FINAL ENVIRONMENTAL ASSESSMENT FOR AIRFIELD SAFETY AND DRAINAGE IMPROVEMENTS AT PATRICK AIR FORCE BASE, FLORIDA

United States Air Force, 45th Space Wing
PAFB, FL

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FINDING OF NO SIGNIFICANT IMPACT (FONSI)
AND FINDING OF NO PRACTICABLE ALTERNATIVES (FONPA)

Airfield Safety and Drainage Improvements at

Patrick Air Force Base, Florida

Introduction: Pursuant to the Council on Environmental Quality regulations, the provisions of the *National Environmental Policy Act (NEPA) of 1969* (40 CFR Parts 1500-1508), and *Environmental Impact Analysis Process* (32 CFR Part 989), the United States Air Force (AF) 45th Space Wing (45 SW) conducted an assessment of the potential environmental consequences of the Proposed Action to improve airfield safety and stormwater drainage for the Patrick Air Force Base (PAFB) airfield, hereby incorporated by reference. Safety hazards to aircraft, crew and wildlife will be alleviated by converting canals to piped stormwater conveyence within the Clear Zone and Accident Potential Zone of the PAFB airfield area. These improvements will enhance stormwater management and prevent standing water, flooding, and bird/wildlife attractants per airfield safety criteria requirements, 45 SW Operations Plan (OPLAN) 91-212, *Bird/Aircraft Strike Hazard Reduction Plan* (BASH), and AFI 91-202, *The US Air Force Mishap Prevention Program*.

Description of the Proposed Action and Alternatives: Specifically, the Proposed Action calls for modification of open canals to underground pipes/culverts with erosion dissipating rip rap wing walls designed to drain with velocities that do not change downstream characteristics. Approximately three canals will be fitted with 30 to 42-inch diameter pipes, backfilled, and restored with grass sod or hydro-seed. Length of pipe necessary for Canal one (1) is approximately 750 ft, Canal two (2) pipe length is approximately 500 ft long (includes a 20-ft setback from protected mangroves along the banks), and Canal three (3) pipe length is approximately 257 ft long (includes a 20-ft setback from protected mangroves along the banks). Approximately 20-ft setbacks will be designed into the wing wall and pipe construction to avoid wetland/mangrove vegetation along the canal banks at the termini of the canals. Shoreline restoration with removal of old concrete revetment, native plantings, and installation of a small section of rip rap for erosion control will also occur under the approved mitigation plan and permit conditions. Per NEPA requirements, the AF must analyze all reasonable alternatives and may eliminate alternatives based on reasonable selection criteria. Using the selection criteria of avoidance of Essential Fish Habitat (EFH), and cost to value analyses, the alternative to pipe the entire canal lengths, which would include removal of mangroves (EFH) near the canal mouths, was eliminated from consideration because it will result in impacts to EFH and involve much higher costs and planning effort without a comparable amount of added value for safety and drainage improvements. The only other alternative evaluated was the No Action Alternative which will maintain airfield drainage by dredging canals and cleaning existing culverts with suction or pressurized water or air. The No Action Alternative is not reasonable as it will not meet the purpose and need because it does not eliminate the safety hazard of open surface water canals within the Clear Zone and Accident Potential Zone which can also attract bird/wildlife and increase bird/aircraft strike risk.

Environmental Consequences: Analyses performed in the EA addressed potential effects of the Proposed Action and Alternatives on air quality, biological resources,

cultural resources, geology and soils, water resources, hazardous materials and waste, safety and health, infrastructure and transportation, land use, noise, and socioeconomics. No significant direct, indirect or cumulative effects were identified that will require the completion of an Environmental Impact Statement. However, some impacts that required more analyses in the EA were identified and the environmental effects are summarized below.

Biological Resources: Federal T&E animal species are found near, but not in, the project area. Manatees have the potential to inhabit the Banana River and Survival Canal located west of the Proposed Action area (Canals 2 and 3), but can't access the canals to be culverted/piped due to sediment build up, vegetation and shallow water at the connection points with the Survival Canal (termini of canals). Additionally, exclusion grates will be installed at the pipe termini to prevent manatee entrapment should severe storm activity cause abnormally high water levels that would allow manatee access; therefore no adverse impacts are anticipated to this species. Wood storks (and wading birds) haven't been observed in the canals proposed for piping because of their steep slopes, deeper depths as well as almost 75% coverage by cattail in Canal 3. None of the Proposed Action canals have suitable foraging habitat characteristics as defined by the United States Fish and Wildlife Service (USFWS), therefore no adverse impacts are anticipated to this species and the USFWS agreed with opinion. Eastern indigo snakes have not been observed at PAFB, however, workers will be required to avoid impact to the species if there is a chance observation in the impact areas. Turtles, aquatic birds/waterfowl (migratory birds), fish and other organisms may be within the canals to be piped. 45 SW staff biologists will walk the area prior to the commencement of project activities to identify any wildlife (or eggs) that will need to be relocated, and best management practices will be used to prevent fish kills due to oxygen reduction with disturbance. The construction activities will be compliant with the 45SWI 32-7001, *Exterior Lighting Management,* to reduce artificial lighting impacts that cause sea turtle nesting/hatching misorientation and disorientation.

Velocity and flow calculations used for pipe/culvert design as well as setbacks will conform with permitting requirements to minimize erosion and maintain current downstream characteristics thereby preventing impacts to vegetation (mangroves) and receiving waters designated as Essential Fish Habitat (EFH) by the National Marine Fisheries Service (NMFS). No seagrass (EFH) is present within the canals or the larger Survival Canal that directly connects to the canals. No adverse impacts to EFH are anticipated and the NMFS agreed with this opinion.

The majority of the airfield canals are currently maintained to reduce bird attraction by maintaining steep slopes and dredging to remove vegetation, however, birds (aquatic/waterfowl) are still occasionally observed within some of the canals. Under permit from the USFWS, active bird harassment and depredation (includes migratory birds not listed as T & E) is authorized for air crew/aircraft safety and air cannons and vehicle horns are used as the primary means of scaring birds off of the airfield. The Proposed Action area will remove some surface waters from bird and other wildlife use, but it will actually be safer for wildlife to find other suitable loafing and foraging locations away from the active runway 02/20. No significant impacts to migratory birds or other wildlife are anticipated. Additionally, restoration of wetland/estuarine shoreline (Banana River) away from the airfield will provide for higher quality habitat with execution of the mitigation plan required to compensate for loss of jurisdictional waters (Canals 2 and 3).

Floodplains and Wetlands: The impact area for Canals 2 and 3 consists of filling of approximately 0.73 acres of jurisdictional waters per Section 404 of the Clean Water Act within the Proposed Action area. Canal 1 is not claimed by either regulatory agency and is classified as an upland-cut ditch. The Army Corps of Engineers (USACE) and the St. John's River Water Management District (SJRWMD) have noted that mitigation will be required for unavoidable impacts and loss of the waters within Canals 2 and 3. Permit coordination by the AF with the regulatory agencies identified a compensatory mitigation plan and actions involving wetland/shoreline restoration along a significant stretch of the Banana River shoreline at PAFB that have been approved by both the USACE and SJRWMD. The mitigation actions will be implemented, funded and monitored by the AF. The mitigation will minimize impacts per Executive Order (EO) 11990, *Protection of Wetlands*, and through the conditions of the permit as the enhancement will provide for greater habitat value and function, and follows the Department of Defense's goal of no overall net loss of value and function of wetlands. Additionally, areas of the Proposed Action are located within the 100-year floodplain. Both Canals 2 and 3 are in the 100-year floodplain. The 'no practicable alternatives to construction within the floodplain' discussion is below in the 'Conclusion' section.

Water Resources: Coordination with the USACE, SJRWMD, and Florida Department of Environmental Protection (FDEP) has occurred for Proposed Action activities for permitting and approved mitigation. Loss of waters claimed by USACE will be compensated with greater function at the mitigation site, and piping systems for stormwater conveyance have been designed such that pipe diameter, slope, elevation, and internal roughness are selected with water velocity calculations in mind to prevent downstream impacts. All permitting requirements will be met to prevent pollutant discharges through best management practices such as siltation curtains or fencing. All disturbed upland areas will be restored with grass sod or hydro-seed to prevent erosion. The Proposed Action will incorporate runoff treatment measures to help ensure nutrient Total Maximum Daily Loads (TMDLs) are met for the south Banana River Lagoon watershed. While there will be an impact in terms of loss of waters, the USACE approved compensatory mitigation will result in overall beneficial effects through improvements to habitat quality and function in accordance with EO 11990 and permit conditions.

Safety and Health: Various hazards associated with heavy equipment operation will exist. All appropriate regulations will be followed during project activities, along with AF and 45 SW-specific guidance. Specific coordination with PAFB Airfield Operations for Proposed Action activities will be required to prevent hazards due to construction on the PAFB airfield. The Proposed Action will reduce bird/aircraft strike hazards, aircraft hydroplaning risks and the potential for crashing into open surface waters only a few hundred feet from the active runway 02/20 through improvements in airfield drainage that will divert standing water away from the airfield and pipe canals, thereby improving aircraft and pilot safety. Beneficial effects are anticipated.

Cumulative Impacts: Cumulative impacts were considered for the Proposed Action and the No Action Alternative. The Proposed Action activities, when combined with other past, present and planned activities in the area, could cumulatively impact wetlands and water resources as canals 1, 2 and 3 drain directly into jurisdictional waters (Banana River and Survival Canal). The permit process, mitigation approval, and recent TMDLs analyses through the regulators will minimize cumulative impacts from the Proposed Action through review of this action on PAFB in relation to the total

Banana River watershed. Additionally, mitigation will compensate for loss of waters through restoration of a section of an estuarine system in the same drainage basin parallel to the Proposed Action area that has been degraded due to erosion and prior practices of stabilization through revetment instead of the utilization of natural, native vegetation. No practicable alternatives have been identified to the Proposed Action. However, the modifications to existing airfield drainage will result in several beneficial cumulative impacts including increased pilot/aircraft safety with removal of open surface waters within a few hundred feet of the active runway 02/20, and deterrence of birds/wildlife on the airfield (reduces strike risk and injury/death to pilots and birds/ wildlife). No significant cumulative impacts should occur with stormwater treatment construction designs developed and coordinated with all appropriate external and internal agencies.

