



INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN

TYNDALL AFB



2015

**DRAFT
INTEGRATED NATURAL RESOURCES
MANAGEMENT PLAN**

TYNDALL AIR FORCE BASE, FLORIDA

**5 YEAR REVIEW IAW 32 CFR PART 190
CONSOLIDATED UPDATE JANUARY 2015**

January 2015



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SIGNATURE PAGE

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1. The Tyndall Air Force Base (AFB) Integrated Natural Resources Management Plan (INRMP) provides specific administrative and operational plans for managing natural resources at Tyndall AFB, and it fulfills the requirements defined in Air Force Instruction (AFI) 32-7064, *Integrated Natural Resources Management*.
2. This plan is effective upon commander’s signature and supersedes all previous versions of the Tyndall AFB INRMP.
3. This plan will be: 1) verified annually by the Environmental Chief, 2) reviewed by Air Force Civil Engineer Center (AFCEC) and all signature parties no less than once every 5 years (as required by AFI 32-7064, *Integrated Natural Resources Management*), in coordination with the United States Fish and Wildlife Service (USFWS) and the Florida Fish and Wildlife Conservation Commission (FWC).
4. The Office of Primary Responsibility for this document is 325th Civil Engineer Environmental Element, Natural Resources (325 CES/CEIEN).
5. Execution of this plan will be directed by the Commander, 325th Fighter Wing or his/her designated representative.
6. The effective date of the INRMP is the date the last required signature is obtained.

Colonel, U.S. Air Force
Commander, 325th Fighter Wing

Date

Dr. Catherine Phillips
Project Leader, Panama City Field Office, USFWS

Date

Nick Wiley
Executive Director, FWC

Date

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SECURITY INSTRUCTIONS/RECORD OF CHANGES

1. The unclassified title of this plan is the *Tyndall Air Force Base Integrated Natural Resources Management Plan* (INRMP).
 2. This document is unclassified and requires no special handling.
 3. This document may be reproduced, in whole or in part, as required for the preparation of supporting documents, checklists, and briefing aids. The approved annual updates and consolidated update will reside on the U.S. Air Force website: e-Plans. Agencies or individuals without direct access will be given printed or compact disc (CD) copies on request.
 4. This plan will be internally verified annually, reviewed by all signature parties at least once every five years and updated as needed on the e-Plans website by the installation in coordination with the U.S. Fish and Wildlife Service (USFWS) and the Florida Fish and Wildlife Conservation Commission (FWC). Certification of all reviews has been delegated to the 325th Civil Engineer Environmental Flight, Natural Resources (325 CES/CEIEN) by the Commander, 325th Fighter Wing. Annual and five-year review cycles per AFI 32-7064 are superseded by the continuous update (annual USFWS and FWC coordination) cycle of e-plans.
 5. Annual review may take one of several forms but the preferred method is to electronically transmit a tracked changes document to the USFWS and FWC for review of proposed changes. Once the review period is complete, the final annual review document is posted electronically. Signatures are not required for the annual review as long as concurrence is documented. This documentation and/or concurrence via email will be provided in an appendix annually.
 6. Revisions and annual coordination with USFWS and FWC will be reflected in a summary title page.
 7. SUMMARY OF CHANGES:
 1. Wildlife, vegetation, and habitat lists and descriptions updated.
 2. Added new threatened and endangered species and petitioned species tables, descriptions, and management activities.
 3. Prescribed fire and wildfire control responsibilities are now fully transferred to the Wildland Fire Center at Eglin Air Force Base (AFB), Florida, for planning, budget, and execution.
 4. Maps updated throughout the document.
 5. Organization names updated throughout the document, and summary of Air Force Civil Engineer Center's (AFCEC's) role added.
 6. Added climate change section.
 7. Updated mission, compliance and consultation sections.
 8. Summary of new INRMP review and update process included.
 9. Goals and objectives have been reorganized and tied to estimated completion date, drivers, and funding sources.
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ACRONYMS, SYMBOLS, AND ABBREVIATIONS

325 CES	325th Civil Engineer Squadron
325 CES/CEIE	325th Civil Engineer Squadron, Environmental Element
325 CES/CEIEC	325th Civil Engineer Squadron, Environmental Element, Compliance
325 CES/CEIEN	325th Civil Engineer Squadron, Environmental Element, Natural Resources
325 FSS	Force Support Squadron
325 FW/SEF	Flight Safety
ACC	Air Combat Command
ACES	Automated Civil Engineer System
AETC	Air Education Training Command
AF	Air Force
AFB	Air Force Base
AFCEC	Air Force Civil Engineer Center
AFI	Air Force Instruction
AFPD	Air Force Policy Directive
AFWFC	Air Force Wildland Fire Center
ARSA	Apalachicola Regional Stewardship Alliance
ATV	all-terrain vehicle
BASH	Bird/Wildlife Aircraft Strike Hazard
BGEPA	Bald and Golden Eagle Protection Act
BMP	best management practice
BO	Biological Opinion
C	Candidate species
CBD	Center for Biological Diversity
CCA	Candidate Conservation Agreement
CD	Compact disc
CFR	Code of Federal Regulations
CH	Critical Habitat
CIE	Crooked Island East
CIW	Crooked Island West
CN	Cultural Natural
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DoD	Department of Defense
DoDD	Department of Defense Directive
DoDI	Department of Defense Instruction
E	Endangered
EA	Environmental Assessment
EC	Environmental Compliance
EFH	Essential Fish Habitat
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EMS	Environmental Management System
EO	Executive Order
EQ	Environmental Quality
ERP	Environmental Restoration Program
ESA	Endangered Species Act
ESOH	Environment, Safety, and Occupational Health
ESOH/CAMP	Environment, Safety, and Occupational Health Compliance Assessment Management Program
F	degrees Fahrenheit
FAC	Florida Administrative Code
FBBCR	Florida Black Bear Conservation Rule
FCMP	Florida Coastal Management Program
FDACS	Florida Department of Agriculture and Consumer Services

ACRONYMS, SYMBOLS, AND ABBREVIATIONS, CONT'D

FDEP	Florida Department of Environmental Protection
FNAI	Florida Natural Areas Inventory
FSS	Force Support Squadron
FSU	Florida State University
FW	Fighter Wing
FWC	Florida Fish and Wildlife Conservation Commission
FWRI	Florida Fish and Wildlife Research Institute
FY	fiscal year
GEBF	Gulf Environmental Benefit Fund
GIS	geographic information system
GOM	Gulf of Mexico
GS	Grade Scale
GSA	General Services Administration
ha	hectare
IAW	in accordance with
ICRMP	Integrated Cultural Resources Management Plan
IDP	Installation Development Plan
INRMP	Integrated Natural Resources Management Plan
IPCC	Intergovernmental Panel on Climate Change
IRP	Installation Restoration Program
km	kilometers
m	meters
MAJCOM	Major Command
MBTA	Migratory Bird Treaty Act
MGT	Management
MMPA	Marine Mammal Protection Act
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MS4	Municipal Separate Storm Sewer System
NCO	Noncommissioned Officer
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
NFWF	National Fish and Wildlife Foundation
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPLD	National Public Land Day
NRDA	Natural Resource Damage Assessment
NRHP	National Register of Historic Places
NWCG	National Wildfire Coordinating Group
NWTF	National Wild Turkey Federation
P	Petitioned for listing under the federal Endangered Species Act
PT	Proposed Threatened
RCW	red-cockaded woodpecker
RED HORSE	Rapid Engineer Deployable Heavy Operational Repair Squadron Engineers
SAM	Sample
SSC	Species of Special Concern
STARS	Striving Toward Achieving Real Success
T	Threatened
T&E	threatened and endangered
TBD	to be determined
TNC	The Nature Conservancy

ACRONYMS, SYMBOLS, AND ABBREVIATIONS, CONT'D

TOA	Table of Allowances
TSI	timber stand improvement
U.S.	United States
UF	University of Florida
USACE	U.S. Army Corps of Engineers
USC	United States Code
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WMA	Wildlife Management Area

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EXECUTIVE SUMMARY

The purpose of this Integrated Natural Resources Management Plan (INRMP) is to provide interdisciplinary strategic guidance for the management and protection of natural resources at Tyndall Air Force Base (AFB), located in Bay County in northwest Florida. The primary objective of Tyndall's Natural Resources program is to ensure continued access to the land and airspace required to accomplish the Air Force mission while maintaining the natural resources in a healthy condition. The INRMP is prepared, in cooperation with the U.S. Fish and Wildlife Service and Florida Fish and Wildlife Conservation Commission, to ensure that natural resources management and mission activities are integrated and in agreement with state and federal mandates. This INRMP establishes guidelines for the protection, conservation, and use of natural resources at Tyndall AFB. The INRMP integrates and prioritizes wildlife, fire, and forest management activities to sustain and restore Tyndall AFB's ecosystems, and ensure "no net loss" in the operational capability of these resources to support Tyndall mission activity.

Tyndall AFB's INRMP provides a solid base for planning and review under the National Environmental Policy Act (NEPA), and also supports management of natural resources in coordination with multiple stakeholders. The INRMP identifies and prioritizes conservation goals to benefit the management of threatened and endangered (T&E) species habitat and jurisdictional wetlands. Regulatory requirements and practice standards outlined by the INRMP foster successful and timely integration of conservation and military activities. Implementation of the INRMP will ensure future mission capacity through good stewardship of natural resources, ecosystem management, and addressing mission priorities for Tyndall AFB. Tyndall's stewardship of natural areas ensures military ground operators have quality environments to utilize for training.

Through conservation of current resources on the installation, the U.S. Air Force promotes positive relationships with the public and with state and federal agencies. Avoidance and minimization measures protect resources and often reduce future operational costs. Opening land and water resources for recreation gives the public an opportunity to enjoy federal lands.

Tyndall AFB is committed to the following five principal natural resources management goals:

- Provide natural resources management and coordination services in support of the mission.
- Restore and manage forests for mission use, habitat improvement, and protection of T&E species.
- Enable long-term sustainability of beach environments for military use by protecting T&E species and their habitats.
- Restore and protect wetland habitats to comply with federal law and protect T&E species.
- Provide a variety of uses, values, products, and services to present and future generations while maintaining sustainable ecosystems.

Overall, these goals do not represent a significant change in the management direction of Tyndall AFB. However, the reorganization, prioritization, and connection of goals and objectives to the

Executive Summary

1 Automated Civil Engineer System are fundamental changes to this five-year review and update
2 of Tyndall's INRMP. Although changes in budget flow may alter the rate, timing, or individuals
3 involved in execution of the listed plans, Tyndall AFB is maintaining existing programs such
4 that the minimum effort will be maintenance of existing numbers and habitat conditions for T&E
5 species. The INRMP will be evaluated through the Environmental Impact Analysis Process and
6 documented on an Air Force Form 813, in accordance with 40 Code of Federal Regulations
7 Section 989 of the NEPA.

1. GENERAL INFORMATION

1.1 PURPOSE

The purpose of this Integrated Natural Resources Management Plan (INRMP) is to provide interdisciplinary strategic guidance for natural resources management on Tyndall Air Force Base (AFB) from 2014 to 2018. The INRMP outlines Tyndall AFB's plan to sustain, restore, and modernize natural and workforce infrastructure to ensure operational capability. This plan provides a means of successfully accomplishing the base mission while integrating all aspects of natural resources management. Additionally, the INRMP provides guidelines for the continued multiple use and sustained yield of Tyndall AFB's biologically diverse natural environment.

To ensure that natural resources management and other mission activities are integrated and in agreement with state and federal mandates, the INRMP is prepared in cooperation with the U.S. Fish and Wildlife Service (USFWS), the Florida Fish and Wildlife Conservation Commission (FWC), and other pertinent groups and agencies.

1.2 AUTHORITY

The INRMP was developed to meet the requirements of the Sikes Act (16 United States Code [USC] 670a *et seq.*) as amended by the Sikes Act Improvement Act; Department of Defense Instruction (DoDI) 4715.03, *Natural Resources Conservation Program*; Air Force Policy Directive (AFPD) 32-70, *Environmental Quality* (EQ); and Air Force Instruction (AFI) 32-7064, *Integrated Natural Resources Management*.

The Sikes Act states 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 the program required by this subsection to provide for:

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

Each INRMP shall, to the extent appropriate and applicable, provide for:

- Fish and wildlife management, land management, forest management, and fish- and wildlife-oriented recreation;
- Fish and wildlife habitat enhancement or modifications;
- Wetland protection, enhancement, and restoration, where necessary for support of fish, wildlife, or plants;
- Integration of, and consistency among, the various activities conducted under the plan;

- 1 • Establishment of specific natural resource management goals and objectives and time
2 frames for proposed action;
- 3 • Sustainable use by the public of natural resources to the extent that the use is not
4 inconsistent with the needs of fish and wildlife resources;
- 5 • Public access to the military installation that is necessary or appropriate subject to the
6 requirements necessary to ensure safety and military security;
- 7 • Enforcement of applicable natural resource laws (including regulations);
- 8 • No net loss in the capability of military installation lands to support the military mission
9 of the installation; and
- 10 • Such other activities as the Secretary of the military department determines appropriate.”

11 DoDI 4715.03, *Natural Resources Conservation Program*, is the overarching instruction for
12 Department of Defense (DoD) natural resource management, and is the primary agent for
13 implementing policy (including the Sikes Act), assigning responsibilities, and prescribing
14 procedures for the integrated management of natural resources on DoD property. This DoDI was
15 updated on 18 March 2011.

16 AFPD 32-70, *Environmental Quality*, establishes policies to: responsibly manage natural and
17 cultural resources on Air Force (AF) properties, clean up past environmental damage, meet
18 current environmental standards, plan future activities to minimize impacts, and eliminate
19 pollution from AF activities whenever possible. Under this directive, an AF EQ Program was
20 developed. This program includes the following activities: cleanup, compliance, conservation,
21 and pollution prevention. Additionally, this directive states that the AF will pursue adequate
22 funding to meet environmental legal obligations.

23 AFI 32-7064, *Integrated Natural Resources Management*, implements AFPD 32-70 and DoDI
24 4715.3. This instruction provides details on how to manage natural resources on AF installations
25 to comply with applicable federal, state, and local laws and regulations. The INRMP for Tyndall
26 AFB facilitates compliance with federal, state, and local environmental requirements. These
27 requirements deal with analysis of potential environmental impacts, water and air quality,
28 wetlands, endangered species, marine mammals, migratory birds, and other wildlife, forest and
29 fire management, and public access and recreation. The relevant statutes, executive orders
30 (EOs), and the application of various Natural Resource program components to significant laws
31 and regulations are listed in Appendix A.

32 **1.3 RESPONSIBILITIES**

33 Multiple installation organizations play roles in managing, protecting, and supporting Tyndall
34 AFB natural resources. To ensure the military training and environmental conservation missions
35 are compatible and mutually supportive, it is essential that these organizations work together to
36 promote the overall U.S. Air Force mission.

1 **1.3.1 Air Force Civil Engineer Center**

2 Air Force Civil Engineer Center (AFCEC) maintains centralized control of environmental
3 budgeting, staffing, and plan development, and assists bases with expertise and guidance. The
4 development of local policy, oversight, and program execution remain base-level
5 responsibilities.

6 **1.3.2 Wing Commander**

7 The Tyndall AFB Wing Commander, 325th Fighter Wing, is responsible for the following
8 aspects of the Tyndall AFB INRMP:

- 9 • Approve the INRMP.
- 10 • Certify the annual review of the INRMP as valid and current; or delegate the certification
11 of the annual INRMP review to the appropriate designee.
- 12 • Control access to and use of installation natural resources.

13 **1.3.3 Environment, Safety, and Occupational Health Council**

14 Active leadership within the Environment, Safety, and Occupational Health (ESOH) Council is
15 critical for the overall success of the Tyndall AFB INRMP. The ESOH Council consists of
16 squadron and unit level commanders whose operations may impact environmental resources at
17 the base, and is chaired by the Installation Commander. Specifically, the ESOH Council is
18 responsible for the following:

- 19 • Establish overall policy for the natural resources program at Tyndall AFB.
- 20 • Provide support of INRMP goals and objectives.
- 21 • Represent their organizations at the Tyndall AFB ESOH Council management review
22 process and conduct periodic internal reviews of their organization.

23 **1.3.4 Civil Engineer Environmental Flight**

24 **Base Civil Engineer**

25 At Tyndall AFB, the Base Civil Engineer is responsible for providing the Civil Engineer
26 Environmental Flight with oversight and management assistance to ensure that the INRMP is
27 implemented and executed. The Base Civil Engineer or his delegate is responsible for
28 coordination with the USFWS (to meet obligations under Section 7 of the Endangered Species
29 Act [ESA] and National Marine Fisheries Service (NMFS) (to meet obligations under the Marine
30 Mammal Protection Act [MMPA] and the Magnuson-Stevens Fishery Conservation and
31 Management Act).

1 Natural Resources

2 The Civil Engineer Installation Management Flight, Environmental Element, Natural Resources
3 (325 CES/CEIEN) is responsible for revision and monitoring of the Tyndall AFB INRMP.
4 Responsibilities include the following:

- 5 • Review AF Form 813s, *Request for Environmental Impact Analysis*, to determine natural
6 resource impacts which would result from a proposed action.
- 7 • Provide status of the natural resources management program to the ESOH Council when
8 requested.
- 9 • Project five years of goals for the implementation of the Tyndall AFB INRMP. Identify
10 objectives which will support each goal.
- 11 • Request appropriate funded projects from AFCEC to achieve objectives.
- 12 • Manage funding for projects.
- 13 • Manage available manpower to implement the Tyndall AFB INRMP.
- 14 • Conduct an annual review of the Tyndall AFB INRMP in coordination with the USFWS
15 and FWC, including updates and adjustments to goals and objectives as conditions
16 change. Record documentation to reflect Commander approval.
- 17 • Consolidate annual updates periodically (nominally every five years) to reflect
18 comprehensive changes. When available, use the e-Plan website.

19 Environmental Compliance

20 The Environmental Element, Compliance section, is responsible for air emissions, wastewater
21 and stormwater discharge, fuel storage, hazardous materials storage and disposal, solid waste
22 disposal and recycling, petroleum, oil, and lubricants, and contamination compliance program.
23 This group collaborates with the Natural Resources Program Manager on wetland and
24 stormwater issues that may affect natural resources.

25 Environmental Impact Analysis Process

26 The Environmental Impact Analysis Process (EIAP) Program Manager will:

- 27 • Act in accordance with (IAW) 32 Code of Federal Regulations (CFR) Part 989,
28 *Environmental Impact Analysis Process*. This is generally accomplished through
29 processing of AF Form 813s, *Request for Environmental Impact Analysis*.
- 30 • Attend the Facilities Review Board to ensure an AF Form 813 has been or will be
31 submitted for proposed projects that have the potential to impact the environment.
- 32 • Collaborate with the Environmental Element Chief to ensure any activity that has the
33 potential to negatively impact natural resources is reviewed.
- 34 • Manage National Environmental Policy Act (NEPA) documentation.

1.3.5 Unit Commanders (Assigned and Tenant Units)

Environmental requirements for units vary, dependent on the number and type of facilities used by the unit, and the number and type of operations performed by the unit. Unit Commanders have the following assigned environmental management responsibilities:

- Advocate Tyndall AFB's INRMP requirements to their respective units through enforcement and communication.
- Require coordination of all activities that have the potential to impact the environment (i.e., ground disturbance, construction, training that occurs off of paved or maintained surfaces) with the Civil Engineer Environmental Flight via AF Form 813, *Request for Environmental Impact Analysis*.
- Publish implementing instructions that are based on Tyndall AFB policies and unit-specific requirements.
- Actively participate in the Environmental Management System (EMS).
- Appoint a Unit Environmental Coordinator to act as the commander's inspector and representative.
- Participate in EMS and the Environmental, Safety, and Occupational Health Compliance Assessment and Management Program (ESOHCAMP) - required of all units operating on Tyndall regardless of unit size.

1.4 MANAGEMENT PHILOSOPHY

1.4.1 Interdisciplinary Approach

INRMP goals and objectives are developed in cooperation with state and federal agencies, military mission user groups, and other interested stakeholders to address natural resource management needs at Tyndall AFB. Once internal coordination and review of the INRMP is complete, it is provided to the USFWS and FWC for review and signature. The signature of these agencies reflects their mutual agreement on those portions of the INRMP within the scope of the agency's authority.

1.4.2 Applying Air Force Principles for Ecosystem Management

The principles of ecosystem management and biodiversity conservation serve as the foundation of the INRMP. The goal of ecosystem management is to preserve and enhance ecosystem integrity. Over the long-term, ecosystem management will improve the sustainability and biological diversity of terrestrial and aquatic ecosystems while supporting sustainable economies and communities. These principles further enable military mission success through sound stewardship and ensure continued access to land and airspace required to accomplish the AF mission.

1 Ecosystem management at Tyndall AFB includes the following AF principles:

- 2 • Maintenance or restoration of native ecosystem types across their natural range where
3 practical and consistent with the military mission.
- 4 • Maintenance or restoration of ecological processes, such as fire and other disturbance
5 regimes, where practical and consistent with the military mission.
- 6 • Maintenance or restoration of the hydrological processes in floodplains and wetlands,
7 when feasible.
- 8 • Collaboration with other DoD components as well as other federal, state, and local
9 agencies, and adjoining property owners.
- 10 • Provision for outdoor recreation, agricultural production, harvesting of forest products,
11 and other practical utilization of the land and its resources, provided that such use does
12 not inflict long-term ecosystem damage or negatively impact the AF mission.

13 **1.4.3 Supporting the Base Comprehensive Planning Process**

14 The INRMP is a key component plan of the Base Comprehensive Plan as detailed in AFI 32-
15 7062, *Air Force Comprehensive Planning*. The INRMP identifies natural resource features that
16 need to be considered and incorporated into the Base Comprehensive Plan regarding future
17 installation development. The INRMP also details natural resources management activities that
18 may need to be considered during comprehensive planning efforts.

19 **1.5 CONDITIONS FOR IMPLEMENTATION AND REVISION**

20 Responsibility for implementation of the Tyndall AFB INRMP (not including the supporting
21 plans) and coordination of reviews has been delegated to the Environmental Element Chief.
22 Interim updates to the INRMP are made in cases where changes in the military mission,
23 environmental compliance requirements, threatened or endangered species listings, or other new
24 information significantly affect the ability of Tyndall AFB to implement the INRMP.

25 **1.5.1 Implementation**

26 INRMP implementation includes, but is not limited to, the following:

- 27 • Execute all “must fund” projects and activities IAW specific timeframes identified in the
28 INRMP
- 29 • Ensure sufficient professionally trained natural resources management personnel are
30 available to perform the tasks required by the INRMP
- 31 • Review the INRMP annually, update goals and objectives, and coordinate changes with
32 regulators, as appropriate
- 33 • Document specific INRMP accomplishments undertaken each year

1 Supporting plans and organizations each have their own authority for budgeting and
2 implementation. The Environmental Element Chief has the responsibility to review, provide
3 input, and recommend changes to plans so they further the goals and objectives of the Tyndall
4 INRMP. Overall implementation responsibility remains with the Installation Commander.

5 **1.5.2 Annual Internal Review**

6 The annual review is formally coordinated with cooperating partners through notification of
7 updates and acknowledgement of guidance. Five-year funding projections are key components
8 of the annual updates. Unmet and new requirements cannot be added in the current or planning
9 year budgets. The annual review must verify the following:

- 10 • All “must fund” projects and activities have been budgeted for and implementation is on
11 schedule.
- 12 • All required trained natural resources positions are filled or are in the process of being
13 filled.
- 14 • Goals, objectives, and projects for the upcoming year have been identified and included
15 in the INRMP. An updated project list does not necessitate revising the INRMP if the
16 goals and objectives remain unchanged.
- 17 • Documentation of any required coordination with USFWS, NMFS, and FWC.
- 18 • Changes to the installation’s mission requirements or its natural resources have been
19 identified. If changes are significant, program for an INRMP out-of-cycle update.

20 **1.5.3 Five-Year Update**

21 The INRMP must be reviewed by all signatories at a minimum frequency of once every five
22 years in coordination with USFWS and FWC. Any changes may be incorporated into a new
23 revision at this time or a re-write may be undertaken if needed. A new signature page will be
24 accomplished under all circumstances. As of 2014, AFCEC will be utilizing continuous updates
25 on the e-Plans website to reduce the effort involved with five-year reviews for all signatory
26 parties.

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2. INSTALLATION OVERVIEW

2.1 LOCATION AND AREA

Tyndall AFB covers almost 30,000 acres (12,140 hectares [ha]) in the southeast corner of Bay County, approximately 13 miles (20 kilometers [km]) east of Panama City, Florida (Figure 2.1). There are approximately 23,350 acres (9,449 ha) of unimproved land, 1,080 acres (437 ha) of semi-improved land, and 4,840 acres (1,958.7 ha) of improved land. The base is a combination of developed and natural areas located on a peninsula that is bisected by U.S. Highway 98 (Figure 2.2). The base is approximately 18 miles (29 km) long and 3 miles (4.8 km) wide, and is surrounded by East Bay, St. Andrew Bay, and the Gulf of Mexico (GOM) to the north, west, and south. Crooked Island West (CIW) and East (CIE), which form St. Andrew Sound, are barrier spits on the Gulf. Tyndall also conducts air operations in range airspace shared with other AF bases and DoD branches, including areas over the GOM.

Tyndall's forested areas and beaches are particularly valued for mission activities. This unique setting in close proximity to overwater airspace provides a sea-to-land transition area—a vital resource for military operations. Additionally, other ground training units utilize Tyndall's forested areas and adjacent water assets.

2.2 INSTALLATION HISTORY

Old Town St. Andrew (present-day Panama City) was settled in the late 1820s. Well into the early twentieth century, turpentine and logging were the main economic revenue in the region. Tyndall Field was established in 1941 during the nation's military buildup, and during World War II, over 45,000 gunners were trained at Tyndall. Highlights of Tyndall's history after the war include the following:

- **1940s:** Tyndall became the home of Air University's Air Tactical School.
- **1950s:** The base was placed under the Air Training Command and designated the U.S. Air Force Pilot Instrument School to train all-weather jet interceptor pilots and air weapons controllers. In 1957, Tyndall became an Air Defense Command unit with the activation of the 73rd Air Division and the 4756th Air Defense Wing. The primary base mission became that of a weapons employment center.
- **1960s:** The U.S. Air Force Air Defense Weapons Center replaced the 4756th Air Defense Wing.
- **1970s:** Air Force Civil Engineer Support Agency, the worldwide focal point for air base operability processes, moved to Tyndall from Washington, D.C. In 1979, Tyndall was transferred to the Tactical Air Command.
- **1980s:** The 325th Fighter Weapons Wing was activated in 1981 and began its mission with F-101, F-106, and T-33 aircraft. It was soon re-designated as the 325th Tactical Training Wing, which assumed responsibility for all F-22 maintenance training for the Tactical Air Command, and began F-22 pilot training.

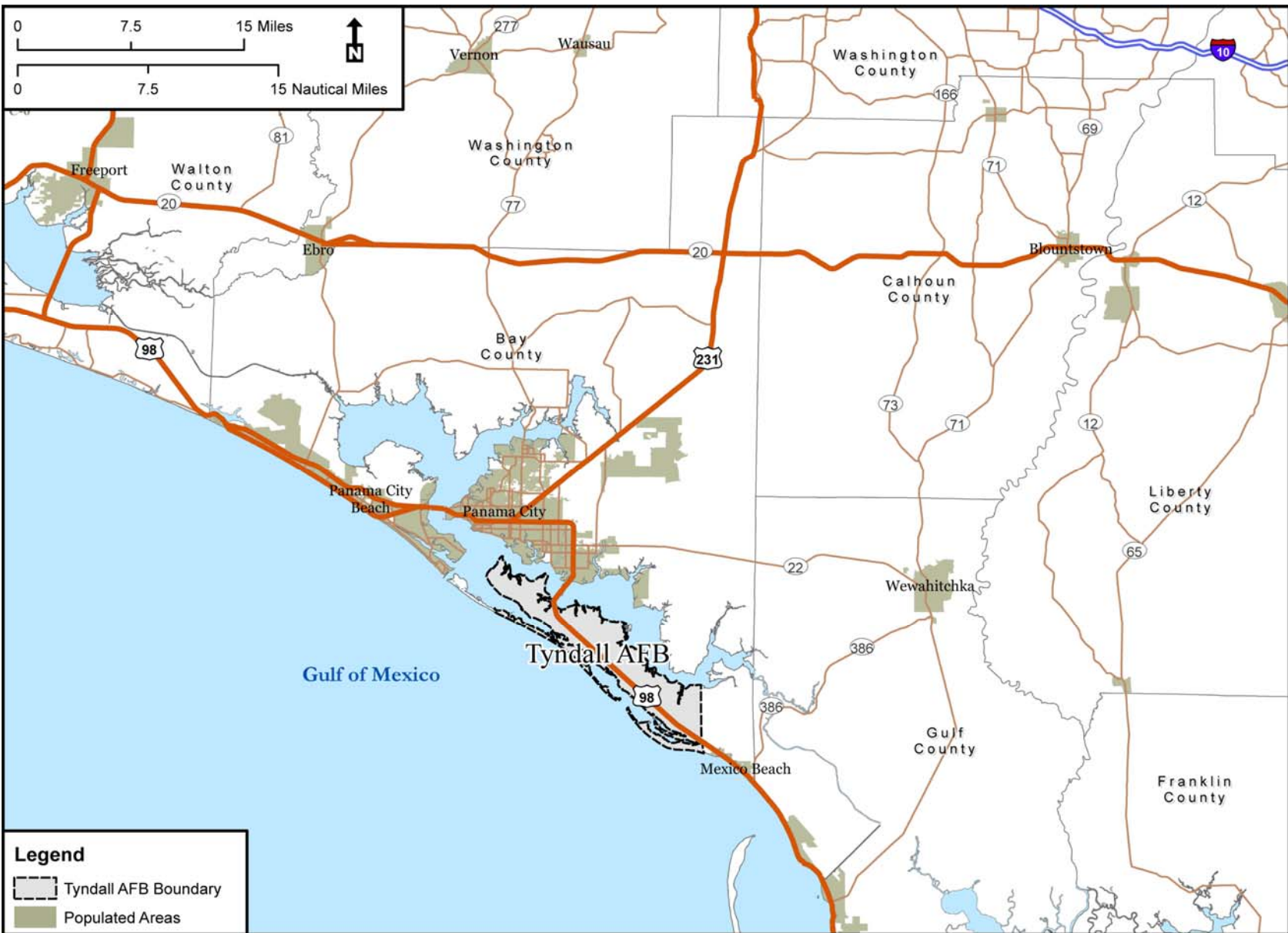


Figure 2.1. Location of Tyndall AFB

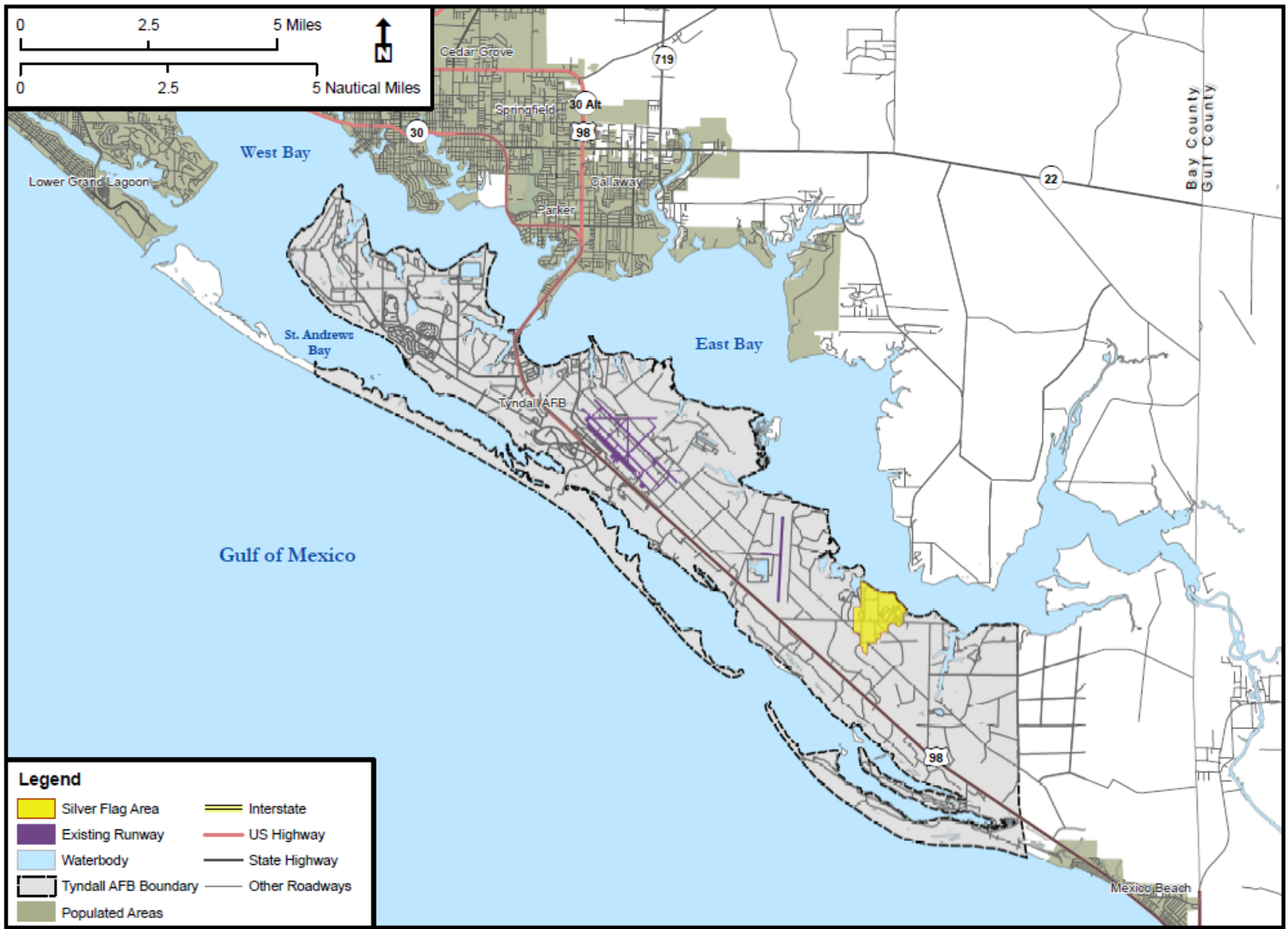


Figure 2.2. Tyndall AFB

- 1 • **1990s:** The Air Defense Weapons Center was deactivated, and the 1st Air Force and North
2 American Aerospace Defense Command moved to Tyndall from Langley AFB. In 1991,
3 the 325th Tactical Training Wing was re-designated as the 325th Fighter Wing (FW).
- 4 • **2000s:** The 325th FW remained the sole F-15 air superiority training wing until 2010.
5 Training was performed by the 1st, 2nd, and 95th Fighter Squadrons until they were
6 deactivated in 2006 and 2010 (2nd and 95th). The 337th Air Control Squadron (assigned
7 to the 33rd Fighter Wing at Eglin AFB but located at Tyndall) remains the only air battle
8 manager training unit in the U.S. Air Force. Tyndall AFB was selected as the center for
9 training the AF's newest F-22 Raptor and received the first Raptor in 2004. The 43rd
10 Fighter Squadron (part of the 325th FW) provides training for new, pipeline students and
11 pilots transitioning from other airframes. A full history is available in the Integrated
12 Cultural Resources Management Plan (ICRMP) or through the base historian's office.
- 13 • **2010s:** Tyndall's Major Command (MAJCOM) changed from Air Education Training
14 Command (AETC) to Air Combat Command (ACC), with the last plane of combat F-22
15 squadron arriving in 2014. Also that year, the QF4 drones begin to be replaced by
16 QF16s.

17 **2.3 CURRENT MILITARY MISSION**

18 The primary mission activities at Tyndall AFB are training personnel and evaluating weapons.
19 The host unit, the 325 FW, is a subordinate unit to the 19th Air Force and the ACC. Descriptions
20 of the major units and tenants at Tyndall AFB are provided below.

21 **2.3.1 325th Fighter Wing**

22 The 325 FW conducts academic and hands-on training for F-22 Raptor pilots to fly in air
23 superiority roles. Training is directed to pilots who have never flown a fighter aircraft,
24 experienced pilots converting to, or re-qualifying in, the F-22, and those who will become
25 instructors in the F-22. The 325 FW is supported by the following four groups:

26 **325th Operations Group**

27 The 325th Operations Group is the focal point for all F/A-22 and F-22 pilot training and air
28 weapons director/air battle manager training. The group consists of the 43rd Fighter Squadron,
29 325th Training Support Squadron, 325th Operations Support Squadron, and the 95th Fighter
30 Squadron. The group staff provides guidance and assistance in successfully executing the
31 training mission and ensures quality performance and standardized procedures for pilots, air
32 weapons directors/air battle managers, aircraft maintenance personnel, weapons load crews, and
33 air traffic controllers.

34 **325th Maintenance Group**

35 The 325th Maintenance Group is responsible for all maintenance operations for the 325 FW. The
36 group consists of three squadrons (325th Maintenance Squadron and 325th Aircraft Maintenance
37 Squadron) and Lockheed Martin Logistics Management for contracted maintenance.

