) Funds

SERDP is DoD's corporate environmental research and development program, planned and executing in full partnership with the U.S. Department of Energy and USEPA, with participation by numerous other federal and non-federal organizations (Navy 2006). SERDP funds are allocated for environmental and conservation project through a competitive process. The focus of SERDP is on Cleanup, Compliance, Conservation, and Pollution Preventions technologies. Due to the competitive process involved with allocation of SERDP Funds, NASK is not expected to receive funds through this source.

Non-DoD Funds

Non-DoD Funds, such as those received from grant programs, are available to fund natural resources management projects, such as watershed management and restoration, habitat restoration, and wetland and riparian area restoration. Federally funded grant programs typically

require non-federal matching funds, however, installations can partner with other groups for preparing proposals for eligible projects. NASK should consider grant funding and partnerships as a potential funding source for INRMP natural resources projects.

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7.0 List of Preparers

This document was updated in 2017 by LG² Environmental Solutions, Inc.

Table 7-1 List of INRMP Preparers

Name	Role	Highest Degree	Years of Experience	Project Responsibility
Lee Gerald	Program Manager	M.S. Biology/Marine Biology	28	INRMP Senior Review
Pete Johnson	Project Manager	B.S. Limnology	22	INRMP Preparation and Coordination
Tina Jackson	Biologist, Task Manager	B.S. Biology/ Marine Science Grad. Cert. NR Policy/ Admin MFAS, in progress	8	INRMP Preparation
Lisa Heise	Biologist	B.S. Biology	5	INRMP Preparation
Kelly Murray	Quality Assurance, Technical Editor	B.S. Geology	26	QA/QC, Editing
Dan Boylan	GIS Analyst	B.S. Geology B.S. Computer Science	34	Revised INRMP Figures

Revisions were based upon a previous version prepared by the Navy Project Team.

Name	Role
Jered Jackson	Navy Technical Representative, NAVFAC Southeast
George Kenny	Navy Technical Representative, NAVFAC Southeast
Jeremy Adams	Navy Technical Representative, NAVFAC Southeast
Laura LaBella	Navy Technical Representative, NAVFAC Southeast
Maria Barrera	Environmental Director, NASK
Abigail Rosenberg	Natural Resources Manager, NASK

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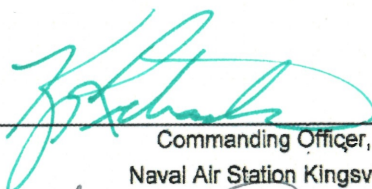
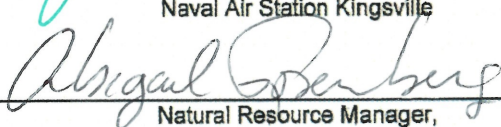
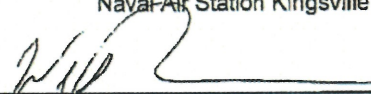
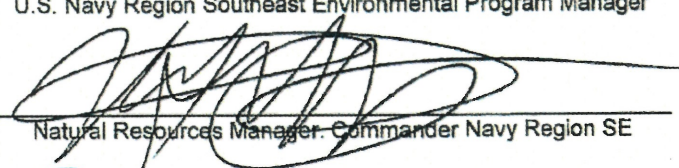

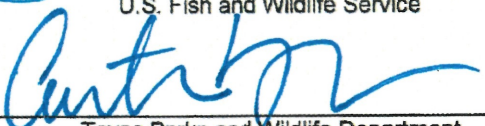
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**NAVAL AIR STATION KINGSVILLE
KINGSVILLE, TEXAS**

**INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN
(INRMP) - 2018 OPERATIONS AND EFFECT CONCURRENCE**

The Sikes Act and Department of Defense instruction require that annual and 5-year operation and effect reviews of INRMPs occur with federal and state partners. Representatives of the Navy, U.S. Fish & Wildlife Service, and the Texas Parks and Wildlife Department participate annually in the Naval Air Station Kingsville INRMP and Natural Resources Metric review. The last operation and effect review of this INRMP was in 2013 and it is due for another 5-year review. 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 the installation natural resources.

 _____ Commanding Officer, Naval Air Station Kingsville	<u>12/19/2018</u> (Date)
 _____ Natural Resource Manager, Naval Air Station Kingsville	<u>12/19/2018</u> (Date)
 _____ U.S. Navy Region Southeast Environmental Program Manager	<u>12/14/2018</u> (Date)
 _____ Natural Resources Manager, Commander Navy Region SE	<u>12/04/2018</u> (Date)
 _____ U.S. Fish and Wildlife Service	<u>6 Dec 2018</u> (Date)
 _____ Texas Parks and Wildlife Department	<u>17 December 2018</u> (Date)