Public Review and Interagency Coordination: Informal responses were received from the USFWS and the NMFS and incorporated into the EA and FONSI/FONPA as appropriate. This Draft EA and FONSI/FONPA were made available to the affected public for a 30-day public comment period. The affected public was notified by advertisements placed in a locally reviewed newspaper, the *Florida Today*. The EA and FONSI/FONPA were made available by placing them on file in the local public library, Satellite Beach, and 45 SW Public Affairs. No comments were received. The Proposed Action has been deemed consistent with the Florida Coastal Management Program per issuance of the SJRWMD permit and consent to use state-owned sovereign submerged land (FL Statute Section 373.428 and FL Administrative Code 18-20.004 and 18-21.005) and USACE permit.

Conclusion: *Practicable Alternatives and Environmental Effect:* Section 1 of Executive Order (EO) 11988, *Floodplain Management*, directs each federal agency to provide leadership and take action to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities for federally undertaken construction and improvement projects. Section 1 of EO 11990, *Protection of Wetlands*, directs each federal agency to provide leadership and take action to minimize destruction, loss or degradation of wetlands. Per EO 11990, the Proposed Action's effect on wetlands should consider factors such as public health, safety, pollution, long term productivity of existing flora and fauna, habitat diversity and recreational use. Although the Proposed Action will remove approximately 0.73 acres of regulated waters and require stormwater management modifications within the 100-year floodplain, it will also restore approximately 2,500 linear feet of estuarine/mangrove habitat and all of the factors listed above will be beneficially affected.

No other practicable alternatives exist to the Proposed Action because of safety requirements to reduce the likelihood of mishaps on the airfield. Currently, the standing water on the runway and surface waters/canals closest to the active runway 02/20 creates safety hazards for pilots and wildlife attracted to the water resources. The proposed activities will be compliant with Unified Facilities Criteria (UFC) 3-230-01, *Surface Drainage Design*, UFC 3-260-01, *Airfield and Heliport Planning and Design* and OPLAN 91-212, *Bird/Aircraft Strike Hazard*. Piping the canals corrects safety issues that outweigh the impacts to these jurisdictional waters that have limited habitat quality especially when mitigation will be implemented that will provide significantly higher functional value directly adjacent to the Banana River, a Florida Outstanding Water Body. The No Action Alternative is not acceptable to 45 SW Flight Safety as maintaining surface waters/canals closest to the active runway doesn't eliminate the direct danger of

open canals that increase accident severity and create bird attractants. This FONSI/FONPA meets the requirement in the EOs to circulate a notice containing an explanation of why the action is proposed to be located in the 100-year floodplain and/or wetland, prior to taking the action, and discuss why no other practicable alternatives exist to avoid impacts.

Finding of No Significant Impact: In accordance with the Council on Environmental Quality (CEQ) regulations implementing the National Environmental Policy Act of 1969 (Public Law 91-190, 42 U.S.C. §§4321-4347), as amended, and 32 CFR 989, 15 Jul 1999 (amended 28 Mar 2001), an assessment of the identified environmental effects has been prepared and is incorporated by reference. In review of the attached *Environmental Assessment for Airfield Safety and Drainage Improvements at PAFB, FL*, I find that the action will have no significant impact on the quality of the human environment; thus, an Environmental Impact Statement is not warranted.

Finding of No Practicable Alternative: Pursuant to Executive Orders 11990 and 11988, the authority delegated by SAFO 780-1, and 32 CFR Part 989 and taking the submitted information found in the attached EA into account, I find that there are no practicable alternatives to this action that will occur in the 100-year floodplain and in wetlands and that all practicable measures will be used to minimize harm to wetlands and minimize potential harm to or within floodplains.

Joseph H Schwarz

JOSEPH H. SCHWARZ, Colonel, USAF
Deputy Director for Installations
and Mission Support

22 Dec 2011

Date

Acronyms and Abbreviations

45 CES/CEA	45 SW Civil Engineering Squadron, Asset Management
45 SW	45th Space Wing
AF	Air Force
AFI	Air Force Instruction
BASH	Bird/Aircraft Strike Hazard
BMPs	Best Management Practices
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CWA	Clean Water Act
CZM	Coastal Zone Management
CZMA	Coastal Zone Management Act
dB	decibel
dBA	“A-weighted” logarithmic scale
DoD	Department of Defense
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EIAP	Environmental Impact Analysis Process
EO	Executive Order
EPA	Environmental Protection Agency
ERP	Environmental Resource Permit
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FDEP	Florida Department of Environmental Protection
FONPA	Finding of No Practicable Alternative
FONSI	Finding of No Significant Impact
INRMP	Integrated Natural Resources Management Plan
MBTA	Migratory Bird Treaty Act
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NRHP	National Register of Historic Places

NOx	Nitrogen Oxides
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
ODS	Ozone Depleting Substance
OPLAN	Operations Plan
OSHA	Occupational Safety and Health Administration
PAFB	Patrick Air Force Base
PM	Particulate Matter
PPE	Personal Protective Equipment
ROI	Region of Influence
SAFMC	South Atlantic Fishery Management Council
SJRWMD	St. Johns River Water Management District
SSC	Species of Special Concern
SWMU	Solid Waste Management Unit
T&E	Threatened and Endangered
TMDLs	Total Maximum Daily Loads
UFC	Unified Facilities Criteria
UMAM	Unified Material Assessment Method
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service

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APPENDICES

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1.0 PURPOSE AND NEED FOR ACTION

This Environmental Assessment (EA) has been prepared in accordance with the requirements of the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations, *Environmental Impact Analysis Process*, as promulgated in Title 32 of the Code of Federal Regulations (CFR) Part 989, and Department of Defense (DoD) Directive 6050. The EA evaluates the potential environmental consequences associated with the proposed airfield safety drainage improvements at Patrick Air Force Base (PAFB), FL.

Chapter 1.0 of this EA provides background information on the existing drainage system at the airfield. A description of the Proposed Action and the No Action Alternative is provided in Chapter 2.0 along with resources that require minimal evaluation. Chapter 3.0 describes the existing conditions of specified environmental resources that could be affected by implementation of the Proposed Action alternatives. Chapter 4.0 addresses how those resources would be affected by implementation of the Proposed Action alternatives.

1.1 Background

When rain falls on a sloped pavement surface, it forms a thin film of water that increases in thickness as it flows to the edge of the pavement. Factors that influence the depth of water on the pavement include the length of flow path, surface texture, surface slope, and rainfall intensity. As the depth of water on the pavement increases, the potential for hydroplaning increases. The current design for stormwater drainage at the PAFB airfield allows for water to pool on and around the runway. Effective drainage of pavements is essential to the maintenance of the service level and to air traffic safety. Conveyance of stormwater is critical to reduce aircraft accidents and prevent pooling of water around the airfield. The Unified Facilities Criteria (UFC) 3-260-01, *Airport and Heliport Planning and Design,* provides standardized airfield, heliport and airspace criteria for the geometric layout, design, and construction of runways, helipads, taxiways, aprons, and related permanent facilities to meet sustained operations pertinent to all DoD military facilities in the Unites States. The UFC 3-230-01, *Surface Drainage* Design, identifies the requirements for surface drainage and grading at DoD and Federal Aviation Administration (FAA) airfields. The criteria are provided for the design of storm drainage systems which collect, convey, and discharge stormwater on and around pavements and other transportation facilities. The established criteria require that the runway and taxiway shoulders must have appropriate sloping from 10’ to 20’ from the edge of the pavement to prevent ponding and unsafe edge conditions. Historically stormwater has conveyed to storm drains and open surface canals within the airfield area. The surface water that is found within the PAFB airfield can be an attractant to some wildlife as a freshwater source as PAFB is on a barrier island surrounded by salt and brackish water, the Atlantic Ocean to the east and the Banana River to the west, respectively.

In addition to airport and surface drainage design and criteria, an updated (2011) Air Force Instruction, AFI 91-202, *The US Air Force Mishap Prevention Program,* directs AF bases to develop and implement procedures and plans to prevent and reduce safety mishaps. The 45th Space Wing (45 SW) Bird Hazard Reduction Plan, OPLAN 91-212 (also known as the Bird/Aircraft Strike Hazard [BASH] Plan), establishes procedures to

minimize bird hazards at 45 SW airfields. The BASH Plan directs the Base Civil Engineer to use land management practices that will reduce BASH potential at the airport including preventing standing water. In addition, drainage canal sides should be maintained as steeply as possible (a minimum of 5:1 slope) to discourage wading birds. Emergent vegetation should be removed as often as necessary to maintain flow and discourage use by birds. Canals/surface waters found within the airfield zone and especially directly adjacent to the active runway 02/20 should be converted to piped water conveyance if at all possible as the ultimate means of preventing wildlife hazards.

Due to the potential for ponding of water on the runway after heavy rainfall and the location of open drainage canals near the runway, pilot/aircraft and bird safety are at risk. Past experiences with planes sliding off the runway and coming very close to falling in an open drainage canal within 390 ft of the runway have prompted the push for safety and drainage improvements on the PAFB airfield. In order to reduce bird/aircraft strike hazards, hydroplaning risks, and more serious accident outcomes, the airfield drainage must be improved to divert standing water away from the airfield, provide for faster conveyance off of the airfield pavement through conversion to piped systems, and reduce bird/wildlife usage of the airfield by converting open surface waters to closed piped systems closest to the runway.

1.2 Location

PAFB is located on a barrier island on the east-central coast of Florida, south of the City of Cocoa Beach, and covers approximately 2,000 acres bounded by the Atlantic Ocean on the east and the Banana River on the west. The PAFB airfield begins in the central portion of PAFB and extends to the southern end of the installation. The active runway 02/20 runs from the eastern edge of the installation southwesterly to the western edge of the installation bordering the Banana River. Figure 1-1 provides an overview of the Proposed Action area.