1 **325th Mission Support Group**

2 The 325th Mission Support Group provides the security and proper care for Tyndall AFB's
3 personnel and facilities. It includes the 325th Force Support Squadron (FSS), 325th Security
4 Forces Squadron, 325th Communications Squadron, 325th Contracting Squadron, 325th Logistics
5 Readiness Squadron, and the 325th Civil Engineer Squadron (325 CES). The 325 CES includes
6 the engineering and environmental flights which are responsible for planning, developing, and
7 managing contract programs to construct, improve, and maintain nearly 30,000 acres (12,141 ha)
8 of land consisting of Tyndall AFB.

9 **325th Medical Group**

10 The 325th Medical Group is responsible for providing medical and dental care to support all
11 wing and associate units.

12 **2.3.2 Major Associate Tenants**

13 Major associate tenants at Tyndall AFB are described in this section.

14 **1st Air Force**

15 The 1st Air Force provides airspace surveillance and control and directs all air sovereignty
16 activities for the Continental United States Southeast Air Defense Sector.

17 The Southeast Air Defense Sector, headquartered at Tyndall AFB, is responsible for the air
18 defense of the southeastern United States, mission-tactical warning and threat assessment, and
19 defense against air attack. Its duties also include detecting and monitoring suspected drug
20 smuggling aircraft in coordination with the U.S. Customs and Border Protection Agency and law
21 enforcement agencies.

22 **North American Aerospace Defense Command System Support Facility**

23 The North American Aerospace Defense Command System Support Facility is an integral part of
24 the Atmospheric Early Warning System, established to enforce air sovereignty and provide
25 surveillance of the United States and Canada, and is responsible for the detection, identification,
26 and interception of unknown aircraft penetrating its area of responsibility.

27 **53rd Weapons Evaluation Group**

28 The 53rd Weapons Evaluation Group conducts air-to-air Weapon Systems Evaluations
29 Programs, overseeing flight operations and recovery of full-scale (QF-4 and QF-16) and subscale
30 (BQM-34 and MQM-107) drone targets. The AF, Air National Guard, Navy, Canadian Air
31 Defense Force units, and other foreign military forces come to Tyndall AFB to fire their missiles
32 at realistic targets over the GOM. The 53rd Weapons Evaluation Group includes the 81st Test
33 Support Squadron, 82nd Aerial Targets Squadron, and 83rd Fighter Weapons Squadron.

1 **Air Force Civil Engineer Center**

2 AFCEC is a field-operating agency of the AF Civil Engineer in Port San Antonio, Texas.
3 AFCEC missions include facility investment planning, design and construction, operations
4 support, real property management, readiness, energy support, environmental compliance and
5 restoration, and audit assertions, acquisition and program management. In addition, through the
6 Installation Support Teams, AFCEC has many INRMP-related responsibilities. Their primary
7 INRMP-related task is to provide execution guidance and to oversee implementation of natural
8 resources management programs on installations within the command.

9 The Environmental Directorate is responsible for managing the AF restoration, compliance,
10 sustainability and NEPA programs. The directorate members provide environmental technical
11 assistance and advice to AF installations, MAJCOMs and other clients. The directorate develops
12 execution strategies for environmental and sustainability issues, projects and programs based on
13 best practices garnered from experience and research. The directorate is organized into four
14 divisions: Restoration, Technical Support, Compliance, and Operations.

15 The Requirements and Acquisition Division (formerly the AF Research Laboratory) at Tyndall
16 AFB manages the life-cycle of airbase systems and equipment.

17 **Air Base Technologies Division**

18 The Air Base Technologies Division provides science, technology, and engineering to advance
19 fixed and deployed airbase capabilities in force protection, infrastructure, and homeland defense.

20 **Detachment 1, 823rd RED HORSE Squadron**

21 The mission of the Detachment 1, 823rd Rapid Engineer Deployable Heavy Operational Repair
22 Squadron Engineers (RED HORSE) is to provide agile combat support training to active duty,
23 Air National Guard, and AF Reserve civil engineer, services, and personnel teams in order to
24 construct, operate, and maintain forward operating bases for deployed forces. RED HORSE
25 recently gained approval to modify the Silver Flag Training Area on Tyndall to allow for a
26 broader range of Explosive Ordnance Disposal training (U.S. Air Force, 2013).

27 **Detachment 4, 372nd Training Squadron**

28 The 372nd Training Squadron, Detachment 4 provides worldwide and local training on F-22
29 aircraft systems and support equipment. Customers include all active duty, Air National Guard,
30 and Reserve units operating F-22 Raptor aircraft.

31 **Noncommissioned Officer Academy**

32 The Paul W. Airey Noncommissioned Officer Academy is a part of the Air University,
33 associated with the establishment of the College for Enlisted Professional Military Education.

1 **2.4 SURROUNDING COMMUNITIES**

2 Bay County has a population of approximately 172,000 people. Bay County's economic base is
3 a mixture of military, tourism, logging, services, manufacturing, construction, and commercial
4 fishing. Tyndall AFB and the Naval Support Activity Panama City are the largest contributors to
5 the County's economic base.

6 **Regional Land Use**

7 Cities and towns located near Tyndall AFB include Parker, Callaway, and Springfield (Figure
8 2.2. Tyndall AFB). Land use in the City of Parker is primarily residential housing with
9 commercial development along major thoroughfares. Callaway, located east of Parker, is also a
10 residential community containing primarily single family homes of both old and new
11 construction. Springfield, located north and west of Tyndall AFB, contains residential,
12 commercial, public, and recreational land uses, and also has significant industrial land use.
13 Unincorporated land located to the northeast between Tyndall AFB and Mexico Beach was
14 predominately managed by the former St. Joseph Paper Company as undeveloped or timber
15 cultivation land. In 2008, the company morphed into the St. Joe Company, with the primary
16 interest in developing the real estate it holds. In 2013, the majority of these holdings were sold
17 to AgReserves Incorporated. Rock Tenn owns and operates a pulp and paper mill in nearby
18 Callaway, Florida. Management of forests for paper production is expected to remain an
19 important economic consideration, thus minimizing some local development pressures.

20 Planned future residential and commercial growth, along with the accompanying encroachment,
21 will occur in areas around Tyndall AFB. In such cases, Tyndall would participate in county and
22 regional planning bodies to ensure development is compatible with the military mission. The
23 potential for incompatible development is greatest in the southeast portion of Parker near DuPont
24 Bridge; this area is affected by noise from base air operations.

25 **Local and Regional Natural Areas**

26 The area within five miles (eight km) of Tyndall AFB includes multiple bays, inlets, and GOM
27 beaches. Several parks are located near the base as shown in Figure 2.3. The land across East
28 Bay consists of woodlands and some cleared farm land. St. Joseph Peninsula State Park is just
29 outside the five-mile (eight-km) zone, as is the Apalachicola River and Econfina Creek Water
30 Management Areas.

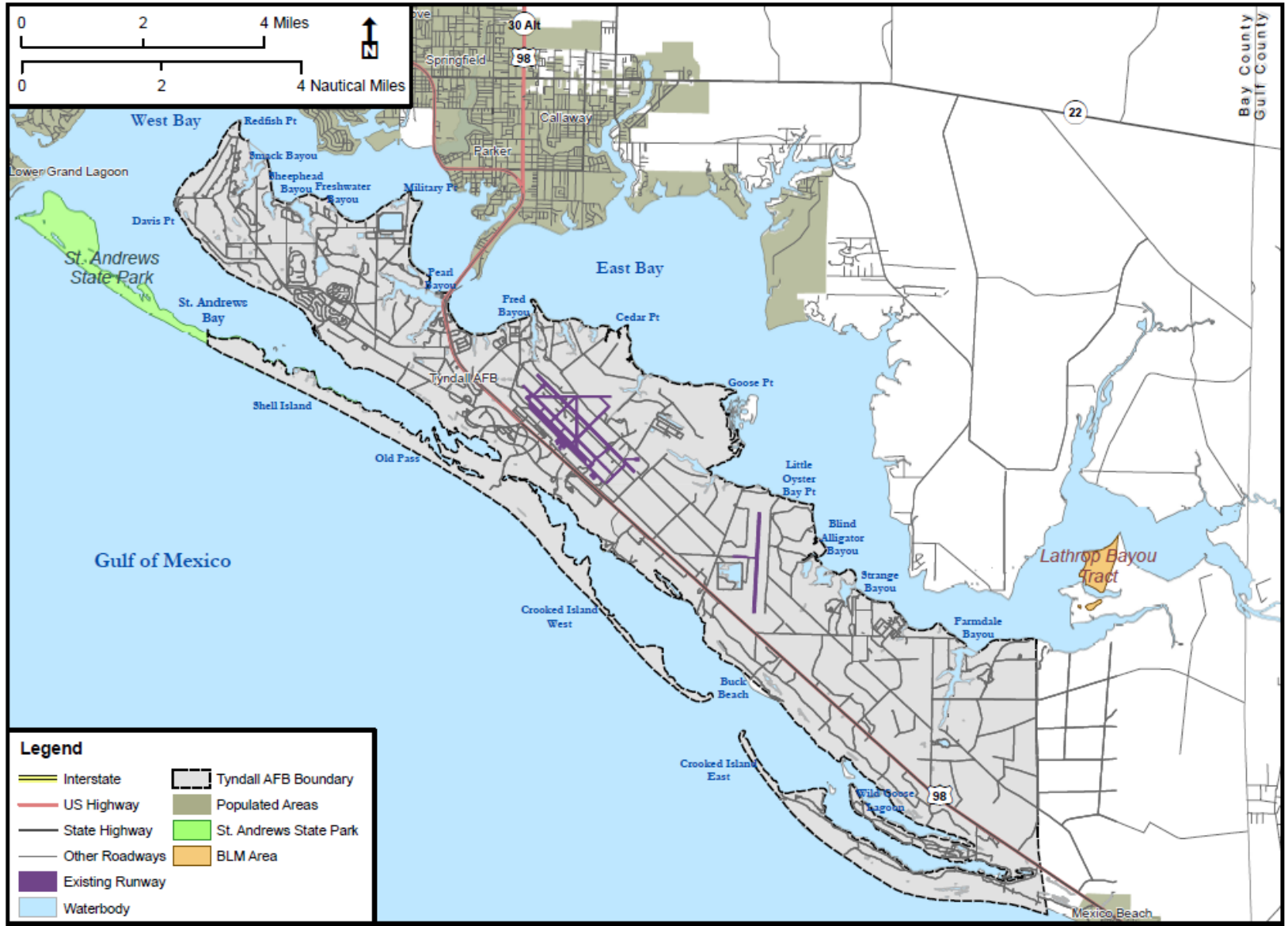


Figure 2.3. Local Natural Areas

3. PHYSICAL ENVIRONMENT

3.1 CLIMATE

Tyndall AFB has a moderate climate, with temperatures rarely dropping below 40 degrees Fahrenheit (°F) in the winter or rising above 90°F during the summer (Figure 3.1). The rainy season occurs from June through September (Figure 3.2), with average annual precipitation of 58 inches. Prevailing winds are from the southeast. Mild climatic conditions contribute to a long growing season, averaging 285 days a year. The base is prone to severe tropical storms that produce extremely high winds, heavy rainfall, and tidal surges. Hurricane Ivan, a Category 3 hurricane that made landfall in September 2004, was the most recent hurricane to cause damage at Tyndall AFB.

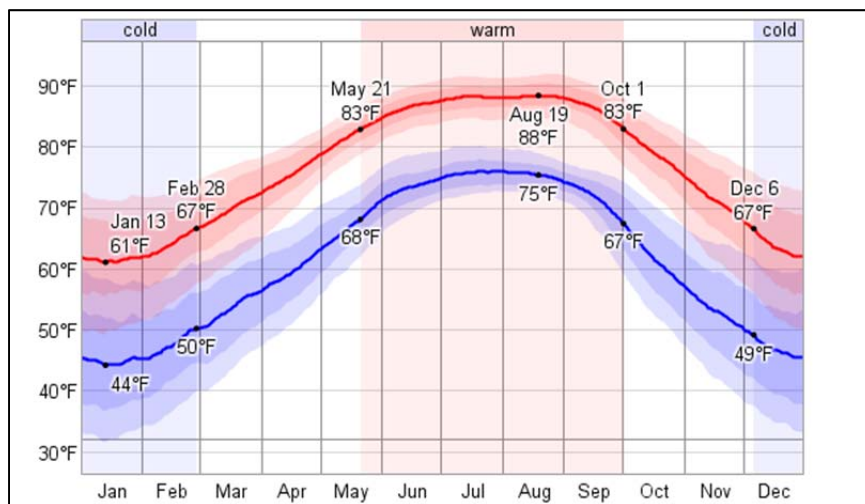


Figure 3.1. Daily Average High and Low Temperatures, with 25th to 75th Percentile (inner band) and 10th to 90th Percentile (outer band)
 Source: WeatherSpark, 2014

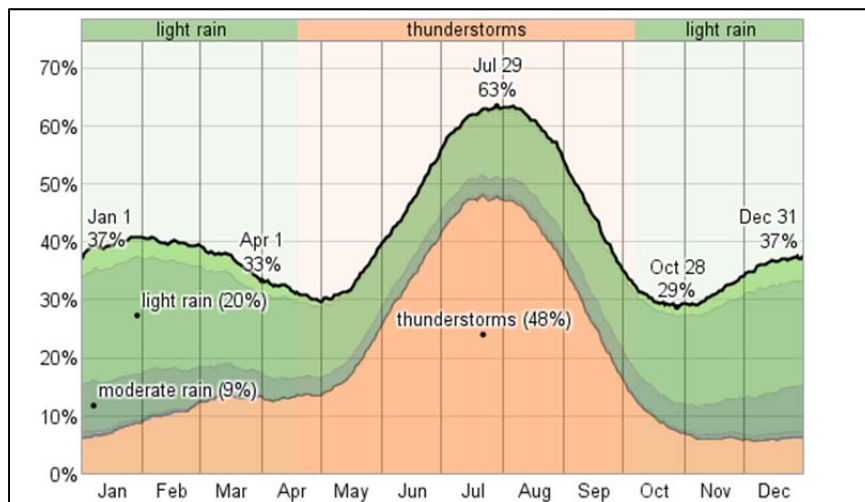


Figure 3.2. Monthly Probability of Precipitation
 Source: WeatherSpark, 2014

1 **3.2 LANDFORMS**

2 The Tyndall region is in the East Gulf Coastal Plain physiographic province, a former sea
3 bottom. The installation falls within two physiographic subdivisions—the Gulf Coastal
4 Lowlands and Flatwoods Forests. The coastal setting includes sand dunes, beaches, bayous, and
5 tidal marshes. The interior has moderately well drained, gently sloping uplands, poorly drained
6 flatwoods, permanent ponds, and seasonally inundated wetlands. The peninsula has a maximum
7 elevation of about 30 feet (9.14 meters [m]) above mean sea level, and the established airfield
8 elevation is 18 feet (5.48 m) above mean sea level.

9 **3.3 GEOLOGY AND SOILS**

10 **3.3.1 Geology**

11 Quaternary sediments of the Florida Panhandle have been described as undifferentiated
12 Pleistocene-Holocene sediments comprised of fine to coarse-grained sands, silty sands, and silty
13 clay (Scott, 2001). Near Tyndall AFB, the uppermost deposits are moderately permeable with
14 varying amounts of interstitial silt and clay and occasional hardpan layers. Deeper layers consist
15 of the Intracoastal Formation, a very sandy, microfossil-bearing, poorly consolidated limestone
16 interlaced with silica-rich fine-grained deposits. Soil pH in the Florida coastal region is acidic.
17 Although sinkholes are common in Florida, none have been historically noted at Tyndall.
18 Sinkhole formation occurs when carbon dioxide reacts with rain to create a weak acid that slowly
19 dissolves the limestone bedrock, creating cracks and fissures that compromise underground
20 structural support and result in a collapse of the land surface.

21 **3.3.2 Soils**

22 General soil associations and detailed soil types at Tyndall AFB have been identified by the U.S.
23 Department of Agriculture (USDA), Natural Resources Conservation Service Soil Survey for
24 Bay County, Florida ([USDA, 1984](#)) (Figure 3.3). Soils at Tyndall are formed from sandy marine
25 sediments, and are predominately sandy, acidic, poorly drained, have low shrink-swell potential,
26 and are relatively close to the underlying water table. General soil type categories include Sand,
27 Fine Sand, Loamy Sand, and Muck. Characteristics of major soil series and other soil types
28 found on the installation are provided in Table 3-1.

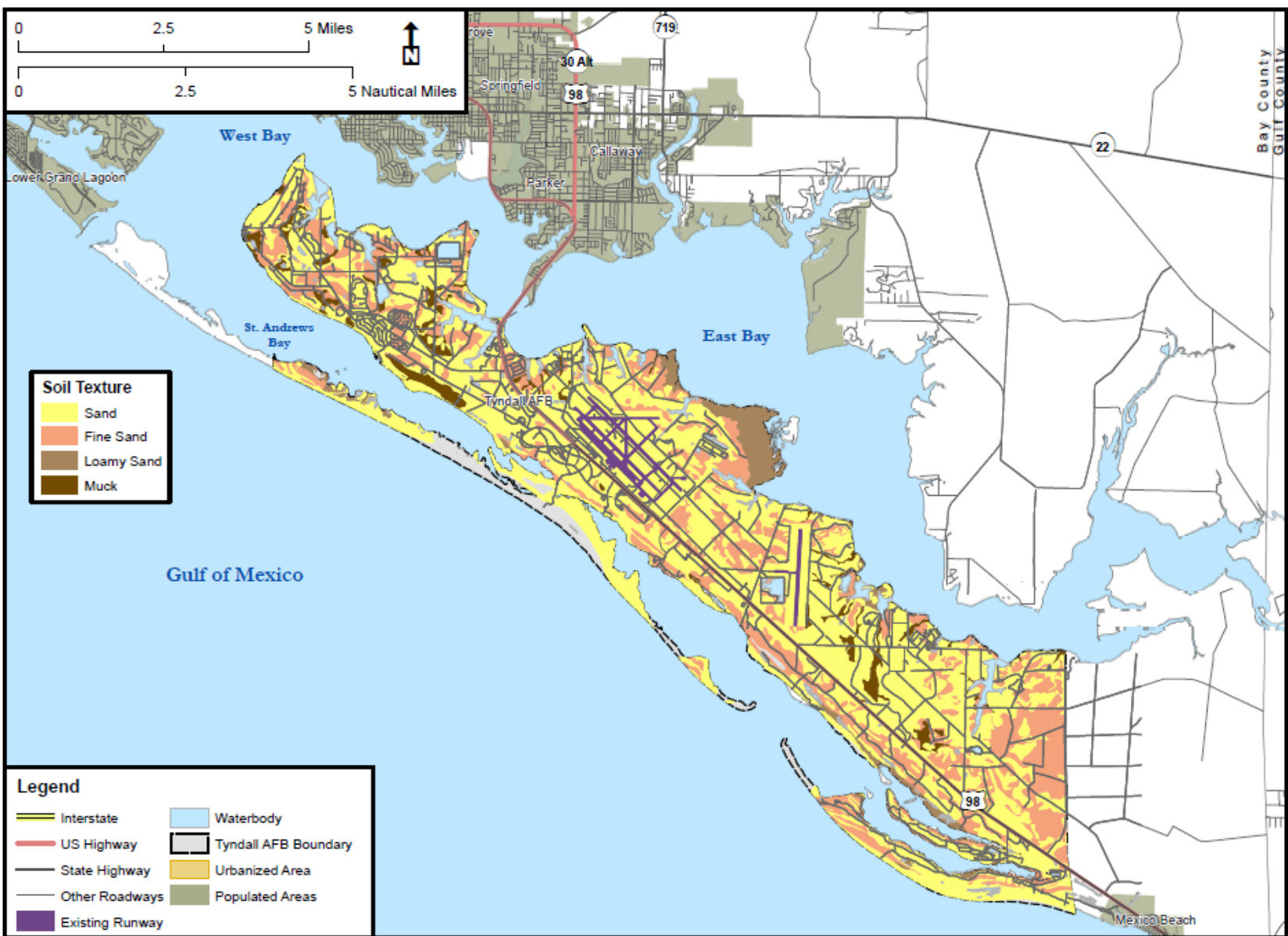


Figure 3.3. Soils at Tyndall AFB

Table 3-1. Soil Types and Characteristics Represented on Tyndall AFB

Soil Series	Depth to Water Table	Location	Characteristics
Bayvi	0 to 6 inches	Tidal marshes on marine terraces	Extremely acidic, very deep, poorly or very poorly drained, have a very low available water capacity, slow runoff, rapid permeability (but internal drainage is impeded by the high water table), very high surface runoff, and are very prone to flooding (especially during high tides).
Hurricane	24 to 42 inches	Flats and rises of marine terraces	Strongly acidic, very deep, very poorly drained, have a low available water capacity, very rapid permeability and negligible surface runoff, are not prone to ponding or flooding, but are very susceptible to wind erosion.
Leon	6 to 18 inches	Flatwoods on marine terraces	Very strongly acidic, very deep, poorly drained, have a very low available water capacity, rapid permeability on the surface, high surface runoff, are not prone to ponding or flooding, but are very susceptible to wind erosion.
Mandarin	18 to 42 inches	Flats and rises of marine terraces	Very strongly acidic, very deep, somewhat poorly drained, have a low available water capacity, rapid permeability on the surface, very low surface runoff, are not prone to ponding or flooding, but are very susceptible to wind erosion.
Osier	0 to 6 inches	Depressions on marine terraces and flatwood areas	Extremely acidic, very deep, poorly drained, have a low available water capacity, rapid permeability (but internal drainage is impeded by the high water table), negligible surface runoff, are not prone to flooding, but are prone to ponding, and are very susceptible to wind erosion.
Pickney	0 to 6 inches	Depressions on marine terraces	Very strongly acidic, very deep, very poorly drained, have a moderate available water capacity, rapid permeability on the surface (but internal drainage is impeded by the high water table), negligible surface runoff, are frequently prone to ponding and occasionally prone to flooding, and are very susceptible to wind erosion.
Pottsburg	0 to 6 inches	Flats of marine terraces	Very strongly acidic, very deep, poorly drained, have a low available water capacity, rapid permeability on the surface, negligible surface runoff, are not prone to ponding or flooding, and are very susceptible to wind erosion.
Resota	42 to 60 inches	Ridges and knolls of marine terraces	Strongly acidic, very deep, moderately well drained, have a very low available water capacity, very rapid permeability on the surface, negligible surface runoff, are not prone to ponding or flooding, and are very susceptible to wind erosion.
Rutledge	0 to 6 inches	Depressions on marine terraces	Strongly acidic, very deep, very poorly drained, have a low available water capacity, rapid permeability on the surface (but internal drainage is impeded by the high water table), negligible surface runoff, are not prone to flooding but frequently pond, and are very susceptible to wind erosion.
Arent	8 to 36 inches	Rises on marine terraces	Manmade mixture of various soil series (from earth moving operations such as dredging and filling). Neutral, very deep, somewhat poorly drained, have a very low available water capacity, variable permeability, negligible surface runoff, and are not prone to either flooding or ponding.

1 3.4 HYDROLOGY

2 3.4.1 Groundwater

3 The surficial aquifer at Tyndall AFB ranges in thickness from approximately 50 to 100 feet (15
4 to 30 m) below ground surface and is not used as a potable source (Tyndall AFB, 2011). The
5 Floridan Aquifer is approximately 250 to 350 feet (76 to 107 m) below the surface. Some areas
6 of Tyndall AFB are served by permitted wells; the water taken from these wells is filtered and
7 chlorinated prior to use.

8 3.4.2 Surface Waters

9 Tyndall AFB is located within the St. Andrew Bay Watershed. Major surface water features of
10 this watershed include the GOM, Saint Andrew Bay (including West, East, and North bays),
11 Saint Joseph Bay, Deer Point Reservoir, and Saint Andrew Sound. Tyndall AFB has several
12 freshwater lakes, some of which were artificially created by excavation or impoundment, while
13 others (coastal dune lakes) developed naturally due to coastal land processes. The largest natural
14 lake on Tyndall is Felix Lake, a non-coastal dune lake in the northern part of the base. Other
15 notable surface water bodies on or near Tyndall AFB include Wild Goose Lagoon, Blind
16 Alligator Bayou, Strange Bayou, Fred Bayou, Pearl Bayou, Freshwater Bayou, Sheephead
17 Bayou, and Smack Bayou. In general, surface water drains to the north in areas north of U.S.
18 Highway 98 and to the south in areas south of U.S. Highway 98. There are no named rivers on
19 Tyndall, but several unnamed sinuous watercourses branch inland from the major bayous.

20 3.4.3 Wetlands

21 The term *wetlands* describe marshes, swamps, bogs, and similar areas. Approximately
22 40 percent of Tyndall's property is considered wetlands (Figure 3.4). Wetlands are covered in
23 detail in Section 4.6.

24 3.4.4 Floodplains

25 Floodplains are generally flat, lowland areas bordering inland and coastal waters that are subject
26 to a 1 percent or greater chance of flooding in any given year, otherwise known as the "100-year
27 floodplain" or "installation flood elevation." Such inland areas are a result of freshwater
28 precipitation and/or runoff, and are generally of long duration, whereas coastal floodplains are
29 often the result of short-duration freshwater precipitation and/or runoff as well as intense storm
30 surges. Many of the shoreline areas of Tyndall (bay and coastal) are within the 100-year
31 floodplain. Tyndall AFB is vulnerable to flooding from tropical storms and hurricanes due to
32 associated torrential rainfall and tidal surges. Figure 3.4 shows the locations of floodplains on
33 Tyndall AFB, and Figure 3.5 shows the storm surge areas. Note that the 100-year floodplain
34 does not account for tidal surges.

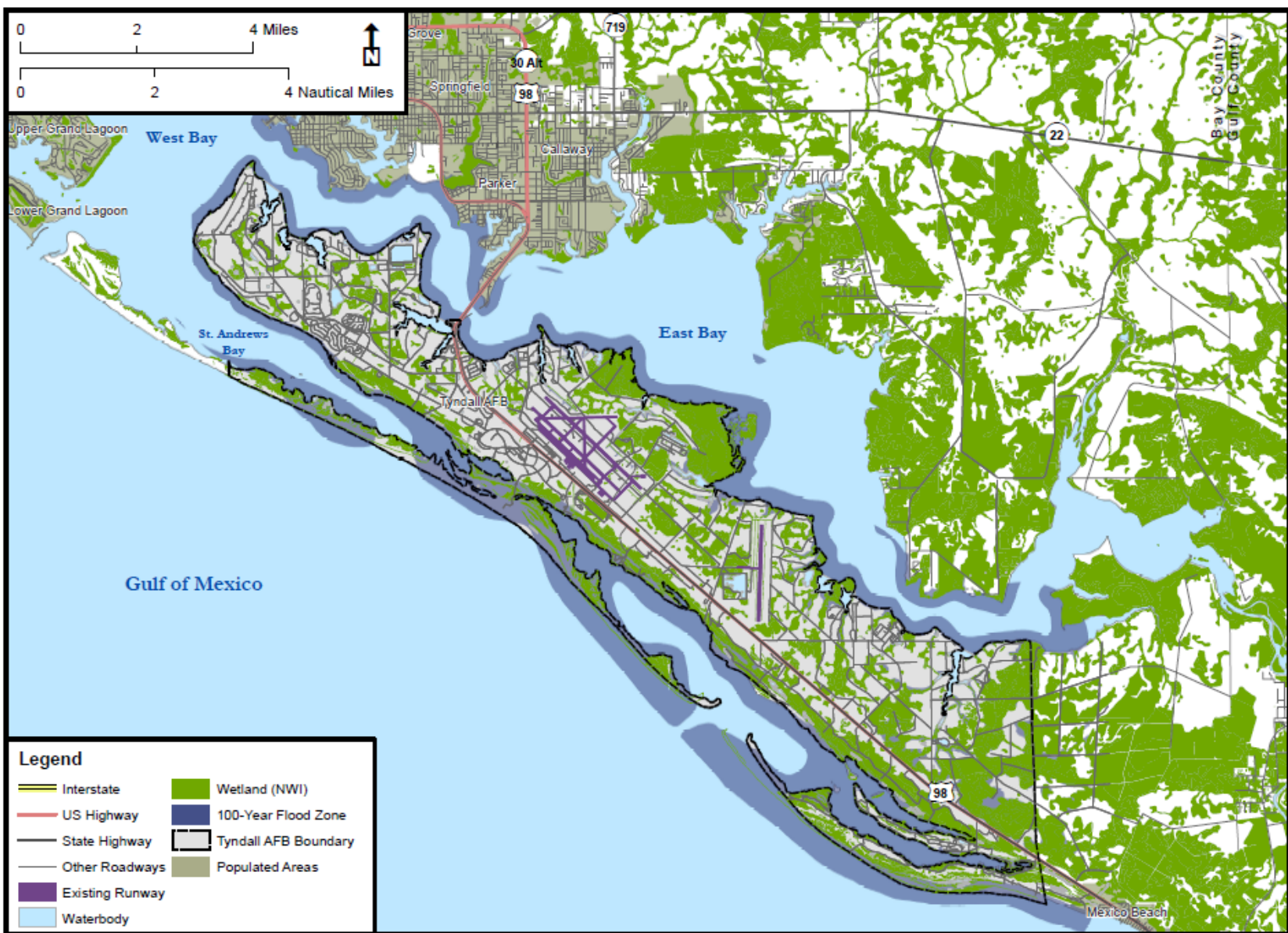


Figure 3.4. Location of Wetlands and 100-Year Floodplain

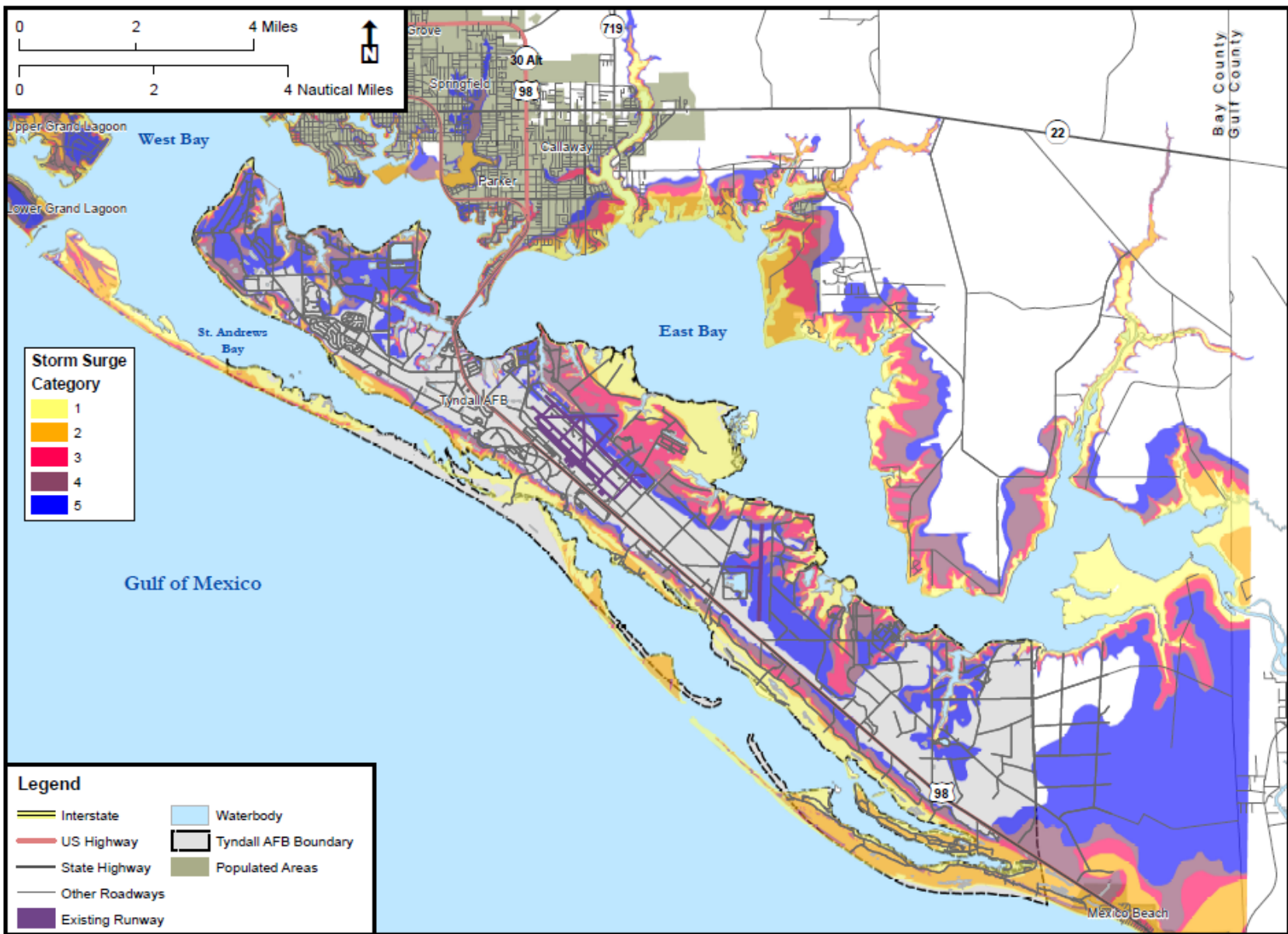


Figure 3.5. Storm Surge Areas

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4. ECOSYSTEMS AND THE BIOTIC ENVIRONMENT

4.1 ECOSYSTEM CLASSIFICATION

The National Hierarchical Framework of Ecological Units is a mapping and classification system that utilizes soils, physiography, and habitat types to stratify the landscape into smaller areas (Bailey, 1995). Using this classification system, Tyndall AFB lies within the Humid Temperate Domain, Subtropical Division, Coastal Plain Mixed Forest Province, Section 232D (Florida Coastal Lowlands-Gulf Section). This geographic area is generally flat with mostly sandy, poorly drained soils and a shallow water table. Shallow seasonally inundated depressions are common. Predominant overstory vegetation typically would consist of longleaf-slash pine and oak-gum-cypress cover types.

4.2 VEGETATION

4.2.1 Historic Vegetative Cover

Around the time of European settlement in 1824, the St. Andrew Bay area was dominated by longleaf pine (*Pinus palustris*) flatwoods, sandhills, and savannas. Other important habitat types common at that time included maritime forests (hardwood hammocks), scrub-shrub, tidal marshes, and sand dunes/beaches. Longleaf pine communities are dependent on low-intensity frequent fires for maintenance of their characteristic open structure that lacks a midstory and contains diverse herbaceous understory species composition. In flatwoods and savannas where fires occurred infrequently (as a result of environmental conditions or human activities), longleaf pine was often replaced by slash pine (*Pinus elliottii*) as the dominant canopy species, and a thick shrub layer of palmetto (*Serenoa repens*) and gallberry (*Ilex glabra*) displaced the herbaceous ground cover dominated by wiregrass (*Aristida stricta*), other native warm-season grasses, and forbs.

Turpentine and lumbering became important economic activities in the late 1800s, and vegetation burns were initiated to facilitate access to turpentine trees and regenerate native vegetation. By the 1930s, these industries had faltered due to exhaustion of timber resources. After establishment of Tyndall AFB in 1941, the federal government reduced fire protection measures, and subsequent wildfires destroyed large areas of forest. Also, the base operated a sawmill from 1944 to 1954, twice cutting over the timber in the area. As a result of these factors, little mature timber remained on the installation. With the hiring of a professional forester in 1960, reforestation activities were begun, and extensive commercial plantations of slash and sand pine were established throughout the base.

1 4.2.2 Current Vegetative Cover

2 Many of the upland and flatwoods areas historically dominated by longleaf pine are currently
 3 planted in commercial slash pine plantations or longleaf pine restoration sites (Figure 4.1).
 4 Uplands with deep, sandy soils typically have been planted, or have naturally regenerated, in
 5 sand pine due to the lack of fire and longleaf pine seed trees. Efforts to correct damage to the
 6 peninsula's native ecosystems are currently underway, using a variety of modern forestry
 7 methods (e.g., selective cutting, artificial regeneration, natural regeneration, and controlled
 8 burning). The acreages of general cover types found on the installation are provided in Table
 9 4-1; vegetative communities currently at Tyndall are described below.

Table 4-1. General Tyndall AFB Cover Types

General Cover Type ¹	Acreage ²
Military Lands	4,941
Pine Plantations	7,989
Wetlands	11,704
Coastal Barrier Islands	3,128
Gulf of Mexico Shoreline	18 miles
Bay and Sound Shorelines	104 miles

¹ Does not include all cover types on Tyndall

² Total acreage for Tyndall AFB is 29,946

10 Mesic/Wet Slash Flatwoods

11 Mesic/wet slash flatwoods are characterized by an understory of saw palmetto, wax myrtle, and
 12 titi. Other typical plant species include St. John's-Wort, water toothleaf, dwarf huckleberry,
 13 fetterbush, and low bush blueberry. Due to historic fire suppression on Tyndall AFB for the last
 14 50 years, shrubs and other woody species have become unnaturally dense in Mesic and Wet
 15 Flatwoods, leaving little herbaceous groundcover. Often only small, isolated patches of
 16 wiregrass remain in the groundcover; wiregrass used to be the dominant groundcover species
 17 with a diversity of herbaceous groundcover species among the wiregrass. Rare plant species
 18 found in Wet Flatwoods on Tyndall include Chapman's crownbeard, Southern red lily,
 19 Godfrey's butterwort, Apalachicola dragonhead, bog tupelo, and Henry's spiderlily.

20 Natural Longleaf Pine

21 Natural longleaf pine is a community type that has an overstory canopy of longleaf pine, with
 22 scattered scrub oaks in the understory. Rusty lyonia, Florida rosemary, gopher apples, wiregrass,
 23 broom sedges, and large seeded beak rush occur in the shrub and ground layers. In fire
 24 suppressed longleaf communities, scrub oaks may become more prevalent and can shade out
 25 understory herbaceous species.

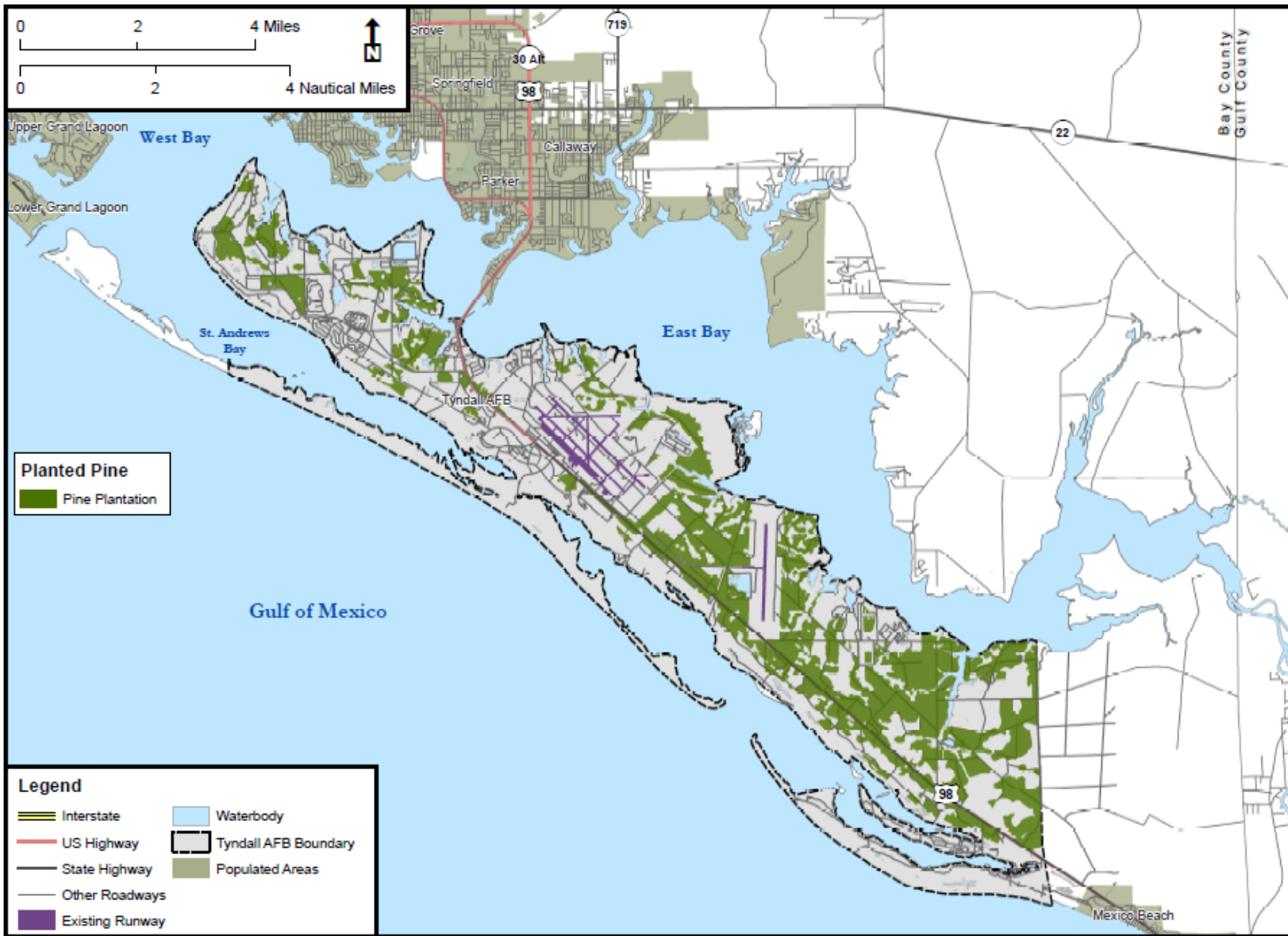


Figure 4.1. Planted Pine Locations on Tyndall AFB

1 **Estuarine Tidal Marsh**

2 Estuarine tidal marsh, commonly referred to as salt marsh, occurs along the edges of bayous at
3 Goose and Cedar Points, and in low energy areas along the shore on the bay side of the barrier
4 islands. The dominant plant is black needle rush; pure stands of cord grass and grassworts are
5 also common. Some other important species are saw grass, salt grass, bearded spangle grass,
6 Gulf cord grass, salt myrtle, marsh elder, arrow-leafed morning-glory, and cattails.

7 **Coastal Uplands**

8 The Barrier Islands community forming Tyndall's Gulf-side coastline is categorized as Coastal
9 Uplands. Beach Dunes are found on Shell Island, CIE, CIW, and along the Gulf side of the main
10 peninsula. Common plants found on Beach Dunes include sea oats, Gulf blue stem, bitter panic
11 grass, sea rocket, sea purslane, beach morning glory, beach pennywort, sand pine, and Florida
12 rosemary. Coastal interdunal swales are found on Tyndall in wet depressions between old dune
13 ridges. Typical interdunal swale plants include umbrella grass, rushes, bog buttons, blue heart,
14 and milkwort.

15 Coastal grasslands are found on Shell Island, CIW, CIE, and Raffield Peninsula between Beach
16 Dune vegetation on the Gulf side and Scrub or Coastal Dune Lake habitat on the inland side.
17 Plants typical of the Coastal Grassland are Gulf blue stem, other blue stem grass species, sea
18 oats, Muhly grass, wax myrtle, bush goldenrod, Godfrey's golden aster, and sand squares.
19 Coastal dune lakes are important features of Shell Island, CIW, CIE, and Raffield Peninsula
20 (more detail in Coastal Dunes Lakes section below). Ephemeral brackish pools are also
21 important to this community type.

22 **Wet Prairie**

23 Wet prairie is a fire maintained wetland community and usually appears as a treeless savanna.
24 The stunted overstory trees are primarily slash pine, with occasional longleaf pine, sweet bay,
25 and swamp bay (Florida Natural Areas Inventory [FNAI], 1990). Shrubs (often scattered)
26 include St. John's-Wort, black titi, swamp titi, gallberry, tall gallberry, and swamp tupelo.
27 Groundcover includes wiregrass, beaksedges, meadow beauty species, hatpins, pitcher plants,
28 sundews, foxtail club moss, yellow-eyed grasses, and orchids.

29 **Basin Swamps**

30 Basin swamps are low, seasonally inundated areas that develop in ancient coastal swales or
31 lagoons. They are closed basins with no outlets, often dominated by pond cypress or swamp
32 tupelo (FNAI, 1990). On Tyndall AFB, basin swamps are dominated by shrubs such as swamp
33 titi and black titi. Other shrubs present include myrtle-leaf holly, wild olive, fetter bush, wax
34 myrtle, and sweet bay.

1 Baygall

2 Baygall habitats on Tyndall AFB are found at the margins of bayou headwaters and are
3 dominated by shrubs such as black titi, swamp titi, and tall gallberry. Other shrubs present
4 include myrtle-leaf holly, wax myrtle, and fetterbush. Slash pine, sweet bay, and swamp tupelos
5 are often present. The ground is usually covered in deep litter, with occasional patches of
6 sphagnum moss, hatpins, pitcher plants, sundews, and green briars.

7 Floodplain Swamps

8 Floodplain swamp habitats are most common on the eastern end of the main peninsula of
9 Tyndall AFB. Dominant trees are pond cypress, Ogeechee tupelo, and swamp tupelo, but some
10 sites also include swamp titi, wax myrtle, dahoon holly, myrtle-leafed holly, tall gallberry, sweet
11 bay, and swamp bay (FNAI, 1990). Other species present are lizard's tail, royal fern, laurel
12 greenbrier, sphagnum moss, and switch cane.

13 Slash Scrub

14 Slash scrub is found on more recently deposited landmasses and occurs in patches to form
15 shrubby zones inland from the barrier islands and Gulf coast, as well as emergent areas north of
16 Tyndall AFB in East Bay. The primary species associated with this community type are slash
17 pine in the overstory with an understory composed of Florida rosemary, bush golden rod, and
18 sand live oak.

19 Sand Pine Scrub

20 Natural sand pine scrub occurs on sand ridges along former shorelines, while planted sand pine
21 may occur in a wider range of sandhills habitats. Some of the sand ridges originated as wind-
22 deposited dunes, while others originated as wave-washed sandbars. Thus, scrub soils are
23 composed of well-washed, deep sands that are brilliant white at the surface. The loose sands
24 drain rapidly, creating very xeric conditions. This community type is often characterized as a
25 closed canopy forest of sand pines with dense thickets of scrub oaks and other shrubs dominating
26 the understory. Herbaceous ground cover is sparse or absent, with large areas of sand or deer
27 moss and lichens present. Understory plants include myrtle oak, sand-live oak, Chapman's oak,
28 woody goldenrod, Florida rosemary, prickly pear cactus and gopher apple.

29 Ponds, Lakes, and Bayous

30 A number of man-made and natural freshwater ponds and lakes occur on Tyndall AFB. The
31 largest natural lake is Felix Lake, located in the northern part of the base. Other notable surface
32 water bodies on or near Tyndall AFB include Davis Point, PQM 102, Wild Goose Lagoon, Blind
33 Alligator Bayou, Strange Bayou, Fred Bayou, Pearl Bayou, Freshwater Bayou, Sheephead
34 Bayou, and Smack Bayou.

1 Coastal Dune Lakes

2 Coastal dune lakes are shallow, freshwater, irregularly shaped depressions that are generally
3 supplied with water from lateral groundwater seepage through the surrounding sands. These
4 lakes typically begin as tidal-influenced basins or lagoons that become closed as sand fills the
5 inlet. Salinity may vary greatly over time due to factors such as saltwater intrusion, evaporation,
6 storm surge, and rainfall. The lakes may be short-lived or may persist for long periods of time.
7 Depending on the lake's characteristics and location, associated vegetation may be restricted to a
8 narrow band along the shore, or may be dense and forested with mature trees and shrub diversity
9 (refer also to the Coastal Uplands community type). Coastal dune lakes are important features of
10 CIW, CIE, and Raffield Peninsula. Yvonne Lake, Hurricane Lake and Big Alligator Lake are
11 examples of permanent coastal dune lakes.

12 Maritime Hardwood Hammock

13 Maritime hardwood hammock is a hardwood forest lying just inland from coastal communities.
14 On Tyndall AFB, this community type is primarily an assemblage of live oak, hickory, cabbage
15 palm, southern magnolia, slash pine, wax myrtle, and saw palmetto. Maritime hammocks are
16 closely associated with and often grade into sand pine scrub and xeric hardwood hammocks.

17 Xeric Hardwood Hammock

18 Xeric hardwood hammock occurs on old dunes near the coast that have been stabilized long
19 enough for forest growth. They are extremely droughty and are vegetated primarily by live oak
20 and sand pine with an understory of myrtle oak, Chapman's oak, Florida rosemary, and gopher-
21 apple. Xeric hardwood hammock grades into sand pine scrub and is an advanced successional
22 stage of scrub.

23 Slash and Sand Pine Plantations

24 Slash and sand pine plantations, ranging in age from 52 to 10 years old, are planted areas that
25 have been mechanically prepared and planted with commercially grown seedlings. These
26 plantations on Tyndall are now being converted to longleaf pine. For more detailed information
27 refer to Section 6.7, *Forest Management*.

28 4.3 SPECIAL INTEREST NATURAL AREAS

29 Six areas were identified on Tyndall AFB by FNAI in 1994 as Special Interest Natural Areas
30 (FNAI, 1994):

- 31 • Barrier Islands and Peninsulas
- 32 • Cedar Point Flatwoods
- 33 • Drone Launch Wet Prairie

- 1 • Farmdale Bayou Wet Flatwoods
- 2 • Goose Point Tidal Marsh
- 3 • Strange Point/Alligator Bayou

4 These areas either presently support or have high potential to support endangered, threatened, or
 5 rare species, and most sites have largely remained in a natural condition. Tyndall Natural
 6 Resources will be conducting surveys in fiscal year (FY) 2015 to re-designate these areas as
 7 Outstanding Natural Areas, Significant Botanical Sites, and High Quality Natural Communities,
 8 and to develop maps of these areas. The focus of management in these areas will be the
 9 maintenance of natural processes such as prescribed fire and the abatement of invasive species to
 10 promote native herbaceous ground cover. Tyndall Natural Resources will develop guidelines and
 11 an internal process to evaluate management actions within these areas.

12 4.4 FISH AND WILDLIFE

13 Tyndall AFB supports a rich diversity of game and non-game fish and wildlife species due to the
 14 variety of habitats found on the installation (Table 4-2). Common game species include white-
 15 tail deer, wild turkey, and Eastern gray squirrel. Tyndall also has a variety of non-game
 16 mammals, shorebirds, neotropical migrant birds, snakes, lizards, salamanders, frogs, and turtles.
 17 The base's geographic location supports a warm water (70°F and higher) fisheries program,
 18 including largemouth bass, bluegill and other *Lepomis* species, and channel catfish.

19 The mixed seagrass beds, sand flats, and muddy bottom habitat in the waters surrounding
 20 Tyndall, especially Crooked Island Sound and St Andrew Bay, are significant for young sharks.
 21 During recent surveys in these waters, Atlantic sharpnose (*Rhizoprionodon terraenovae*) and
 22 bonnethead sharks (*Sphyrna tiburo*) were the dominant species encountered (Bethea et al., 2014).
 23 Additional species included blacktip (*Carcharhinus limbatus*), scalloped hammerhead (*S.*
 24 *lewini*), spinner (*C. brevipinna*), blacknose (*C. acrontous*), and finetooth sharks (*C. isodon*).
 25 Only found in small numbers were Florida smoothhound (*Mustelus norrisi*), bull (*C. leucas*),
 26 great hammerhead (*S. mokarran*), and sandbar sharks (*C. plumbeus*). Threatened and endangered
 27 (T&E) species are discussed in Section 4.5.

Table 4-2. Representative Fish and Wildlife Species Found on Tyndall AFB

Common Name	Scientific Name	Common Name	Scientific Name	Common Name	Scientific Name
Belted Kingfisher	<i>Megaceryle alcyon</i>	Garter Snake	<i>Thamnophis sirtalis</i>	Opossum	<i>Didelphis virginiana</i>
Black Racer	<i>Coluber constrictor</i>	Ghost Crab	<i>Ocypode quadratus</i>	Oyster	<i>Crassostrea virginica</i>
Cotton Mouse	<i>Peromyscus gossypinus</i>	Gray Fox	<i>Urocyon cinereoargenteus</i>	Periwinkles	<i>Littorina irrorata</i>
Cotton Mouth	<i>Agkistridon piscivorus</i>	Great Blue Heron	<i>Ardea herodias</i>	Pocket Gopher	<i>Geomys pinetus</i>
Cottontail Rabbit	<i>Sylvilagus floridanus</i>	Great Horned Owl	<i>Bubo virginianus</i>	Red-shouldered Hawk	<i>Buteo lineatus</i>
Cotton Rat	<i>Sigmodon hispidus</i>	Green Anole	<i>Anolis carolinensis</i>	Red-winged Blackbird	<i>Agelaius phoeniceus</i>

Common Name	Scientific Name	Common Name	Scientific Name	Common Name	Scientific Name
Eastern Mole	<i>Scalopus aquaticus</i>	Gulf Crab	<i>Calinectes smilis</i>	Salt Marsh Rabbit	<i>Sylvilagus aquaticus</i>
Eastern red bat	<i>Lasiurus borealis</i>	Largemouth Bass	<i>Micropterus salmoides</i>	Sheepshead Minnow	<i>Cyprinodon variegatus</i>
Five-lined Skink	<i>Eumeces fasciatus</i>	Least Shrew	<i>Cryptodus parva</i>	Six-lined Racerunner	<i>Cnemidophorus sexlineatus</i>
Flycatchers	<i>Tyrannidae</i> spp.	Long-nosed Killifish	<i>Fundulus similis</i>	Slender Glass Lizard	<i>Ophisaurus attenuatus</i>
Red Fox	<i>Vulpes vulpes</i>	Northern Bobwhite	<i>Colinus virginianus</i>	White-tailed Deer	<i>Odocoileus virginianus</i>

1 **4.5 PROTECTED SPECIES**

2 A number of federal- and state-protected species are documented to occur or may occur on and
 3 near Tyndall AFB (see Figure 4.2 and Section 6.3). Species federally protected under the ESA
 4 include those currently listed as endangered or threatened, as well as Candidate and petitioned
 5 species. Candidate species are those species for which the USFWS has sufficient information to
 6 propose them as endangered or threatened under the ESA, but for which development of a listing
 7 regulation is precluded by other higher priority activities. Petitioned species refer to those
 8 species that have been petitioned for listing under the ESA, and for which the Service has found
 9 substantial information indicating that listing may be warranted.

10 Migratory birds and marine mammals are federally protected under the Migratory Bird Treaty
 11 Act (MBTA) and MMPA, respectively. State status categories include endangered and
 12 threatened species, and Species of Special Concern (SSC). SSC is defined as a species that
 13 warrants special protection, recognition, or consideration because of significant vulnerability to
 14 habitat modification, environmental alteration, human disturbance, or human exploitation which
 15 may result in its becoming a threatened species. Two species found on Tyndall are protected by
 16 other specific laws or regulations, including the Bald and Golden Eagle Protection Act (BGEPA)
 17 and the Florida Black Bear Conservation Rule. The total number of federal, state, and other
 18 protected species known to occur on Tyndall are provided in Table 4-3.

Table 4-3. Rare and Listed Species at Tyndall AFB

	Animals	Plants
Federally-listed T&E species (includes Gulf species)	13	1
Federal Proposed T&E species	1	0
Federal Candidate species	1	0
Federally Petitioned species	3	3
State listed T&E species	15	24
State listed SSC	8	0
Species protected by other regulations (MMPA, BGEPA, and FBBCR)	22	0

BGEPA = Bald and Golden Eagle Protection Act; FBBCR = Florida Black Bear Conservation Rule; MMPA = Marine Mammal Protection Act; SSC = Species of Special Concern; T&E = threatened and endangered

19 The FWC categorizes federally listed species that occur in Florida as “federally designated
 20 endangered” or “federally designated threatened” species. In addition, the State has a listing
 21 process to identify species that are not federally listed but at risk of extinction; these species are
 22 considered “State-designated threatened.” All State-designated species have recently undergone

1 biological status reviews that were presented at the June 2011 Commission meeting and
2 approved. These listing status changes will not occur until management plans are approved for
3 the species. When enacted, these changes will likely affect the number of listed species on
4 Tyndall, and changes may be necessary for Table 4-4, as well as other sections of the INRMP.

5 Monitoring and/or management programs are in place for most of the federally protected species
6 that occur at Tyndall AFB (Table 4-4), and also for some Candidate and petitioned species,
7 shorebirds, migratory birds, and certain other state-listed species. Of the federally listed species
8 shown in Table 4-4, all but the American alligator (*Macroclemys temminckii*) have federal
9 recovery plans currently in place. There are also 18 federally protected marine mammal
10 species/species groups that potentially occur within the Eglin Gulf Test and Training Range
11 areas used by Tyndall.

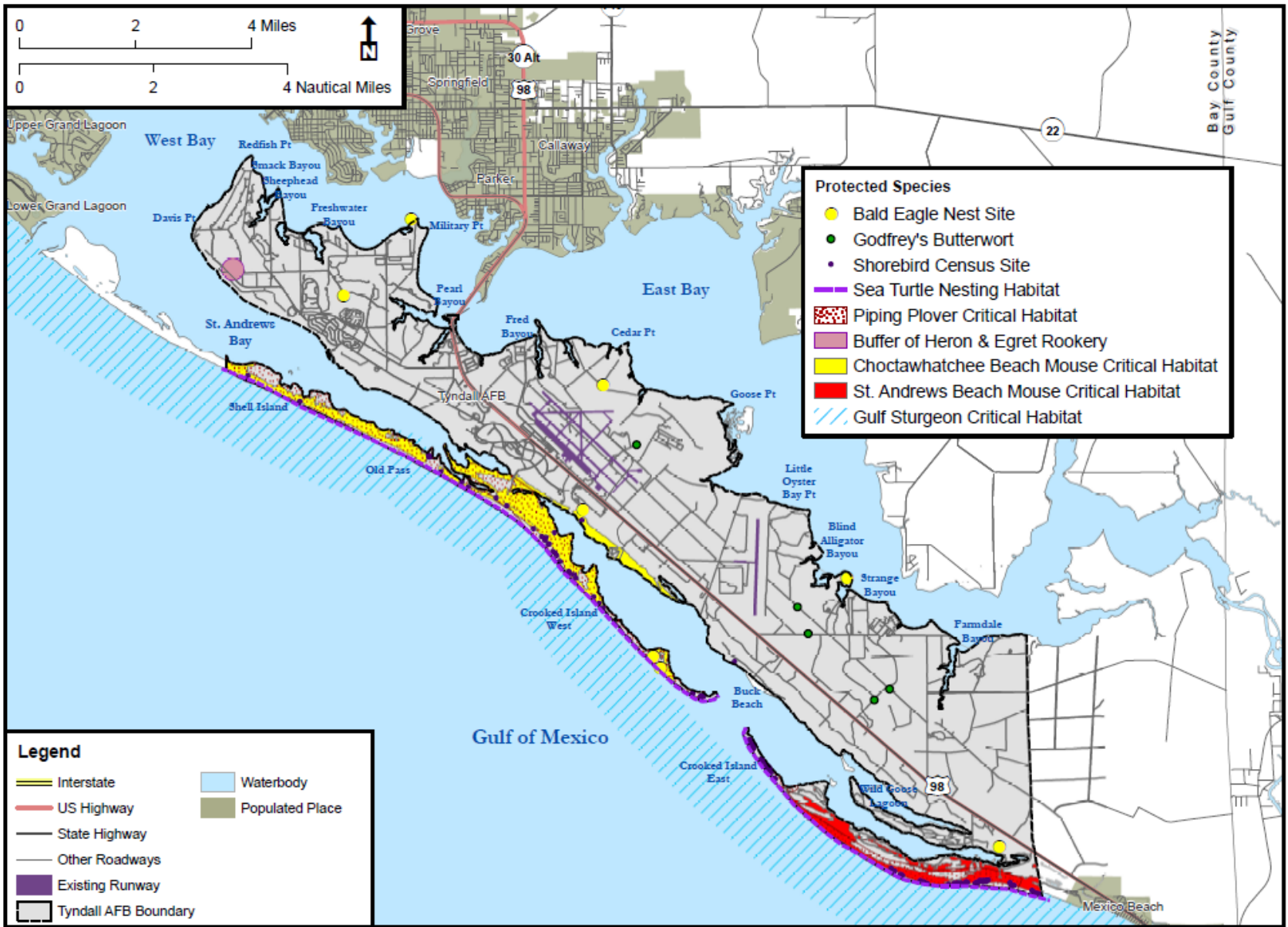


Figure 4.2. Protected Species at Tyndall AFB

1 Two recent Center for Biological Diversity (CBD) petitions to the USFWS prompted the
 2 consideration of over 50 amphibian and reptile species and almost 400 freshwater species in the
 3 southeastern United States for protection under the ESA (CBD, 2010; CBD, 2012). Several of
 4 these petitioned species have been documented to occur on Tyndall, or have the potential to
 5 occur based on habitat requirements (Table 4-5). In hopes of avoiding federal listing of
 6 additional species, Tyndall is examining ways to minimize or eliminate threats to the petitioned
 7 species that occur on its property.

Table 4-4. Protected Species at Tyndall AFB

Common Name	Scientific Name	Federal Status	State Status
Plants			
Apalachicola dragonhead	<i>Physotegia godfreyi</i>		T
Chapman's crownbeard	<i>Verbesina chapmanii</i>		T
Chapman's butterwort	<i>Pinguicula planifolia</i>		T
Dew thread sundew	<i>Drosera filiformis</i>		E
Giant water dropwort	<i>Oxypolis greenmanii</i>		E
Godfrey's butterwort	<i>Pinguicula ionantha</i>	T	E
Godfrey's golden aster	<i>Chrysopsis godfreyi</i>		E
Gulf coast lupine	<i>Lupinus westianus</i>		T
Harper's yellow-eyed grass	<i>Xyris scabrifolia</i>		T
Henry's spider lily	<i>Hymenocallis henryae</i>	P	E
Karst pond yellow-eyed grass	<i>Xyris longispala</i>		E
Large-leaved jointweed	<i>Polygonella macrophylla</i>		T
Purple pitcher plant	<i>Sarracenia rosea</i>		T
Parrot pitcher plant	<i>Sarracenia psittacina</i>		T
Quillwort yellow-eyed grass	<i>Xyris isoetifolia</i>		E
Small spreading pogonia	<i>Pogonia bifaria</i>		E
Snakemouth orchid	<i>Pogonia ophioglossoides</i>		T
Southern milkweed	<i>Asclepias viridula</i>		T
Southern red lily	<i>Lilium catesbaei</i>		T
Spoon-leaved sundew	<i>Drosera intermedia</i>		T
Thick-leaved water willow	<i>Justicia crassifolia</i>		E
White-flowered wild petunia	<i>Ruellia noctiflora</i>		E
Wiregrass gentian	<i>Gentiana pennelliana</i>		E
Yellow-flowered butterwort	<i>Pinguicula lutea</i>		T
Birds			
American oystercatcher	<i>Haematopus palliatus</i>		SSC
Bald eagle	<i>Haliaeetus leucocephalus</i>	BGEPA	
Black skimmer	<i>Rhychops niger</i>		SSC
Brown pelican	<i>Pelecanus occidentalis</i>		SSC
Least tern	<i>Sterna antillarum</i>		T
Little blue heron	<i>Egretta caerulea</i>		SSC
Piping plover	<i>Charadrius melodus</i>	T/CH	T
Red knot	<i>Calidris canutus rufa</i>	PT	T
Reddish egret	<i>Egretta rufescens</i>		SSC
Snowy egret	<i>Egretta thula</i>		SSC
Snowy plover	<i>Charadrius alexandrinus tenuirostris</i>		T
Southeastern American kestrel	<i>Falco sparverius paulus</i>		T
Tricolor heron	<i>Egretta tricolor</i>		SSC
White ibis	<i>Eudocimus albus</i>		SSC

Table 4-4. Protected Species at Tyndall AFB (Cont'd)

Common Name	Scientific Name	Federal Status	State Status
Amphibians			
Gopher frog*	<i>Rana capito</i>		SSC
Reptiles			
Alligator snapping turtle	<i>Macrolemys temminckii</i>	P	SSC
American alligator	<i>Alligator mississippiensis</i>	T (S/A)	T (S/A)
Eastern indigo snake*	<i>Drymarchon corais couperi</i>	T	T
Florida pine snake*	<i>Pituophis melanoleucus mugitus</i>		SSC
Gopher tortoise	<i>Gopherus polyphemus</i>	C	T
Green sea turtle	<i>Chelonia mydas</i>	E	E
Kemp's ridley sea turtle	<i>Lepidochelys kempii</i>	E	E
Leatherback sea turtle	<i>Dermochelys coriacea</i>	E	E
Loggerhead sea turtle	<i>Caretta caretta</i>	T	T
Land Mammals			
Choctawhatchee beach mouse	<i>Peromyscus polionotus allophrys</i>	E/CH	E
Florida black bear	<i>Ursus americanus floridanus</i>		FBBCR
Southeastern fox squirrel	<i>Sciurus niger</i>		SSC(S/A)
St. Andrew beach mouse	<i>Peromyscus polionotus peninsularis</i>	E/CH	E
Marine Mammals			
Florida manatee	<i>Trichechus manatus latirostris</i>	E	E
Atlantic spotted dolphin	<i>Stenella frontalis</i>	MMPA	
Beaked whales	<i>Mesoplodon spp.</i>	MMPA	
Bottlenose dolphin	<i>Tursiops truncatus</i>	MMPA	
Bryde's whale	<i>Balaenoptera edeni</i>	MMPA	
Clymene dolphin	<i>Stenella clymene</i>	MMPA	
Dwarf/pygmy sperm whale	<i>Kogia spp.</i>	MMPA	
False killer whale	<i>Pseudorca crassidens</i>	MMPA	
Fraser's dolphin	<i>Lagenodelphis hosei</i>	MMPA	
Killer whale	<i>Orcinus</i>	MMPA	
Melon-headed whale	<i>Peponocephala electra</i>	MMPA	
Pantropical spotted dolphin	<i>Stenella attenuata</i>	MMPA	
Pygmy killer whale	<i>Feresa attenuate</i>	MMPA	
Risso's dolphin	<i>Grampus griseus</i>	MMPA	
Rough-toothed dolphin	<i>Steno bredanensis</i>	MMPA	
Short-finned pilot whale	<i>Globicephalus spp.</i>	MMPA	
Spinner dolphin	<i>Stenella longirostris</i>	MMPA	
Sperm whale	<i>Physeter macrocephalus</i>	E/MMPA	E
Striped dolphin	<i>Stenella coeruleoalba</i>	MMPA	
Fish			
Gulf sturgeon	<i>Acipenser oxyrinchus desotoi</i>	T/CH	T
Smalltooth sawfish	<i>Pristis pectinate</i>	E	E

BGEPA = Bald and Golden Eagle Protection Act; C = Candidate species; CH = Critical Habitat has been designated; E = Endangered; FBBCR = Florida Black Bear Conservation Rule; MMPA = Marine Mammal Protection Act; P = Petitioned for listing under the federal Endangered Species Act; PT = Proposed Threatened; S/A = Similarity of Appearance; SSC = Species of Special Concern; T = Threatened

*Not documented

Table 4-5. USFWS Petitioned Species Known or Potentially Found on Tyndall

Common Name	Scientific Name	Classification
Alligator snapping turtle*	<i>Macrolemys temminckii</i>	Reptile
Eastern Diamondback Rattlesnake	<i>Crotalus adamanteus</i>	Reptile
Bear tupelo	<i>Nyssa ursina</i>	Plant
Blackbract pipewort*	<i>Eriocaulon nigrobracteatum</i>	Plant
Hairy-peduncled beakrush*	<i>Rhynchospora crinipes</i>	Plant
Henry's spider lily	<i>Hymenocallis henryae</i>	Plant
Kral's yellow-eyed-grass	<i>Xyris longisepala</i>	Plant
Panhandle meadow-beauty*	<i>Rhexia salicifolia</i>	Plant
Small-flower meadow-beauty*	<i>Rhexia parviflora</i>	Plant
Smooth-barked St. John's-wort*	<i>Hypericum lissophloeus</i>	Plant
West's Flax*	<i>Linum westii</i>	Plant
Purple Skimmer*	<i>Libellula jesseana</i>	Invertebrate
Say's Spiketail*	<i>Cordulegaster sayi</i>	Invertebrate
Coastal flatwoods crayfish	<i>Procambarus apalachicola</i>	Invertebrate

*Not documented on Tyndall AFB

1 Species descriptions and management activities for listed species are discussed in Chapter 6 of
 2 the INRMP and are covered in detail in the *T&E Species Component Plan* (Appendix B).

3 **4.6 WETLANDS**

4 Wetlands are areas of transition between terrestrial and aquatic systems where the water table is
 5 usually at or near the surface, or the land is covered by shallow water (Mitsch and Gosselink,
 6 2000). Abiotic and biotic environmental factors such as morphology, hydrology, water
 7 chemistry, soil characteristics, and vegetation contribute to the diversity of wetland community
 8 types. Local hydrology and soil saturation largely affect soil formation and development, as well
 9 as the plant and animal communities found in wetland areas (U.S. Environmental Protection
 10 Agency [USEPA], 1995). Wetlands are often categorized by water patterns (the frequency or
 11 duration of flooding) and location in relation to upland areas and water bodies. Wetland
 12 hydrology is considered one of the most important factors in establishing and maintaining
 13 wetland processes, and is critical to the groundwater recharge, floodwater storage, nutrient
 14 cycling, and wildlife habitat functions of wetland systems.

15 Wetlands are among the most productive ecosystems in the world, providing food and shelter for
 16 many different species. Wetlands also provide a host of ecologically important functions such as
 17 groundwater recharge, flood control, shoreline protection, and watershed protection. The
 18 National Wetlands Inventory classification (Cowardin et al., 1979) describes wetland habitats
 19 based on factors such as hydrologic and geomorphic features, and chemical and biological
 20 characteristics. The five wetland categories in this classification system are:

- 21 • ***Estuarine*** - Deepwater tidal habitats and adjacent tidal wetlands that are usually
 22 semi-enclosed by land but have open, partly obstructed, or sporadic access to the ocean,
 23 with ocean water at least occasionally diluted by freshwater runoff from the land. The
 24 upstream and landward limit is where ocean derived salts measure less than 0.5 parts per
 25 thousand during the period of average annual low flow. The seaward limit is (1) an
 26 imaginary line closing the mouth of a river, bay, or sound, and (2) the seaward limit of
 27 wetland emergents, shrubs, or trees when not included in (1).

- 1 • **Riverine** - All wetlands and deepwater habitats contained within a channel except those
2 wetlands (1) dominated by trees, shrubs, persistent emergents, emergent mosses, or
3 lichens, and (2) which have habitats with ocean-derived salinities in excess of 0.5 parts
4 per thousand.
- 5 • **Lacustrine** - Wetlands and deepwater habitats (1) situated in a topographic depression or
6 dammed river channel, (2) lacking trees, shrubs, persistent emergents, emergent mosses,
7 or lichens with greater than 30 percent aerial coverage, and (3) whose total area exceeds
8 8 ha (20 acres), or area less than 8 ha if the boundary is active wave-formed or bedrock
9 or if water depth in the deepest part of the basin exceeds 2 m (6.6 feet) at low water.
10 Ocean-derived salinities are always less than 0.5 parts per thousand.
- 11 • **Palustrine** - All nontidal wetlands dominated by trees, shrubs, persistent emergents,
12 emergent mosses, or lichens, and all such tidal wetlands where ocean-derived salinities
13 are below 0.5 parts per thousand. This category also includes wetlands lacking such
14 vegetation but with all of the following characteristics: (1) area less than 8 ha, (2) lacking
15 an active wave-formed or bedrock boundary, (3) water depth in the deepest part of the
16 basin less than 2 m (6.6 feet) at low water, and (4) ocean-derived salinities less than 0.5
17 parts per thousand.
- 18 • **Marine** - Open ocean overlying the continental shelf and coastline exposed to waves and
19 currents of the open ocean shoreward to (1) extreme high water of spring tides,
20 (2) seaward limit of wetland emergents, trees, or shrubs, or (3) the seaward limit of the
21 Estuarine System, other than vegetation. Salinities exceed 30 parts per thousand.

22 Wetlands comprise approximately 40 percent of Tyndall AFB, and include Palustrine and
23 Estuarine systems (Table 4-1, Figure 3.4). Palustrine (Class Forested) is the predominant
24 wetland type on Tyndall. Refer to Section 6.5 for information on wetlands protection.

25 **4.7 ECOSYSTEM SERVICES**

26 The natural environments on Tyndall provide numerous ecosystem services. It is difficult to
27 assign a monetary value to the majority of these services, and therefore many times they are not
28 adequately valued against other competing demands that provide a clear economic benefit. For
29 the cost of a general recreation permit, members of the public can enjoy a multitude of
30 recreational activities, including hiking, biking, and canoeing. Hunting and fishing opportunities
31 provide both recreational and provisioning services. The same forests and waters used by
32 recreationists also provide supporting services such as nutrient cycling, water filtration, and air
33 purification. The activities detailed in this INRMP strive to maintain and improve these valuable
34 ecosystem services.

35 **4.8 CLIMATE CHANGE VULNERABILITY ASSESSMENT**

36 To address the mandate in DoDI 4715.03 to plan for climate change impacts to natural resources,
37 this section discusses preliminary actions designed to reduce vulnerability against expected
38 climate changes. Because the science and practice of adaptation is still in early stages of
39 development, Tyndall will continue to research planning for climate change.

4.8.1 Background

For the Florida panhandle, climate models predict an average increase in temperature of 3.2°F by 2050 and 5.4°F by the end of the century. Minor changes are projected for annual precipitation averages, but seasonal changes could be more pronounced. Global climate change is also predicted to result in greater climate variability, with more extended droughts and increased storm intensity (Parry et al., 2007).

While sea level rise is anticipated, determining its timing and extent is problematic. The Intergovernmental Panel on Climate Change (IPCC) estimates a global sea level rise of 0.6 to 1.9 feet (0.18 to 0.59 m) by 2100 (IPCC, 2007). Models by Vemere and Rahmstorf (2009) predict a sea level rise between 2.5 to 6 feet (0.75 to 1.9 m) by 2100. Specifically for Tyndall AFB, within East St. Andrew Bay, greater losses of estuarine beach are predicted (45% in East Bay vs. 33% for entire study area), while greater increases in ocean beach are predicted (29% gain vs. 10%) (Warren Pinnacle Consulting, Inc., 2011).

4.8.2 Carbon, Greenhouse Gases and Biofuels

The storage of carbon in forest biomass, litter, and soils is a significant mitigation factor for climate change resulting from elevated emissions of greenhouse gases from fossil fuel combustion (IPCC, 2007; National Research Council, 2000; Wayburn et al., 2007). Since forest biomass and productivity are generally well known for most forest types in the south, it is not difficult to estimate the large carbon storage in pine biomass.