Figure 1-1: Aerial Overview of PAFB Airfield

1.3 Purpose and Need for Action

The purpose of the Proposed Action is to correct safety and drainage issues on the airfield by diversion of stormwater away from the airfield and elimination of open surface waters closest to the active runway 02/20. These improvements will alleviate safety hazards to aircraft, crew and wildlife created by standing and surface water in the PAFB airfield area. The presence of standing water on the runway can adversely affect braking performance of the aircraft by reducing the friction force between the tires and the runway surface and increase the risk of hydroplaning. Furthermore, the deep, wide open drainage canals near the runway elevate the severity of accident risk, and availability of surface water adjacent to the runway can be an attractant to wildlife, including resident and migratory birds, presenting a strike hazard to the aircraft. The 2007-2009 45 SW Migratory Bird Survey Reports identified several BASH concerns at the airfield, and included recommendations to eliminate standing/open water that creates feeding opportunities for wading birds, thereby reducing bird/aircraft strike hazards.

1.4 Scope of the Environmental Assessment

This EA evaluates the potential site-specific environmental consequences associated with airfield safety and drainage improvements at PAFB (Proposed Action), and the No Action Alternative. This EA was produced using available information to the maximum extent possible. All applicable environmental data necessary was collected to describe current environmental conditions. The following aspects were identified for analysis: Air Quality, Cultural Resources, Geology and Soils, Biological Resources, Water Resources, Safety and Health, Hazardous Materials and Waste, Infrastructure and Transportation, Land Use, Noise, and Socioeconomics.

1.5 Agencies Involved in Environmental Analysis

The National Marine Fisheries Service (NMFS) was consulted with informally under the Magnuson-Stevens Fisheries Management Act to address Essential Fish Habitat (EFH) impacts. The 45 SW opinion was that EFH wouldn't be impacted with avoidance of mangroves and a pipe design that wouldn't create downstream impacts. After coordination with the Army Corps of Engineers (USACE), the NMFS agreed with the 45 SW opinion, but did note an interest in providing advice for estuarine shoreline restoration agreed to by the USACE and St. John's River Water Management District (SJRWMD) for compensatory mitigation for loss of jurisdictional waters with conversion to piped systems based on their agency's past restoration experience (Appendix A).

The 45 SW reviewed appropriate consultation documentation in reference to the Federally listed threatened Florida manatee, endangered wood stork, and migratory birds and determined that no significant impacts would occur. The U.S. Fish and Wildlife Service (USFWS) agreed with the 45 SW opinion (Appendix B).

The USACE and SJRWMD reviewed the Proposed Action and have issued the permits necessary for project construction. The USACE required mitigation for loss of jurisdictional waters per permit requirements and EO 11990, and approved the mitigation plan that provides for Banana River estuarine shoreline restoration along approximately 2,500 linear feet of PAFB's western boundary (Appendices C and D).

The Florida State Clearinghouse (section in FDEP) reviews EAs for projects planned at PAFB pursuant to Gubernatorial Executive Order 95-359; the Coastal Zone Management Act (CZMA); 16 U.S.C. SS 1451-1464, as amended; and the National Environmental Policy Act, 42 U.S.C. SS 4321, 4331-4335, and 4341-4347. Per FL Statute Section 373.428, the State's final concurrence of the project's consistency with the Florida Coastal Management Program is determined through the environmental permitting process. The SJRWMD permit and consent to use of State-owned sovereign submerged land have been issued which authorized the proposed action with adherence to the associated terms and conditions. The USACE permit has also been issued, and the Proposed Action has been deemed consistent with the CZMA.

2.0 Description of Proposed Action and Alternatives

This Section describes the Proposed Action, the larger scale project action that was not carried forward, and the No Action Alternative.

2.1 Proposed Action

The Proposed Action is a safety and stormwater drainage improvements project for the PAFB Airfield. The proposed activities will be compliant with UFC 3-230-01, *Surface Drainage Design*, and UFC 3-260-01, *Airfield and Heliport Planning and Design*. Figure 2-1 identifies the location of all of the canals that are proposed for modification by Proposed Action activities.

Open surface water canals would be replaced with closed culverts and piped stormwater conveyance for Canals One (1), Two (2), and Three (3). Canal One is proposed for piping east of Rescue Road, approximately 150 ft from the connection with the Banana River (Figure 2-2). The eastern section of Canal One proposed for piping can be closed without a permit according to the Army Corps of Engineers (USACE) and St. John's River Water Management District (SJRWMD) because it is classified as an upland open-cut ditch without wetland or jurisdictional waters (navigable, etc.) designation. Canal Two (Figure 2-3) requires a dredge and fill permit (under the Clean Water Act Section 404 and the Rivers and Harbors Act Section 10) as well as mitigation for functional loss of jurisdictional open waters in accordance with permiting conditions and Executive Order 11990. Avoidance of a small line of mangroves, present at the connection of the canal to the larger Survival Canal (see Figure 2-3), will occur to prevent impacts to this protected species (Essential Fish Habitat Federally protected under the Magnuson Stevens Act, and State protected). Canal Two will be fitted with a 30-inch diameter pipe approximately 500 ft in length, and the terminus of the pipe with new headwall and rip-rap wing walls (8 ft long by 20 ft wide) will be set back at least 20 ft from the mangroves. Pipe installation in Canal Three (Figure 2-4) will be approximately 42-inch diameter and 257 ft in length with pipe terminus, headwall and rip-rap wing walls (8 ft long by 20 ft wide) being set at least 20 ft from mangroves growing in the canal's mouth at the connection with the Survival Canal (Figure 2-4). Manatee exclusion grates would be installed at the pipe termini closest to the Survival Canal for Canals Two and Three.

Canals Two and Three require mitigation by the USACE for loss of approximately 0.73 surface acres of jurisdictional waters. Mitigation requirements are based on the quality of the resource being impacted. Canal Two is of slightly higher quality than Canal Three because there is minimal vegetation in the canal, and it is used more frequently by fish and wildlife with its more open connection with the Survival Canal (and ultimately the Banana River). Canal Three is choked by cattail, and a sand bar and mangroves restrict the connection with the Survival Canal except during high water events, therefore its quality is quite low. Based on Unified Material Assessment Methods (UMAM) required by the USACE, the 0.73 acres of regulated surface waters that will be converted to piped stormwater conveyance will be compensated with mitigation of approximately 2,500 ft of riverine shoreline restoration.

For compliance with permit conditions and Executive Order 11990*, Wetland Protection*, the Proposed Action also includes mitigation that will involve removal of concrete rip-rap placed along the PAFB western shoreline 20-50 years ago for shoreline protection. Mangroves that have recruited into the area and began growing over some of the concrete will be avoided, other native vegetation such as buttonwood, sea oxeye, and sea purslane will also be avoided. Concrete pieces will be removed with a backhoe and thumb bucket and also by hand. Native, wetland species will be planted in the gaps created by concrete removal in the restoration area to provide natural stabilization through a living shoreline. A five-year monitoring period with 80% survivorship of planted herbaceous vegetation and 50% of canopy plantings (mangroves), and documented stabilization of the mitigation project area will be required. Less than 5% of exotic vegetation will be maintained/controlled within the mitigation site. Stabilization with rip rap, 103 cubic yards, will also occur at the southern end of shoreline near the mouth of the Survival Canal along 100 linear feet where erosion has been prominent.

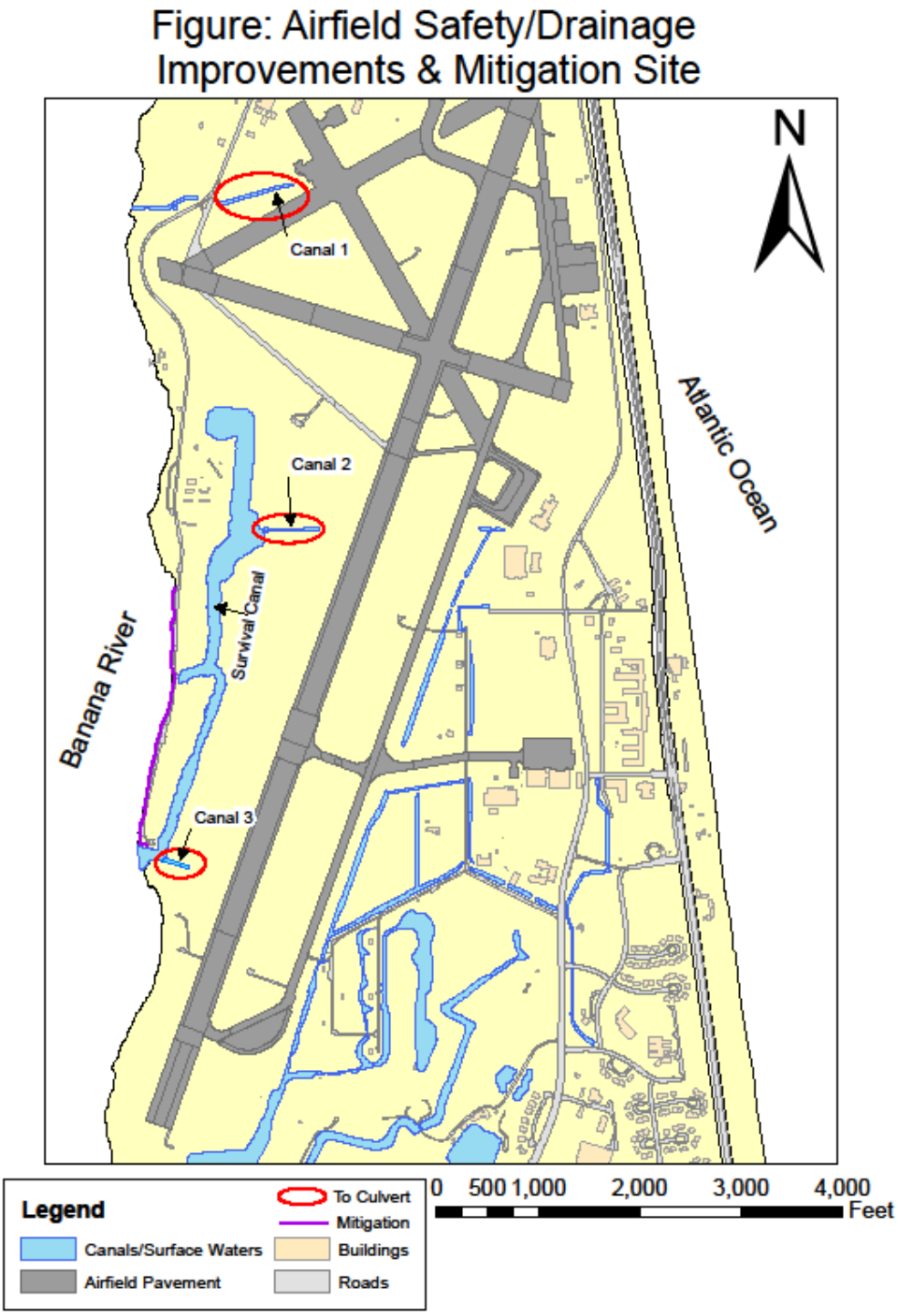

Figure 2-1: Proposed Safety/Drainage Improvements and Mitigation Site for the PAFB Airfield Project