Regional land use activities interact with climate change in dynamic ways, and their influence upon the carbon cycle provides for feedbacks through the storage of carbon in forests, and the emissions of carbon via deforestation. In southeastern forests the storage of carbon in biomass and soils is a mitigation factor for the emissions of greenhouse gases (carbon dioxide) from combustion of fossil fuels. Understanding the carbon cycle and management influences upon it are critical, especially the context for carbon dioxide emissions with prescribed fire in healthy forests versus wildfires in fire-suppressed scenarios. In carbon accounting, also understanding the C costs and efficiencies of harvesting forest biomass for fuelwood can inform environmental policies, and influence the use of sustainable forest biomass for energy.

Ecosystem research has only recently begun to assimilate individual studies on fire-maintained longleaf pine into integrated C models that can evaluate net values for a range of different productivity classes (Starr et al., 2010). There is also a need to model a range of management scenarios, to include the utilization of prescribed fire versus its suppression and alternative wildfire scenarios, and alternative utilization of wood products as biofuels under different regulatory policies. Managers will need to understand how best to maximize the restoration and ecological value of biomass removal while minimizing the potential (both in the near and distant future) of negative and unintended ecological impacts.

4.8.3 Management Responses to Climate Change

There are two primary categories of management strategies for addressing climate change and sea level rise: (1) increasing the resiliency of ecological systems and (2) providing areas for

1 migration of habitat and species (also known as a mitigation strategy) (Joyce, 2008; Peterson,
2 2008). The uncertainties surrounding actions related to climate change or sea level rise require
3 an adaptive management approach to the evaluation and implementation of management
4 responses (Kareiva, 2008). Some of the areas of uncertainty include how climate change will
5 affect:

- 6 • Hydrologic regime, water temperature, water chemistry, sediment, and rare aquatic
7 species in the wetlands and water bodies on and adjacent to Tyndall AFB.
- 8 • Amount and proportion of beach habitat for nesting sea turtles, beach mice, piping
9 plovers, snowy plovers, and other beach species.
- 10 • Habitat and food sources for gopher tortoises, indigo snakes, and black bears.
- 11 • Growth rates and mortality of longleaf pine.
- 12 • Regeneration and restoration of longleaf pine.
- 13 • Wildfires and prescribed fires.
- 14 • Spread of invasive non-native plant and animal species.
- 15 • Threat of erosion.

16 Below is a list of possible general adaptation approaches for natural resource management at
17 Tyndall AFB in response to climate change:

- 18 1. Reduce the impacts of current stressors to enhance ecosystem resilience to climate
19 change in the near term. Current stressors include altered fire regimes (unnaturally high
20 fuel loads, presence of off-site species), invasive species, and altered hydrology.
- 21 2. Maximize unfragmented patches of ecological systems, including within ecosystem
22 topographic and hydrologic variability, functional ecological processes, and landscape
23 patterns of ecological systems.
- 24 3. To ensure there are migration corridors for rare plants and wildlife, encourage the land
25 management of natural vegetation in areas of potential inland migration by the use of
26 prescribed fire and invasive species control. Dense vegetation and invasive species may
27 interfere with the inland migration of marsh vegetation.
- 28 4. Monitor trends in ecological systems to assess changes in reference conditions, especially
29 longleaf pine regeneration and ground cover responses. Use the dynamic reference
30 condition approach to assess changes over time.

31 Identifying and adapting to the likely effects of climate change calls for a proactive rather than
32 reactive approach to maintain cost effective programs and meet legal requirements to manage
33 natural resources. Collaboration with other natural resources agencies will lead to a successful
34 result for all stakeholders. These management strategies will help foster an ecosystem approach
35 that considers and addresses the impacts of climate change.

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5. NATURAL RESOURCES AND MISSION SUSTAINABILITY

The underlying driver for all natural resources management actions on Tyndall AFB is military mission support. Coordination among multiple organizations is required to minimize conflicts and impacts, both to mission activities and natural resources. Tyndall's natural resource managers integrate and prioritize wildlife, fire, and forest management activities to protect and effectively manage the base's natural environments to ensure long-term mission sustainability.

5.1 CURRENT MISSION IMPACTS

This section describes those current mission activities that affect or may potentially affect natural resources. The primary concerns for natural resources at Tyndall are associated with direct impacts to species and their habitats. Mission requirements mandate clear zones and airspace glide slopes around active airfields, thus resulting in the extension of non-forested areas and the harvest of areas every 25 years where trees are projected to penetrate certain air slope requirements (Figure 5.1). Runway clear zones are 3,000 square feet (278.7 square meters) areas at the end of a runway. Runway Clear Zones should be actively mowed so no trees can grow. Several areas on Tyndall AFB are designated as explosive ordnance clear zones. These zones range in radius from 400 to 4,000 feet (122 to 1219 m). These designated areas are restricted, allowing no hunting or public/recreational access. Airfield approaches are managed as to reduce the attractiveness of habitat to birds to reduce collisions with aircraft. Osprey nests are removed from towers, navigational and utility structures, and around the airfield.

The development of the Silver Flag training area in the flatwoods is converting natural habitat to roads and buildings, increasing runoff, decreasing water quality, and adding disturbance and noise to the species present (Figure 5.2). Operations here prevent unrestricted hunting and limit recreation opportunities. The *Silver Flag Environmental Assessment* (EA) (U.S. Air Force, 2013) contains detailed analysis of potential impacts.

Recreational areas for hunting and fishing (Bi Ammo Lake) near the Ammunition Storage facilities were closed in 2012 for safety concerns.

There is also the potential for impacts from air and water pollution point sources, noise, hazardous waste, and Environmental Restoration Program (ERP) sites, but Tyndall Compliance organizations maintain permits and monitor these, and there are currently no major concerns for natural resource impacts. Some freshwater fishing ponds are now restricted because of lead contamination (ERP site) or graywater reuse (David Pond at old Golf Course). Tyndall AFB manages potential environmental contamination sites through the ERP. Tyndall addresses potential industrial point source water pollution problems through a Multi-Sector General Permit, which is described in the base's Stormwater Pollution Prevention Plan. A stormwater management program for potential non-industrial discharges is addressed through best management practices (BMPs) implemented under the base's Municipal Separate Storm Sewer System (MS4) permit.

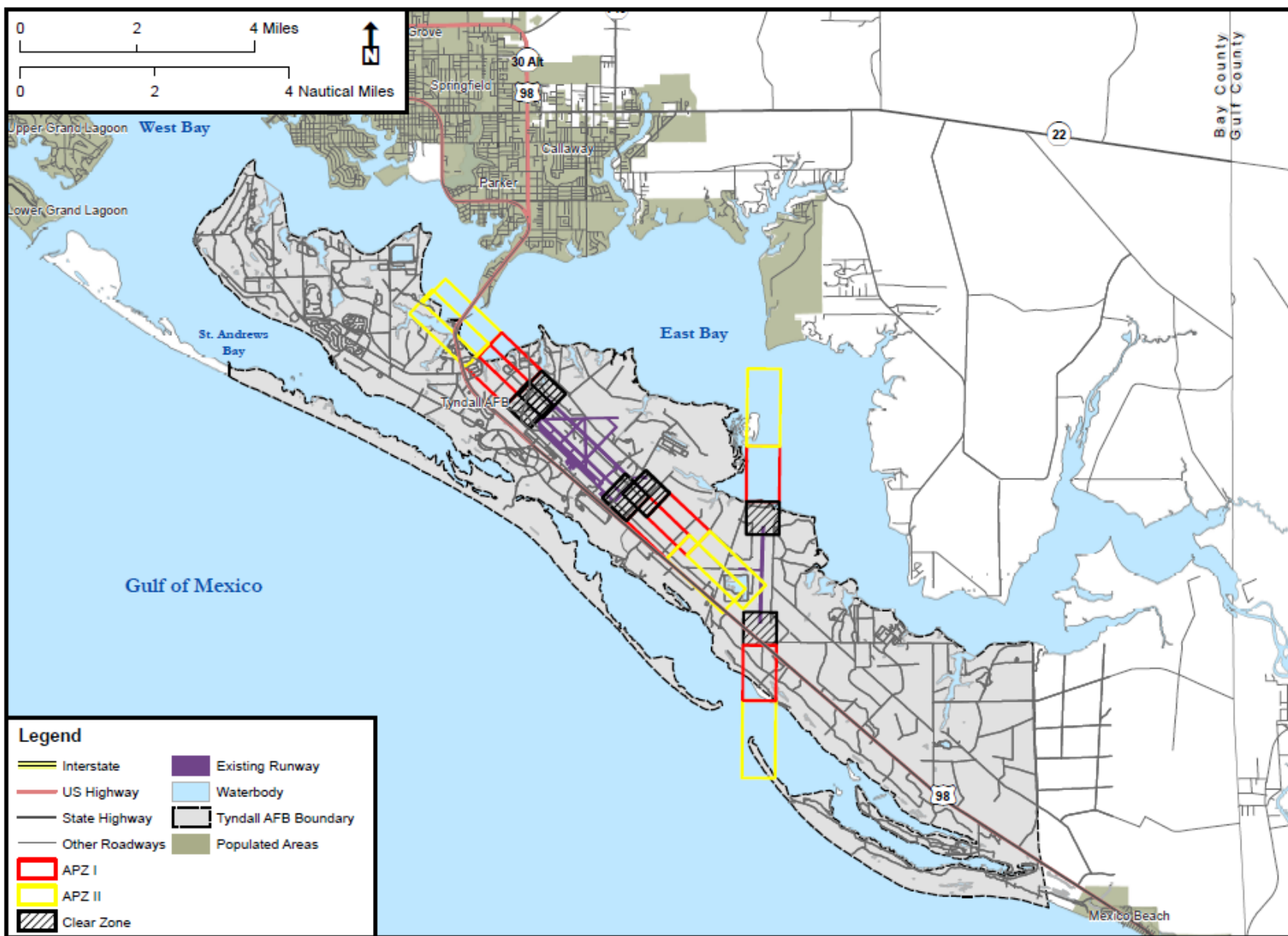


Figure 5.1. Clear Zones at Tyndall AFB



Figure 5.2. Silver Flag Training Area

1 **5.2 POTENTIAL FUTURE IMPACTS**

2 Land clearing, construction, and ground training activities are the main activities with the
 3 potential to affect natural resources on Tyndall AFB, primarily through stormwater issues and
 4 reduction in natural areas. Current and proposed construction projects may impact sensitive
 5 habitats for federally listed species, either directly through habitat destruction, or indirectly
 6 through changes in management, such as decreased ability to conduct prescribed burns near new
 7 buildings. Proposed construction may also impact species indirectly by prohibiting growth of the
 8 species or connection of suitable habitat to merge populations, as well as increasing predators
 9 and nuisance wildlife drawn to food (i.e., trash) in developed areas. Equipment decontamination
 10 procedures for construction will be needed to slow the spread of invasive plants.

11 **5.2.1 Tyndall Installation Development Plan**

12 The Tyndall General Plan was completed in 2004 and subsequent Area Development Plans were
 13 written in 2008. Currently AFCEC has contracted the Tyndall Installation Development Plan
 14 (IDP) which will be completed March 2015 (Cook, 2014). The new Tyndall IDP will meet the
 15 new AF Comprehensive Planning instruction requirements (AFI 32-7062), which were
 16 substantially revised in 2013. The Tyndall mission has significantly changed in the last decade
 17 with the replacement of a training squadron of F-15s with a deployable squadron of F-22s and
 18 replacement of the QF-4s with QF-16s. The base switched MAJCOMs from AETC to ACC. The
 19 IDP provides a developmental path forward that incorporates known and projected mission
 20 requirements, developmental constraints and opportunities, and recommended courses of action
 21 to achieve optimal use of lands, facilities, and resources in support of installation performance
 22 (Cook, 2014). The completed IDP will provide leadership a concise snapshot of Tyndall to make
 23 effective development decisions affecting the installation and the surrounding community over
 24 the next 20 years (Table 5-1).

Table 5-1. Tyndall FY 16 MILCON Projects

Project	Potential Impact to Natural Resources
Fire Station	Stormwater
Explosive Ordnance Disposal Facility	Stormwater
Highway 98 Overpass	Stormwater, protected species
Flightline Security Fencing	Stormwater, protected species
Mission Support Group Annex (Phase 1)	Stormwater
Civil Engineer Complex (Phase 1)	Stormwater
Lodging (Phase 1)	Stormwater
Wing Command Center	Stormwater
Dormitory (Phase 2)	Stormwater
Weapons Evaluation Group Consolidation	Stormwater

Source: Tyndall AFB, 2013a.

25 **5.2.2 Ground Training Operations**

26 Increased ground training operations may limit access for natural resource management; this may
 27 result in a decreased ability to conduct prescribed fires, forest restoration activities, and
 28 monitoring of protected species. Habitat alteration is the primary natural resources concern

1 associated with increased ground training as heavy ground training may cause erosion problems
 2 in areas where vegetation is trampled. In addition, increased human presence and noise may
 3 harass protected species (i.e., nesting sea turtles). Tyndall Natural Resources will need to
 4 address conflicts between military missions and protected species management through Section 7
 5 consultations.

6 **5.3 NATURAL RESOURCES CONSTRAINTS TO MISSIONS AND MISSION**
 7 **PLANNING**

8 Constraints are considered to be anything that causes restrictions on the mission. In some cases,
 9 the presence of T&E species, water resources, or sensitive habitats may limit the types or degree
 10 of activities in an area, but rarely are mission activities completely restricted due to natural
 11 resource issues. Early consideration of these issues in planning typically results in solutions
 12 where the mission can proceed unimpeded, either through slight modifications in location or
 13 timing or by obtaining permits through the appropriate regulatory channels that allow the
 14 potential for negative impacts to the resource (i.e., ESA Section 7 consultation). Section 7
 15 consultations previously completed by Tyndall (formal and informal) are summarized in
 16 Table 5-2.

Table 5-2. ESA Section 7 Consultations for Tyndall AFB

Consultation Title	Proponent	Location	Year	Affected Species
Combat Support Training Complex Tyndall AFB, Florida	Tyndall AFB	Farmdale Site	1989	American alligator, Eastern indigo snake, Piping plover, and Red-cockaded Woodpecker (RCW)
Family Housing Project	Tyndall AFB	Wood Manor Housing	1993	Eastern indigo snake
Increase in F-15 Fighter Aircraft Assets	Tyndall AFB	Installation wide	1994	Sea Turtles, Gulf sturgeon, Piping plover, Bald Eagle, Least Tern, and RCW
Armed Forces mission-related vehicle access and driving (USFWS, 1998)*	Tyndall AFB	GOM beaches except Shell Island	1998	Sea Turtles and Piping plovers
The Employment of Chaff and Flares in the Carrabelle and Compass Lake Overland Work Areas	Tyndall AFB	Airspace north and east of Tyndall AFB	1998	Sea turtles and RCW
Reopening of East Pass (USFWS, 2001 and 2002)*	Bay County Board of Commissioners and Tyndall AFB	East Pass between GOM and St. Andrew Bay on Shell Island	2001, Amended in 2002	Choctawhatchee and St. Andrew beach mice, Piping Plover, and Sea Turtles
Tyndall FY02 Pest Management Plan	Tyndall AFB	Installation wide	2002	Choctawhatchee and St. Andrew beach mice
Military Point Transmission Line Project*	Gulf Power	Transmission line over St. Andrew Bay extending from Parker to Tyndall AFB	2004	Bald Eagle
Tyndall AFB Bald Eagle	Tyndall AFB	Drainage ditch 1	2004	Bald Eagle

Table 5-2. ESA Section 7 Consultations for Tyndall AFB (Cont'd)

Consultation Title	Proponent	Location	Year	Affected Species
Monitoring Plan for New Nest within a Installation Restoration Program Site		and 2 south of old Wastewater Treatment Plant site LF006		
Military Family Housing Privatization	Tyndall AFB	Military Family Housing units in Shoal Point, Bay View, and Wood Manor	2005	Eastern Indigo Snake and Bald Eagle
Sky X Utilities	Tyndall AFB (Research Laboratory)	Farmdale 2 Road	2006	Bald Eagle
325 th FW INRMP	Tyndall AFB	Installation wide	2006	Choctawhatchee and St. Andrew beach mice, Piping plover, Sea turtles, Gulf sturgeon, American alligator, West Indian manatee, Bald Eagle, and Godfrey's butterwort
Construction of a Multi-Story Dormitory at Tyndall AFB	Tyndall AFB	Georgia Avenue, Tyndall AFB	2006	Sea turtles
Fitness Center	Tyndall AFB	Mississippi Road, Tyndall AFB	2007	Sea turtles
325 th FW Construction and Operation of Air Force Research Laboratory Facilities in the 9700 Area of Tyndall AFB	Tyndall AFB	9700 Area of Tyndall AFB	2008	Sea turtles
Rebuild Bonita Bay dock	Tyndall AFB (82nd Aerial Targets Squadron)	Pearl Bayou	2010	West Indian Manatee, Gulf sturgeon
F-22 Operational Squadron and T-38A Detachment Beddown at Tyndall AFB, Florida	Tyndall AFB	Installation wide	2011	Bald Eagle, Alligator snapping turtle (P), American alligator, Eastern indigo snake, and piping plover
East Boundary Fire Break	Natural Resources	East boundary line, south of Highway 98	2011	St. Andrew Beach Mouse
Silver Flag EA	823rd RED HORSE	Eastern part of Tyndall AFB along southern coast of East Bay	2013	Godfrey's butterwort
SR 30 (US 98) at Tyndall AFB, Highway Flyovers with Gate Reconfiguration	Florida Department of Transportation	Highway 98	2013	Sea turtles
NCO Beach Access Road Maintenance Project (USFWS, 2014)	Natural Resources	NCO beach access road	2014	Choctawhatchee and St. Andrew beach mice, Piping Plover, and Sea Turtles

AF = Air Force; AFB = Air Force Base; EA = Environmental Assessment; ESA = Endangered Species Act; FW = Fighter Wing; GOM = Gulf of Mexico; NCO = Noncommissioned Officer; P = Petitioned species; RED HORSE = Rapid Engineer Deployable Heavy Operational Repair Squadron; USFWS = U.S. Fish and Wildlife Service

*Indicates Formal consultation

1 Although open space is the predominant land use at Tyndall AFB, environmental constraints
2 limit the use of certain areas for development, and in some cases for ground training. Portions of
3 Tyndall may be constrained by natural resources concerns such as T&E species habitat, wetlands
4 and floodplains; and beach areas. Missions may also be affected on days with high fire danger
5 when missions with potential to start wildfires may be restricted, or in situations where missions
6 are shut down or delayed due to smoke or fire suppression activities.

7 Seasonal natural resource considerations exist for some species such as sea turtles, shorebirds,
8 and piping plovers. For many of these species, shifting the timing of a mission to outside of the
9 nesting or foraging season results in few to no requirements. In other situations, the
10 consideration may be location; oftentimes a simple shifting of 100 feet (30.5 m) or a
11 modification in the extent of the activity will resolve location conflicts. Coordination with
12 mission planners allows Tyndall Natural Resources to initiate Section 7 consultations in a timely
13 manner to avoid mission delays. Early planning is the key to making these resources
14 “considerations” rather than “constraints.”

15 The environmental requirements developed through the EIAP or brought forward by other
16 regulatory drivers are mandatory. Personnel and unit commanders may be held personally liable
17 for violations of environmental statutes and regulations. Failure to follow these requirements
18 may constitute a violation of federal and state environmental laws. Adherence to these
19 requirements helps maintain quality environments for future missions and ensures that Tyndall is
20 in compliance with all applicable state and Federal regulations. Examples of natural resources
21 requirements include:

- 22 • Avoid activities that may damage dunes or shoreline vegetation.
- 23 • Beachfront activities occurring between 01 May and 31 October must follow numerous
24 requirements to avoid impacts to sea turtles. Sea turtles are sensitive to noise, light, and
25 ground disturbing activities.
- 26 • Beach driving must be coordinated through Tyndall Natural Resources.
- 27 • Maintain 660 foot construction buffer around bald eagle nests
- 28 • Avoid vehicles and heavy equipment use within 25 foot (7.6 m) radius of gopher tortoise
29 burrow entrances

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6. NATURAL RESOURCES PROGRAM MANAGEMENT

Natural resources management is an inherently integrated process. While this chapter discusses programs separately, it must be noted that each of the strategic priorities of Tyndall Natural Resources involves multiple program elements. All INRMP projects support achievement of the five overarching principal natural resources management goals, which are:

- Provide natural resources management and coordination services in support of the mission.
- Restore and manage forests for mission use, habitat improvement, and protection of T&E species.
- Enable long-term sustainability of beach environments for military use by protecting T&E species and their habitats.
- Restore and protect wetland habitats to comply with federal law and protect T&E species.
- Provide a variety of uses, values, products, and services to present and future generations while maintaining sustainable ecosystems.

6.1 NATURAL RESOURCES PROGRAM MANAGEMENT

To ensure Tyndall AFB's military missions and environmental conservation missions are compatible and mutually supportive, multiple installation organizations play a role in managing, protecting, and supporting Tyndall's natural resources. A description of the organizations necessary to implement Tyndall's INRMP, as well as descriptions of the entities involved in stewardship of Tyndall's natural resources, is provided in the following subsections.

6.1.1 Organizations Necessary to Implement INRMP

325th Civil Engineer Squadron, Environmental Element (325 CES/CEIE)

The Tyndall AFB Environmental Element (325 CES/CEIE) is responsible for management of environmental compliance and natural and cultural resources programs. The Environmental Element team works closely with other organizations on the base to ensure compliance with applicable federal, state, and local regulations and permits. The compliance staff is responsible for managing programs in pollution prevention, air emissions, asbestos, underground storage tanks, EAs, cultural resources management, water, hazardous waste, and the AF's ESOHCAMP.

Natural Resources (325 CES/CEIEN)

Tyndall Natural Resources (325 CES/CEIEN) protects and enhances Tyndall's natural resources and related programs, including forest management, fish and wildlife management, non-structured outdoor recreation and education, wildland fire management support, and natural resources public relations. Natural Resources manages permits and information on hunting, fishing, and non-consumptive outdoor recreation activities. Routine decisions and actions related to natural resources management at Tyndall are the responsibility of the Environmental

Natural Resources Program Management

1 Element Chief. Issues typically outside the Chief’s authority include actions that would result in
2 a change of policy or budget, actions that would affect other agencies or organizations, and
3 actions that would have a legal impact. For such actions, the Environmental Element Chief
4 would seek direction from other authorities.

5 **Roles of Other Tyndall Organizations**

6 Other Tyndall organizations that support Tyndall Natural Resources activities are listed in
7 Table 6-1, along with descriptions of the support provided.

8 **6.1.2 Role of Other Defense Organizations**

9 **U.S. Army Corps of Engineers**

10 The U.S. Army Corps of Engineers (USACE) provides the following services to Tyndall AFB:

- 11 • Contract support
- 12 • Dredge and fill permitting
- 13 • Regulatory, wetlands delineation

14 **AFCEC Support**

15 AFCEC provides primary support for installation sustainment, including engineering and
16 environmental programs. Many functions formerly completed by command and staff are now
17 AFCEC functions; AFCEC funds, reviews plans, contracts, and provides contract support to
18 installations. Specific support actions for Natural Resources are as follows:

- 19 • Aid installations in preparation and review of INRMPS, including review for compliance
20 with pertinent directives.
- 21 • Ensure that installations conduct required inventories of natural resources, and validate
22 installation natural resources budgets, staffing, and training requirements.
- 23 • Provide technical assistance to MAJCOMs and installations on natural resources
24 programs and training.
- 25 • Provide and manage contracts, interagency agreements, and cooperative agreements to
26 assist MAJCOMs and installations with implementation of natural resources management
27 projects.
- 28 • Manage the forestry; agricultural and grazing; and hunting, fishing and outdoor recreation
29 program reimbursable budgets.
- 30 • Provide technical guidance and expertise on pest management, grounds maintenance, and
31 water conservation.
- 32 • Wildland Fire Center provides wildland fire policy and standards, tracks AF firefighter
33 qualifications, assists with program planning and implementation, obligates fire related
34 funding, and contracts interagency support for burning.

Natural Resources Program Management

Table 6-1. Roles of Other Tyndall Organizations

Organization Name	Section	Natural Resources Support Provided
325 CES/CEIEC	Environmental Planning	Conducts NEPA analysis for Natural Resources activities and plans
	Environmental Compliance	Provides policy, guidance, and permits for air, dredge/fill, potable/non potable water, stormwater, wastewater, and spill response
	Pollution Prevention	Encourages base organizations to use pollution prevention as a primary strategy for meeting environmental compliance requirements. Coordinates EMS audits and EC assessments.
325 CES/CEIEN	Cultural Resources	Coordinates natural resource activities to avoid negative impacts to significant historical resources and conducts consultations with the State Historic Preservation Office
325 CES/CEIAI	Computer Support	Computer and technical support
325 CES/CEIAR	Contract and Finance Management	Administrative assistance in financial management and contract management.
AFCEC	Environmental Restoration Program	Supports natural resources activities to avoid areas with IRP and land use control constraints
325 FW	Public Affairs	Media relations, community relations, and internal information and public education concerning natural resources, how they are managed, utilized and protected.
	Protocol Office	Tours for distinguished visitors
	History Office	Maintains records of history of natural resources management on Tyndall
	Safety Office	Oversight of ground, weapons, and range safety, as well as the Bird/Wildlife Aircraft Strike Program.
	Judge Advocate, Environmental Law Division	Legal advice and representation
	Contracting Directorate	Contract/ MOA support
	Wing Plans Office	Strategic plans and programmatic environmental analysis
325 th Comptroller Squadron		Financial management.
325 th Operations Group		Provides test and training requirements, test planning and execution, special operations, helicopter support, integrating natural resources considerations into mission planning, and weather support.
325 th Operations Support Squadron		Provides the coordination between Tyndall and training groups.
325 th Medical Group		Firefighter and occupational physicals
325 th Civil Engineer Squadron		Performs the operation, maintenance, repair, and construction of real property that sustains Tyndall's facilities.
325 th Logistics Readiness Squadron		Provides supply and equipment orders
325 th Security Forces Squadron		Law and regulation enforcement
325 th Force Support Squadron		Provides Human Resources support for seasonal employees through MOA and manages some outdoor recreation programs

325 CES = 325th Civil Engineer Squadron; AFCEC = Air Force Civil Engineer Center; EC = Environmental Compliance; EMS = Environmental Management System; FW = Flight Wing; IRP = Installation Restoration Program; MOA = Memorandum of Agreement; NEPA = National Environmental Policy Act

1 **6.1.3 Role of Other Federal and State Agencies**

2 **Role of the U.S. Fish and Wildlife Service on Tyndall AFB**

3 The USFWS Ecological Services Office in Panama City, Florida, has worked cooperatively with
4 Tyndall Natural Resources for many years. The Service's main role on Tyndall has been to
5 assist Natural Resources with the conservation and management of federally listed T&E species
6 that occur on the installation in a manner that sustains and supports Tyndall's military mission.
7 In 2013, the USFWS began supplying personnel through Cooperative Agreements to conduct
8 species monitoring at Tyndall. Tyndall coordinates annually with the USFWS regarding INRMP
9 updates and adjustments made to goals and objectives.

10 **Role of the Florida Fish and Wildlife Conservation Commission on Tyndall AFB**

11 Tyndall AFB and the FWC have maintained an effective partnership and close working
12 relationship for the past several decades. As a conservation partner, the FWC assists Tyndall NR
13 in the review and development of management plans, and the annual review of the INRMP. This
14 agency also provides technical information and support of Tyndall AFB's fish and wildlife
15 management program.

16 ***Critical Wildlife Area***

17 Critical Wildlife Areas are specific sites designated by the FWC to protect places where wildlife
18 congregates to nest, roost, and feed (Florida Administrative Code [FAC] 68A-19.005, 68A-
19 14.001 and 68A-14.0011). These areas are designated through an establishment order where
20 these important wildlife areas can be impacted by human-related activities. Tyndall's Critical
21 Wildlife Areas include the entire emergent lands known as CIE, CIW, and Shell Island. Areas
22 within the Critical Wildlife Area boundary may be posted closed to dogs, vehicles and people
23 from April 1 to September 15 for the protection of nesting birds or year-round for the protection
24 of migratory and resident wintering birds. Areas not posted are open to public access. The
25 boundary was revised in 2014 using GPS coordinates to more accurately define the shorebird
26 habitat on the barrier islands. The re-designation package is currently at FWC headquarters in
27 Tallahassee awaiting signature.

28 ***Wildlife Management Area***

29 Tyndall is designated as a Florida Wildlife Management Area (WMA). This designation enables
30 Tyndall AFB-specific rules and regulations to be codified into FAC 68A-15.063(18). Under this
31 program, Tyndall Natural Resources serves as the lead management agency and collects fees
32 from the sale of hunting and fishing permits to manage fish and wildlife resources under state
33 jurisdiction. In exchange, Tyndall AFB permits public hunting and fishing opportunities and the
34 FWC provides fish and wildlife law enforcement support. These actions enable FWC Wildlife
35 Officers to enforce Tyndall AFB-specific rules, such as no hunting in closed areas and unique
36 management unit regulations.

1 ***Florida's State Wildlife Action Plan***

2 As a steward of significant areas of wildlife habitat in Florida, Tyndall Natural Resources
3 cooperates with FWC in implementation of the [Florida's State Wildlife Action Plan](#). This plan
4 (previously the Comprehensive Wildlife Conservation Strategy) is an action plan for conserving
5 all of the state's wildlife and vital natural areas for future generations. It outlines what native
6 wildlife and habitats are in need, why they are in need and, most importantly, what actions will
7 be taken to address these needs. The goals of the plan are to: provide a blueprint for management
8 and conservation of Florida's wildlife, define a common vision for protecting wildlife, design a
9 non-regulatory effort creating partnership to implement the plan through local actions, and target
10 resources to prevent native wildlife from declining to the point of imperilment.

11 The [Florida's State Wildlife Action Plan](#) identifies nearly 1,000 wildlife species that are “species
12 of greatest conservation need” and 45 different habitat categories, along with the threats to these
13 habitats. It addresses potential solutions to mitigate or remove threats such as acquisition of
14 important lands, cooperative conservation efforts with public and private landowners, and public
15 education. Tyndall Natural Resources will continue to cooperate with this effort by conducting
16 sound ecosystem management, providing data on species and habitats when available, and
17 conducting monitoring on species and habitats when feasible. Examples of current efforts are
18 shorebird monitoring, sea turtle monitoring, and gopher tortoise surveys.

19 **Role of the National Marine Fisheries Service on Tyndall AFB**

20 The NMFS is the regulatory agency that enforces the MMPA and the ESA for marine species.
21 NMFS works with action proponents to prevent or minimize potential takes or harassment of
22 marine species protected under these laws. Multiple over-water missions originating at Tyndall
23 are addressed in the *Eglin Gulf Test and Training Range EA* and the associated Biological
24 Opinion and MMPA take permit.

25 **Other Groups That Support INRMP Implementation**

26 Various universities and organizations conduct research projects on Tyndall AFB that provide
27 information to support INRMP implementation. Some of the groups that work with Tyndall AFB
28 include The Nature Conservancy (TNC), FNAI, U.S. Forest Service, Florida State University,
29 Apalachicola Regional Stewardship Alliance (ARSA), and the University of Florida (UF) (Table
30 6-2). Additionally, contractors provide direct support to Tyndall Natural Resources.

31
32 Another group that supports INRMP projects is Striving Toward Achieving Real Success
33 (STARS), which is a Bay County youth program. The program provides hands-on opportunities
34 for students. Past projects conducted on Tyndall AFB through this program include: installing
35 fencing around sensitive coastal and cultural areas (beach mouse critical habitat, access roads,
36 and cemeteries), clearing vegetation on nature trails and around fishing ponds, building picnic
37 tables, and improvements at group campground sites.

Table 6-2. Natural Resources Support from Other Agencies and Organizations

Agency/Group	Partner Description	Project Location
Federal Agency		
USFWS	Cooperative agreement to provide term and intern personnel for project support: baseline wildlife surveys, ecology, T&E species monitoring. AF funding transfers began in 2013.	Throughout installation
USFWS	Assist intermittently with wintering and breeding shorebird surveys, especially International Plover Census, Christmas Bird Count, and Annual Snowy Plover Census, beginning in 2009.	CIE, CIW, Shell Island and bay shorelines
USFWS	Beach mice live trapping, population estimates, translocations and monitoring from 1999 to present.	CIE, CIW, and Shell Island
USFWS	Coastal Program cooperative agreement funding longleaf restoration on Tyndall from 2013-14.	Forested areas throughout installation
NOAA Fisheries	Southeast Fisheries Science Center in Panama City Beach conducts shark surveys, monitoring, and population assessments in nursery grounds one to two times per month, since 2005.	Crooked Island Sound and St. Andrew Bay
NOAA Fisheries and USFWS	Tracking Gulf Sturgeon during winter months in marine waters since 2007.	Crooked Island Sound, St. Andrew Bay, Gulf of Mexico
USGS	Southeast Ecological Science Center conducts inwater sea turtle surveys in water surrounding Tyndall since 2012. Pursuing future Cooperative Agreement for hydrologic restoration of wetlands in 2016.	Crooked Island Sound, St. Andrew Bay, Gulf of Mexico
USDA	APHIS Wildlife Services provides intermittent predator control trapping for coyote, raccoon, fox, opossum, armadillo, feral hog, and feral cat, primarily in coastal areas to lower predation on T&E species since 2007. New Cooperative Agreement in 2015 will allow for full-time nuisance species management.	Coastal areas south of Hwy 98, west end of base added in 2010, throughout installation added in 2015
USDA	APHIS Wildlife Services, National Wildlife Research Center will study bald eagle and aircraft collision reduction work through a DoD Legacy funded project in 2015-16.	Eagle nests around the main runway
USDA	Forest Service provides support for wildland fire and prescribed burning though Nationwide Memorandum of Understanding (MOU) with DoD, since 2000.	Undeveloped areas throughout installation
Natural Resources Damage Assessment (NRDA)		
Piping Plover	Shorebirds (oil spill response): one time survey for piping plovers in 2011.	CIE, CIW, and Shell Island
Migratory Birds	Shorebirds (oil spill response): bi-weekly survey for oiled birds in 2010.	CIW and Shell Island
Shorebirds	Shorebirds (oil spill response): weekly survey for injured or dead birds in 2010.	CIE, CIW, and Shell Island
Benthic Sampling	Long term annual sampling, began in 2011	East Bay (Goose Bayou)
State Agency		
FWC	FWRI monitors tracking tubes monthly for population trends on St. Andrew beach mice, since 2008	CIE
FWC	FWRI monitors tracking tubes monthly for population trends on Choctawhatchee Beach Mice, since 2010.	CIW and Shell Island
FWC	Northwest Regional office and FWRI conduct bimonthly winter shorebird monitoring, nesting season surveys, and annually assist with posting shorebird areas. Biennially 2002-06, annually 2009-11.	CIE, CIW, Shell Island, and Buck Beach

Natural Resources Program Management

Table 6-2. Natural Resources Support from Other Agencies and Organizations (Cont'd)

Agency/Group	Partner Description	Project Location
FWC	Critical Wildlife Area Technician for weekly breeding shorebird surveys funded through a NOAA grant from 2012-13. FWC applied for Conserve Wildlife Tag grant funding for 2016 season.	CIE, CIW, Shell Island, and Buck Beach
FWC	Shorebird technician for weekly wintering and breeding shorebird surveys funded through a NFWF Shell Marine Habitat grant from 2014-15.	CIE, CIW, Shell Island, Buck Beach and bay shorelines
FWC	Invasive Plant Management Section provides technical assistance and funds eradication of non-native invasive plants. Funded in 2010 and 2014.	Throughout installation
FWC	Division of Law Enforcement regularly patrols land and water to enforces regulations for Wildlife Management Area and Critical Wildlife Area.	East Bay, St. Andrew Bay, Crooked Island Sound, and undeveloped areas throughout installation
FWC	Division of Habitat & Species Conservation provides assistance setting quotas for game species and protocols for nongame surveys. Division of Hunting and Game Management publishes Tyndall's hunting regulations.	Undeveloped areas throughout installation
FWC	Division of Freshwater Fisheries Management stocks fishing ponds, conducts assessments and assists with youth fishing events annually.	Freshwater ponds
Florida Forest Service	Provide intermittent support for wildland fire and prescribed burning from 2000-2013; future participation uncertain with development of Eglin Wildland Fire Center.	Undeveloped areas throughout installation
FDEP	Florida Park Service assists with shorebirds surveys since 2011, and accesses park lands through Tyndall.	Shell Island, occasionally other coastal areas
FDEP	Division of Water Resource Management conducts monthly water quality sampling since 2012	Crooked Island Sound and St. Andrew Bay
Universities		
State University of New York	Graduate research completed 2011-12 studying snowy plover and shorebird disturbance factors	CIE, CIW, and Shell Island
Boise State	Graduate research completed in 2009-10 examining snowy plover habitat features.	CIE, CIW, Shell Island, and Buck Beach
UF	Graduate research project on snowy plover demographics and life history from 2008-09; continued as a 10-year banding and re-sighting project by FDEP (ending in 2016)	CIE, CIW, Shell Island, and Buck Beach
UF	Completed 2007-08 graduate research on sea turtle disorientation from AFB lighting	CIE, CIW, and Shell Island
FSU – Tallahassee	Graduate research completed biannual coastal vegetation plant census in 2010-12 to document oil spill response and coastal processes (e.g. hurricanes) that alter dune plant communities. Study plots continued 2013-present.	CIE
FSU – Coastal Marine Lab at Turkey Point	Completed salt marsh study 2010-11 to quarterly monitor smooth cordgrass, other marsh vegetation and native snail populations.	Submerged vegetation in Pearl Bayou and East Bay, near Bonita Bay
Boise State	Plant collections completed for a senior thesis project from 2011-13.	Throughout installation
Illinois Natural History Survey	Multiple cooperative projects on rare plant conservation, primarily <i>Pinguicula</i> species, coordinated with USFWS from 2011-14. Collected leaf material for genetic analysis; graduate research on plant response to shading.	Three rare plant sites: Road 5, Tower Road, Drone Recovery Field

Natural Resources Program Management

Table 6-2. Natural Resources Support from Other Agencies and Organizations (Cont'd)

Agency/Group	Partner Description	Project Location
Eastern Illinois University	Completed <i>Pinguicula ionantha</i> seed collections in 2011-12 for senior thesis on germination methods	Two <i>P. ionantha</i> sites on Road 5, and Tower Road
Wayne State College	Completed one-time beach mouse and small mammal trapping/training in 2010.	CIE, CIW, and Drone Recovery Field
Gulf Coast Community College	Intermittently provide survey locations for undergraduate student marine related projects since 2009, such as oyster or scallop growth studies	Bay shorelines, especially near piers
Non-Governmental Organization		
National Wild Turkey Federation (NWTf)	Provide annual grant funding since 2011 under an MOA with AFCEC for longleaf pine tree planting and roller chopping/site preparation for ecosystem restoration.	Undeveloped areas throughout installation
ARSA	Under an MOU, provides ongoing grant funding and on-the-ground support for longleaf pine restoration, prescribed fire and invasive species control projects since 2008.	Undeveloped areas throughout installation
FNAI	Coastal Plant Succession Census: annually documenting trends and changes in plant communities over 20+ years, including dunes and upland forests from the Gulf to bay shoreline.	1 plot transect on both CIE and CIW
Bok Tower Gardens	Collect seeds in 2011-12 from rare plant species on military lands for ex situ conservation at the Center for Plant Conservation; funded through DoD Legacy Program.	Two <i>P. ionantha</i> sites on Road 5, and Tower Road
Coastal Bird Conservation Program (Conservian)	Breeding shorebird surveys in 2009-10, and assessing disturbance factors	CIE, CIW, and Shell Island
Bay County Audubon Society	Conduct annual Christmas Bird Count for 15+ years, volunteer wintering shorebird surveys 2009-11, intermittent educational outreach programs	Throughout installation
Audubon of Florida	Set up breeding shorebird steward and docent programs to minimize disturbance to beach nesting birds and provide education to beach-goers from 2010-12. Awarded NRDA Early Restoration funds for breeding shorebird season 2013-16. Awarded GEBF funds for wintering season 2014-16.	CIE, CIW, and Shell Island
Gulf Coast Shell Club	Conduct intermittent shell collecting and educational field trips (ongoing); provide specimens for outreach displays.	Bay and Barrier Island Shorelines
TNC	Lead for the ARSA Cooperative Invasive Species Management Area; assist with prescribed burning since 2012; received DoD Legacy grant for invasives species control in 2010-11; provide grant funding through various sources for invasives and longleaf restoration 2013-14.	Throughout installation

AFB = Air Force Base; AFCEC = Air Force Civil Engineer Center; ARSA = Apalachicola Regional Stewardship Alliance; CIE = Crooked Island East; CIW = Crooked Island West; DoD = Department of Defense; FDEP = Florida Department of Environmental Protection; FNAI = Florida Natural Area Inventory, FSU = Florida State University; FWC = Florida Fish and Wildlife Conservation Commission; FWRI = Florida Fish and Wildlife Research Institute; GEBF = Gulf Environmental Benefit Fund; MOA = Memorandum of Agreement; MOU = Memorandum of Understanding; NFWF = National Fish and Wildlife Foundation; NOAA = National Oceanic and Atmospheric Administration; NRDA = Natural Resource Damage Assessment; NWTf = National Wild Turkey Federation; T&E = threatened and endangered; TNC = The Nature Conservancy; UF = University of Florida; USDA = U.S. Department of Agriculture; USFWS = U.S. Fish and Wildlife Service; USGS = U.S. Geological Survey

Natural Resources Program Management

6.1.4 Required Permits

Tyndall Natural Resources must maintain certain permits for monitoring, burning, nuisance animal control, and other natural resource management activities (Table 6-3). These permits are updated annually or as required. Contractors conducting activities on behalf of Natural Resources are required to obtain the applicable permits.