Figure 2-2: Canal One at PAFB Airfield, view to Northwest

Figure 2-3: Canal Two at PAFB Airfield, view to West

Figure 2-4: Canal Three at PAFB Airfield, View to West

2.2 Alternative Eliminated from Further Consideration

Per NEPA requirements, the AF must analyze all reasonable alternatives and may eliminate alternatives based on reasonable selection criteria. Alternative 1 was to install pipes along the entire lengths of each of the three canals which would cause direct impacts to Essential Fish Habitat (EFH) and direct and indirect impacts to water quality (potential for future erosion and turbidity). The NMFS previously identified EFH in the project area and noted that avoiding the mangroves would eliminate EFH direct impacts and shortening the length of the pipes would minimize indirect impacts such that no mitigation would be required by NMFS (Appendix A). Alternative 1 would involve significantly higher costs for construction and mitigation for destruction/removal of EFH. In addition to mitigation costs, there would be greater difficulty in developing a larger mitigation site at PAFB due to limited on-site areas that would qualify for compensatory mitigation. Using the selection criteria of avoidance of EFH (mangroves found at the canal mouths), and cost to value analyses, the alternative to pipe the entire canal lengths was eliminated from consideration because it will result in impacts to EFH, involve much higher costs and planning effort without a comparable amount of added value for safety and drainage improvements, and would not meet the purpose and need.

2.3 No Action Alternative

As required under NEPA, the only retained alternative to the Proposed Action was the No Action Alternative. Under the No Action Alternative, the 45 SW would maintain drainage of canals and cleaning of existing culverts with dredging and suction using either pressurized water or air to maintain stormwater conveyance. The No Action Alternative does not eliminate the safety hazard of open drainage canals near the runway that are also potential wildlife attractants. Therefore, the No Action Alternative is not reasonable as the status quo will not meet the purpose and need to improve airfield safety and drainage.

2.4 Summary of Potential Environmental Issues

Ten broad environmental components were initially considered to provide a context for understanding the potential effects of the Proposed Action alternatives and as a basis for assessing the significance of potential impacts. The areas of environmental consideration were air quality; biological resources; cultural resources; geology and soils; water resources; hazardous materials and waste; safety and health; infrastructure and transportation; land use; noise; and socioeconomics.

No significant impacts from implementation of either the Proposed Action or No Action alternatives have been identified for any of the resource areas examined in this document. Minor impacts associated with most of the environmental components are briefly summarized, and a more detailed analysis of potential impacts to the remaining resource areas (i.e., biological resources and water resources) is presented in Chapter 4.0.

A comparison matrix of the potential impacts resulting from the Proposed Action to all of the resource areas considered is provided in Table 2-1. The three levels of impact utilized in this document are defined as follows:

- No Impact - No impact is predicted.
- Not Significant Impact - An impact is predicted, but the impact does not meet the intensity/context significance criteria for the specific resource.
- Significant Impact - An impact is predicted that meets the intensity/context significance criteria for the specific resource.

Table 2-1: Environmental Impact Matrix

Environmental Components	Proposed Action	No Action Alternative
Air Quality	No Significant Impact	No Significant Impact
Biological Resources	No Significant Impact	No Significant Impact
Cultural Resources	No Impact	No Impact

Geology and Soils	No Significant Impact	No Significant Impact
Hazardous Materials and Waste	No Significant Impact	No Significant Impact
Safety and Health	No Significant Impact	No Significant Impact
Infrastructure and Transportation	No Significant Impact	No Significant Impact
Land Use	No Significant Impact	No Significant Impact
Noise	No Significant Impact	No Significant Impact
Socioeconomics	No Impact	No Impact
Water Resources	No Significant Impact	No Significant Impact

2.4.1 Issues Eliminated from Detailed Analysis

The AF determined that negligible/minor impacts or no impacts would be anticipated to air quality; cultural resources; geology and soils; hazardous materials and waste; infrastructure and transportation; land use; noise; and socioeconomics. The following is a summary of impacts potentially associated with these categories that are not significant thereby allowing for elimination from detailed analysis.

2.4.1.1 Air Quality

In Florida, regional air quality is assessed at the county level. PAFB is located within Brevard County which has been designated by both EPA and FDEP to be in attainment for all criteria pollutants. Ambient air monitoring records from monitoring stations maintained by the appropriate state or local agency for the affected environment are examined to characterize the existing air quality. PAFB is located in an area that is in attainment for all criteria air pollutants; therefore, a conformity determination is not required. However, several sources of air emissions were considered that could result from implementation of the Proposed Action. Changes in local air quality resulting from these sources would not be significant.

National Ambient Air Quality Standards (NAAQS) 40 CFR Part 50-51, Title V of the Clean Air Act Part 70, and Florida Administrative Code Chapter 62 set standards for pollutants to attempt to control levels that may affect public health and the environment. Air Force Instruction (AFI) 32-7040, *Air Quality*, identifies AF requirements for an air quality compliance program. PAFB is currently authorized to operate under the Florida Department of Environmental Protection (FDEP) Title V Air Permit No. 0090021-007-AV, renewed in 2007. The permit is valid for a five-year period and will expire on 30 April 2012, and the AF will seek renewal of the permit at this time.

Major sources of pollutants at PAFB include steam boilers, surface coating operations, and fuel storage tanks. Other sources of pollutants at the base are deemed insignificant activities under Title V rules as only stationary sources are considered. The Proposed Action will include mobile sources of air emissions. Vehicles would emit exhaust (carbon monoxide (CO), nitrogen oxides (NO_x), and sulfur dioxide (SO_2) during project activities. Dust particles (*i.e.*, particulate matter (PM)) would also be suspended during

construction activities. PAFB is currently operating as a synthetic minor generator of HAP emissions under federally enforceable operating limitations. Construction events aren't required to be reported through Title V permitting because these activities aren't generating pollutants from stationary sources. Mobile sources, aircraft operations, outdoor weapons training, construction activities, etc., also generate pollutants at PAFB. Air emission inventories for PAFB have indicated that particulate matter (PM) has become a major criteria air pollutant when considering the increased construction/demolition activities that have been occurring in the past three years.

Greenhouse gas emission reduction through energy efficiency and sustainability, however, is the goal of the Federal government recently mandated through Executive Order 13423, *Strengthening Federal Environmental, Energy and Transportation Management*. Currently there are no published thresholds of significance for greenhouse gas emissions, but the Federal government recognizes the need to reduce energy consumption and shift to renewable and alternative fuels to reduce emissions. Energy improvements such as replacement of old HVAC equipment, installation of energy management controls, and metering for energy use are being implemented at PAFB and are expected to eliminate millions of tons of greenhouse gases annually once completed.

Equipment used to install stormwater conveyance pipes and restore shoreline emit exhaust and dust particulates. The two main pollutants of concern in diesel exhaust that affect human health are nitrogen oxides (NOx) and particulate matter (PM). The construction sector is a significant contributor to these emissions, creating 32% of all mobile-source NOx emissions and 37% of PM emissions. A typical idling diesel engine in an on-road tractor consumes 1.2 gallons of fuel per hour at high idle and 0.6 gallons per hour at low idle. Emissions estimated using power requirements, duration of operations, and emission factors for the various equipment types from the USEPA's *Compilation of Air Pollution Emissions Factors, AP-42, Volume 1 (2002),* will be minimal for this small construction/mitigation project and well within NAAQS with only a short duration localized increase in concentrations. Emissions are miniscule (less than 0.03%) in comparison to existing point, nonpoint and mobile source emissions in Brevard County (comparison of approximately 1 ton/year for short construction period to 34,251 tons/year in Brevard County for just NOx).

Dust suppression techniques, such as periodic site watering would be used to reduce particulate matter pollutants and engine idle will be reduced as much as practical to reduce emissions. With the No Action Alternative, equipment used to clean canals emit exhaust as well, but maintenance is usually scheduled once a year or every two to three years dependent on vegetative growth and sedimentation rates. Only short-term impacts are projected to air quality for both the Proposed Action and the No Action Alternative.

2.4.1.2 Cultural Resources

Cultural resources include prehistoric-archaeological, historic, architectural, and Native American resources. Areas of potential impact include properties, structures, landscapes, or traditional cultural sites that qualify for listing in the National Register of Historic Places. Section 106 of the National Historic Preservation Act of 1966 (as amended) requires federal agencies to consider the effects of their actions on historic

properties. AFI 32-7065, *Cultural Resources Management*, provides guidelines for the protection and management of cultural resources on AF-managed lands.

There has been no systematic archaeological survey of PAFB, however, there are no recorded sites within the boundaries of the base as a reconnaissance study conducted by the National Park Service in 1982 found that the two shorelines at PAFB were severely disturbed due to past filling and paving activities, and the remaining property at PAFB was either subjected to extensive earth moving or was developed. The study concluded that the likelihood that significant sites were preserved was limited and no cultural resource survey was planned. The Proposed Action location is in a previously disturbed area as the airfield was developed with dredge spoils from the Banana River from the 1940s to the 1950s. Additionally, no historic properties are located within the Proposed Action area.

Federal cultural resource preservation statutes (including the Native American Graves Protection and Repatriation Act) mandate that should prehistoric or historic artifacts be unexpectedly discovered during construction or excavation, such materials shall be identified and evaluated by an archaeologist. Should human remains or cultural artifacts be encountered, federal statutes specify that work shall cease immediately and the proper authorities be notified. The 45 SW Cultural Resource manager (archaeologist) will work with the State Historic Preservation Office (SHPO) should unexpected discoveries be identified, and project re-commencement will only be authorized once the SHPO clears the site. No impacts to cultural resources are anticipated from the Proposed Action or the No Action Alternative.

2.4.1.3 Geology and Soils

The soils within the Proposed Action area have been identified by former Department of Agriculture surveys as Canaveral series which are characterized as poorly to moderately drained. Additionally, dredge material from the Banana River was used as fill for the airfield over 60 years ago. This material contains thick marine deposits, sand and shell fragments which are moderately to well drained. The canals within the airfield area were developed for stormwater drainage and were maintained with steep slopes according to airfield criteria to reduce wildlife attraction. Erosion hasn't been an issue along the canals; sedimentation at the mouths has occurred as vegetation has grown and trapped additional sediment flushed from airfield stormwater and river sediments. The potential for erosion is highest during construction activities. To reduce the impacts of erosion, standard construction Best Management Practices (BMPs) would be used. These measures include the use of silt fences, mulch, siltation basins, and re-vegetation of disturbed areas to control erosion. Specific erosion and sediment controls identified for the Proposed Action are ingress/egress stabilization, perimeter controls with silt fencing, use of turbidity curtains at the terminus of pipe installation, re-stabilization of disturbed areas with hydroseed or sod, and strategic removal of concrete rip-rap and installation of vegetation at the mitigation site.

Two 45 SW Installation Restoration Program (IRP) Solid Waste Management Unit (SWMU P173 & P026) sites exist approximately 570 ft and 350 ft respectively from the closest points near the Proposed Action area. The northern 45 SW IRP site (P173) is north of Canal Two within the northern limits of the Survival Canal where sediments are contaminated with metals due to a former skeet range where bullet casings remain in the canal. The second 45 SW IRP site (P026) is a closed, fenced landfill located west of

Canals One and Two and east of the mitigation site. Land use controls have been implemented to ensure that contaminated sediments in the northernmost section of the Survival Canal are not disturbed, and the integrity of the landfill is maintained. Currently, long-term monitoring of groundwater and surface water are ongoing; there has been no indication of release of contaminants into the groundwater or surrounding surface waters. Impacts are unexpected because no excavation will be closer than 350 ft from the contaminated sites and no breaching into contaminated sites is required for any aspect of construction. The No Action Alternative continues dredging/cleaning maintenance of the canals which also is not expected to have any effect on the deeper contaminated sediments in the northern reach of the Survival Canal and the closed landfill similar to the Proposed Action.

The No Action Alternative would also include placement of dredge spoils in a designated upland area away from surface waters, and stabilization of any disturbed areas such as excavated canal banks or equipment paths within grassy areas surrounding the canals. No significant impacts are anticipated to geology or soils for the Proposed Action or the No Action Alternative.

2.4.1.4 Hazardous Materials and Waste

AFI 32-7042, *Solid and Hazardous Waste Compliance*, identifies compliance requirements for all solid and hazardous waste, except radioactive waste.

Hazardous materials typically associated with equipment use, such as lubricants and fuels, would be used during the Proposed Action and the No Action Alternative. Any hazardous waste would be identified, removed, and disposed of in accordance with current regulations. Although not anticipated, any additional hazardous materials/waste generated due to the implementation of the Proposed Action would be identified and removed in accordance with existing regulations.

The contractor will be responsible for sampling all wastes to determine whether they are hazardous or non-hazardous and ensure proper disposal. All containers must be labeled to accurately reflect the contents. Management of hazardous waste must be completed in accordance with 40 CFR 260-279 and 45 SW Management Plan 19-14. All AF hazardous waste is to remain on PAFB until it is properly containerized and then shipped off-site by the AF under an Environmental Protection Agency (EPA) identification number.

The Pollution Prevention Act of 1990 (42 U.S.C. 13101(b)) established a National policy to prevent or reduce pollution at the source. The environmental implications of the Proposed Action activities must be considered during the design phase to minimize or eliminate environmental liability, and a pollution prevention environmental analysis must be performed. All construction contracts are required to comply with AFI 32-7086, *Hazardous Materials Management*, and must ensure that all recyclable material (e.g., concrete) is recycled and recycled quantities reported by weight to 45 CES Environmental. Any solid waste must be managed in accordance with the instructions set forth in the specifications of the contract. It is anticipated that all non-hazardous, non-recyclable construction debris would be disposed in the Brevard County landfill.

No significant impacts to hazardous materials and waste are anticipated for the Proposed Action or the No Action Alternative.

2.4.1.5 Infrastructure and Transportation

Infrastructure and transportation include utilities and transportation networks. Utility lines would be identified prior to any excavation and an AF Form 103 would be obtained. Utilities and airfield lighting will be avoided during the Proposed Action and No Action Alternative. Existing stormwater grates within the airfield area will also be marked for avoidance to prevent unintentional erosion and flushing of sediments into stormwater conveyance systems. Under the Proposed Action, three stormwater drainage canals will be impacted during the conversion to underground piping, however, drainage improvements will result which will increase airfield safety.

Traffic may be temporarily delayed to allow construction vehicles to safely enter and exit the work zones. Construction while within the airfield area will require coordination with airfield operations to prevent impacts to flight schedules. Flights may need to be delayed when construction equipment is working at Canal Two due to the close proximity to the active runway 02/20. A temporary airfield construction waiver will be required, and the contractor will need to be in constant contact with the PAFB Control Tower during construction to assure safety for workers as well as aircraft and crew. While shoreline restoration construction activities are occurring at the mitigation site, Rescue Rd beyond FamCamp may need to be closed while heavy equipment is in use as the road is narrow and unpaved.

If construction lighting is necessary, it will be coordinated with 45 CES Environmental to ensure the appropriate balance between safety, energy conservation, sea turtle protection and reduced light pollution. All exterior lighting must be in compliance with 45SWI 32-7001, *Exterior Lighting Management*.

Under the No Action Alternative, continued airfield canal maintenance would occur. No significant impacts are anticipated to infrastructure and transportation for the Proposed Action or the No Action Alternative.

2.4.1.6 Land Use

In recognition of the increasing pressures of over-development upon the nation's coastal resources, Congress enacted the Coastal Zone Management Act (CZMA) in 1972. The CZMA encourages states to preserve, protect, develop, and, where possible, restore or enhance valuable natural coastal resources such as wetlands, floodplains, estuaries, beaches, dunes, barrier islands, and coral reefs, as well as the fish and wildlife using those habitats.

The Secretary of Commerce delegated the administration of the CZMA to the National Oceanic and Atmospheric Administration (NOAA). The Office of Ocean and Coastal Resource Management administers individual state programs.

The CZMA contains environmental compliance implications for many federal projects and programs "directly affecting" the states' coastal zones. Federal property is exempt from the definition of the states' coastal zones, but activities occurring on federal property that directly affect the states' coastal zones must comply with the CZMA. The section of the Act most significant to the Proposed Action is Section 307, "Coordination and Cooperation." Section 307(c)(1)(A) mandates that each federal agency activity within or outside the coastal zone that affects any land or water use or natural resource of the coastal zone shall be carried out in a manner which is consistent, to the maximum

extent practicable, with the enforceable policies of approved state management programs.

Applicable federal actions must be consistent with NOAA's federal consistency regulations at 15 CFR Part 930. Federal consistency is required for federal actions that are defined as federal activities, including any development projects (15 CFR Part 930, Subpart C). Subpart C regulations require that all federal activities and development projects be consistent to the maximum extent practicable with federally approved state Coastal Zone Management (CZM) programs (Table 2-2). Activities must be reviewed to determine which directly affect the coastal zone of states with approved plans and provide a written "consistency determination" to the authorized state CZM agency for all activities directly affecting the state's coastal zone. With issuance of the USACE (Dredge and Fill) Permit and State General Permit (SJRWMD), the Proposed Action has been deemed consistent with Florida's CZM program.

The Proposed Action will eliminate canals historically cut for stormwater conveyance and convert them to pipe conveyance. Mitigation required to compensate for this loss of jurisdictional surface waters will result in restoration of wetland shoreline adjacent to the Banana River within the 100-year floodplain which is an action consistent with the CZMA. Permits have been received that signify concurrence with the Florida CZM program (see Florida Statute Section 373.428 below in Table 2-2 and Appendix C). No significant impacts to land use are anticipated due to the Proposed Action.

Under the No Action Alternative, continued maintenance of the drainage canals would occur; no significant impacts would be anticipated to land use.

Table 2-2: Summary of Land Use and Zoning Requirements

Law or Rule	Permit/Action(s)	Requirement	Agency or Organization
Coastal Zone Management Act	Development projects must be consistent to the maximum extent practicable with Florida's Coastal Zone Management Program	Preserve, protect, develop, and, where possible, restore or enhance valuable natural coastal resources such as floodplains, and dunes	Florida Department of Environmental Protection (FDEP), Air Force
Florida Statutes, Section 373.428	Federal Consistency	When an activity regulated under this part is subject to federal consistency review under Section 380.23, the final agency action on a permit application submitted under this part shall constitute the state's determination as to whether the activity is consistent with the federally approved Florida Coastal Management Program. Agencies with authority to review and comment on such activity pursuant to the Florida Coastal Management Program shall review such activity for consistency with only those statutes and rules incorporated into the Florida Coastal Management Program and implemented by that agency.	NOAA

Law or Rule	Permit/Action(s)	Requirement	Agency or Organization
Florida Statutes, Section 380.23	Federal Consistency	(1) When a federally licensed or permitted activity subject to federal consistency review requires a state license, the issuance or renewal of a state license shall automatically constitute the state's concurrence that the licensed activity or use, as licensed, is consistent with the federally approved program.	NOAA
Florida Administrative Code 62B-33.004 (3) (b)	Exemptions from Permit Requirements	(3) In addition to the exemptions provided in Section 161.053(12), F.S., the following are exempt from the provisions of Section 161.053, F.S., and this rule chapter: (b) Construction, excavation, and damage or destruction of vegetation conducted by the United States Government on lands owned and maintained by the United States Government.	FDEP

2.4.1.7 Noise

The EPA administers the Noise Control Act of 1972, and has identified 65 dB (A-scale) as an acceptable noise level for compatible land uses. This level is not regarded as a noise standard, but as a basis to set appropriate standards that should also factor in local considerations and issues.