Table 6-3. Required Permits for Tyndall Natural Resources Management Activities

Permit		Purpose	Permit Issuer
Federal	Migratory Bird Depredation Permit	Authorizes take, by lethal means, of certain migratory birds under the Bird/Wildlife Aircraft Strike Hazard (BASH) program	USFWS
	Eagle Depredation Permit	Authorizes the use of non-lethal harassment activities to discourage eagle presence near the airfields	
State	Steel Trap Permit	Authorizes the use of steel traps to take destructive coyotes, fox, bobcats, beaver, and otter	FWC
	Alligator Trapping Permit	Authorizes the capture and holding or relocation of nuisance alligators, depending on size of the alligator.	
	Marine Turtle Permit	Authorizes nesting surveys, protection of nests with screens or cages, relocation of nests, maintenance and display of preserved specimens, and stranding and salvage activities.	
	Bear Hazing and Trapping	Authorizes the use of ‘less-than-lethal’ ammunition and other techniques to scare bears away from an area. Also, allows removing bears from situations that constitute a human safety risk or a risk to the well-being of the bear.	
	Inactive Osprey/Bird Nest Removal Permit	Authorizes the removal of inactive osprey and migratory bird nests in support of the BASH program	
	Open Burning Authorization	Authorizes the utilization of prescribed burning on the Tyndall Reservation (issued by Florida Forest Service on a daily basis)	
	Salvage Permit	Authorizes the keeping and exhibition of wildlife	
Antlerless Deer Permit	Authorizes take of doe and antlerless buck in the areas outside of the WMA		

BASH = Bird/Wildlife Aircraft Strike Hazard; FWC = Florida Fish and Wildlife Conservation Commission; USFWS = U.S. Fish and Wildlife Service; WMA = Wildlife Management Area

6.2 GEOGRAPHIC INFORMATION SYSTEM

Tyndall AFB utilizes a geographic information system (GIS) called GeoBase to assist base planners with making informed decisions for current and future activities. This system contains digitized maps, land use data, and planning information. Tyndall Natural Resources uses ArcView GIS to assist with natural resources management. Currently, natural resources information incorporated into the GIS includes fire management, forestry, wildlife, and outdoor recreation.

The U.S. AF is working to consolidate and centralize all AF GIS data. The current centralized system loses fidelity at the installation level because the installations have had no ability to update the system; this situation is being addressed as funding permits. The consolidated system has not been conducive to T&E data or protected cultural data management. Should the centralized system be adopted, the ability to use GIS for natural resources planning will be diminished. As of FY 2014, the future status of Natural Resources GIS data is uncertain.

6.3 MANAGEMENT OF THREATENED AND ENDANGERED SPECIES AND HABITATS

Tyndall AFB is home to a number of state- and federally listed species. Tyndall Natural Resources strives to protect and recover these species in a manner that provides maximum mission flexibility while still ensuring regulatory compliance. Most of Tyndall's protected species are found either on the barrier islands or within wetlands where interactions with the military mission are minimal. With proper management, Tyndall AFB can practice good stewardship without compromising its military mission.

6.3.1 Legal Requirement to Manage and Conserve T&E Species

The ESA of 1973 is the primary legal driver for the protection and management of federally listed T&E species. The ESA is intended to conserve the ecosystems upon which T&E species depend, and to provide a program for the conservation of such T&E species. Section 7 of the ESA outlines the obligations of federal agencies pertaining to the ESA, including the duties to conserve and refrain from jeopardizing species and their habitat. In preparation of a Biological Assessment, Section 7 requires agencies to determine if listed species are present within or in close proximity to an action area, and if the action may potentially affect the listed species. Section 7 (a) (2) of the ESA requires that each federal agency consult with the USFWS and/or NMFS on proposed actions that the AF has determined may affect federally listed T&E species. The MMPA is also a legal driver for protection of marine species and permits are required for operations that may affect marine mammals.

To further stress and clarify the importance of conserving T&E species, the DoD along with the Departments of Commerce, Interior, Transportation, USDA, and the USEPA, signed a Memorandum of Understanding (MOU) in 1994. Section III of the MOU reads as follows: "Each individual agency that is a party of this MOU will: Use its authority to further the purposes of the ESA by carrying out programs for the conservation of federally listed species, including implementing appropriate recovery actions that are identified in recovery plans."

State-listed animal species are statutorily designated via FAC Rules 68-A27.003, 68-A27.004, and 68-A-27.005, and maintained by FWC as endangered, threatened, or SSC. State-listed plant species are statutorily designated via The Preservation of Native Flora of Florida Act (s.581.185-187, Florida Statutes) and maintained by Florida Department of Agriculture and Consumer Services (FDACS) as endangered, threatened, or SSC.

6.3.2 Management and Recovery of T&E Species for Mission Support

A combination of habitat and species management is used to recover T&E species. Natural Resources conducts a variety of management activities to conserve and manage T&E species habitat, such as prescribed burning, longleaf planting, and wetland restoration. Species-specific management may include population monitoring, habitat management, and translocation of species. When progress is made toward species recovery, mission flexibility is increased.

6.3.3 ESA Section 7 and MMPA Consultations for Mission Support

Tyndall Natural Resources supports consultations with the USFWS regarding potential impacts to T&E species associated with missions. Natural Resources works closely with mission personnel in preparing Biological Assessments, coordinating permit details with regulators, and briefing binding Terms and Conditions to mission proponents. The continuance of good working relationships with regulators is vital to the expedient processing of consultations. It is expected that the number of ESA consultations may grow in the future as the number of missions increase.

Some of Tyndall's missions occur over the GOM and have the potential to impact marine mammals. Typically in such cases, a permit under the MMPA is required. These permits are granted by the NMFS. Most of Tyndall's over-water missions are currently included in a Programmatic Environmental Assessment and associated Biological Assessment and MMPA permit prepared by Eglin AFB. However, it is possible that Tyndall will need to prepare MMPA permit applications in the future.

6.3.4 Natural Resources Compliance

After Section 7 consultations with the USFWS and/or NMFS, a concurrence letter or a Biological Opinion, including an Incidental Take Statement, is sent to Tyndall outlining the conservation measures and Terms and Conditions that must be completed in order for the exemption in Section 7 of the ESA to apply; these are legally binding and non-discretionary. If Tyndall AFB: (1) fails to assume and assure implementation of the Terms and Conditions, or (2) fails to require the participants in the activities to adhere to the Terms and Conditions of the incidental take statement through enforceable terms, the protective coverage of Section 7(a)(2) may lapse.

6.3.5 Management and Monitoring of Federally Listed Species

Tyndall's management and monitoring activities are conducted IAW applicable species recovery plans and permits and are coordinated with the USFWS and the state through INRMP reviews and additional discussions as necessary. In situations where recovery plans are not available, or where specific guidance is not provided in the recovery plan, Tyndall confers with the USFWS and other biologists who work with the species to determine accepted methods.

Federally listed species, federal Candidate and Petitioned species, and species protected by other federal laws are described below. A summary of status, monitoring, and management activities are provided as applicable. Refer to the *T&E Species Component Plan* for more detailed information.

Red-cockaded Woodpecker

The red-cockaded woodpecker (RCW) is a federally endangered bird species endemic to open, frequently burned pine ecosystems in the southeastern United States (USFWS, 2003). RCWs are the only woodpecker species in the Southeast to excavate cavities in live pine trees. They prefer mature longleaf pine in particular, because older longleaf have greater incidence of red heart

1 disease which makes cavity construction easier. Although the RCW does not currently occur on
2 Tyndall, RCWs do nest and forage in areas near Tyndall (approximately 1.5 miles (2.4 km) away
3 at Lathrop Island); thus, there is the potential for the birds to expand their range onto Tyndall. If
4 RCWs are documented on Tyndall in the future, the INRMP would be updated to include
5 species-specific information on management and monitoring activities, such as prescribed
6 burning and nest surveys. Some of the areas where RCWs may colonize are already being
7 managed with prescribed fire and longleaf plantings, which promote habitat conditions favorable
8 for RCWs. Surveys for RCWs and potential nesting habitat on Tyndall are to occur in 2014.

9 **Piping Plover and Critical Habitat**

10 The piping plover is a state and federally threatened migratory shorebird that is present at
11 Tyndall during its non-breeding season. In Florida, piping plovers prefer sandy beaches and tidal
12 flats along both coasts (USFWS, 1996). All of the barrier islands have been designated as
13 Critical Habitat (CH) for non-breeding piping plovers; the area is also designated as a Critical
14 Wildlife Area by FWC (Figure 4.2). CH includes Shell Island, CIW, and CIE. The boundaries
15 of CH are subject to change due to the changing morphology of the shoreline.

16 Piping plovers consistently winter along Tyndall's shoreline during the non-breeding (wintering
17 and migrating) season of July 15 through May 15. Concentration is highest in areas containing
18 pools and low elevation beach sites that are washed over and exposed by tidal fluctuations. This
19 includes, but is not limited to, the tidal salt pools on CIE, both sand spits adjacent to Hurricane
20 Cut (currently closed), and the area known as East Pass on Shell Island, which has been a closed
21 pass since 2002. A winter survey conducted in 2010 documented 24 piping plovers on Tyndall's
22 barrier islands. In 2011, nine piping plovers were documented.

23 Tyndall Natural Resources supports bimonthly piping plover monitoring at four established
24 census sites (Buck Beach, CIE, CIW, and Shell Island) from July 15 to May 15 (Figure 4.2), and
25 annually at Redfish Point. Surveys are currently conducted in partnership with FWC, Audubon,
26 and the Florida Department of Environmental Protection (FDEP). Data is entered into the
27 Florida Shorebird Database. Tyndall staff also participates in the International Piping Plover
28 Census, which occurs every five years.

29 Tyndall's management for the piping plover consists of maintaining suitable habitat and
30 preventing or minimizing disturbance. Signs and fencing are used to protect foraging areas
31 within piping plover CH from human disturbance. Disturbance due to dogs, cats, and beach
32 driving is minimized through implementation of applicable Tyndall AFB Instructions and
33 enforcement of Critical Wildlife Area provisions. Predator control (including feral cats) is
34 practiced. Detailed management practices are provided in the *T&E Component Plan*.

35 **Red Knot**

36 The USFWS ruled to list the red knot as threatened December of 2014. The red knot occurs in
37 small numbers at Tyndall AFB during migration. The red knot has similar habitat requirements
38 and is present during similar time periods as the piping plover. Therefore, Tyndall's

1 management for the piping plover provides benefits to the red knot as well. The red knot is
2 included in bimonthly shorebird monitoring surveys conducted in cooperation with FWC,
3 Audubon, and FDEP.

4 **Bald Eagle**

5 The bald eagle is protected under the BGEPA and the MBTA, as well as state rule (FAC 68a-
6 16.002). The bald eagle is seldom seen far from water, typically occurring along coastal and bay
7 shorelines, rivers, and lakes. Bald eagles are seen regularly on Tyndall AFB during the winter
8 months, and in 2013 and 2014 were reported even during the summer months. As of summer of
9 2014, there were six eagle nests on the installation (Figure 4.2). After two bald eagle/aircraft
10 collisions in 2013, a Work Plan was developed by Tyndall and the USDA to track bald eagle
11 movement on and near the runways through GPS trackers, but the project is pending DoD
12 Legacy funding. If a BASH conflict is identified, relocation of the nest may be needed (once
13 proper permits have been obtained); however, this approach is not likely to succeed without
14 constant harassment since abundant nesting habitat available throughout the installation. In
15 addition, Airfield Management is actively engaged in habitat modification to discourage prey in
16 the airfield.

17 **Eastern Indigo Snake**

18 The Eastern indigo snake is a federally and state threatened species. The eastern indigo is a very
19 large, conspicuous, slow-moving and docile snake that can attain a body length of 8.5 feet (2.6
20 m). These characteristics make it an easy target for those who indiscriminately kill snakes on
21 sight. It is also a species that is highly sought after by collectors in the commercial pet industry.
22 The indigo snake utilizes sandhills during the winter months and frequently utilizes the burrows
23 of gopher tortoises and other species for over-wintering (USFWS, 1982). Riparian areas are
24 frequently utilized in the summer. There have been no documented sightings of the indigo snake
25 on Tyndall AFB although suitable habitat is available. Due to the lack of sightings, the species is
26 not actively managed. However, habitat management for the gopher tortoise also would benefit
27 any indigo snakes that might occur on Tyndall.

28 **American Alligator**

29 The American alligator, although once in danger of extinction because of over-harvesting, is now
30 listed as threatened only because of its similarity of appearance to the American crocodile.
31 Therefore, there are generally no Section 7 requirements under the ESA. The species is
32 abundant on Tyndall, and also occurs in water bodies adjacent to the installation. No specific
33 monitoring or management activities for the American alligator are in place on Tyndall AFB.
34 However, nuisance alligators are relocated or removed depending on the size of the alligator.

1 Loggerhead, Green, Kemp's Ridley, and Leatherback Sea Turtles**2 *Status***

3 Four species of sea turtles occur in the nearshore GOM waters off Tyndall AFB. These species
4 include the loggerhead, green, Kemp's ridley, and leatherback sea turtles. The loggerhead is
5 threatened, while the green, Kemp's ridley, and leatherback are endangered (NMFS and
6 USFWS, 1991; NMFS and USFWS, 1992; NMFS and USFWS, 2008; NMFS, USFWS, and
7 Secretaría del Medio Ambiente y Recursos Naturales, 2011). The loggerhead is the most
8 common of the four species and it nests every year on Tyndall's beaches, including Shell Island,
9 CIE, and CIW and sporadically on Buck Beach. There is occasional nesting by leatherback and
10 green sea turtles, and suspected but unconfirmed nesting by Kemp's ridley sea turtles. The peak
11 nesting period is June and July, with an average of 50 nests per year.

12 *Monitoring*

13 The USFWS delegated the authority and responsibility for monitoring sea turtle nesting and
14 hatching to the State; therefore, Tyndall maintains appropriate permits with the State for these
15 activities. Tyndall must conduct surveys and monitoring IAW the specific protocols detailed in
16 the State permit. Tyndall Natural Resources conducts early morning sea turtle surveys five times
17 per week on 18 miles (29 km) of Shell Island, CIE and CIW from May 15 to August 31. These
18 surveys are intended to locate the crawls of nesting female turtles, determine the species,
19 determine whether the crawl is a nesting crawl or a false crawl, place protective screening over
20 the nest to deter predators, and mark the nest location. Nests are checked three times per week
21 from September through November, or until the last nest hatches for potential storm damage,
22 hatching activity, and predation. The objective of the sea turtle monitoring program is to provide
23 location information (for mission avoidance) and annual data on the distribution and abundance
24 of sea turtle nesting activity on Tyndall's beaches. Additional information on monitoring is
25 available in the T&E Plan.

26 *Management*

27 The primary goal of sea turtle management on Tyndall AFB is to provide the highest level of
28 capability and flexibility to the military operations while meeting the legal requirements of the
29 ESA. The main role Natural Resources plays in the management and conservation of sea turtles
30 is to locate, mark, and protect sea turtle nests; assess potential impacts to sea turtles from
31 proposed mission activity; recommend conservation measures to avoid impacts to nesting sea
32 turtles, their nests, and emerging hatchlings; and relocate turtle nests only if necessary and under
33 certain permitted conditions.

34 In addition to the actions identified above, Tyndall implements the following management
35 measures:

- 36 • Predator control with USDA Wildlife Services personnel
- 37 • Prohibition of lights (FWC, 2011), fires, and camping on beaches

- 1 • Avoidance of off-road vehicle use during nesting season
- 2 • Enhancement and restoration of dune habitat
- 3 • Support of U.S. Geological Survey and UF sea turtle tagging and tracking project

4 **Choctawhatchee Beach Mouse and Critical Habitat**

5 The federally endangered Choctawhatchee beach mouse occurs in Bay, Okaloosa, and Walton
6 Counties. Beach mice inhabit coastal dune ecosystems, including primary, secondary, and
7 interior dunes, and prefer well-developed dunes vegetated with sea oats (*Uniola paniculata*) and
8 higher back dunes with live oak and rosemary (Federal Register, 2006). Habitat loss from
9 storms and human disturbance may have contributed to the decline of beach mice. CH Unit 5 for
10 the Choctawhatchee beach mouse consists of over 1,700 acres (688 ha) in Bay County that
11 contain essential habitat features, and includes portions of Shell Island, CIW and the bay
12 shoreline of the main peninsula. FWC conducts monthly tracking tube surveys to monitor the
13 Choctawhatchee beach mouse for Tyndall Natural Resources. Tyndall may consider
14 translocation of beach mice to suitable habitat along the bay shoreline, as well as translocations
15 to off-site (off-Tyndall) locations. Management actions conducted for other species may also
16 benefit the beach mouse, such as protection of dune habitat (i.e., boardwalks), dune re-
17 vegetation, and predator control.

18 **St. Andrew Beach Mouse and Critical Habitat**

19 The federally endangered St. Andrew beach mouse inhabits Bay and Gulf Counties (USFWS,
20 2010). The species currently consists of two distinct populations, with one of the populations
21 occurring on Tyndall AFB property (CIE). The majority of the St. Andrew beach mouse CH
22 Unit 1 occurs on Tyndall's CIE property. Similar to the Choctawhatchee beach mouse, FWC
23 conducts monthly tracking tube surveys for the St. Andrew beach mouse for Tyndall Natural
24 Resources. Dune restoration, predator control, and boardwalk maintenance are beneficial
25 management activities for beach mice.

26 **Florida Manatee**

27 The Florida manatee, a subspecies of the West Indian manatee, is a marine mammal federally
28 listed as endangered. Manatees are generally restricted to peninsular Florida in winter but
29 disperse throughout the GOM and Atlantic Ocean coastline during warm months and during
30 migration. Manatees move freely between fresh water and nearshore marine water habitats.
31 Manatees are occasionally sighted during the summer in the bays and GOM adjacent to Tyndall
32 AFB. Manatee strandings have occurred recently during the winter, and these incidents may
33 increase as sea water temperatures increase. Tyndall provides educational materials and may
34 close portions of base-controlled marinas if manatees are present. The marina is maintained as a
35 clean harbor with strict refueling and waste disposal protocols in place.

1 Sperm Whale

2 The sperm whale is a large whale species federally listed as endangered. Sperm whales are
3 generally found in offshore waters beyond the 200 m (656 feet) isobath. Due to their distribution
4 in the Gulf, there are no active management measures in place. Many of the over-water training
5 activities originating from Tyndall that may potentially affect sperm whales are included in the
6 *Eglin Gulf Test and Training Programmatic EA*, Biological Assessment, and associated MMPA
7 permit.

8 Gulf Sturgeon and Critical Habitat

9 The federally threatened Gulf sturgeon is an anadromous fish that occurs in most major river
10 systems from the Pearl River, Louisiana, to the Suwannee River, Florida, and in marine waters
11 from the central and eastern GOM to Florida Bay offshore (USFWS and Gulf States Marine
12 Fisheries Commission, 1995). This large fish occurs predominately in the northeastern GOM,
13 feeding in offshore areas and inland bays during the winter months and moving into freshwater
14 rivers during the spring to spawn. Migration into freshwater generally occurs from March to
15 May, and migration into the GOM starts in the fall. Sturgeon from multiple river systems have
16 been detected overwintering in marine nearshore waters off Tyndall. At Tyndall, CH extends
17 from the Gulf coastal shoreline to one nautical mile (1.85 km). Tyndall does not conduct active
18 management for Gulf sturgeon; however, stormwater is managed to reduce or eliminate
19 sediment, nutrients and other forms of pollution as part of operational BMPs.

20 Smalltooth Sawfish and Critical Habitat

21 The federally endangered smalltooth sawfish is an elasmobranch that currently inhabits warm,
22 shallow coastal and estuarine waters of southern peninsular Florida. In the U.S., this species
23 historically occurred in the GOM from southern Florida to Texas and along the Atlantic coast
24 from Florida to Cape Hatteras. The distribution range has contracted dramatically due primarily
25 to by-catch effects and habitat loss. CH consists of two areas along the southwestern coast of
26 Florida between Charlotte Harbor and Florida Bay. Due to the unlikelihood of occurrence,
27 Tyndall Natural Resources does not conduct active management for smalltooth sawfish.
28 However, stormwater is managed to reduce or eliminate sediment, nutrients and other forms of
29 pollution as part of operational BMPs.

30 Godfrey's Butterwort

31 Godfrey's butterwort (also known as Violet-flowered butterwort) is a carnivorous federally
32 threatened plant species that is only known to occur in six counties of the Florida Panhandle
33 (USFWS, 1994). Typical habitat includes open, acidic soils of seepage bogs on gentle slopes,
34 deep quagmire bogs, ditches, and depressions in grassy pine flatwoods and grassy savannas. The
35 species often occurs in shallow standing water. Primary threats include fire suppression and
36 habitat alteration.

1 Godfrey's butterwort is known to occur at five locations on Tyndall AFB (Figure 4.2). Tyndall
2 currently conducts annual surveys at these sites; future surveys will be supported by the new
3 Tyndall USFWS Ecologist. A survey of Tyndall AFB for the butterwort and other rare plants is
4 in the FY 2015 budget. Tyndall conducts prescribed fire in cooperation with the AF Wildland
5 Fire Center to manage these areas; however more work needs to be done on growing season
6 burns and burning through wetlands. Efforts are underway to minimize impacts from mowing,
7 road and ditch maintenance.

8 **6.3.6 Federal Candidate Species**

9 **Gopher Tortoise**

10 The gopher tortoise is a federal candidate species and a state threatened species (USFWS, 2008).
11 The Federal Register Vol. 76, No. 144 / July 27, 2011, documented the 12-month finding on a
12 petition to list the gopher tortoise as threatened in the eastern portion of its range. The review
13 found that the listing of the gopher tortoise is warranted; however, listing is precluded by higher
14 priority actions. The Federal Register notice also stated that a proposed rule to list the gopher
15 tortoise will be developed as priorities allow. In 2008, all DoD entities, as well as state agencies
16 and other non-governmental organizations signed a Candidate Conservation Agreement with the
17 USFWS. This agreement defines what each agency will voluntarily do to conserve the gopher
18 tortoise and its habitat.

19
20 The gopher tortoise typically inhabits sandhills, pine/scrub oak uplands, and pine flatwoods
21 associated with the longleaf pine ecosystem. High-quality tortoise habitat can be maintained by
22 prescribed fire or cutting/thinning when scrub oaks shade out the ground cover eaten by the
23 tortoise. Gopher tortoise burrows serve as important habitat for more than 300 commensal
24 species, some of which are threatened or endangered. Gopher tortoise burrows are easily
25 damaged by ground disturbance, especially from heavy equipment, as they can cave in due to
26 ground instability. Individual burrows are marked, and buffer of a 25 foot (7.6 m) radius around
27 the mouth of the burrow is maintained during forestry, fire, military training, construction or
28 other ground disturbing activities.

29 Tyndall completed a baseline survey for gopher tortoises in 2010, which found most tortoises on
30 isolated deep sand ridges that are typically found near bayous. Management actions consist of
31 longleaf pine forest restoration and prescribed burning. Surveys are conducted in support of
32 specific activities such as construction projects, and affected tortoises are relocated as necessary
33 IAW FWC protocols.

34 **6.3.7 Federally Petitioned Species**

35 In 2011, the USFWS announced a finding on a petition to list over 400 plant and animal species
36 occurring in the southeastern United States under the ESA (USFWS, 2011). The Service found
37 that there is substantial information indicating that listing may be warranted for 374 of the
38 species; a status review of these species is currently in progress. Additionally, in 2012 the CBD
39 submitted a petition to the USFWS to consider protection for 53 amphibian and reptile species
40 under the ESA (CBD, 2012). Some of these petitioned plant and animal species may occur on
41 Tyndall AFB (Table 6-4).

Table 6-4. Federally Petitioned Species Known or Potentially Occurring on Tyndall AFB

Species	Scientific Name	Habitat	Management
Henry’s spider-lily*	<i>Hymenocallis henryae</i>	Endemic to Florida Panhandle. Found in wet flatwoods and along edges of cypress stringers and ponds. Populations on Tyndall are in wet prairie at subscale drone launch site, in drone recovery area, and north of Ammo Lake; also a suspected site south of drone recovery field.	Prescribed fire and avoidance of soil disturbing activities.
Bear tupelo*	<i>Nyssa ursina</i>	Endemic to Florida Panhandle. Documented at eight locations on Tyndall in wet wiregrass savanna habitat.	
Kral’s yellow-eyed-grass*	<i>Xyris longisepala</i>	Found in moist to wet margins of sinkhole lakes and sandhill upland lakes; seepage slopes and bogs; and wet prairies.	
Blackbract pipewort	<i>Eriocaulon nigrobacteatum</i>	Found in open, wet, mucky bogs at stream heads or in open, grassy seepage slopes.	Not confirmed on Tyndall, but potential habitat does exist. Tyndall is conducting species inventories in 2015.
Hairy-peduncled beakrush	<i>Rhynchospora crinipes</i>	Occurs along streams/ rivers in wet, peaty silt of narrow shelving banks or sand-clay bars; may be rooted in streambeds.	
Panhandle meadow-beauty	<i>Rhexia salicifolia</i>	Inhabits sunny margins of depression marshes, flatwoods ponds, and sandhill upland lakes in wet sands or peats.	
Small-flower meadow-beauty	<i>Rhexia parviflora</i>	Occurs in seepage slopes, margins of dome swamps, depression marshes, and evergreen shrub ponds.	
Smooth-barked St. John’s-wort	<i>Hypericum lissophloeus</i>	Occurs along shorelines and in shallow waters of sandhill upland lakes, typically within longleaf pine-deciduous scrub oak sandhills.	
West’s Flax	<i>Linum westii</i>	Found in wet flatwoods, depression ponds, dome swamps, and at the edges of pond cypress swamps.	Prescribed fire and avoidance of soil disturbing activities, particularly near gopher tortoise burrows.
Eastern diamondback rattlesnake*	<i>Crotalus adamanteus</i>	Inhabits sandy woodlands, pine flatwoods, and coastal scrub habitats. Utilizes gopher tortoise burrows to overwinter.	
Alligator snapping turtle	<i>Macrolemys temminckii</i>	Occurs in the deep water of streams, rivers, lakes, and swamps. Nests on land.	Wetlands and stream buffer protections apply.
Coastal flatwoods crayfish*	<i>Procambarus apalachicola</i>	Found in seasonal ponds, and may inhabit wet depressions in flatwoods. Constructs a burrow when ponds/depressions become dry.	Wetlands protections apply.
Purple Skimmer	<i>Libellula jesseana</i>	Inhabits clear-water ponds and lakes with sand bottoms. Adults forage in open woodland or shrubland.	Not confirmed on Tyndall, but potential habitat does exist. Tyndall is conducting species inventories. Wetlands protections apply.
Say’s Spiketail	<i>Cordulegaster sayi</i>	Found at silt-bottom seepage streams in hardwood forests. Adults forage in open woodlands and clearings.	

*Documented on Tyndall AFB

6.3.8 The INRMP as a Substitute for Critical Habitat Designation

Unless it is determined to not be prudent or determinable, designation of CH is intended to occur simultaneously with the listing of a species as threatened or endangered. Areas designated as CH are constrained with respect to the types of activities that can occur. Indeed, federal agencies are required (Section 7(a) of the ESA) to ensure that their actions do not jeopardize the continued existence of listed species, and do not result in the destruction or adverse modification of CH. Designation of CH is required to be made on the best available scientific data and to consider the economic and other impacts of such designation. The Secretary of the Interior (USFWS) or the Secretary of Commerce (NMFS) is responsible for designating CH for species listed as threatened or endangered. Certain groups continue a trend to file petitions and lawsuits to force designation of CH for listed species.

National Defense Authorization Act for FY 2004 (House Resolution 1588)

The passage of the National Defense Authorization Act for FY04 further emphasized the importance of the INRMP by allowing the substitution of an INRMP for CH designation under the ESA so long as implementation of the INRMP provides a benefit to the particular species. Significant changes to the ESA and the MMPA are identified in the National Defense Authorization Act for FY04 (House Resolution 1588) including:

Section 318. Military Readiness and Conservation of Protected Species

- CH will not be designated on any lands or geographical areas owned or controlled by DoD if an approved INRMP is in place.
- Section 7 consultations will still be required for activities affecting listed species.
- National security must be considered when designating CH.

Section 319. Military Readiness and Marine Mammal Protection

- The Secretary of Defense, after “conferring” with the Secretary of Commerce/Interior, may exempt *any* action from compliance with *any* MMPA requirement, if it is necessary for national defense.
- “Harassment” definitions are modified for military readiness activities.
 - Level A: any act that injures or has the *significant* potential to injure...
 - Level B: any act that disrupts behavioral patterns such that they are *abandoned or significantly altered*.
- For incidental take authorizations (one- or five-year), determination of “least practicable adverse impact” must take into consideration military personnel safety, practicality of implementation, and impact on the effectiveness of a military readiness activity.
- Incidental take authorizations affecting military readiness activities will not be subject to “geographical region” or “small numbers” restrictions.

1 Using the INRMP to Avoid Critical Habitat Listings on Tyndall AFB

2 Pursuant to Title 16, USC, Section 1533((1)(3)(B)(i)), the Secretary of Interior “shall not
3 designate as CH any lands or other geographical areas owned or controlled by the DoD, or
4 designated for its use, that are subject to an INRMP prepared under section 101 of the Sikes Act
5 (16 USC 670a), if the Secretary determines in writing that such plan provides a benefit to the
6 species for which CH is proposed for designation.”

7 This INRMP and the associated *T&E Species Component Plan* is meant to serve as the substitute
8 for CH designation under the ESA special management criteria. In order for this to occur, the
9 plan must provide a conservation benefit to the species; the plan must provide certainty that the
10 management plan will be implemented; and the plan must provide certainty that the conservation
11 effort will be effective. This is particularly important given the candidate and petitioned species
12 occurring in the vicinity of Tyndall that could become listed. Tyndall’s INRMP and *T&E*
13 *Species Component Plan* clearly show how management actions adequately protect and benefit
14 species, and thus should preclude any future CH designation on the installation.

15 CH designations were made for the piping plover, Gulf sturgeon, Choctawhatchee beach mouse,
16 and St. Andrew beach mouse prior to finalization of Tyndall’s INRMP in 2006, thus Tyndall did
17 not qualify for exemption from designation. Once this 2014 update to the INRMP is finalized
18 and approved, it can be used to amend these CH designations since the INRMP does provide
19 benefits to these four species through programmed protection measures and habitat
20 improvements.

21 6.3.9 Management of State-Listed T&E Species and SSC

22 There are numerous state-listed T&E species and SSC occurring seasonally or year-round on
23 Tyndall AFB (Table 4-4). AFI 32-7064 encourages biodiversity management to include the
24 conservation of state-listed and other rare species, stating that INRMPs will provide for the
25 protection and conservation of state listed species when practicable and when protection is not in
26 direct conflict with the military mission. In addition, INRMPs are developed in cooperation with
27 state wildlife agencies. However, biodiversity management is not an AF mandate and as such is
28 not considered a “must fund” area in the AF budgetary system. Nonetheless, the conservation of
29 state-listed species and other rare but unlisted species is encouraged. Protection of state-listed
30 and/or petitioned species on Tyndall AFB could help decrease the likelihood that listing under
31 the federal ESA becomes necessary.

32 Management operations conducted by Tyndall Natural Resources for many of the federally listed
33 species and for the health of the ecosystem provide direct and indirect benefits to state-listed,
34 petitioned and other species. For example, Tyndall’s habitat management of the sandhills
35 ecosystem, which includes prescribed fire, conversion of slash pine plantations to longleaf pine,
36 and invasive species control. Other beneficial management operations include: wetlands
37 protection and improvement through use of prescribed fire, public education, and limiting public
38 access in sensitive habitat areas. Protective measures for state-listed species are recommended
39 during the NEPA process. The Tyndall T&E Plan includes additional detail on state listed
40 species and protections measures, and references FWC Species Action Plans for these species:
41 gopher frog, alligator snapping turtle, Florida pine snake, American oystercatcher, black

1 skimmer, brown pelican, least tern, little blue heron, reddish egret, snowy egret, snowy plover,
2 Southeastern American kestrel, tricolored heron, white ibis, and Eastern chipmunk.

3 **6.4 WATER RESOURCE PROTECTION**

4 Water resources include groundwater and surface waters including ponds/lakes, bays, bayous,
5 and wetlands. Tyndall AFB is surrounded on three sides by East Bay to the north, St. Andrew
6 Bay and Sound to the west and south, and the GOM to the south. Primary threats to these water
7 resources are excess sedimentation, bacterial contamination, and high water use demand.

8 **Water Supply**

9 There are three groundwater aquifers that underlie Tyndall AFB: the surficial aquifer, the
10 Intermediate Confining Unit and the Floridan Aquifer. Tyndall has three permitted drinking
11 water wells that pump from the Floridan Aquifer. Other wells on base pump from the surficial
12 aquifer, and this water is used primarily for irrigation. Tyndall AFB purchases potable water
13 from Bay County. Bay County's water supply comes from Deer Point Lake, a 5,000-acre
14 (2,023 ha) impoundment on the St. Andrew Bay system located northwest of Tyndall AFB.