Noise impacts from the operation of construction equipment are usually limited to a distance of 1,000 feet or less. Vehicles associated with the Proposed Action typically have a dBA between 65 and 100, at a distance of 50 feet (USEPA, 1971). The proposed project is located in the airfield area and there are no sensitive receptors (*e.g.,* schools, hospitals) in the vicinity. All work activities would be confined to daylight hours to avoid nuisance noise in the evenings. Increased air traffic would not be anticipated as a result of the Proposed Action.

In accordance with 29 CFR 1910, protection against the effects of noise exposure would be provided. When employees are subjected to elevated sound levels, feasible administrative or engineering controls would be utilized. If such controls do not reduce sound levels to the levels presented in Table 2-3, hearing protection would be provided and used to reduce exposure. No significant noise impacts are anticipated due to the Proposed Action. Under the No Action Alternative, continued canal dredging maintenance would occur, and no significant noise impacts would occur.

Table 2-3: Permissible Noise Exposures

Duration Per Day (Hours)	Slow Response Sound Level (dBA)
8	90
6	92
4	95
3	97
2	100
1.5	102

1	105
0.5	110
0.25 or less	115

2.4.1.8 Socioeconomics

Socioeconomics comprise such interrelated resources as population, employment, income, temporary living quarters (during construction activities), public finance and disproportionate impact analysis for low income or minority populations. Under EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, Federal agencies must analyze environmental effects such as human health, economic and social effects on low-income and minority populations, and mitigate significant effects to these communities.

The Proposed Action area is not located adjacent to minority populations or low-income population centers, and indirect impacts to such communities located in the surrounding areas were not identified during the analysis of the Proposed Action. The drainage improvements would not produce excessive pollution or create a hazardous situation that would affect the surrounding community, regardless of economic background. Therefore, it is concluded that the Proposed Action would not result in disproportionately high or adverse human health or environmental effects on minority or low-income populations. The Proposed Action alternatives would not substantially affect human health or the environment and would not exclude persons from participation, deny persons the benefits, or subject persons to discrimination because of their race, color, or national origin. In accordance with EO 12898, the public will have the opportunity to review this EA and comment on its actions accordingly. It is not anticipated that the Proposed Action or No Action Alternative will affect employment patterns on a permanent basis or induce substantial growth or growth-related impacts. No increase in population levels would result. Therefore, no impacts are anticipated to socioeconomics by either the Proposed Action or No Action Alternative.

3.0 AFFECTED ENVIRONMENT

In compliance with NEPA and CEQ guidelines, this Chapter describes the existing environment of the Proposed Action area for those resources/categories that were not previously eliminated from further analysis (see Chapter 2). This information serves as a baseline from which to identify and evaluate potential environmental changes resulting from implementation of the Proposed Action. In addition to Chapter 2 of this EA, the *Environmental Assessment for the General Plan and Maintenance of PAFB, FL* (Finding of No Significant Impact (FONSI) signed on 26 June 2005) provides baseline information to minimize duplication of effort per 40 CFR 1502.20 and 32 CFR 989.10. The resources/categories addressed in this Chapter that were carried forward for further analysis are biological resources and water resources.

3.1 Biological Resources

The following information was derived from several sources; much of the detailed information included has been extracted from the *45 SW Integrated Natural Resources Management Plan* (INRMP). Biological resources covered in this section include native and nonnative vegetation communities, wetland habitats, threatened and endangered species (T&E), and migratory birds.

3.1.1 Wetlands and Floodplains

Wetlands are the transition zones between dry upland ecosystems and deeper aquatic habitats. Each wetland area is unique according to its surrounding geologic, hydrologic, and climatic conditions. Wetlands provide flood control, aquifer recharge, coastal protection, and act to help filter pollutants from the ecosystem. Wetlands often support a wide range of rare and endangered aquatic plants and wildlife. Section 1 of Executive Order 11990 *Protection of Wetlands*, directs each federal agency to provide leadership and take action and include all practical measures to minimize destruction, loss, degradation or harm to wetlands. Although no net loss of value and function of wetlands is the goal of any construction project, it is recognized by USEPA and the U.S. Army Corps of Engineers (USACE) that this goal may not be achievable in every permit action (USEPA, 1990). Per EO 11990, the Proposed Action's effect on wetlands should consider factors such as public health, safety, water supply, pollution, long term productivity of existing flora and fauna, habitat diversity and recreational use. If it is determined that the only practicable alternative consistent with the law and with the policy set forth in this EO requires siting in a wetland, the agency is required to include all practical measures to minimize harm to wetlands.

The canals proposed for conversion to underground piping were artificially cut but have various degrees of connection with the Banana River which influences their quality and habitat value. Canal One is of poor quality and is separated from the Banana River by two culverts that are on either side of Rescue Road which limits fish use. Other wildlife use is limited due to the steeper banks which are approximately 3.5 ft from top of bank to water surface. Canal Two is of marginal quality because it has steep banks with a 5.2 ft difference between top of bank and the water’s surface, yet the mouth does have a connection with the Banana River through the Survival Canal that allows some use by fish and other aquatic life. Canal Three is of poor quality because of its steep banks with

a 7.9 ft difference between top of bank and the water's surface, its constricted mouth due to sedimentation as well as cattail buildup over three-quarters of the canal.

Facultative and facultative wet plants are found near Canals Two and Three such as saltbush, sea oxeye daisy, broom sedge, etc. Red and white mangroves are found at the mouths of Canals Two and Three. Invasive vegetation was more pervasive along the banks of Canals Two and Three, but the base's invasive vegetation removal program eliminated Australian pine and Brazilian pepper that had surrounded portions of the canals. The mitigation site is located within the estuarine wetland zone of the Banana River shoreline. Although invasive vegetation has been controlled along the shoreline over the years, some saplings of Australian pine and Brazilian pepper are found in a few locations within the mitigation area. Native, wetland plants are also found interspersed along the shoreline (mitigation site) such as sea purslane, sedges, rushes, sea oxeye daisies, buttonwood, red, black and white mangroves, etc. The mitigation site (see Figure 2-1) was selected because of its high potential for habitat quality improvements with restoration. Natural estuarine, wetland shoreline habitat had been degraded in the past (40-60 years ago) with the practice of using demolished concrete as rip rap to combat erosion. Over time mangroves have recruited into the area and have grown over concrete rip rap in several locations (Figure 3-1). Some concrete slabs have become submerged in the Banana River and are now covered in growth of various species of algae.

Figure 3-1: PAFB's Western Boundary, Example Location for Banana River Shoreline Mitigation Site for Airfield Canal Dredge and Fill (mangroves growing over concrete rip rap)

Jurisdictional waters are limited at PAFB. Canals Two and Three drain into the Survival Canal; all three are included in the six total surface waters found within PAFB property that are classified as jurisdictional waters of the United States by the Army Corps of Engineers (USACE) under Section 404 and 401 of the Clean Water Act and Section 10 of the Rivers and Harbors Act (see Figure 3-2 below). The USACE has declared that mitigation is required to compensate for loss of these 0.73 surface acres of regulated waters, and approved the mitigation plan (Appendices C and D). SJRWMD has issued a Letter of Consent and General Permit without a mitigation requirement (Appendix C). However, SJRWMD required the AF to submit the mitigation plan for review because of the joint State jurisdiction of the Banana River shoreline.

Both Proposed Action and No Action Alternative activities would also generally occur on previously disturbed and developed land surrounding the canals that is vegetated primarily with Bahia grass routinely mowed for the airfield.

The Proposed Action location is within the 100-year floodplain, with portions of the area within the 500-year floodplain (Figure 3-2). A floodplain is the lowland adjacent to a river, lake, or ocean. Floodplains are designated by the frequency of the flood that is large enough to cover them. Flood frequencies, such as the 100-year flood, are determined by plotting a graph of the size of all known floods for an area and determining how often floods of a particular size occur.

Section 1 of Executive Order (EO) 11988, *Floodplain Management*, directs each federal agency to provide leadership and take action to restore and preserve the natural and beneficial values served by floodplains (specifically 100-year) in carrying out its responsibilities for federally undertaken construction and improvement projects. If it is determined that the only practicable alternative consistent with the law and with the policy set forth in this EO requires siting in a floodplain, the agency is required to minimize potential harm to or within the floodplain.