15 **Wastewater and Stormwater Management**

16 Almost all wastewater on Tyndall AFB is collected and sent to Bay County Advanced
17 Wastewater Treatment Plant. The sanitary wastewater collection system consists of building
18 sewers, laterals, mains, manholes, cleanouts, lift stations, oil water separators, grease traps, and
19 septic tanks. The majority of this infrastructure dates from the original construction of the base in
20 the 1940s and 1950s, although it has periodically been upgraded and expanded. Wastewater lift
21 stations are used to convey wastewater from the buildings to the Bay County Wastewater
22 Treatment Plant. No hydraulic capacity study has been performed for the wastewater gravity
23 collection system. Six lift stations have run time meters and the major lift station has a flow and
24 pH meter installed. It is therefore difficult to determine if the capacity of the collection system
25 or lift stations is adequate for incoming flows. During heavy rainfall events, infiltration volumes
26 into the system exceed the major lift station pumping capacity. Due to the large available on-site
27 storage, system overflow rarely occurs. A hydraulic capacity study should be performed to
28 include lift station interactions.

29 Several areas are still on septic tanks, including the 9700 area, AFCEC (formerly Air Force
30 Research Lab), the 9300 area (Full Scale Drone launch and recovery), the 8500 area (Sub-Scale
31 Drone Launch), and several buildings in the 9400 area (Silver Flag). The major portion of Silver
32 Flag was connected to Sanitary Sewer with waste being sent to Bay County Wastewater
33 Treatment Plant in 2012.

34 Stormwater percolates into the sand rapidly and surface drainage is adequate in most parts of the
35 base. Tyndall AFB currently operates under a Multi-Sector Generic Permit issued by the FDEP,
36 and is permitted under the Industrial Sector "S," Air Transportation Facilities, of the National
37 Pollutant Discharge Elimination System (NPDES) to operate facilities and discharge industrial
38 stormwater from the flightline side of the base to surface waters. Tyndall also has a MS4 permit
39 from FDEP to discharge stormwater to surface waters. The NPDES stormwater permitting

1 program is separate from Florida's stormwater/environmental resource permitting programs and
2 local stormwater/water quality programs, which maintain their own regulations and permitting
3 requirements.

4 Effective stormwater pollution prevention relies on BMPs such as preventative maintenance,
5 prevention and response to spills, sediment and erosion control, structural runoff controls,
6 hazardous material and waste management, petroleum, oil, and lubricant management, pesticide
7 management, shoreline cleanups, industrial and domestic wastewater management. Tyndall's
8 stormwater system consists primarily of open ditches in undeveloped areas and underground
9 piping in developed areas. Tyndall AFB has seven permitted stormwater discharge points from
10 the airfield and industrial areas. Tyndall AFB does have drainage outfalls to receiving waters
11 off-base, including some into Shoal Point Bayou, which is located to the northwest of the base
12 and is the major receiving water to the north. Other outfalls discharge into Little Cedar Bayou
13 (northeast of the base), Saint Andrew Sound (south of the base), and East Bay (northeast of the
14 base). Tyndall AFB has 34 permitted outfalls under the MS4 permit discharging into East Bay,
15 St. Andrew Bay, St Andrew Sound and Crooked Island Sound.

16 **6.5 WETLAND PROTECTION**

17 With approximately 40 percent of the installation considered wetlands, their protection is vital to
18 maintaining the natural environment at Tyndall. Wetlands are protected to the greatest extent
19 possible, but are still vulnerable to threats such as non-native invasive species, loss of plant
20 species diversity due to insufficient fire, and non-point source pollution in the form of sediment,
21 nutrients, pesticides, oil, grease, and debris (see Wastewater and Stormwater Management).
22 Ground disturbance and hydrologic alteration (primarily from past practices) are also concerns
23 for Tyndall's wetlands.

24 Tyndall complies with the following regulations which have been instituted to protect wetlands:

- 25 • Clean Water Act
- 26 • Rivers and Harbors Act 1899
- 27 • EO 11990, Protection of Wetlands
- 28 • EO 11988, Floodplain Management
- 29 • Safe Drinking Water Act
- 30 • Watershed Protection and Flood Protection Act
- 31 • North American Wetlands Conservation Act
- 32 • Coastal Wetlands Protection Act

33 Projects or activities that may impact wetlands must go through EIAP review. During this
34 process, required permits are identified and other protective measures are developed to avoid or
35 minimize impacts. The 325th Civil Engineer Squadron, Environmental Element, Compliance
36 (325 CES/CEIEC) is responsible for ensuring wetland/dredge and fill permits are obtained
37 through the FDEP and USACE, Regulatory Division. Ground disturbing activities such as off-
38 road driving and digging are restricted in wetlands, unless the proper permits have been obtained.

1 Tyndall Natural Resources manages wetlands with prescribed fire to maintain natural vegetation
2 patterns, and also through control of non-native plants and animals that may damage these fragile
3 habitats. Prescribed fire and forest management activities are conducted IAW *Silviculture Best*
4 *Management Practices* (published by FDACS). Efforts are taken to avoid fire suppression
5 activities within wetlands unless it is an emergency situation (i.e., if the fire threatens man-made
6 structures or other fire sensitive areas); any damage caused to wetlands during wildfire support
7 activities is repaired to restore natural conditions. Tyndall has programmed for a wetlands field
8 investigation, and development and implementation of a wetlands restoration plan beginning in
9 FY 2016. The plan will identify priority wetlands for restoration based on criteria developed by
10 Tyndall Natural Resources (i.e., presence of protected species or improving hydrologic function).

11 **6.6 GROUNDS MAINTENANCE**

12 Routine land management and grounds maintenance activities conducted on Tyndall AFB
13 include mowing, fertilization, pest management, urban landscape management, and related
14 activities. These actions are accomplished under contract for both the main base area and the
15 surrounding areas of the installation. The Natural Resources staff works with grounds
16 maintenance contracted personnel to ensure that BMPs are used near wetlands. Tyndall Natural
17 Resources is responsible for non-native invasive plant species control efforts (discussed in
18 Section 6.10).

19 **6.7 FOREST MANAGEMENT**

20 The principal focus of forest management on AF installations is to support the military mission
21 while remaining consistent with long-term ecosystem-based management goals that put
22 ecological sustainability objectives above revenue optimization goals (see DoDI 4715.03).
23 Under the principles of ecosystem management, forest treatments may be used to achieve
24 installation goals for forest enhancement and restoration, T&E species and wildlife habitat
25 improvement, wildfire protection, recreational development, military training requirements, and
26 airfield safety compliance. Wood production is still an important consideration in that the
27 revenue generated is reimbursable directly to Tyndall and is used to implement ecosystem
28 restoration projects; however, maximum production is not an installation goal.

29 Slash and sand pine plantations were established across much of Tyndall AFB in the 1960s.
30 Commercial forestry practices were the primary focus of the forest management program until
31 2005. At that time, the installation forester implemented an ecological forestry program that
32 emphasizes restoration of native understory plant communities and natural processes through
33 selective thinning, natural/artificial regeneration of native species, and prescribed fire.
34 Section 4.2.2 describes current land cover types and vegetation on Tyndall AFB.

35 **6.7.1 Timber Management**

36 **Military Mission Support**

37 Most timber management activities result in benefits to both the military mission and to native
38 ecosystems. Direct mission support includes cuts of merchantable timber from areas that
39 interfere with military mission capabilities (i.e., glide slope) and clearing of new areas in support

1 of missions. Activities may also include manipulation of forest structure for a specific mission
2 need or to create a security buffer, visual screen, or noise buffer.

3 **Forest Inventory**

4 During Tyndall's last forest inventory effort in 2006, all pine plantations were sampled. Tyndall
5 will be updating the forest inventory in 2015, including updated plantation and natural area forest
6 data. Natural Resources continues to maintain records on planting and survival densities, and
7 will soon begin five-year stocking checks in reforested areas.

8 **Sand Pine Removal**

9 Sand pine has replaced longleaf through much of its historic range on Tyndall, and has been
10 targeted for removal. Forest Management has the goal to identify priority sand pine stands that
11 would be candidates for removal and subsequent restoration back to longleaf pine (Figure 4.1).
12 As of 2013, Tyndall had removed approximately 700 acres (283 ha) of sand pine. Around
13 350 acres (142 ha) of those have been planted in longleaf. When stands of sand pine are cleared,
14 foresters leave most hardwood trees that are 10 inch (25.4 centimeter) diameter breast height and
15 larger. Understory vegetation control measures (i.e., herbicides, mowing and prescribed fire) are
16 used to prepare the site for longleaf planting. Wildlife and forest management personnel are
17 working together to determine appropriate prescriptions for these areas.

18 **Fuelwood Operations**

19 Fuelwood operations are used to create regeneration gaps, for timber stand improvement (TSI),
20 and to reduce urban interface wildfire hazards (see *Wildland Fire Management Plan*). In certain
21 areas, both sand pine encroachment and hardwood encroachment are a threat to longleaf habitat.
22 Fuelwood contractors are able to harvest hardwoods and softwoods that would not be considered
23 merchantable during a traditional timber sale. The material removed during a fuelwood harvest
24 is typically chipped on site and removed via chip vans. The vans then deliver the wood chips to
25 local paper mills or sawmills where the chips are burned as a "green" fuel to generate electricity.
26 Small areas are targeted for personal use firewood sales.

27 **Slash Pine Plantation Management**

28 Tyndall is working to convert slash pine plantations to uneven aged pine forests with a mixed
29 composition of artificially regenerated longleaf and naturally regenerated Slash Pine. This
30 conversion is occurring in two 20-year phases. The first phase creates 40 – 50 foot (12 – 15 m)
31 gaps through selective row harvesting that are subsequently roller chopped and hand planted
32 (when possible) with containerized longleaf. The second phase removes the remaining slash
33 pine rows with the exception of legacy trees¹. The legacy trees will be widely spaced at two to
34 four trees per acre, and prescribed fire will be used within these areas. Details of these
35 management options are available in the *Forest Management Component Plan*.

¹ Legacy trees are old trees that have been spared during harvest or have survived stand-replacing natural disturbances. Legacy trees have achieved near-maximum size and age and are significantly larger and older than the average trees on the landscape.

1 Longleaf Pine Management

2 Longleaf pine thinning operations will be used to promote an open, multi-aged canopy structure.
3 Continued coordination with Wildlife and Fire personnel will identify areas throughout the base
4 with high densities of longleaf pine stems where thinning operations would improve habitat and
5 not conflict with other ecosystem management goals. Longleaf thinning may provide
6 opportunities to further restoration objectives through revenue generation for conservation
7 activities and sales that combine low-density sand pine with longleaf.

8
9 For first harvests, Forest Management will initiate straight row or selective tree marking sales to
10 mimic natural disturbance. Stands will be assessed individually for the appropriate prescription.
11 Goals of additional harvest will be advancement of quality stems, creation of natural
12 regeneration opportunities, and promotion towards uneven aged structure of the residual stand.

13 Timber Salvage

14 Dead trees (snags) are known to be important habitat for numerous wildlife species; Tyndall
15 Natural Resources retains snags and downed trees whenever possible (for further details see the
16 *Forest Management Component Plan*). However, it is sometimes necessary to conduct timber
17 salvage operations involving various quantities of unwanted/damaged trees to maintain forest
18 health or support the mission. The majority of salvage pine trees are killed by fire, insects, or
19 storms. Any stand of timber that is dead or dying will be considered for a salvage sale. Forest
20 Management coordinates with other Tyndall organizations to determine areas where a timber
21 salvage operation is needed. Salvage sales are unplanned timber harvests and these sales are
22 additional regeneration opportunities to restore longleaf pine.

23 Commercial Forestry Areas

24 The active flight lines have areas with glide slope restrictions that dictate maximum tree height.
25 These areas are planted with slash pine and are designated for a 25-year rotation for commercial
26 forestry.

27 6.7.2 Restoration and Reforestation Program

28 The restoration/reforestation program promotes the restoration and natural regeneration of
29 longleaf pine in support of ecosystem management and T&E species recovery. Restoration
30 consists of a gradual conversion of slash pine plantations back to longleaf pine by creating
31 regeneration gaps through two 20-year harvest phases, planting all gaps with longleaf pine, and
32 maintaining with frequent fire (two- to five-year return interval depending on objectives). In
33 reforestation areas that were previously bedded, roller-chopping is now used for initial site
34 preparation (site prep). Longleaf pine containerized seedlings, grown from a coastal seed source,
35 are planted in regeneration gaps. Whenever possible, planting is done by hand in a random
36 fashion. Slash pine is expected to naturally regenerate in the gaps as well, but in most areas it
37 will be thinned or reduced through prescribed burning. A stocking check is conducted at five
38 years after planting and any stands with survival/recruitment of less than 200 trees per acre
39 (100 trees per ha) are replanted. Both slash and longleaf are counted in the stocking check.

1 **Timber Stand Improvement**

2 TSI involves physically cutting (mechanical) and using herbicides (chemical) to control
3 encroachment of non-merchantable sand pine and oak in natural longleaf stands and longleaf
4 plantations. The TSI goal is to improve habitat, restore the longleaf pine ecosystem, and/or to
5 improve habitat of sensitive species. Removing competing sand pine and oaks facilitates the re-
6 establishment of natural longleaf pine and native groundcover, and improves ecosystem
7 structure, enabling low-intensity fire to maintain habitat. Mechanical TSI can involve manual
8 labor using machetes or power saws to cut undesirable stems or mowing. Herbicides are also
9 used to control undesirable stems at pre-planting or post planting. The specific type of TSI
10 applied to stands depends on individual stand characteristics.

11 **Longleaf Pine Reforestation**

12 Reforestation of longleaf pine on Tyndall occurs on former slash pine and sand pine plantations
13 that have been and continue to be harvested. Mechanical and chemical site preparation
14 techniques (i.e., roller chopping and herbicide treatments) promote reforestation by creating
15 environmental conditions needed for seed/seedling establishment, early growth, and survival. In
16 areas where sand pine has been clear cut, mechanical and/or chemical treatments are conducted
17 prior to planting longleaf pine seedlings. In particular, prior to planting longleaf pine seedlings,
18 understory oaks must be controlled to reduce competition thereby promoting the survival of
19 longleaf pine seedlings and desirable native ground cover species. Once planted with longleaf
20 pine, herbicide may be applied again within five years depending upon competition from
21 undesirable oaks and other plant species that may be negatively impacting the growth and
22 survival of the longleaf pine seedlings. In slash pine conversion areas, harvested areas, (i.e.
23 gaps), logging decks, and skid trails are roller chopped, and stands are then burned to reduce
24 logging debris and promote the growth of native ground cover species. Containerized longleaf
25 pine seedlings are then planted in the gaps that have been roller chopped. One year after
26 planting, survivorship of planted longleaf pine seedlings is assessed, and areas are replanted if
27 there are less than 200 trees per acre (100 trees per ha). Tyndall also conducts a five-year
28 stocking check of the stand, with replanting as required.

29 **6.7.3 Best Management Practices**

30 Tyndall follows the *Silviculture Best Management Practices* (published by FDACS) to minimize
31 impacts to the environment resulting from forest restoration activities. The DoD may be held to
32 higher standards than what is expected of private landowners. The BMPs set forth by the Florida
33 Forest Service include specific guidance for timber harvests, site prep, planting, working around
34 wetlands and streams, stream crossings, construction and maintenance and forest roads.

35 Before any work begins on a timber sale, the contract inspector conducts a briefing with the
36 contract logging crew emphasizing expectations and the crew's responsibility to follow Florida
37 BMPs. The timber management contract inspector will conduct inspections as frequently as
38 once a day to ensure the crews are following the BMPs. If an infraction is found by the contract
39 inspector, the logging crew must take immediate action to correct it. If it is not corrected in a

1 timely manner, the crew may face a monetary penalty or may lose the privilege of conducting
2 business on the installation.

3 **6.8 WILDLAND FIRE MANAGEMENT**

4 Mission support, ecosystem management, and protection of life and property all depend on a
5 professionally managed wildland fire program. Effective 2014, Tyndall AFB receives support
6 from the newly established AFCEC Wildland Fire Center regionally based at Eglin AFB for all
7 fire management activities on the installation. The Tyndall AFB fire department supports the
8 installation only during prescribed burns in the urban interface to protect structures. The
9 installation fire department is neither funded nor trained to handle wildfire operations. AFI 32-
10 7064 states that wildland fire management personnel “must meet the applicable National Fire
11 Protection Association (NFPA) standards for wildland fire activities... [and] may use training
12 criteria in the National Wildland Fire Coordinating Group Wildland Fire Qualification
13 Subsystem Guide (PMS 310-1/NFES 1414) to attain equivalent NFPA certifications.”

14 **6.8.1 Prescribed Fire**

15 Prescribed fire is the most important ecosystem management tool for Tyndall’s natural resources
16 managers, and is vital to reducing hazardous fuels that could negatively impact the mission. An
17 aggressive prescribed fire program is essential for meeting ecosystem management goals,
18 maintenance/ restoration of natural communities including enhancement of T&E species habitat
19 (see Section 6.3), and control of non-native plant species (see Section 6.10). In addition to
20 improving habitat for numerous fire dependent plants and animals, it is used for minimizing
21 damage and costs from wildfires, reducing mission interference from wildfire smoke and
22 wildfire suppression efforts, eliminating Brown Spot Needle Blight disease from longleaf pine
23 seedlings, preparing areas for longleaf pine restoration, creating conditions that promote a
24 diverse native understory plant community by suppressing hardwoods and other undesirable
25 plant species, and manipulating vegetation for mission requirements. Prescribed fire requires
26 close coordination with military mission personnel as well as state and federal
27 cooperators/regulators. The complexities of smoke management, military mission coordination
28 and airspace restrictions pose significant challenges to the prescribed fire program. Smoke
29 management is a priority for all prescribed burns. Wind and atmospheric conditions that result in
30 smoke on Highway 98, the Tyndall AFB runway, or other sensitive smoke receptors will be
31 avoided when possible.

32 An average of approximately 9,000 acres (3,642 ha) must be burned annually to meet ecosystem
33 management and protected species goals (Figure 6.1). The desired fire rotation is every 18
34 months to 2 years, with a combination of growing and dormant season burns. Factors considered
35 in the prioritization of areas for prescribed burning include the time elapsed since the last burn,
36 the fire frequency, silvicultural treatments (particularly sand pine TSI), and multiple floral and
37 faunal elements, such as the presence of T&E species. Details for prescribed fire planning,
38 policy, smoke management, and implementation on Tyndall AFB are covered in the *Tyndall*
39 *AFB Wildland Fire Management Plan*.

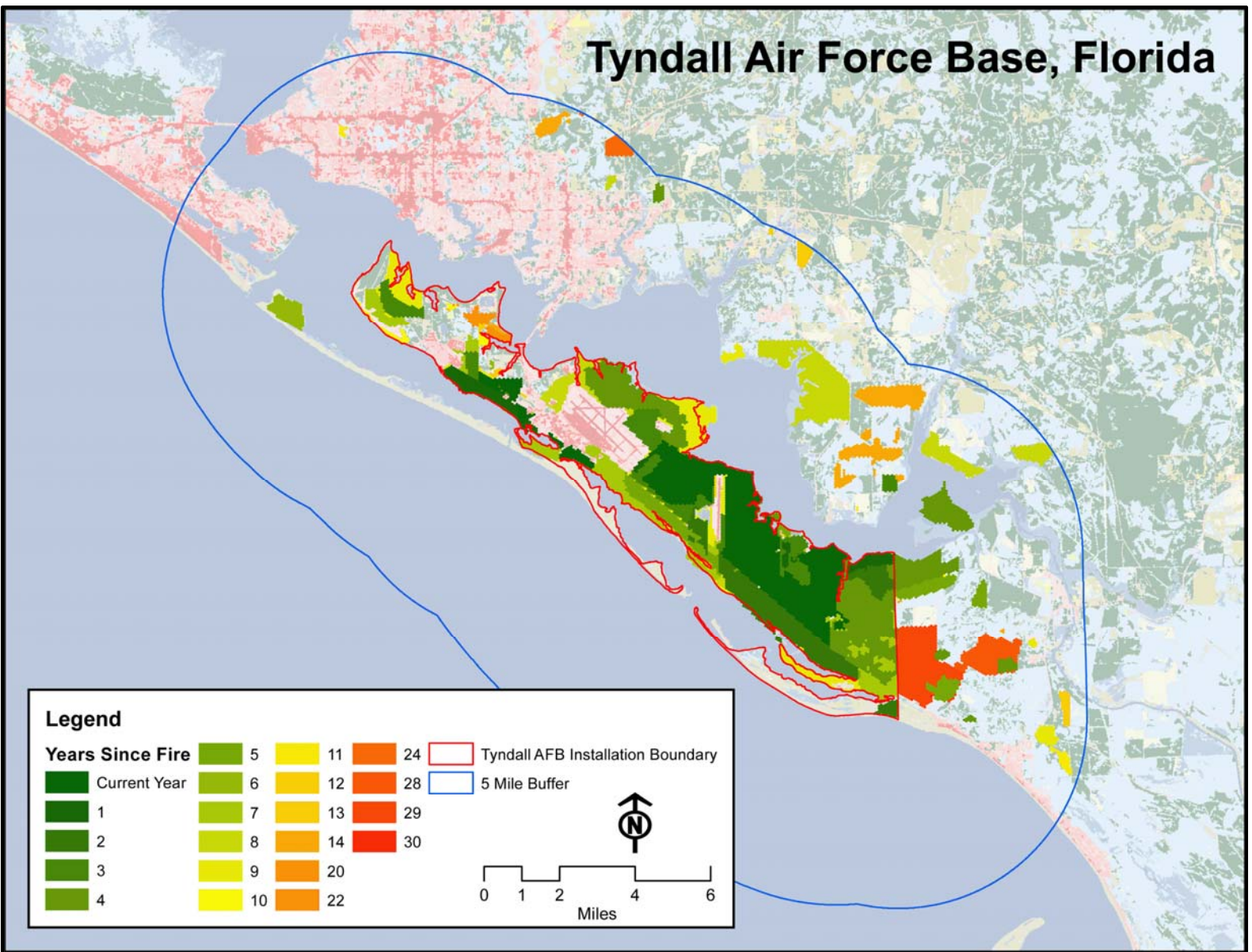


Figure 6.1. Years Since Fire

6.8.2 Wildfire Support

Wildfire support includes all aspects of fire prevention, detection, suppression, readiness, fireline rehabilitation, and training. Wildfire frequency at Tyndall is approximately 3 to 5 per year. Natural Resources personnel responsible for deciding suppression activities are the Environmental Chief, wildland fire program manager, or other designated representative. At all times, for all wildfires, the safety of firefighting personnel will be the governing consideration.

Equipment is maintained on a daily basis and personnel maintain a state of readiness for possible wildfires. When fire danger or occurrence is high, pre-positioning of equipment and personnel may be required. When wildfire risk and/or occurrence is very high to extreme, additional resources may be ordered through the Florida Forest Service. The Florida Forest Service also assists Tyndall with suppression of lightning caused wildfires at no charge. Additional detail for wildfire control activities for Tyndall AFB is provided in the *Wildland Fire Management Plan*.

6.9 AGRICULTURAL OUTLEASING

Currently, there are no agricultural outleasing activities on the installation, and none are under consideration. Any changes to this program would be reflected in future revisions of this document.

6.10 INVASIVE NON-NATIVE SPECIES AND NUISANCE SPECIES MANAGEMENT

An invasive species can be defined as a species that is not native to an ecosystem and whose intentional or accidental introduction causes or is likely to cause environmental or economic damage or harm to human health. Once established, invasive species may reduce biological diversity and disrupt the natural integrity and function of native ecosystems by altering habitat and out-competing native species. The introduction and spread of non-native invasive species may also create negative issues for military training or for other anthropogenic land uses.

EO 13112, *Invasive Species*, requires federal agencies to identify actions that may affect the status of invasive species and to use appropriate programs and authorities to:

- Prevent invasive species introductions.
- Detect populations of invasive species and rapidly institute cost-effective and environmentally sound control measures.
- Monitor invasive species populations.
- Restore native species and habitat conditions in areas that have been invaded.
- Conduct research and develop technologies to prevent the introduction of, and to control the spread of, invasive species.
- Promote public awareness of invasive species and the means to address them.

1 The order also states that federal agencies are not to authorize, fund, or carry out actions that are
2 likely to promote the introduction or spread of invasive species unless the agency has made
3 public its determination that the benefits of such actions clearly outweigh the potential harm
4 caused by invasive species and that all reasonable measures to minimize the risk of harm will be
5 taken in conjunction with the actions. Tyndall's *Nuisance Species Component Plan* describes the
6 management of non-native invasive, pest, and nuisance species.

7 **6.10.1 Invasive Non-native Plant Species**

8 Tyndall AFB is committed to the identification, control, and eradication of invasive non-native
9 plant species. The overall goal is to restore areas to their natural ecological community type,
10 prevent new introductions, and protect imperiled species and their habitats in compliance with
11 EO 13112, the Sikes Act, and the ESA. The primary invasive plants of concern for Tyndall AFB
12 are cogon grass (*Imperata cylindrica*), Japanese climbing fern (*Lygodium japonicum*), and
13 Chinese tallow (*Triadica sebifera*); a complete list of invasive plant species documented on
14 Tyndall is provided in the *Nuisance Species Component Plan*.

15 In 2004, Tyndall accomplished a partial survey identifying invasive species locations, along with
16 control recommendations and priorities. Initial limited herbicide control efforts began in 2006.
17 A new effort to map all invasive plant locations on the base was initiated in 2009 and is ongoing.
18 Once an infested plant site is identified, herbicides are applied and monitoring is conducted to
19 evaluate control effects and maintenance needs. Installation-wide herbicide control efforts
20 through an FWC assistance program began in 2010 to augment AF funded control projects. A
21 grant-funded partnership with TNC has treated invasives on Tyndall and nearby private lands
22 since 2012. All of the proposed treatment areas are considered to have high potential for
23 restoration of natural community types using surrounding seed sources.

24 **6.10.2 Non-native and Nuisance Animal Species**

25 Non-native and nuisance animals can prey on rare and sensitive species, compete with native
26 species for resources, damage desirable/managed habitats, and carry rabies and other infectious
27 diseases that may affect wildlife populations. The presence of non-native animals may also
28 cause nuisance issues on the installation. Nuisance species are defined as wild animals that
29 cause annoyance, health hazard, safety hazard, landscape or property damage, or compromise
30 mission objectives, and may be native or non-native. Control of nuisance animals is the
31 responsibility of the Pest Management Shop and Tyndall Natural Resources. The Pest
32 Management Shop generally responds to complaints of nuisance animals in and around buildings
33 and other structures, with the exception of Base Housing. The Military Housing Contractor
34 responds to all Base Housing complaints. Natural Resources removes nuisance wildlife upon
35 request.

36 Non-native and nuisance animal species present on the base include black bears, alligators,
37 osprey, deer, bats, coyotes, feral hogs, red and gray foxes, feral dogs and cats, and other species
38 such as snakes, raccoons, beavers, skunks, and nine-banded armadillos. Tyndall AFB has the
39 capability of using a variety of techniques such as chemicals, traps, and lethal methods to control
40 wildlife. Applicable federal and state permits are obtained prior to implementation of any
41 wildlife control technique. Required permits include, but are not limited to, black bear
42 hazing/capture, MBTA depredation, bald eagle harassment, steel trap (for USDA Wildlife

1 Services personnel), FWC alligator relocation permit, and DoD pesticide certification. Tyndall
2 also conducts preventative nuisance animal control through securing/removal of attractants (i.e.,
3 trash, pet food, bird feeders), and provides education to base residents, as resources allow.

4 Nuisance animals that impact T&E species, particularly on the barrier islands, are removed
5 through an USDA Animal and Plant Health Inspection Service Memorandum of Agreement
6 contract under permit through the FWC. National Resource Damage Assessment Early
7 Restoration funding from the Deepwater Horizon oil spill has created supplemental funding for
8 shorebird protection via USDA predator removal through 2017. Tyndall AFB is one of the sites
9 that will receive additional trapping; target predators include coyotes, fox, raccoons, armadillos,
10 opossum, feral cats, and feral hogs.

11 Refer to the *Nuisance Species Component Plan* for more information. Details regarding bird
12 control, including incidental and intentional takes, during military readiness activities are
13 described in the *Tyndall AFB BASH Plan*.

14 **6.11 BIRD/WILDLIFE-AIRCRAFT STRIKE HAZARD**

15 Birds and wildlife have the potential to cause millions of dollars in damage to aircraft and the
16 loss of human life. 325th FW Flight Safety (325 FW/SEF) is the office of primary responsibility
17 for monitoring and implementation of *BASH Plan 910* (Tyndall AFB, 2013b). The participation
18 of Tyndall Natural Resources in the BASH program is directed by AFI 32-7064, *Integrated*
19 *Natural Resources Management*, and AFI 91-202/Air Combat Command Supplement 1, *The US*
20 *Air Force Mishap Prevention Program*. The directives mandate that Tyndall Natural Resources
21 participate in the development, review, approval, and implementation of the Tyndall BASH Plan.
22 Additional Natural Resources responsibilities include maintaining current state and federal
23 permits required for management of birds and wildlife to promote airfield safety.

24 Passive control measures such as landscape design, elimination of food and roost sources,
25 turf/water management and forest management are the most permanent ways of reducing the
26 attractiveness of airfields for bird and wildlife utilization. Active control measures may
27 incorporate trained working dogs, pyrotechnics, bioacoustics, and depredation (lethal control)
28 activities. Depredation activity is only implemented as a last resort when other scare tactics are
29 proven unsuccessful.

30 Specific types of management strategies and actions incorporated into the BASH program
31 include the following:

- 32 • Bird harassment techniques (using wildlife biologists and trained working dogs)
- 33 • Removal of dead animals (carrion) from airfields
- 34 • Auditory bird dispersal unit
- 35 • Propane cannons
- 36 • Sirens/horns/lights
- 37 • Pyrotechnics (shell crackers)
- 38 • Maintain drainage ditches in areas that have potential to hold water

- 1 • Grass heights are maintained at 11 inches
- 2 • Insect outbreaks may be sprayed with pesticides
- 3 • Tree and scrub vegetation management
- 4 • Maintain sanitary conditions around main installation dumpsters
- 5 • Lethal control measures, as necessary (depredation permits are acquired and annual
- 6 reports are submitted to the USFWS by the 325 FW/SEF office)

7 USDA Wildlife Services is the primary source for observing wildlife hazard conditions; they
8 coordinate with Flight Safety, Base Operation, and maintenance personnel for collection of bird
9 remains after strikes, submitting reports, shipping salvaged bird remains for analysis, and
10 providing wildlife harassment and dispersal services. Wildlife Services conducts wildlife
11 surveys, maintains a database of wildlife activities to identify long-term trends, traps animals
12 when necessary (raccoons, coyotes, etc.), and trains airfield management personnel on proper
13 BASH response. Wildlife Services also prevents other animal hazards to aircraft by use of
14 trapping and exclusion methods for animals such as wild hogs. Fencing may control deer, and
15 the deer hunting program is considered part of the BASH program. Some animals may be
16 removed by shooting. See the *Tyndall BASH Plan* for additional information.

17 **6.12 OUTDOOR RECREATION, HUNTING, AND FISHING**

18 Tyndall Natural Resources strives to promote and develop sustainable recreational opportunities
19 for DoD and non-DoD personnel, which include hunting, fishing, and non-consumptive uses, in
20 a manner compatible with the military mission and subject to safety and security requirements
21 (Tyndall AFB, 2014a). The FWC has established approximately 12,000 acres (4,856 ha) of
22 Tyndall's land as a WMA, which is a public hunting and recreation area operated by the
23 landowner in cooperation with the FWC. With some restrictions for force protection, public
24 safety, operations, and ecological protection, the public can enjoy many recreation activities on
25 the installation. Tyndall has entered into Cooperative Agreements with the USFWS and FWC,
26 under which these agencies provide technical data and management assistance in developing the
27 installation's recreation plan. The following section provides a general overview of the Tyndall
28 fish and wildlife program; detailed information is provided in the Tyndall AFB *Outdoor*
29 *Recreation Component Plan* and *Hunting, Fishing, and General Recreation Regulations* (Figure
30 6.2).

31 Outdoor recreation is managed by 325th FSS and 325 CES Natural Resources offices (Table
32 6-5). The 325 FSS provides rental and for fee recreational services such as bowling, recreation
33 equipment rental, boat rental, and archery and skeet ranges; these activities must either be self-
34 sustaining or receive marginal cross funding from profits generated by the Base Exchange.
35 Natural Resources hosts activities that qualify for Sikes Act and other public funding, such as
36 hunting, camp sites, hiking trails, beach oversight, and other property management related to
37 recreation. These two offices currently operate with separate information access systems and
38 under separate commanders. An online hunting permit system is being "rolled out" in FY 2015
39 that may relieve some of the confusion.

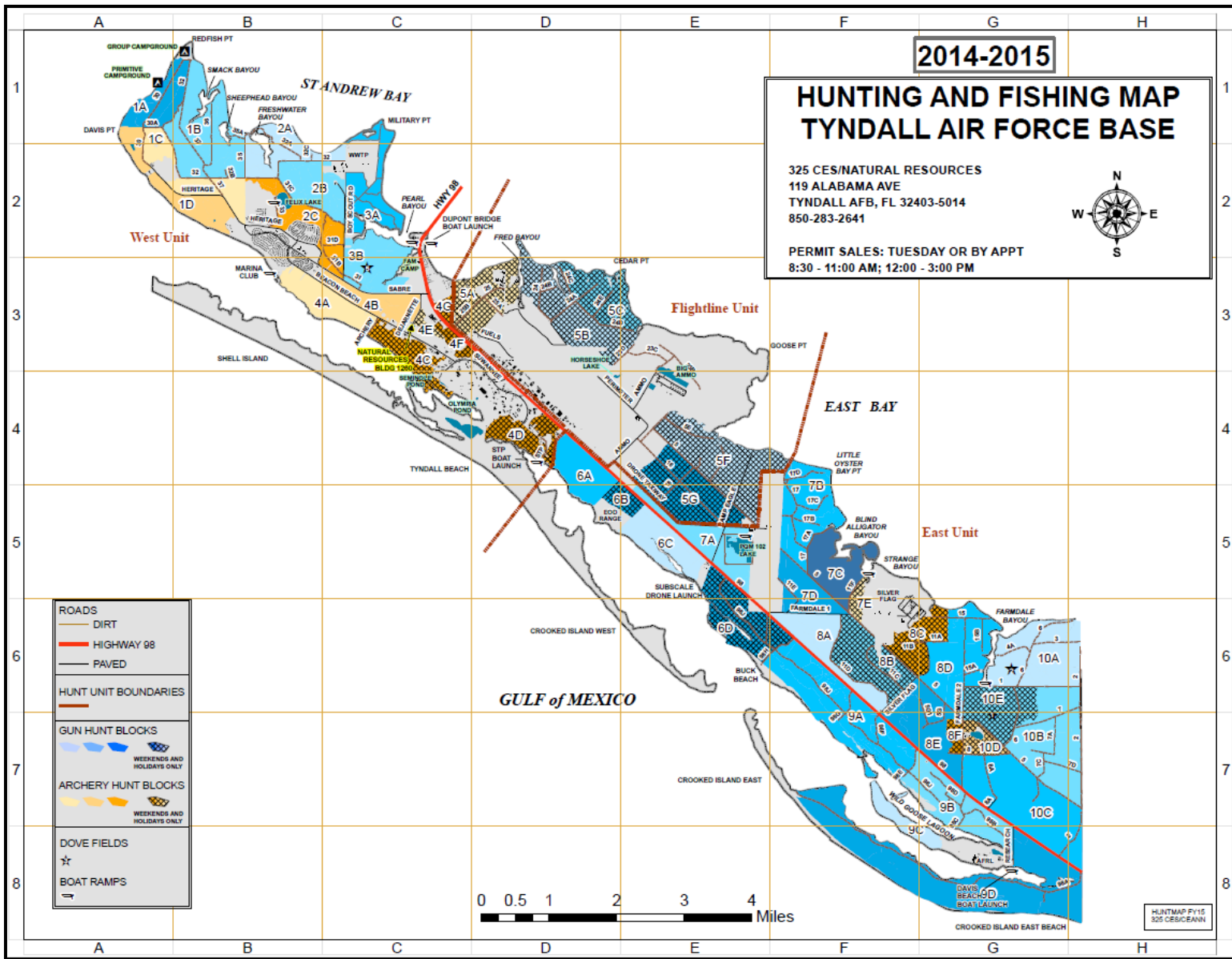


Figure 6.2. Tyndall AFB 2014-2015 Hunting and Fishing Map

Table 6-5. Responsible Organizations for Recreational Activities on Tyndall AFB

Activity	Responsible Organization	
	325 CES/CEIEN (Natural Resources)	325 FSS (Force Support Squadron)*
Hunting (guns, archery)	X	
Freshwater fishing	X	
Archery range		X
Skeet shooting		X
RV park (Fam Camp)		X
Paintball		X
Tent Camping	X	X
Boat rental		X
Hiking trails/boardwalks	X	
Non-consumptive use (hiking, biking, bird watching, etc.) of beaches, woodlands	X	

325 CES/CEIEN = 325th Civil Engineer Squadron, Environmental Element, Natural Resources; AFB = Air Force Base; FSS = Force Support Squadron

*325 FSS maintains a website (<http://325fss.com/>) that lists recreational activities and contact information.