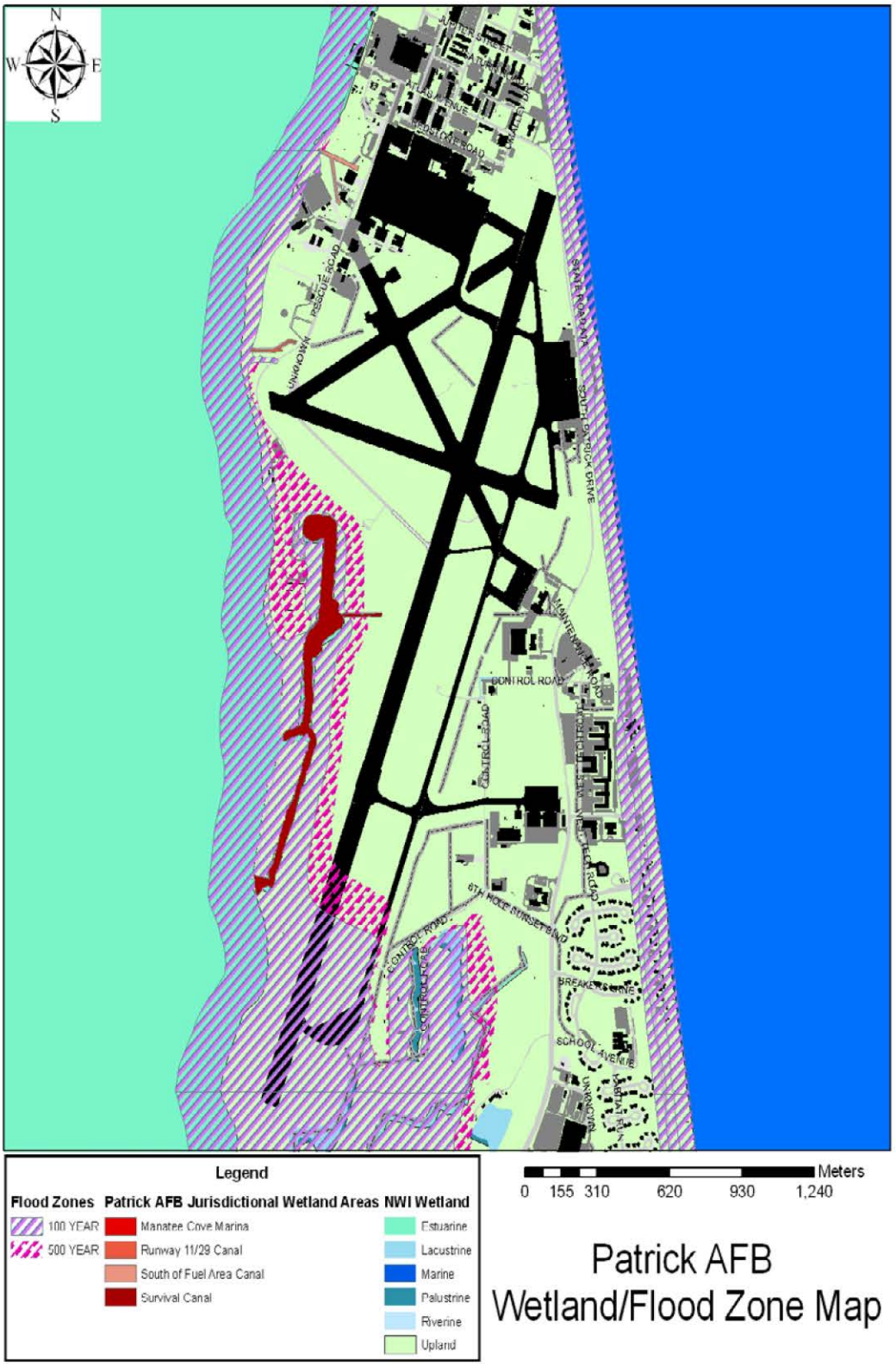

Figure 3-2: PAFB Airfield Wetland/Floodplain Zone Map

3.1.2 Essential Fish Habitat

Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act, as amended, required interagency coordination to further the conservation of federally managed fisheries and for each Federal agency that may adversely affect Essential Fish Habitat (EFH) to consult with the National Marine Fisheries Service (NMFS) and identify EFH. The Act defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Regional Fishery Management Councils under the NMFS are responsible for designating EFH in their management plans. The South Atlantic Fishery Management Council (SAFMC) currently manages for several species in the vicinity of PAFB.

Essential fish habitat for coastal migratory pelagic species includes sandy shoals and offshore bars, all coastal inlets, designated nursery habitats, and high profile rocky bottom and barrier island ocean-side waters. This extends from the surf to the shelf break zone from the Gulf Stream shoreward, including *Sargassum*.

Areas inshore of the 100-foot contour, estuarine emergent vegetated wetlands, tidal creeks, estuarine scrub/shrub, oyster reefs and shell banks, unconsolidated bottom (soft sediments), artificial reefs, coral reefs, and live/hard bottom habitats are EFH for specific life stages of estuarine-dependent and nearshore snapper-grouper species. The NMFS identified EFH adjacent to the Proposed Action area and noted potential use by managed species of snapper, brown and pink shrimp, and bluefish. Growth of mangrove along the banks of the Survival Canal which are also found at the mouths of Canals Two and Three result in qualification as EFH, and are noted by NMFS to also provide water quality function and a key nutrient provider in aquatic food chains. The mitigation site, required because of loss of jurisdictional waters under Section 404 of the Clean Water Act (not EFH), is adjacent to EFH but work will occur above the water interface, will avoid mangroves, and will plant new mangroves so will not adversely impact EFH.

3.1.3 Wildlife

Various species of wildlife inhabit, utilize, or frequent PAFB. The base is located on a barrier island which is a type of ecosystem that is an important natural area that supports many plants and animals. Barrier islands along the Atlantic coast are especially important for nesting sea turtles, populations of small mammals, and as foraging and loafing habitat for a variety of resident and migratory shorebirds, wading birds, and songbirds. Refer to the 45 SW INRMP for specific information on wildlife found at PAFB.

3.1.3.1 Threatened, Endangered and Special Concern Species

No Federal-listed threatened and endangered (T&E) plant species have been identified at PAFB, and only State listed mangroves (red-*Rhizophora mangle*, black-*Avicennia germinans*, and white-*Languncularia racemosa*) are found in the Proposed Action area.

Several T&E animals and Special Species of Concern (SSC) may occur in areas adjacent to the proposed project site: Florida manatee, roseate spoonbill, little blue heron, reddish egret, snowy egret, tricolored heron, white ibis, southeastern American kestrel, American oystercatcher, American alligator, bald eagle, brown pelican, black skimmer, least tern, and wood stork. The wood stork, Federally listed as endangered,

has been observed at PAFB using some shallow drainage canals for feeding and wading and resting along the banks of canals found within the PAFB golf course. There is no formally designated critical habitat on PAFB, as defined under Section 4 of the ESA. The wood stork, *Mycteria americana*, is a large, white, bald-headed wading bird of the southeastern swamps, and the only stork breeding in the United States. Its late winter breeding season is timed to the Florida dry season when its' fish prey become concentrated in shrinking pools. The wood stork eats small fish from 1 to 6 inches long, especially topminnows and sunfish provide this bird's primary diet. Feeding often occurs in water 6 to 10 inches deep where a stork can probe the waters/sediments with its bill partly open. Wood storks need periodic flooding and drying of the environment for successful rookeries.

The Florida manatee (*Trichechus manatus latirostris*) is a marine mammal that is found in marine, estuarine, and freshwater habitats, and is generally restricted to the southeastern United States. Habitat areas include foraging, freshwater drinking, and resting sites, travel corridors, etc. Manatees are herbivores that feed opportunistically on a wide variety of plants included submerged, floating and emergent vegetation. Manatees have been found within the Banana River and have been observed in the deep Survival Canal. The Survival Canal is used by manatee generally for resting as it is secluded, deeper water away from motorized vessels and excessive human disturbances. Manatees are unable to access the canals proposed for filling within the airfield area due to impedance by siltation, sand bars and/or mangrove growth.

Eastern indigo snake (*Drymarchon couperi*), a Federally threatened species, is a large non-venomous snake that is widely distributed throughout central and South Florida with a preference for upland habitat. Burrows, utilized by indigo snake as shelter from cold and intense heat, have been found within PAFB, however no observations of indigo snake have occurred. Eastern indigo snake frequent pine flatwoods, high pine, dry prairie, tropical hardwood hammocks, edges of freshwater marshes, and coastal dunes, etc.

3.1.3.2 Migratory Birds

PAFB is located along one of the major migratory flyways for neo-tropical migrants that breed in eastern North America. Therefore, habitat on PAFB that is suitable for migrant birds is of conservation concern. A number of migratory birds were identified at the airfield in the 45 SW Migratory Bird Survey (2007-2009). Birds observed in the Proposed Action vicinity included palm warblers, merlin, and eastern meadowlarks, all of which are lower safety threat birds. Moderate to high aircraft strike threat species observed in the runway area were killdeer, black-bellied plovers, and tree swallows. These species are generally found in large swarming flocks of over one hundred birds. In addition, osprey, egrets, and ibises were observed in the airfield area, which are also a moderate to high aircraft strike threat. However, no nesting has been observed at the Proposed Action area. A United States Fish and Wildlife Service (USFWS) migratory bird depredation permit allows for harassment of migratory birds to reduce Bird/Aircraft Strike Hazard (BASH).

3.1.3.3 Fish and Other Fauna

Other species have been observed within the canals such as black chin tilapia (exotic), mosquito fish, stingray, catfish, larval forms of amphibians, etc., dependent on water

depths throughout the year. Raccoon, turtles, frogs, alligators, osprey, rabbits, etc., have also been observed within the Proposed Action area.

3.2 Water Resources

The Banana River is a major surface water nearby on the west side of the Proposed Action area. The Survival Canal along with several drainage canals are the only other surface waters located in the airfield area as identified in Figures 1-1, 2-1 and 3-2. Most of the drainage canals contain water throughout the year because they connect with the surficial aquifer. Several of the canals are interconnected with the Banana River and are thus slightly brackish.

Groundwater at PAFB occurs under unconfined (water table), semi-confined, and confined (artesian) conditions. The unconfined aquifer, composed of Holocene and Pleistocene age surficial deposits of marine sand, shell fragments, and sand conglomerate of the Anastasia Formation, is recharged by direct infiltration or rainfall. The generalized direction of groundwater flow in the surficial aquifer is westward, toward the Banana River. Localized flow in the surficial aquifer is from topographic highs (mounds, swells, dune ridges) toward surface water bodies (creeks, ponds, drainage canals).

Permitting through the USACE is required where waters regulated under Section 404 of the Clean Water Act (33 U.S.C. 1344) and Section 10 of the Rivers and Harbors Act (33 U.S.C. 403) will be affected, specifically through dredge and fill activities. A permit has been obtained from the USACE for these activities.

AFI 32-7041, *Water Quality Compliance*, identifies essential AF actions to achieve and maintain compliance with the Clean Water Act, and other applicable Federal, State, and local water quality standards. It requires adherence to applicable State and local water quality standards when they are more stringent than Federal standards. Dredge and fill permits under Section 404 of the Clean Water Act require minimization of turbidity during operations and monitoring for turbidity after operations with removal of curtains/blankets/booms after there are no turbidity conditions. A General Permit through SJRWMD has been obtained. A National Pollutant Discharge Elimination System (NPDES) Permit will be obtained if one acre or greater is disturbed with a Notice of Intent for Storm Water Discharges prior to associated construction activity and a Notice of Termination when all construction activities have been completed.