1 Recreation on Tyndall follows all Federal and State regulations, with additional Tyndall-specific
 2 restrictions on off-road vehicle use, after-dark access, weapon choice, and weekday access as
 3 detailed in the *Tyndall AFB Hunting, Fishing, and General Recreation Regulations*, including
 4 the following (Tyndall AFB, 2014b):

- 5 • Off-road vehicles, motorcycles, and bicycles are restricted to established named roads.
 6 Unauthorized “trail busting” is aggressively discouraged. Violators risk losing
 7 installation driving privileges.
- 8 • To prevent accidental interaction between hunters and ground forces performing
 9 exercises, public access is prohibited during the hours of full darkness (1.5 hours after
 10 sunset/before sunrise). Weapon choice is limited to shotguns, black powder rifles, bows,
 11 and cross-bows. Pistols and rifles are excluded to prevent over-travel across roads or
 12 inhabited areas.
- 13 • Weekday access restrictions to ensure a safety buffer around military working areas
 14 during high activity periods.

15 Closed areas are fenced or posted; however, with over 120 miles (193 km) of shoreline, Tyndall
 16 does not have all shoreline areas posted. FWC officers enforce only state and federal law; the
 17 Tyndall Conservation Law Enforcement officer additionally enforces Tyndall-specific
 18 regulations. Tyndall Security Forces focus on traditional law enforcement activities and do not
 19 typically check for compliance with natural resources regulations. Community Police have all-
 20 terrain vehicles (ATVs), boats and jet skis and may assist when it is necessary to get to hard-to-
 21 reach areas.

22 Tyndall AFB’s hunting and fishing regulations and map are reviewed and updated annually by
 23 Natural Resources, including any modifications requested by mission groups (i.e., Silver Flag,
 24 Security Forces), and then they are submitted to the Base Commander, Civil Engineer
 25 Commander, and the Legal office for approval. This map/regulations product is provided to

1 persons purchasing permits. It contains federal, state, and installation fish, wildlife, and natural
2 resources laws, defines hunting areas, and establishes legal hunting days and methods. User fees
3 are collected to offset costs incurred for the protection, conservation, and management of fish
4 and wildlife programs, including habitat improvement. Tyndall Natural Resources generates
5 approximately \$18,000 annually from permits sales, the majority of which goes to pay for check
6 station operators.

7 **6.12.1 Public Access Classifications**

8 AFI 32-7064 requires classification of AF managed lands into categories that describe the degree
9 of public access for all areas that are identified as suitable for outdoor recreation. Tyndall
10 classifies its property into open, restricted, and prohibited areas for public access purposes:

- 11 • **Open Areas.** DoD¹ and non-DoD personnel are permitted to enjoy many recreation
12 activities on the base including beach activities, boating, canoeing, fishing, firewood
13 cutting, hunting, and trail walking. Tyndall AFB has two fishing lakes, three fishing
14 ponds, three nature trails, four elevated boardwalks and a variety of hunting
15 opportunities.
- 16 • **Restricted Areas.** DoD personnel are afforded additional recreational opportunities on
17 Tyndall AFB under the authority of AFI 34-262. The Bonita Bay Outdoor Recreation
18 Complex includes a marina, an outfitters shop, and a picnic area. Additional facilities
19 available for use include the Tyndall AFB Marina Club on St. Andrew Bay, skeet range,
20 archery range, Aero Club, family campground, and a variety of playing fields and courts.
21 Hunting is restricted to DoD personnel within the West Hunt Unit and the Flight Line
22 Unit.
- 23 • **Prohibited Areas.** Certain areas of Tyndall AFB are prohibited for recreational activities
24 for force protection, public safety, operations, or ecological protection.

25 Access to Tyndall AFB for recreational purposes is in part determined by the force protection
26 level of the base. Because portions of Tyndall are designated WMAs, when it appears that
27 restrictions of recreational use of the base due to higher force protection levels will remain in
28 effect for a significant period of time, Natural Resources will contact FWC to explain the
29 situation. Because background checks are required and immediate access is not available to the
30 public, the FWC removed the West Hunt Unit from the WMA system.

31 **6.12.2 Hunting Program**

32 Historically, the greatest public demand for Tyndall's land has been for hunting, particularly deer
33 hunting. Tyndall includes the following hunting seasons: archery, small game, muzzle-loading,
34 general gun, spring turkey (draw hunt), and migratory bird season (as defined in the State of
35 Florida Hunting Regulations). Specific regulations are provided in the *Tyndall AFB Hunting,*
36 *Fishing, and General Recreation Regulations.* All hunters must also follow general state laws

¹ DoD personnel are defined as Active Duty Military, Reserve, National Guard, DoD Civilians, Retired Military, Retired DoD Civilians, their dependents, and DoD Contractors with a current DoD identification card with base wide access. Individuals who are members of the public and are not affiliated with the DoD are herein referred to as non-DoD.

1 and regulations relating to wildlife unless specifically noted otherwise. Hunting programs at
2 Tyndall AFB are managed to ensure wildlife resources are conserved and protected:

- 3 • Three dove fields are planted annually (contingent upon funding), and maintained by
4 mowing, burning, and disking. These fields tend to pull doves away from the airfields,
5 thus reducing the BASH potential.
- 6 • Disabled persons' hunting and fishing is available along with viewing points
 - 7 ○ Disabled persons' fishing access is available on the dock and in designated areas.
- 8 • Food plots are planted to lure deer off of U.S. Highway 98 in an effort to reduce the
9 threat of deer/car strikes.
- 10 • Food plots are used to concentrate turkey for controlled hunts.

11

12 Open and closed areas are coordinated through a check station. A hunting check station
13 (Building 4027) is manned as appropriated funds are available. Hunting permits may be
14 obtained at the check station (when manned); otherwise, permits are issued at the Natural
15 Resources Office (Building 1260). Hunters must check in prior to going out, and are required to
16 have a tag for the specific block they are hunting that day. The check station is typically only
17 open on Fridays, Saturdays, Sundays, and holidays, but may be open additional days during the
18 opening of some seasons (i.e., archery) or around Christmas. Currently, a quota of one hunter
19 per 45 acres (18.2 ha) is set to ensure a quality hunt. However, this quota can be adjusted to
20 meet certain management objectives. If the DoD web-based hunting/recreation system is
21 adopted at Tyndall, it may alter this process.

22 **White-tailed Deer**

23 Tyndall AFB has an excellent deer herd in terms of numbers, body weights, and antler
24 development, in large part due to the three points on a side antler restriction. Deer herd
25 management is divided into three zones: the West Hunt Unit, East Hunt Unit, and the Flight Line
26 Hunt Unit.

27 ***West Hunt Unit***

28 The West Hunt Unit comprises the areas around main base and housing and due to security
29 restricts hunting to DoD personnel only. It has the highest deer density and the highest hunter
30 pressure, making this unit the best deer habitat on Tyndall AFB.

31 ***East Hunt Unit***

32 The East Hunt Unit encompasses the areas to the east surrounding the drone runway and Silver
33 Flag. Body weights, condition indices, and antler development are slightly lower in the East
34 Hunt Unit than in the West Hunt Unit. This area also has fewer hardwoods in comparison to the
35 West Hunt Unit; habitat in this unit is expected to improve as prescribed burning increases. Deer
36 density in this unit is moderate relative to other areas on Tyndall.

1 ***Flight Line Hunt Unit***

2 The Flight Line Hunt Unit is located behind the flight line in the vicinity of the alert area. Unlike
3 the white-tailed deer management philosophy in the East and West Hunt Units, the management
4 goal in the Flight Line Unit is to harvest enough deer to keep the population low. By controlling
5 the population size, the possibility of a deer strike on the airfield will be reduced.

6 **Wild Turkey**

7 Tyndall AFB has fair turkey habitat on the West and East Hunt Units. Expansion of the
8 controlled burning program is expected to improve marginal turkey habitat. Turkey restoration
9 began in 1993 when 23 turkeys were released on the West Hunt Unit. An additional seven
10 turkeys were introduced in 1997 to the East Hunt Unit. A sighting index is used to monitor
11 populations on both hunt units. Spring gobbler hunting began on the West Hunt Unit in 1998;
12 the current population in this unit is estimated at 100 birds. Turkey hunting at Tyndall AFB
13 currently occurs during select weekends in March and April. Hunters for these two-day hunts
14 are selected at random.

15 **Wood Duck**

16 Wood duck management on Tyndall AFB has been sporadic. Several small man-made water
17 holes were dug on the West Hunt Unit to serve as temporary feeding and roosting areas. During
18 dry periods of the year, these ponds evaporate and the resident wood ducks congregate in Lake
19 Yvonne and the freshwater swamp adjacent to Warbler's Way. Several dozen wood duck
20 nesting boxes have been erected in or along the shores of most of Tyndall's suitable nesting
21 habitat.

22 **Mourning Dove**

23 There is moderate demand for managed dove hunting on Tyndall AFB, possibly due to the fact
24 that there is very little agriculture and other quality dove habitat in Bay County. Due to
25 Tyndall's proximity to Panama City, many hunters would rather drive to the base than the
26 northernmost counties in the Panhandle. Three dove fields are planted annually by Natural
27 Resources Staff, contingent upon funding.

28 **Other Game Species**

29 Tyndall has hunting seasons open for other small game species (i.e., gray squirrel), but habitat is
30 not actively managed for these species. General land management such as prescribed fire
31 typically is beneficial to these species.

32 **6.12.3 Recreational Fisheries Program**

33 Tyndall offers both freshwater and saltwater fishing options. Tyndall AFB fishing permits may
34 be obtained at the check station or at the Natural Resources Office. All State of Florida rules
35 apply to fishing on the installation (includes required state recreational fishing license).
36 Freshwater fishing areas include Felix Lake, Horseshoe Lake, PQM-102, Olympia and Seminole
37 (see *Tyndall AFB Hunting, Fishing, and General Recreation Regulations* for access restrictions).

1 Saltwater fishing is allowed for DoD personnel at designated boat ramps and along shorelines
2 unless otherwise posted. A Tyndall AFB permit is required for non-DoD personnel to saltwater
3 fish from shore in the West Unit; a permit is not required for the East Unit or the DuPont Bridge
4 Boat Launch Area.

5 The fish species in Tyndall ponds/lakes include largemouth bass, bluegill bream, redear sunfish
6 (shell crackers), crappie, channel catfish, threadfin shad, and grass carp. Good water quality and
7 adequate habitat are necessary for largemouth bass reproduction, and with proper management
8 the population will be able to maintain itself with little to no restocking. Bluegill are managed in
9 the fisheries program because they provide a source of food for largemouth bass, are prolific
10 spawners, usually do not require restocking, and populations can withstand intense fishing
11 pressure. Small ponds on Tyndall AFB are managed for channel catfish-- these fish are utilized
12 by visiting anglers, special event, and outreach groups as a put-grow-and-take-fishery and are
13 restocked as needed. Additional information on the specific management requirements and
14 access categories for the managed ponds and lakes is available in the Tyndall AFB *Outdoor*
15 *Recreation Component Plan*.

16 **6.12.4 General Outdoor Recreation Program**

17 In addition to hunting and fishing, many other recreational opportunities exist on Tyndall AFB,
18 including but not limited to boating, swimming, diving, waterskiing, canoeing, camping, fuel
19 wood cutting, picnicking, trail walking, and boardwalks. A general recreation permit is required
20 for such activities, and may be obtained at the hunting check station (Building 4027) or the
21 Natural Resources Office (Building 1260). Applicable regulations are provided in the *Tyndall*
22 *AFB Hunting, Fishing, and General Recreation Regulations*.

23 **Watchable Wildlife**

24 Elevated boardwalks at Warblers Way, Pelican Way, Gator Way, and Seminole Trail, as well as
25 Felix Lake and Deer Run Natural Trail, provide access to military and the general public to
26 observe and enjoy the various wildlife species at Tyndall AFB. Additionally, the base wildlife
27 biologist may provide occasional tours to interested groups including, but not limited to, the
28 Boy/Girl Scouts, school groups, civic groups, and wildlife-oriented organizations.

29 **Off-Road Vehicle and Mountain Bike Use**

30 Tyndall AFB has 120 miles (193 km) of existing roads and trails designated for off-road vehicle
31 and mountain bike use. The use of off-road vehicles and mountain bikes on the beach or
32 undesignated areas and trails is prohibited. Oversight of all maintenance and rehabilitation of
33 off-road vehicle roads and trails is performed by Tyndall Natural Resources.

34 **6.12.5 Enforcement**

35 Presently the Natural Resources Conservation Law Enforcement Officer, FWC Officers, and
36 Tyndall Security Police enforce the laws pertaining to natural resources at Tyndall AFB.
37 Tyndall AFB's hunting and fishing regulations and map, published annually, is provided to
38 persons purchasing permits. This regulation contains federal, state and installation fish, wildlife,
39 and natural resources laws, defines hunting areas, and establishes legal hunting days and

1 methods. Tyndall AFB game regulations are state law and enforceable by the base Conservation
2 Officer and FWC through FAC 68A-15.004 and 68A-15.063 (20). Additionally, installation
3 personnel are encouraged to report violations to the commander, who can take action to bar or
4 otherwise discipline violators outside of formal law enforcement channels.

5 **6.13 COASTAL ZONE MANAGEMENT**

6 Under the Coastal Management Act, the Florida Coastal Management Program (FCMP) was
7 established for determining federal consistency under the federal Coastal Zone Management Act
8 (CZMA). Approved by the National Oceanic and Atmospheric Administration in 1981, the
9 FCMP is based on 24 statutes administered by a network of nine state agencies and five water
10 management districts. Federal agency activities that have the potential to impact Florida's
11 coastal resources are required to be consistent with the FCMP.

12 Federal agencies, such as Tyndall AFB, make determinations as to whether their actions are
13 consistent with the 24 statutes of the FCMP. Determinations are submitted to the FDEP State
14 Clearinghouse for review and concurrence. The Clearinghouse enables state agencies to review
15 federal activities. If a reviewing agency determines that a project is not consistent with Florida's
16 statutes, the FCMP requires the applicant to revise its plans. In this way, the Florida State
17 Clearinghouse and the federal agency work together to ensure projects are consistent with
18 Florida's statutes thus protecting coastal resources.

19 Natural Resources coordinates planned construction activities through the use of the CZMA as
20 part of the EIAP review process. Projects do not proceed until all clearances and approvals are
21 in place.

22 **6.14 CULTURAL RESOURCES PROTECTION**

23 The primary goal of cultural resources management at Tyndall is to support mission readiness
24 through regulatory compliance. As a federal agency, Tyndall is required by law to consider the
25 effects of its actions on archaeological sites and historic properties. Mandating legislation
26 includes:

- 27 • Antiquities Act of 1906
- 28 • Historic Sites Act of 1935
- 29 • National Historic Preservation Act (NHPA) of 1966 as amended, 36 CFR Part 800
- 30 • Archaeological and Historical Preservation Act of 1974
- 31 • Archaeological Resources Protection Act of 1979, the NEPA of 1969
- 32 • Native American Graves and Repatriation Act of 1990
- 33 • American Indian Religious Freedom Act
- 34 • Cultural Resources Management Program (AFI 32-7065)

1 While numerous archaeological investigations have been conducted at Tyndall, as of 2013 only
2 4,495 acres (1,819 ha) (15 percent of Tyndall) had received intensive archaeological surveys that
3 meet current professional and regulatory standards. Tyndall's ICRMP provides
4 recommendations for the routine maintenance of both National Register of Historic Places
5 (NRHP) eligible and potentially eligible archeological sites, as well as historic buildings on
6 Tyndall AFB (Tyndall AFB, 2014c). The ICRMP for Tyndall AFB was last updated in 2010 and
7 is scheduled to be updated again in 2015.

8 Projects and other resource management activities located in un-surveyed areas have the
9 potential to impact unknown sites. NHPA Section 106 requires that federal agencies analyze the
10 impacts of their activities on historic properties, or cultural resources included in, or eligible for
11 inclusion in, the NRHP through the State Historic Preservation Officer. Activities outlined in
12 this INRMP are subject to Section 106 review; close coordination between Cultural Resources
13 and Natural Resources staff occurs to avoid impacts to cultural resources, especially for timber
14 sales, TSI, prescribed fire, erosion control, invasive species, and recreational use projects. For
15 instance, Tyndall Natural Resources Forest Management personnel submit maps to Cultural
16 Resources to determine if the areas will require a survey prior to a forestry operation. Fire
17 Management personnel coordinate directly with Cultural Resources by providing burn maps in
18 advance of scheduled burns so that resources and areas that need to be protected from fire and
19 heavy equipment can be identified.

20 **6.15 PUBLIC OUTREACH**

21 Communication and cooperation with the public is a critical component of any natural resource
22 management effort. The goal of public outreach efforts is to encourage understanding of,
23 support for, and involvement in the many management and monitoring programs at Tyndall.
24 Without the support of partner organizations and local citizens, it becomes very difficult to run
25 effective management programs. Outreach is accomplished through: (1) research partnerships
26 and internships (Table 6-2), (2) presentations and guided tours, and (3) volunteer involvement
27 (i.e., T&E monitoring, permit sales, forestry program, hunting, and others).

28 As resources allow, Tyndall's wildlife biologist and forester provide classes and tours to
29 interested parties, including, but not limited to, Boy/Girl Scouts, school groups, Tyndall Youth
30 Center, civic groups, and wildlife-oriented organizations. Educational materials such as
31 brochures and a display depicting wildlife found in the region are available in the Natural
32 Resources Building.

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7. GOALS AND OBJECTIVES

2 Based on an assessment of the resources, current conditions, and management issues identified in
3 the previous chapters, this section details the primary and supporting goals of the INRMP to
4 ensure Tyndall AFB successfully accomplishes its mission while maintaining and improving the
5 natural environment. The full scope of the Tyndall Natural Resources program is a combination
6 of continuing established protocols, programs, and projects (detailed in Chapter 6) in the context
7 of strategic priorities and new objectives in Table 7-1.

Table 7-1. Tyndall AFB Natural Resources Goals and Objectives Matrix

Principal Goal	Supporting Goal	Objective	Objective Description	Drivers	Funding/Labor Source*	Section
I. Provide natural resource management and coordination services in support of the mission.	I.A. Support military mission objectives through a responsive natural resources analysis and consultation process (NEPA/ESA).	I.A.1.	By 2015, develop safeguards in the EIAP to ensure that actions do not proceed until all pertinent coordinating agencies have had the opportunity to comment, and any necessary CZMA, ESA, Essential Fish Habitat (EFH), and MMPA clearances have been obtained.	ESA, DoDI 4715.03, AFI 32-7064, 32 CFR 989, CZMA	In-house labor	Compliance /T&E
		I.A.2.	By 2017, develop General Negative Determination Agreement with the FDEP to facilitate compliance with the CZMA.	CZMA, AFI 32-7064	UNFUNDED	Compliance /T&E
	I.B. Ensure long-term availability of natural resources to support the military mission through coordination with other environmental and mission organizations.	I.B.1.	By 2017, review all Section 7 consultations, Environmental Impact Statements (EISs), EAs, and other applicable regulatory permits for commitments made by Tyndall, and establish a process by which natural resource requirements are communicated to pertinent personnel for implementation. For those that are the responsibility of Natural Resources, ensure these are programmed for in ACES.	ESA, DoDI 4715.03, AFI 32-7064, 32 CFR 989	In-house labor	Compliance /T&E
		I.B.2.	By 2017, establish a process to track natural resource requirements from Section 7 consultations, MMPA and EFH permits, EISs, EAs, and other applicable regulatory permits, and implement a system that ensures compliance with the requirements (i.e., site inspections). Provide required annual reports to regulators.	ESA, DoDI 4715.03, AFI 32-7064, 32 CFR 989	UNFUNDED	T&E
		I.B.3	Provide a Natural Resources familiarization briefing and tour of the base for commanders within three months of taking command.	ESA, DoDI 4715.03, AFI 32-7064	In-house labor	All
		I.B.4.	By 2016, develop a briefing on natural resources and associated protection measures, and provide to appropriate organizations and projects that have the potential to impact these resources.	ESA	In-house labor	All

Table 7-1. Tyndall AFB Natural Resources Goals and Objectives Matrix (Cont'd)

Principal Goal	Supporting Goal	Objective	Objective Description	Drivers	Funding/Labor Source*	Section
		I.B.5.	By February 1 of each year, conduct assessment to determine what organizations have a need for beach access and driving; by April 1 of each year, provide a reminder or new notice about the base operating instruction to affected organizations.	ESA	In-house labor	T&E
		I.B.6.	Ensure compatibility of recreation areas with the short and long-term requirements of the military mission through at least annual coordination with natural and cultural resource managers.	Sikes Act	In-house labor	Recreation
		I.B.7.	At least annually review and update natural resources data layers.	ESA, Sikes Act	In-house labor	All
		I.B.8.	By 2015, establish a streamlined base access process such that natural resources contractors, surveyors, regulators, and fire and forestry personnel can more easily access the base.	ESA, Sikes Act	In-house labor	All
		I.B.9.	Coordinate with other agencies and organizations regarding climate change impacts that may affect Tyndall AFB, and communicate pertinent information to base leadership.	DoDI 4715.03	In-house labor	All (T&E Lead)
		I.B.10.	Evaluate options for addressing climate change impacts on Tyndall's natural resources (i.e., movement corridors for federally listed species and other wildlife).	ESA, DoDI 4715.03	In-house labor	T&E

Table 7-1. Tyndall AFB Natural Resources Goals and Objectives Matrix (Cont'd)

Principal Goal	Supporting Goal	Objective	Objective Description	Drivers	Funding/Labor Source*	Section
	I.C. Provide wildland fire management support to Tyndall's military mission, in coordination with the AFWFC.	I.C.1	By 2016, update the Tyndall Wildland Fire Management Plan in cooperation with AFWFC, including delineation of burn blocks, prescribed fire frequency, burn prioritization criteria, and strategies for reducing risk to the mission.	ESA, DoDI 4715.03, AFI 32-7064	AFWFC ACES; in-house labor	Fire
		I.C.2	Conduct annual planning meetings with the AFWFC and Natural Resources staff to establish criteria to prioritize areas that require prescribed fire, and create an annually updated map showing these areas.	ESA, DoDI 4715.03, AFI 32-7064	AFWFC ACES; in-house labor	All (Fire Lead)
		I.C.3.	Coordinate with pertinent installation personnel to create an annually updated map of internal and external values at risk from wildfire.	NHPA, Mission support	AFWFC ACES; in-house labor	Fire
		I.C.4.	Submit annual AF Form 813 detailing proposed burn blocks and proposed roads and firebreaks to be maintained.	ESA, DoDI 4715.03, AFI 32-7064, 32 CFR 989	AFWFC ACES; in-house labor	Fire
		I.C.5.	Educate training groups and other organizations at Tyndall AFB to facilitate a reduction in fire starts.	Mission support	AFWFC ACES; in-house labor	Fire
		I.C.6.	Determine fire management qualifications required for all firefighters and fire managers, and ensure all personnel assigned to those positions are qualified per NWCG standards for their expected duties.	DoDI 4715.03, AFI 32-7064	AFWFC ACES; in-house labor	Fire
		I.C.7.	Through a responsive planning process, ensure minimal interference with military mission activity during wildland fire operations.	DoDI 4715.03, AFI 32-7064	AFWFC ACES; in-house labor	Fire
		I.C.8.	By 2016, update all interagency agreements related to wildfire incident response that formalizes and integrates this response with Tyndall's Fire and Emergency Services and other responding agencies.	DoDI 4715.03, AFI 32-7064	AFWFC ACES; in-house labor	Fire

Table 7-1. Tyndall AFB Natural Resources Goals and Objectives Matrix (Cont'd)

Principal Goal	Supporting Goal	Objective	Objective Description	Drivers	Funding/Labor Source*	Section
		I.C.9.	Enter the perimeters of all hazardous fuel treatments into a GIS database to be maintained within the Wildland Fire Program. Periodically analyze this database to ensure all priority lands within Tyndall AFB are being included in the prescribed fire program.	ESA, DoDI 4715.03, AFI 32-7064	AFWFC ACES; in-house labor	Fire
		I.C.10.	By 2016, establish criteria to identify priority fire-dependent areas that require mechanical vegetation removal due to the difficulty of burning (i.e., urban interface, fire suppressed/high hazard). Conduct mechanical fuel treatments on identified areas.	ESA, DoDI 4715.03, AFI 32-7064	AFWFC ACES; in-house labor; MGT, SPECIES, VIOLET BUTTERWORT; MGT, HABITAT, FISH AND WILDLIFE	Fire
		I.C.11.	By 2016, identify a system of fire breaks, including minimum specifications and condition monitoring protocols to reduce the probability of a fire threatening identified high valves at risk.	DoDI 4715.03, AFI 32-7064,	AFWFC ACES; in-house labor	Fire
		I.C.12.	Annually maintain firebreaks based on needs identified during condition monitoring.	DoDI 4715.03, AFI 32-7064	AFWFC ACES; in-house labor	Fire
		I.C.13	By 2015, develop a fire considerations map detailing sensitive areas such as wetlands, endangered species locations, and unexploded ordinance contaminated areas, and formalize procedures required for these areas.	ESA, DoDI 4715.03, AFI 32-7064	AFWFC ACES; in-house labor; MGT, SPECIES, VIOLET BUTTERWORT	Fire, T&E
	I.D. Provide for effective resource conservation and protection through enforcement of natural resources laws and public use outdoor recreation rules and regulations.	I.D.1.	Maintain conservation law enforcement presence at Tyndall to enforce natural resource regulations.	ESA, DoDI 4715.03, AFI 32-7064, Sikes Act	In-house labor	Recreation, T&E
		I.D.2.	Annually coordinate with Security Forces to identify areas where they could assist with enforcement of natural resources regulations, and develop procedures to support this coordinated effort.	ESA, DoDI 4715.03, AFI 32-7064, Sikes Act	In-house labor	Recreation, T&E

Table 7-1. Tyndall AFB Natural Resources Goals and Objectives Matrix (Cont'd)

Principal Goal	Supporting Goal	Objective	Objective Description	Drivers	Funding/Labor Source*	Section
	I.E. Provide natural resources expertise and field support to Flight Safety and BASH program.	I.E.1.	Annually maintain all permits required for lethal control of migratory birds and coordinate removal of nuisance wildlife as needed to promote airfield safety.	AFI 32-7064, AFI 91-202	In-house labor	T&E, Nuisance Species
		I.E.2.	Annually meet with BASH Working Group to identify long-term solutions for management of airfield wetlands that minimize adverse effects to natural resources while reducing BASH.	AFI 32-7064, AFI 91-202	In-house labor	T&E, Nuisance Species
		I.E.3.	Conduct forestry operations when practical to remove trees that are in or have immediate potential to encroach into airfield glide slopes.	Mission support	In-house labor	Forestry
II. Restore and manage forests for mission use, habitat improvement, and protection of T&E species.	II.A. Annually prioritize and maintain/ restore native forest ecosystems and associated species to increase ecosystem resiliency and military mission flexibility.	II.A.1.	Annually initiate any NEPA, Section 7 consultation, Section 106 consultation, and other pertinent consultations/permits required for Tyndall INRMP activities.	32 CFR 989, ESA, NHPA	UNFUNDED	Compliance
		II.A.2.	By 2016, complete update of T&E component plan, determine need for separate Forest Management, Outdoor Recreation, and Nuisance Species plans.	ESA, DoDI 4715.03, AFI 32-7064	UNFUNDED	All
		II.A.3.	Complete at least 9,000 acres of prescribed fire annually based on a five-year running average.	ESA, DoDI 4715.03, AFI 32-7064	AFWFC ACES; in-house labor	Fire
		II.A.4.	Conduct Natural Resource coordination and review twice a year, or as needed, detailing proposed timber sale areas, restoration areas, and roads to be improved for access. By 2015 develop a formal internal project review process.	32 CFR 989	In-house labor	Forestry
		II.A.5.	By 2016, update Tyndall's forest inventory.	DoDI 4715.03, AFI 32-7064	Forest Management Reimbursements	Forestry

Table 7-1. Tyndall AFB Natural Resources Goals and Objectives Matrix (Cont'd)

Principal Goal	Supporting Goal	Objective	Objective Description	Drivers	Funding/Labor Source*	Section
		II.A.6.	By 2016, establish criteria to prioritize areas for longleaf pine restoration.	ESA, DoDI 4715.03, AFI 32-7064	In-house labor; MGT, SPECIES Violet Butterwort; Forest Management Reimbursements	Forestry, T&E
		II.A.7.	To create longleaf restoration gaps, annually conduct timber harvests of at least 450 acres in priority restoration areas.	ESA, DoDI 4715.03, AFI 32-7064	Forest Management Reimbursements	Forestry
		II.A.8.	Site prep and plant at least 450 acres of longleaf seedlings annually in priority restoration areas at approximately 681 trees per acre.	ESA, DoDI 4715.03, AFI 32-7064	Forest Management Reimbursements; NWTF; TNC grant	Forestry
		II.A.9.	By 2016, establish criteria and a process to prioritize areas of invasive plant species infestations for treatment.	EO 13112, AFI 32-7064	MGT, INVASIVE SPECIES; in-house labor	Nuisance Species
		II.A.10.	Annually identify and map locations of invasive plant species, and treat approximately 500 acres of priority areas.	EO 13112, AFI 32-7064	MGT, INVASIVE SPECIES; FWC Upland Invasive Plant Grant; in-house labor	Nuisance Species
		II.A.11.	Conduct predator and nuisance animal removal, control, hazing, trapping, and relocation in priority areas.	EO 13112, AFI 32-7064, ESA	MGT, SPECIES, NUISANCE WILDLIFE	Nuisance Species
		II.A.12.	Provide education/outreach services to housing residents, Security Forces, and geographically separated work areas on the Tyndall range regarding nuisance species.	EO 13112, AFI 32-7064	MGT, SPECIES, NUISANCE WILDLIFE; In-house labor	Nuisance Species

Table 7-1. Tyndall AFB Natural Resources Goals and Objectives Matrix (Cont'd)

Principal Goal	Supporting Goal	Objective	Objective Description	Drivers	Funding/Labor Source*	Section
		II.A.13.	By 2016, integrate groundcover restoration with longleaf restoration, including a needs assessment of areas for planting, identification of suitable harvest sites, and determination of the best species composition and planting times for Tyndall.	DoDI 4715.03, AFI 32-7064	MGT, SPECIES, VIOLET BUTTERWORT; In-house labor	Forestry, T&E
		II.A.14.	By 2016, develop and implement a process to evaluate timber harvests in Natural Areas (versus plantations), including T&E plant and animal inventories; determination of suitable harvest, site prep, and planting methods; evaluation of native groundcover; and establishment of monitoring protocols.	DoDI 4715.03, AFI 32-7064	MGT, SPECIES, VIOLET BUTTERWORT; In-house labor	Forestry, T&E
	II.B. Protect bald eagles, migratory birds, and other protected avian species IAW federal law.	II.B.1	Annually survey for new bald eagle nests, and conduct monthly checks during nesting season. Maintain a minimum 330-foot buffer around active nests, follow Activity Specific guidelines for any applicable category of activity (A-H), and implement any other pertinent recommendations from the Bald Eagle Management Guidelines.	BGEPA	MGT, HABITAT, T&E; MGT, SPECIES, RCW	T&E
		II.B.2	By 2015, survey for nesting or foraging RCWs; repeat surveys every 5 years for new RCWs.	ESA, DoDI 4715.03, AFI 32-7064	MGT, SPECIES, RCW	T&E
		II.B.3.	By 2016, evaluate suitable foraging or nesting habitat and explore the feasibility of RCW cavity inserts.	ESA, DoDI 4715.03, AFI 32-7064	MGT, SPECIES, RCW; In-house labor	T&E

Table 7-1. Tyndall AFB Natural Resources Goals and Objectives Matrix (Cont'd)

Principal Goal	Supporting Goal	Objective	Objective Description	Drivers	Funding/Labor Source*	Section
	II.C. Protect indigo snakes and their habitats IAW federal law, and prepare for federal listing of the gopher tortoise.	II.C.1.	Survey for gopher tortoises, indigo snakes, and other sensitive commensals at proposed project areas within high priority habitat where the ground will be significantly disturbed.	ESA, DoDI 4715.03, AFI 32-7064, Gopher Tortoise Candidate Conservation Agreement (CCA)	In-house labor; MGT, SPECIES, T&E; MGT, SPECIES, RCW	T&E
		II.C.2	By 2015, develop a gopher tortoise survey protocol for pine plantations before harvests and site prep activities, including how best to mark gopher tortoise burrows for avoidance.	ESA, DoDI 4715.03, AFI 32-7064, Gopher Tortoise CCA	In-house	T&E
		II.C.3.	By 2016, establish a low intensity monitoring program to prepare for the federal listing of the gopher tortoise.	ESA, DoDI 4715.03, AFI 32-7064, Gopher Tortoise CCA	In-house labor; MGT, SPECIES, T&E; MGT, SPECIES, RCW	T&E
		II.C.4.	Annually develop a comprehensive map layer of known gopher tortoise burrows and report for CCA data call.	ESA, DoDI 4715.03, AFI 32-7064, Gopher Tortoise CCA	MGT, SPECIES, T&E; MGT, SPECIES, RCW; In-house	T&E
	II.D. Survey for and manage federally listed and petitioned plant species IAW federal law, and to minimize potential listing impacts.	II.D.1	Between 2015 and 2018, survey for, mark and map federally listed and petitioned plant species which are either known to occur or may occur on Tyndall, including the following: Godfrey's butterwort, bog tupelo, Henry's spider lily, black-bract pipewort, hairy-peduncled beakrush, Kral's yellow-eyed grass, panhandle meadow-beauty, small-flower meadow-beauty, smooth-barked St John's wort, West's flax, Florida skullcap, white birds-in-a-nest, and telephus spurge.	ESA, DoDI 4715.03, AFI 32-7064	MGT, SPECIES, VIOLET BUTTERWORT; MGT, HABITAT, T&E	T&E
		II.D.2	By 2016, develop and implement a monitoring and management plan for all	ESA, DoDI 4715.03, AFI 32-	MGT, SPECIES, VIOLET	T&E

Table 7-1. Tyndall AFB Natural Resources Goals and Objectives Matrix (Cont'd)

Principal Goal	Supporting Goal	Objective	Objective Description	Drivers	Funding/Labor Source*	Section
			known locations of the Godfrey's butterwort, and other federally listed and petitioned plant species, including coordination with Grounds Maintenance for road and ditch maintenance in areas with the butterwort.	7064	BUTTERWORT	
III. Enable long-term sustainability of barrier island environments for military use by protecting T&E species and their habitats.	III.A. Monitor and survey sea turtles, beach mice, shorebirds, and Gulf sturgeon IAW federal law.	III.A.1.	Locate, protect, and evaluate 100 percent of sea turtle nests on Tyndall property. Collect and maintain data on nest success, depredation, and disorientation for all nests.	ESA, DoDI 4715.03, AFI 32-7064, volunteers	MGT, SPECIES, SEA TURTLES; In house	T&E
		III.A.2.	Respond to, and investigate, 100 percent of sea turtle stranding reports on AF property. Collect appropriate data and report to the stranding and salvage network; contact within 24 hours of investigating the report. Coordinate with outside partners on marine mammal strandings. Report 100% Gulf sturgeon strandings to USFWS-Panama City and NMFS-Southeast Regional Office/Office of Protected Resources/St. Petersburg.	ESA, DoDI 4715.03, AFI 32-7064, MMPA	MGT, SPECIES, SEA TURTLES; In house	T&E
		III.A.3.	By 2014, establish protocols and conduct shorebird surveys (piping plover, red knot, snowy plover, least tern, and others) bi-monthly to identify important habitat areas for protection and to determine population trends.	ESA, DoDI 4715.03, AFI 32-7064	MGT, SPECIES, RCW; NRDA; NFWF/Shell grant	T&E
		III.A.4.	By 2014, establish protocols and conduct shorebird nesting surveys for snowy plovers from March through August to locate and protect nests. Re-evaluate need for intensive monitoring prior to 2016 breeding season.	ESA, DoDI 4715.03, AFI 32-7064	MGT, SPECIES, RCW; NRDA; NFWF/Shell grant	T&E
		III.A.5.	Conduct or support FWC and USFWS track count surveys, tracking tube surveys, and trapping for population density and trends in Choctawhatchee and St. Andrew beach mice, and support with translocation of Tyndall's beach mice off-site if deemed helpful to achieving species recovery.	ESA, DoDI 4715.03, AFI 32-7064	MGT, SPECIES, BEACH MICE; USFWS/FWC personnel; In-house labor	T&E

Table 7-1. Tyndall AFB Natural Resources Goals and Objectives Matrix (Cont'd)

Principal Goal	Supporting Goal	Objective	Objective Description	Drivers	Funding/Labor Source*	Section
		III.A.6.	Monitor beach mice for activities that result in or could result in take or habitat loss, and conduct periodic monitoring of habitat and species health (live trapping/observation). Conduct population surveys as needed to verify the success of the overall recovery effort.	ESA, DoDI 4715.03, AFI 32-7064	MGT, SPECIES, BEACH MICE; in-house labor	T&E
		III.A.7.	Partner with Eglin AFB, UF, and USGS on in-water surveys for juvenile sea turtles within the Drone Launch Corridor and over-water military ranges. Purchase in-water tagging accessories and use turtle movement data to inform future mission planning.	ESA	MGT, SPECIES, SEA TURTLES; UF/ USGS personnel; In-house labor	T&E
	III.B. Reduce or eliminate threats to sea turtles, beach mice, and shorebirds IAW federal law.	III.B.1.	Annually post nesting and wintering areas for shorebirds (piping plover, red knot, snowy plover, least tern, black skimmer, American oystercatcher) for protection.	ESA, DoDI 4715.03, AFI 32-7064	MGT, SPECIES, RCW; MGT, SPECIES, T&E; MGT, HABITAT, COASTAL DUNE; NRDA; NFWF/Shell grant	T&E
		III.B.2.	By 2016, work with Gulf Coast Electric Coop, Alutiq, and Gulf Power to conduct detailed lighting surveys and plan retrofits accordingly.	ESA, DoDI 4715.03, AFI 32-7064	In-house labor	T&E
		III.B.3.	By 2017, establish a Base policy regarding beach lighting that follows FWC guidelines and considers both sea turtle and beach mouse requirements.	ESA, DoDI 4715.03, AFI 32-7064	In-house labor	T&E

Table 7-1. Tyndall AFB Natural Resources Goals and Objectives Matrix (Cont'd)

Principal Goal	Supporting Goal	Objective	Objective Description	Drivers	Funding/Labor Source*	Section
		III.B.4.	Install scavenger-proof trashcans in areas where beach mice are found and work 325 CES/Operations to ensure frequent trash pick-up.	ESA, DoDI 4715.03, AFI 32-7064, EO 13112	MGT, SPECIES, NUISANCE WILDLIFE; In house labor; National Public Lands Day (NPLD) grant	T&E
		III.B.5.	Annually refurbish the NCOs beach access road.	ESA, DoDI 4715.03, AFI 32-7064; Sikes Act	UNFUNDED	T&E
	III.C. Protect and restore beach habitats for sea turtles, beach mice, and shorebirds IAW federal law.	III.C.1.	By 2017, identify priority beach areas in need of erosion prevention, food sources, and cover for protected species, and employ appropriate dune and/or native vegetation reestablishment methods.	ESA, DoDI 4715.03, AFI 32-7064	MGT, HABITAT, T&E; MGT, HABITAT, COASTAL DUNE; MGT, SPECIES, BEACH MICE; T&E Species, Violet Butterwort	T&E
	III.C.2.	Annually evaluate the beach boardwalk system at least annually and maintain as needed to eliminate disturbance of dunes by pedestrian traffic.	ESA, DoDI 4715.03, AFI 32-7064	MGT, HABITAT, T&E; MGT, HABITAT, COASTAL DUNE; MGT, SPECIES, BEACH MICE; SABER contract	T&E	

Table 7-1. Tyndall AFB Natural Resources Goals and Objectives Matrix (Cont'd)

Principal Goal	Supporting Goal	Objective	Objective Description	Drivers	Funding/Labor Source*	Section
		III.C.3.	By 2015, post signs directing pedestrians to access beaches only by boardwalks and access paths through shorebird posted areas, and maintain as required.	ESA, DoDI 4715.03, AFI 32-7064	MGT, HABITAT, T&E; MGT, HABITAT, COASTAL DUNE; MGT, SPECIES, BEACH MICE	T&E
IV. Restore and protect wetland habitats to comply with federal law and protect T&E species.	IV.A. Survey and rehabilitate priority wetlands IAW federal law.	IV.A.1.	By 2018, conduct wetland field investigations, update wetland GIS data, and complete written reports of investigations to include executable discrete steps for required remediation/restoration of wetland hydrology across Tyndall, as well as project prioritization based on impact and cost.	ESA, DoDI 4715.03, AFI 32-7064, EO 11990	MGT, WETLANDS/FL OODPLAIN	T&E
	IV.B. Survey for and manage federally petitioned wetland animal species IAW federal law, and to minimize potential listing impacts.	IV.B.1.	As needed, survey for, mark, and map federally petitioned wetland animal species locations which may occur on Tyndall, including the following: <i>Procambarus apalachicola</i> , purple skimmer, and Say's spiketail.	ESA, DoDI 4715.03, AFI 32-7064	UNFUNDED	T&E
V. Provide a variety of uses, values, products, and services to present and future generations while maintaining sustainable ecosystems.	V.A. Provide hunting and fishing opportunities consistent with demand, quality, and cost within the constraints of the Air Force mission.	V.A.1.	Annually evaluate, prioritize, and submit 332s to maintain/repair boat ramps to prevent erosion and safety issues.	Sikes Act, CWA	In-house labor; Fish and Wildlife Reimbursements; SABER contract	Recreation
		V.A.2.	Work with the USFWS to evaluate the fisheries management potential for Tyndall's ponds, develop a management plan, and work with FWC/USFWS on stocking ponds as funding allows.	Sikes Act	In-house labor; Fish and Wildlife Reimbursements	Recreation
		V.A.3.	Annually monitor Davis Pond to reopen for recreational fishing.	Sikes Act	In-house labor; Fish and Wildlife Reimbursements	Recreation

Table 7-1. Tyndall AFB Natural Resources Goals and Objectives Matrix (Cont'd)

Principal Goal	Supporting Goal	Objective	Objective Description	Drivers	Funding/Labor Source*	Section
		V.A.4.	By 2016, present a plan to base leadership to re-open the West Unit to hunting, and to reinstate the WMA.	Sikes Act	In-house labor; Fish and Wildlife Reimbursements	Recreation
		V.A.5.	Annually monitor deer populations to ensure management objectives are being met, and determine feasibility of other game species surveys (turkey, quail).	Sikes Act	In-house labor; Fish and Wildlife Reimbursements; NWTf	Recreation
		V.A.6.	By 2016, present a plan to base leadership to eliminate requirement for a background check for non-DoD personnel prior to granting a recreation permit.	Sikes Act	In-house labor; Fish and Wildlife Reimbursements	Recreation
		V.A.7.	By 2016, construct a pavilion at Horseshoe Pond.	Sikes Act	In-house labor; NPLD grant	Recreation
		V.A.8.	By 2017, repair fishing docks and replace handrails at PQM Lake.	Sikes Act	In-house labor; NPLD grant	Recreation
		V.A.9.	By 2016, conduct vegetation removal at Olympia Pond.	Sikes Act	In-house labor; NPLD grant	Recreation, Nuisance Species
		V.A.10.	Determine potential for development and maintenance of a Natural Resources website.	Sikes Act	In-house labor; Fish and Wildlife Reimbursements	All
	V.B. Provide non-consumptive recreation opportunities consistent with demand, quality, and cost within the constraints of the Air Force mission.	V.B.1.	By 2017, evaluate funding and logistical options for replacing downed bridge on the Felix Lake Nature Trail.	Sikes Act; CWA	In-house labor	Recreation
		V.B.2.	Maintain Warbler's Way elevated boardwalk, including repairs for continuous water damage.	Sikes Act	UNFUNDED	Recreation
		V.B.3.	Create educational display materials on sea turtles.	ESA, Sikes Act	In-house labor, Sea Turtle license plate grant	T&E

Table 7-1. Tyndall AFB Natural Resources Goals and Objectives Matrix (Cont'd)

Principal Goal	Supporting Goal	Objective	Objective Description	Drivers	Funding/Labor Source*	Section
		V.B.4.	Annually evaluate and repair posted informational signs describing sensitive beach habitats and species, along with protective measures that should be followed.	ESA, Sikes Act, DoDI 4715.03, AFI 32-7064	MGT, HABITAT, T&E; in-house labor; SUPPLIES, Cultural Natural (CN)	T&E
		V.B.5.	By 2017 develop a native ecosystem restoration plan for the closed golf course.	Sikes Act	MGT, SPECIES, VIOLET BUTTERWORT; In-house labor	Forestry, T&E
		V.B.6.	By 2016 establish a process to track how many man-hours of volunteer support Natural Resources receives.	Sikes Act	In-house labor; MGT, SPECIES, SEA TURTLE	T&E
		V.B.7.	Provide information to the public on sensitive species, habitats, and regulatory requirements.	ESA, DoDI 4715.03, AFI 32-7064	OUTREACH; In house labor	T&E
		V.B.8.	By 2016, develop and implement penalties for violations of Tyndall regulations on the beaches, including presence of pets, pedestrian traffic on dunes, camping and lights at night.	ESA, DoDI 4715.03, AFI 32-7064, Sikes Act	In-house labor	T&E
	V.C. Provide forest products compatible with the military mission while restoring and maintaining long-term ecosystem sustainability, diversity, and productivity.	V.C.1.	Annually update a three year silvicultural activity prioritization plan.	DoDI 4715.03, AFI 32-7064	In-house labor	Forestry
		V.C.2	Review 813s and 332s to identify opportunities to capture timber value through commercial harvests, prior to implementation of base projects.	DoDI 4715.03, AFI 32-7064	In-house labor	Forestry

Table 7-1. Tyndall AFB Natural Resources Goals and Objectives Matrix (Cont'd)

Principal Goal	Supporting Goal	Objective	Objective Description	Drivers	Funding/Labor Source*	Section
	V.D. Provide wildfire protection for all of Tyndall (including the wildland/urban interface areas) to reduce potential threats to life, property and natural resources.	V.D.1.	Safely and professionally suppress all wildfires on Tyndall to the extent possible commensurate with firefighter safety, current and expected fire behavior, resource values at risk and impacts to public health and safety.	DoDI 4715.03, AFI 32-7064	AFWFC ACES; in-house labor	Fire

*The following ACES lines support most Tyndall natural resources monitoring and management activities: EQUIPMENT PURCHASE / MAINTAIN, EC, SAM; EQUIPMENT, CN ACTIVITIES; SUPPLIES, CN; VEHICLE FUEL & MAINTENANCE, IN EXCESS OF TOA, CN.

ACES = Automated Civil Engineer System; AF = Air Force; AFB = Air Force Base; AFCEC = Air Force Civil Engineer Center; AFI = Air Force Instruction; AFWFC = Air Force Wildland Fire Center; BASH = Bird/Wildlife Aircraft Strike Hazard; BGEPA = Bald and Golden Eagle Protection Act; CCA = Candidate Conservation Agreement; CFR = Code of Federal Regulations; CN = Cultural Natural; CWA = Clean Water Act; CZMA = Coastal Zone Management Act; DoDI = Department of Defense Instruction; EA = Environmental Assessment; EC = Environmental Compliance; EFH = Essential Fish Habitat; EIAP = Environmental Impact Analysis Process; EIS = Environmental Impact Statement; EO = Executive Order; ESA = Endangered Species Act; FWC = Florida Fish and Wildlife Conservation Commission; GIS = geographic information system; IAW = In accordance with; INRMP = Integrated Natural Resources Management Plan; MBTA = Migratory Bird Treaty Act; MGT = Management; MMPA = Marine Mammal Protection Act; NEPA = National Environmental Policy Act; NHPA = National Historic Preservation Act; NFWF = National Fish and Wildlife Foundation; NPLD = National Public Lands Day; NRDA = Natural Resource Damage Assessment; NWCG = National Wildfire Coordinating Group; NWTF = National Wild Turkey Federation; RCW = red-cockaded woodpecker; SAM = sample; T&E = Threatened and Endangered; TOA = Table of Allowances; TSI = timber stand improvement; UF = University of Florida; USFWS = U.S. Fish and Wildlife Service; USGS = U.S. Geological Survey; UXO = unexploded ordnance; WMA = Wildlife Management Area

1

8. IMPLEMENTATION

2 The individual programs and their associated budgets implement the INRMP at Tyndall AFB.
3 This chapter provides specific information on the procedures necessary to implement the goals,
4 objectives, and projects listed in Chapter 7, *Goals and Objectives*.

5 8.1 COMPONENT PLANS

6 Component plans were produced for each major program within Tyndall Natural Resources to
7 support the main INRMP. Component Plans describe the day-to-day operations and projects of
8 each program in greater detail than in the main body of the INRMP. These component plans are
9 part of the overall INRMP and should be used by reviewers and partners to find additional
10 information on each program. As part of the annual INRMP update process, Natural Resources
11 managers will re-evaluate priority projects for funding and identify appropriate funding sources;
12 this information will be included in each of the component plans (included as appendices to this
13 INRMP):

- 14 • Wildland Fire Management Component Plan
- 15 • Forest Management Component Plan
- 16 • Outdoor Recreation Component Plan
- 17 • Threatened and Endangered Species Component Plan
- 18 • Nuisance Species Component Plan

19 8.2 NATURAL RESOURCES MANAGEMENT STAFFING

20 Tyndall's goals and objectives (Chapter 7) are primarily carried out as duties and responsibilities
21 of the Environmental Chief, as relayed to the Natural Resources staff. When possible, other
22 organizations, contractors, and volunteers are utilized to supplement Natural Resources staff
23 efforts. Efforts beyond the capabilities of the installation are carried forward as projects to
24 AFCEC for inclusion in the five-year budget review. Current program staffing is provided in
25 Table 8-1.

Table 8-1. Current Staff of the 325 CES/CEIEN at Tyndall AFB

Grade Scale (GS)	Job Title	
Government Positions		
GS-13	Environmental Chief	
GS-11	Wildlife Biologist	
GS-11	Forester	
GS-09	Conservation Law Enforcement Officer	
GS-07	Forestry Technician (Fire)	
GS-05	Biological Technician	
Contract Support		
Non-appropriated Funds	Hourly/Seasonal	Biological Aids (2)
Non-appropriated Funds	Hourly/Seasonal	Lead Biological Assistant
Center for Environmental Management on Military Lands – Colorado State University	Contract Dependent	Cultural & Fire
USFWS	Full Time/Term	Ecologist

325 CES/CEIEN = 325th Civil Engineer Squadron, Environmental Element, Natural Resources; AFB = Air Force Base; GS = Grade Scale; USFWS = U.S. Fish and Wildlife Service

- 1 To fully implement the Goals and Objectives of this INRMP, additional resources beyond the
 2 capabilities of the current staff are needed, as outlined in Table 8-2. Requests are dependent on
 3 the availability of base resources, AFCEC resources/expertise, funding, and civilian volunteers.

4 **8.3 ANNUAL COORDINATION REQUIREMENTS**

- 5 Management of Tyndall's natural resources is a dynamic process with various plans and
 6 programs that require frequent review and continuous updates. Tyndall's Environmental Chief
 7 will conduct periodic reviews and updates to account for changes in the military mission,
 8 condition of natural resources, the ecosystem and regulatory requirements. The INRMP serves as
 9 a continuous cycle of improvement to ensure that the most up-to-date methods are being
 10 implemented. Annual meetings and INRMP reviews with the USFWS and FWC will help foster
 11 a positive dialogue to benefit the INRMP and the conservation efforts on Base.

12 **8.4 MONITORING INRMP IMPLEMENTATION**

- 13 The INRMP Annual Review Cycle will also be maintained as a tabular check sheet for tracking
 14 purposes. Manual updates will be reflected in the INRMP with "tracked changes" from the year.
 15 Additionally, completion and status of the Objectives identified in Chapter 7 will be tracked.
 16 Tyndall's Environmental Element Chief will review these documents at each INRMP Review
 17 Cycle and will enforce compliance with the INRMP.

Table 8-2. Tyndall AFB INRMP Project Descriptions and Justifications

Project Title	FY	INRMP References	Project Justification	Project Description
EQUIPMENT, CN ACTIVITIES	2015-2019	TBD	Equipment required for sampling, analysis, and monitoring for Compliance (i.e., Air, Hazardous Waste) and Natural Resources (i.e., conservation law enforcement, wildlife management/ monitoring, and wildland fire activities) IAW Sikes Act, INRMP, DoDI 4715.3, and AFI 32-7064.	Purchase/lease lab equipment, analyzers, field survey equipment, ATVs, fuel, biologist field supplies, hand tools, electronic monitoring and communication gear, traps, and equipment for wildland fire program support, such as ATV torches and water reservoirs, blowers, drip torches, and tractor accessories.
EQUIPMENT PURCHASE / MAINTAIN, EC, SAM	2016-2019	TBD	EQ vehicles are required to support conservation activities on 30,000 acres of woodlands, 18 miles of beaches, and on marginal roads IAW the Sikes Act, INRMP, DoDI 4715.3, and AFI 32-7064.	Purchase and maintain equipment required for sampling, analysis, and monitoring. Also purchase fuel and maintain EQ-owned/leased (non-General Services Administration [GSA] vehicles and ATVs used primarily for Conservation, Compliance, and endangered species management (i.e., fire breaks, monitoring, posting, prescribed burning). One dedicated conservation law enforcement vehicle, one dedicated reimbursable forestry work (not EQ) vehicle.
SUPPLIES, CN	2015-2019	TBD	Supplies required to support Conservation activities IAW ESA Biological Opinion (BO) 4-P-98-020); Sikes Act, INRMP.	Purchase expendable supplies including, sea turtle nest protection devices, specialized marking flags/ tape, fencing, lumber, signage, and wildlife tranquilizers.
VEHICLE FUEL & MAINTENANCE, IN EXCESS OF TOA, CN	2015-2019	TBD	EQ vehicles are required to support fire program, conservation activities, and conservation law enforcement on 30,000 acres of woodlands, 18 miles of beaches, and on marginal roads IAW the Sikes Act, INRMP, DoDI 4715.3, and AFI 32-7064.	Purchase fuel and maintain EQ-owned/leased (non-GSA) vehicles and ATVs used primarily for Conservation, Compliance, and endangered species MGT (i.e., fire breaks, monitoring, posting, prescribed burning). One dedicated conservation law enforcement vehicle, one dedicated reimbursable forestry work (not EQ) vehicle.
MGT, INVASIVE SPECIES	2015-2019	TBD	Control spread of invasive species, particularly those threatening Godfrey's butterfly, bear tupelo, Henry's spider lily, beach mice, gopher tortoise, shorebirds, piping plover, and RCW, IAW ESA* (including BO 4-P-00-211 and BO 4-P.-98-020), pertinent species Recovery Plans**, MBTA, Sikes Act, INRMP, EO 13112.	Hire technician to locate invasive plants, verify by ground survey, create GIS maps, and to treat invasive plants by methods such as herbicide, prescribed fire, mastication, and removal, and monitor the previous year's treatment blocks. Coordinate prescribed fire with AFWFC, and forest area mechanical grubbing and mastication with 325 CES contractors or USACE.

Table 8-2. Tyndall AFB INRMP Project Descriptions and Justifications (Cont'd)

Project Title	FY	INRMP References	Project Justification	Project Description
MGT, SPECIES, NUISANCE WILDLIFE	2015-2019	TBD	Remove non-native and nuisance animals in uplands, wetlands, and beach habitats for protection of beach mice, piping plover, sea turtles, shorebirds, and gopher tortoises IAW Sikes Act, INRMP, and ESA* (including BO 4-P-00-211, and CH for beach mice and piping plover), and pertinent species Recovery Plans**. Reduce nuisance wildlife impacts on military training and exercises (i.e., BASH).	Hire technician to conduct predator and nuisance animal control, hazing, trapping, and relocation, particularly in T&E species habitats. Individual to arrive with all required equipment, vehicles, traps, license, guns, and training required to perform assigned duties. Individual to provide education and outreach services to housing residents, Security Forces, and geographically separated work areas on Tyndall range. Coordinate preventive nuisance animal control actions by removing attractants. Target species include Florida black bears, alligators, osprey, bats, feral hogs, constrictors, felines, canines, and nutria.
MGT, HABITAT, FISH AND WILDLIFE	2015-2019	TBD	Habitat conservation practices and fuel reduction for Godfrey's butterwort, bear tupelo, Henry's spider lily, and gopher tortoise and ecosystem management IAW Sikes Act, INRMP, ESA, pertinent species Recovery Plans**, and gopher tortoise CCA. Also repair public access and storm damage per Sikes Act, DoDI 4715.3, and AFI 32-7064.	Conduct mechanical vegetation removal to mimic fire in habitats that are difficult to burn (i.e., urban interface, fire suppressed areas), and other ecosystem restoration projects as needed. May also improve habitat for upland game birds by planting grasses.
MGT, HABITAT, T&E	2015-2016	TBD	Protection and restoration of habitats for piping plovers, shorebirds, beach mice, sea turtles, Godfrey's butterwort, bear tupelo, Henry's spider lily, bald eagle, and RCW IAW ESA* (including BO 4-P-00-211 and BO 4-9-98-020), pertinent species Recovery Plans**, BGEPA; MBTA, Sikes Act, and INRMP.	In 2015, hire leader to coordinate rehabilitation crew activities to preserve and enhance beach mouse, piping plover, sea turtle, and shorebird beach habitat through construction and maintenance of trails, boardwalks, and sand fencing and the restoration of sea oats. In 2016, hire technician to conduct surveys, monitor, protect, and restore human and storm damaged habitat for piping plovers, shorebirds, beach mice, sea turtles, Godfrey's butterwort, bear tupelo, Henry's spider lily, bald eagle, and RCW. Assist with recreation, fishing and hunting programs, and conduct upland forested habitat management for bird species.
MGT, SPECIES, T&E	2015	TBD	Management of piping plover, red knot, bald eagle, RCW, state listed shorebirds, and gopher tortoise IAW ESA* (including BO 4-P-00-211 and piping plover CH, pertinent species Recovery Plans**, Sikes Act, INRMP, MBTA, BGEPA, and gopher tortoise CCA.	Hire technician and purchase equipment to inventory, monitor, and manage piping plover, red knot, bald eagle, RCW, state listed shorebirds (snowy plover, least tern, osprey), including posting of shorebird nesting and wintering areas. Purchase tools, vehicle, traps, and rental/use of heavy equipment for gopher tortoise surveys, monitoring, and relocations.

Table 8-2. Tyndall AFB INRMP Project Descriptions and Justifications (Cont'd)

Project Title	FY	INRMP References	Project Justification	Project Description
MGT, SPECIES, VIOLET BUTTERWORT	2015-2018	TBD	Management of listed plants and their habitat IAW ESA, Sikes Act, INRMP.	Hire technician to inventory, monitor, map, and manage Godfrey's butterwort, bear tupelo, Henry's spider lily, and any other listed plant species that may be found during surveys. Inventory to be completed by FY 2018, with future efforts on habitat improvement and maintenance.
MGT, SPECIES, RCW	2016-2019	TBD	Surveying, monitoring, and management activities for piping plover, red knot, bald eagle, RCW, gopher tortoise, indigo snake, and shorebirds IAW Sikes Act, INRMP, MBTA, BGEPA, gopher tortoise CCA, ESA* (including BO 4-P-00-211 and piping plover CH, and pertinent species Recovery Plans**).	Hire biologist to survey and monitor piping plover, red knot, bald eagle, RCW, and shorebirds, and conduct protection and management activities, including posing of nesting/wintering areas. Also conduct surveys and relocations of gopher tortoises as necessary for construction projects, military training exercises, and other ground disturbing activities, including purchase of tools, vehicle, traps, and rental/use of heavy equipment for relocations.
MGT, HABITAT, COASTAL DUNE	2015-2019	TBD	Habitat protection and restoration for beach mice, piping plover, sea turtles, and shorebirds, and beach access maintenance along 18 miles of Tyndall Gulf beaches IAW Sikes Act, INRMP, ESA *(including BO 4-P-98-020 and 4-P-00-211, and CH for two species of beach mice and the piping plover), pertinent species Recovery Plans**, and MBTA.	Hire labor and purchase materials to re-establish sand dunes, native vegetation, and overwash areas, including install/replacement of sand fencing and boardwalk, posting, planting dune vegetation, and conducting heavy machinery work (rental) as needed for restoration and beach access maintenance.
MGT, SPECIES, BEACH MICE	2015-2019	TBD	Monitor and manage St. Andrew Beach Mouse and Choctawhatchee Beach Mouse on 18 miles of beach plus coastal islands, IAW ESA* (including BO 4-P-00-211, and CH for beach mice), pertinent species Recovery Plans**, Sikes Act, INRMP. Auxiliary benefits to piping plover and its CH.	Hire biologist team and purchase equipment to conduct beach mice population surveys, including traps, transportation, and documentation. Also conduct periodic monitoring of habitat and species health (live trapping). Conduct trash control, light pollution control, enforce boardwalk use, plant native vegetation, and trap out nuisance animals. Restore secondary scrub habitat. Conduct translocation off-site to promote delisting efforts in cooperation with USFWS & FWC. Design/ construct beach mouse friendly (6 ft. elevated) boardwalks over critical dune habitat, with annual and post-storm maintenance, and 100% replacement in 15 years (six boardwalks needed).

Table 8-2. Tyndall AFB INRMP Project Descriptions and Justifications (Cont'd)

Project Title	FY	INRMP References	Project Justification	Project Description
MGT, SPECIES, SEA TURTLE	2015-2019	TBD	Sea turtle monitoring and management for 18 miles of beaches, shorebird protection, and coordination of beach driving restrictions IAW ESA* (including BO 4-P-98-020 and 4-P-00-211), pertinent species Recovery Plans**, State of Florida permits/ protocols (including sea turtle salvage activities), Sikes Act, and INRMP. Good data are needed to support effective and timely consultations with regulators.	Hire labor and purchase equipment to conduct sea turtle surveys and protection measures from 1 May to 31 October. File reports, post signs, install egg protection screens, conduct post-hatching nest investigations, and coordinate volunteer surveyors. Conduct year-round response for stranding/ salvage activities along 100+ miles of bay and barrier island shorelines. Partner with Eglin, UF, and USGS on in-water surveys for juvenile sea turtles within Drone Launch Corridor and over-water military ranges, including purchase of in-water tagging accessories. Purchase 3 ATVs, 1 Utility Terrain Vehicle, boat, and trailers, and cover tow vehicle costs.
MGT, WETLANDS/ FLOODPLAIN	2016-2019	TBD	Identification and development of restoration plan, and restoration of wetlands to avoid fines and regulatory restrictions to the mission under the CWA, and IAW Sikes Act, INRMP, AFI 32-7064, and ESA.	Hire technicians to conduct initial study, wetlands field investigation, wetlands GIS map data update, and engineer/hydrologist opinion, including executable steps necessary for remediation. Update 2006 and 2007 reports on Wetland Mitigation Bank/Plan. Conduct restoration of priority wetlands as outlined in restoration plan.
OUTREACH	2015	TBD	Public outreach IAW EO 13423, EO 13514, AFD 90-8, DoDI 4715.17, AFI 32-7001, AFI 32-7064, AFI 32-7065, AFI 90-803, and AFI 90-201, and/or AF EMS policy/ guidance documents.	Purchase publications and regulatory guidance, to be distributed at community outreach activities such as Earth Day, air shows, and partnering efforts.
PLAN UPDATE, INRMP	2016	TBD	Update INRMP IAW Sikes Act; DODI 4715.03; AFI 32-7064.	Cover incidental costs associated with physical update of INRMP; labor generally provided in-house.

AF = Air Force; AFI = Air Force Instruction; AFD = Air Force Policy Directive; AFWFC = Air Force Wildland Fire Center; ATVs = all-terrain vehicles; BASH = Bird/Wildlife Aircraft Strike Hazard; BGEPA = Bald and Golden Eagle Protection Act; BO = Biological Opinion; CCA = Candidate Conservation Agreement; CH = Critical Habitat; CN = Cultural Natural; CWA = Clean Water Act, DoDI = Department of Defense Instruction; EMS = Environmental Management System; EO = Executive Order; EQ = Environmental Quality; ESA = Endangered Species Act; FWC = Florida Fish and Wildlife Conservation Commission; FY = fiscal year; GIS = geographic information system; GSA = General Services Administration; IAW = in accordance with; INRMP = Integrated Natural Resources Management Plan; MBTA = Migratory Bird Treaty Act; MGT = Management; RCW = red-cockaded woodpecker; SAM = sample; T&E = Threatened and Endangered; TBD = to be determined; TOA = Table of Allowances; UF = University of Florida; USACE = U.S. Army Corps of Engineers; USFWS = U.S. Fish and Wildlife Service; USGS = U.S. Geological Survey

*Non-compliance with ESA requirements in Section 7 consultations can result in fines, Notice of Violation, and judicial action, and may also result in halt to construction projects and military exercises, or increased restrictions on these activities. One of the biggest harms is in the credibility of the AF in dealing with the USFWS, which may result in increased scrutiny and decreased flexibility.

**USFWS Recovery Plans exist for the following species documented or potentially occurring at Tyndall AFB: Godfrey's butterfly, piping plover, St. Andrew beach mouse, Choctawhatchee beach mouse, Eastern indigo snake, RCW, green sea turtle, leatherback sea turtle, loggerhead sea turtle, Kemp's ridley sea turtle, and Gulf sturgeon.

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**APPENDIX A
NATURAL RESOURCE RELATED
LEGISLATION AND REGULATIONS**



ACRONYMS AND ABBREVIATIONS (APPENDIX A)

AFI	Air Force Instruction
AFPD	Air Force Policy Directive
CBRA	Coastal Barrier Resources Act
CZMA	Coastal Zone Management Act
DoD	Department of Defense
DoDD	Department of Defense Directive
ESA	Endangered Species Act
FY04	Fiscal Year 2004
H.R.	House Resolution
RCRA	Resource Conservation and Recovery Act
SARA	Comprehensive Environmental Response, Compensation, and Liability Act, Amendments to Superfund in 1983 and 1986
TAFBI	Tyndall Air Force Base Instruction
USC	United States Code

1 The U.S. Air Force developed the following regulations, instructions, directives, and executive
2 orders:

- 3 • Air Force Instruction (AFI) 32-7064, *Integrated Natural Resources Management*,
4 September 17, 2004.
- 5 • AFI 32-7065, Cultural Resources Management, June 13, 1994.
- 6 • Air Force Policy Directive (AFPD) 32-70, *Environmental Quality*, July 20, 1994.
- 7 • Archeological Resources Protection Act of 1979;
- 8 • Bald and Golden Eagle Protection Act of 1940 [Public Law 86-70; Title 16 United States
9 Code (USC) 668 *et seq.*]
- 10 • Clean Air Act of 1970, as amended [Title 42 USC 7401-7671]
- 11 • Clean Water Act of 1977, as amended [Public Law 95-217; Title 33 USC 1251-1376]
- 12 • Coastal Barrier Resources Act (CBRA) (1988), reauthorization as Coastal Barrier
13 Improvement Act of 1990 [Title 16 USC 3501 *et seq.*]
- 14 • Coastal Wetlands Planning, Protection, and Restoration Act of 1998 [Title 16 USC 3501
15 *et seq.*]
- 16 • Coastal Zone Management Act of 1972 (CZMA), and CZMA Reauthorization
17 Amendments of 1990 [Title 16 USC 1451-1464]
- 18 • Comprehensive Environmental Response, Compensation, and Liability Act, Amendments
19 to Superfund in 1983 and 1986 - also known as SARA Title 42 USC 9601-9657]
- 20 • Conservation and Rehabilitation Program on Military and Public Lands [Public Law
21 93-452]
- 22 • Conservation Programs on Military Reservations Act (Sikes Act) of 1960 and Sikes Act
23 Improvement Act of 1997 [Public Laws 96-561 and 105-85; Title 16 USC 670a-670o]
- 24 • Conservation Service Reform Act of 1986 [Title 2 USC 8201]
- 25 • Council on Environmental Quality Regulations
- 26 • Department of Defense Directive (DoDD) 4700.4, *Natural Resources Management*
27 *Program*, January 24, 1989.
- 28 • DoDD 4710.1, Archeological and Historic Resources Management, June 21, 1984.
- 29 • Department of Defense Instruction (DoDI) 4715.3, *Environmental Conservation*
30 *Program*, March 18, 2011.
- 31 • DoDI 7310.1, Disposition of Proceeds from DoD Sales of Surplus Personal Property,
32 July 10, 1989.
- 33 • Emergency Wetlands Resources Act of 1986 [Title 16 USC 3901]
- 34 • Endangered Species Act (ESA) of 1973 and amendments [Public Law 93-205 and
35 95-632; Title 16 USC 1531-1544];

- 1 • Estuary Protection Act (1968) [Title 16 USC 1221]
- 2 • Executive Order 11288 of 1966 (Prevention, Control, and Abatement of Water Pollution
- 3 by Federal Activities)
- 4 • Executive Order 11514 of 1970 (Protection and Enhancement of Environmental Quality)
- 5 • Executive Order 11644 of 1972 (Use of Off-Road Vehicles on the Public Lands)
- 6 • Executive Order 11990 of 1977 (Protection of Wetlands)
- 7 • Executive Order 11987 of 1977 (Exotic Organisms)
- 8 • Executive Order 11988 of 1977 (Floodplain Management)
- 9 • Executive Order 12088 of 1978 (Federal Compliance with Pollution Control Standards),
- 10 amended by Executive Order 12580
- 11 • Executive Order 12580 of 1987 (Superfund Implementation), amended by Executive
- 12 Order 12777
- 13 • Executive Order 12777 of 1991 (Implementation of Section 311 of the Federal Water
- 14 Pollution Control Act of October 18, 1972, as Amended, and The Oil Pollution Control
- 15 Act of 1990)
- 16 • Executive Order 12780 of 1991 (Federal Agency Recycling and the Council on Federal
- 17 Recycling and Procurement Policy)
- 18 • Executive Order 12962 of 1995 (Recreational Fisheries)
- 19 • Executive Order 13045 of 1997 (Protection of Children from Environmental Health Risks
- 20 and Safety Risks)
- 21 • Executive Order 13112 of 1999 (Invasive Species)
- 22 • Executive Order 13423 of 2007 (Strengthening Federal Environmental, Energy, and
- 23 Transportation Management) (Revokes Executive Orders 13101 and 13148)
- 24 • Executive Order 12123 of 1999 (Greening the Government Through Efficient Energy
- 25 Management)
- 26 • Executive Order 13186 of 2001 (Responsibilities of Federal Agencies to Protect
- 27 Migratory Birds)
- 28 • Farmland Protection Policy Act [Public Law 97-98; Title 7 USC 4201 *et seq.*]
- 29 • Federal Environmental Pesticide Control Act of 1972, as Amended [Public Law 92-516;
- 30 Title 7 USC 136-136y]
- 31 • Federal Land Policy and Management Act of 1976 [Title 43 USC 1701 *et seq.*]
- 32 • Federal Noxious Weed Act of 1974 [Public Law 93-629; Title 7 USC 2801 *et seq.*]
- 33 • Federal Water Pollution Control Act Amendments of 1972 [Public Law 92-522; Title 33
- 34 USC 1251 *et seq.*]
- 35 • Federal Water Pollution Control Act of 1977

- 1 • Fish and Wildlife Conservation Act of 1980 [Public Law 89-699; Title 16 USC 2901 *et*
- 2 *seq.*]
- 3 • Fish and Wildlife Coordination Act;
- 4 • Insect Control Act of 1954 [Title 7 USC 148]
- 5 • Magnuson (-Stevens) Fishery Conservation and Management Act of 1976 [Public Law
- 6 94-265; Title 16 USC 1801 *et seq.*]
- 7 • Marine Mammal Protection Act of 1972 [Title 16 USC 1361-1407]
- 8 • Marine Protection, Research, and Sanctuaries Act of 1972 [Title 33 USC 1401-1445 and
- 9 Title 16 USC 1431 *et seq.*]
- 10 • Migratory Bird Conservation Act of 1966 [Title 16 USC 715]
- 11 • Migratory Bird Treaty Act of 1918 [Title 16 USC 703-712]
- 12 • Military Reservation and Facilities: Hunting, Fishing, and Trapping Act of 1958 [Public
- 13 Law 85-337 *et seq.*]
- 14 • National Defense Authorization Act for FY04 (House Resolution 1588) [Public Law 108
- 15 136]
- 16 • National Trails Systems Act of 1968 [Title 16 USC 1241]
- 17 • National Water Commission Act of 1962 [Title 42 USC 1962]
- 18 • Navigable Waters Protection Act [Title 33 USC 407]
- 19 • Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 [Title 16 USC
- 20 3951 *et seq.*]
- 21 • North American Wetlands Conservation Act of 1989 [Title 16 USC 4401-4412]
- 22 • Noxious Plant Control Act of 1968 [Public Law 90-583; Title 43 USC 1241 *et seq.*]
- 23 • Oil Pollution Act of 1990 [Public Law 101-380; Title 33 USC 2701 *et seq.*]
- 24 • Outdoor Recreation-Federal/State Program Act [Title 16 USC 460L *et seq.*]
- 25 • Pollution Prevention Act of 1990 [Title 42 USC 13101-13109]
- 26 • Porter-Cologne Water Quality Control Act [California Water Code B13000 *et seq.*]
- 27 • Protection and Enhancement of Environmental Quality [Amends Executive Order 11514,
- 28 Executive Order 1191]
- 29 • Public Trust Doctrine
- 30 • Resource Conservation and Recovery Act (RCRA) of 1976 [Title 42 USC 6901-6992]
- 31 • Rivers and Harbors Act of 1899 [Title 33 USC 401]
- 32 • Safe Drinking Water Act of 1974, as Amended [Title 42 USC 300f *et seq.*]
- 33 • Soil Conservation and Enhancement Act of 1938 [Title 16 USC 5901 *et seq.*]

- 1 • Toxic Substances Control Act of 1976 [Title 42 USC 2601-2629]
- 2 • Tyndall AFB Instruction (TAFBI) 32-7001, *Hunting, Fishing, and Outdoor Recreation*,
- 3 February 15, 2002.
- 4 • TAFBI 32-7003, Beach Vehicle Access Procedures, January 12, 1999.
- 5 • TAFBI 48-1, Registration and Zoonotic Disease Control, June 30, 1994.
- 6 • Water Resources and Planning Act of 1965 [Title 16 USC 1001 *et seq.*]
- 7 • Wild and Scenic River Act of 1968 [Title 16 USC 1271]

APPENDIX B

MANAGEMENT PLANS AND APPENDICES

- B.1 Threatened and Endangered Species Component Plan
 - B.2 Forest Management Component Plan
 - B.3 Wildland Fire Management Plan
 - B.4 Outdoor Recreation Component Plan
 - B.5 Nuisance Species Component Plan
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B.1
Threatened and Endangered Species
Component Plan

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Forest Management Component Plan

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Wildland Fire Management Plan

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Outdoor Recreation Component Plan

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Nuisance Species Component Plan

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