3.3 Safety and Health

The Proposed Action would reduce ponding of water and close open surface water canals near active runway 02/20, thereby improving pilot/aircraft safety by minimizing bird/aircraft strike hazards and hydroplaning risks.

AFI 91-301, *Air Force Occupational and Environmental Safety, Fire Protection, and Health* program summarizes AF requirements for the protection of health and safety. AFI 91-202, *The US Air Force Mishap Prevention Program* summarizes AF requirements to develop and implement plans and procedures to prevent and reduce mishaps. Common safety hazards associated with heavy equipment operation and construction activities would exist in addition to precautions necessary for workers. All appropriate regulations, including Occupational Safety and Health Administration (OSHA) regulation

29 CFR 1926, *Safety and Health Regulations for Construction*, would be followed during project activities to minimize potential impacts. Table 3-1 identifies specific guidance for maintaining safety and health standards during the implementation of the Proposed Action.

Table 3-1: Summary of Safety and Health Requirements

Law or Rule	Permit/Action(s)	Requirement	Agency or Organization
AFI 91-202, *The US Air Force Mishap Prevention Program*	Various	Prevent and reduce safety mishaps	USAF
AFI 91-301, *Air Force Occupational and Environmental Safety, Fire Protection, and Health Program*	Various	Prevent unsafe conditions on AF bases	USAF
OPLAN 91-212, Bird Hazard Reduction Plan	Various	Prevent unsafe conditions within the airfield area	USAF
Occupational Safety and Health Regulations for Construction, 29 CFR 1926	Various	Prevent unsafe conditions during construction activities	Occupational Safety and Health Administration
Occupational Safety and Health Standards, 29 CFR 1910	Various	Protect health and safety of workers	Occupational Safety and Health Administration

4.0 ENVIRONMENTAL CONSEQUENCES

This Chapter describes the potential environmental impacts associated with the activities under the Proposed Action and the No Action Alternative. Components of the affected environment that are of greater concern are described in greater detail.

Federal, State, and local environmental laws and regulations were reviewed to assist in determining established thresholds for assessing environmental impacts (if any) in fulfillment of NEPA requirements. Proposed activities were evaluated to determine their potential to result in significant environmental consequences using an approach based on the interpretation of significance outlined in the CEQ regulations for implementing the procedural provisions of NEPA (40 CFR 1500-1508) and 32 CFR 989, *The Environmental Impact Analysis Process*.

Guidelines established by the CEQ (40 CFR 1508.27) specify that significance should be determined in relationship to both context and intensity (severity). The assessment of potential impacts and the determination of their significance are based on the requirements in 40 CFR 1508.27. Three levels of impact can be identified:

- No Impact - No impact is predicted
- Not Significant Impact - An impact is predicted, but the impact does not meet the intensity/context significance criteria for the specific resource
- Significant Impact - An impact is predicted that meets the intensity/context significance criteria for the specific resource

Factors contributing to the intensity or severity of the impact include the following:

- The degree to which the action affects public health or safety;
- Unique characteristics of the geographic area such as proximity to cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas;
- The degree to which effects of the action on the quality of the human environment are likely to be highly uncertain or controversial;
- The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration;
- Whether the action is related to other actions with individually insignificant, but cumulatively significant impacts;
- The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the ESA.

Thresholds for determining impact significance are based on the applicable compliance standard. When feasible, these criteria correspond to federal- or state-recognized criteria, and are determined using the associated standardized methods. In the absence

of a compliance standard, the thresholds are based upon a federal- or state-recommended guidance or professional standards/best professional judgment.

4.1 Biological Resources

The AF is committed to the long-term management of all natural areas on its installations, as directed by the Sikes Act and AFI 32-7064, *Integrated Natural Resources Management*. Long-term management objectives are identified in the 45 SW's INRMP with specific land-management objectives such as wetland protection, conservation of threatened and endangered species, and habitat restoration.

4.1.1 Proposed Action

The Proposed Action would occur in a previously disturbed area with minimal vegetation and low habitat quality, and a disturbed area with moderate habitat quality at the mitigation site. Two of the three canals are regulated waters within the Proposed Action area, and all three canals drain into the Banana River which is classified as a Florida Outstanding Water Body. Specific requirements are identified in Table 4-1 that when implemented would minimize impacts to biological resources.

Table 4-1: Summary of Requirements to Protect Biological Resources

Law or Rule	Permit/Action(s)	Requirement	Agency or Organization
Endangered Species Act (ESA)	Consultation with US Fish and Wildlife Service (USFWS), determine no affect or not likely to adversely affect	Conserve ecosystems that support T&E species. Section 7 requires Federal agencies to ensure that any action authorized, funded or carried out by them is not likely to jeopardize the continued existence of listed species or modify critical habitat.	USFWS
Magnuson-Stevens Act	Consultation with National Marine Fisheries Service (NMFS), determine no impact or no significant adverse impact	Conserve/protect Essential Fish Habitat (EFH). Federal agencies must ensure that any action authorized, funded or carried out by them will not adversely impact EFH otherwise mitigation will be required	NMFS
Executive Order (EO) 11988	If the only practicable alternative requires siting in a floodplain, design or modify proposed action to minimize potential harm.	Reduce the risk of flood loss, minimize the impact of floods on human safety, health and welfare, and restore and preserve the natural and beneficial values served by floodplains. Consider alternatives to avoid adverse effects in the floodplains. Prepare Finding of No Practicable Alternative (USAF)	DoD
EO 11990	Directs each federal agency to provide leadership and take action to minimize destruction, loss or degradation of wetlands	Minimize loss, destruction or degradation of wetlands and restore and preserve the natural and beneficial values served by wetlands. Consider alternatives to avoid adverse effects to wetlands. Prepare a Finding of No Practicable Alternative (USAF)	DoD

Law or Rule	Permit/Action(s)	Requirement	Agency or Organization
EO 13112	Remove and control invasive species	Prevent the introduction of invasive species and provide for their control and minimize the economic, ecological, and human health impacts that invasive species cause.	DoD
Migratory Bird Treaty Act	Consult with USFWS as necessary and comply with applicable permits	Prohibits harassment or harm to migratory birds, and destruction of the eggs or nests without a permit.	USFWS
AFI 32-7064	Long-term management of all natural areas on the Installation	Protect listed species, biodiversity, wetlands, etc.	AF
45 SW Instruction 32-7001	Use full cut off, well shielded, low wattage, low pressure sodium or amber lights or prevent use of lighting from 1 May to 31 October	Reduce the amount of exterior lighting visible from the beach during the sea turtle nesting season (1 May – 31 October) from 2100 to 0600 to reduce sea turtle hatchling mortality caused by disorientation (in accordance with the ESA).	45 SW

4.1.1.1 Wetlands and Floodplains

The design of the stormwater drainage system will be compliant with Executive Order 11988, *Floodplain Management* and Executive Order 11990*, Wetland Protection*. Generally, diverting stormwater into culverts/pipes causes water to flow faster. To minimize this impact, the design will reduce the rate at which stormwater moves through the pipe by using texturized roughness inside the piping, and will reduce erosion, scouring, and turbidity with installation of dissipater wing walls, rip rap and by keeping at least a 20 ft distance from the connection with the Survival Canal (which connects with the Banana River) to avoid mangroves. Piping of the three canals (0.73 acres total of jurisdictional waters) will not affect floodplain storage capacity to any significant degree because of the larger capacity of the Survival Canal (over 25 acres) and the low-lying areas adjacent to the Banana River.

Two of the three canals in the Proposed Action area are classified as jurisdictional waters, and compensatory mitigation for the loss of these regulated waters, required by the U.S. Army Corps of Engineers (USACE), occurs in estuarine wetland habitat along the Banana River shoreline. The SJRMWD claims no jurisdiction for the canals, but required review and approval of the mitigation plan because of their jurisdiction over the Banana River and its adjacent shoreline. The proposed mitigation will involve the restoration of approximately 2,500 linear feet of riverine/estuarine shoreline by removing old erosion-control fill material (construction debris used as a shoreline stabilizer prior to regulations), and planting of native mangroves/marsh vegetation. This mitigation plan (Appendix D) has been coordinated with and approved by the regulators because it will improve the functional value of waters/wetlands and will compensate for the loss of waters proposed by the Proposed Action. This was determined through a comparative assessment of the functional values of the impact areas and the proposed mitigation per the Uniform Mitigation Assessment Method (UMAM) utilized in the state of Florida by the

USACE and SJRWMD. Impacts are being mitigated within the same drainage basin as the impact.

The UMAM quantifies the "value" of an assessment area in terms of the quality and quantity of the water environment it supports, the structure and health of the vegetative or benthic community it sustains, and the wildlife habitat it provides based on its location and landscape position. For a given assessment area, these categories are scored on a scale of 0 to 10 (lowest to highest, respectively) according to set criteria outlined in the regulation. The criteria were developed based on a statewide inventory and comparison of various wetlands and water habitats.

The landscape portion and its relationship to surrounding areas influence the value of functions to fish and wildlife. If surrounding habitats are unavailable, poorly connected, or degraded then the value of functions to the fish and wildlife are reduced. In the case of the impact canals, one can infer from their direct connection to the Banana River that there is potential for the canals to influence (e.g. wildlife movement and water flow) the receiving water, and vice versa. The degree to which that occurs, however, is limited due to substantial sediment deposition at the mouths of Canals Two and Three and the division of Canal One by Rescue Road and two headwalls. Water flow is completely impeded by the blockages except during high water events for two of the three canals. On the other hand, the mitigation area, which is a linear shoreline directly adjacent to the Banana River, has the potential to provide greater habitat support within the larger watershed than the canals proposed for culverting/piping.

In addition to the connection restriction to the Banana River as described above, the quality of the water environment for the impact areas is also degraded. The aquatic life that exists in Canal Three is limited to what has become stranded in pools following high water events. The holding capacity of the canal is extremely impaired by the dense cattail that has filled in a majority of the canal. Canal Two has slightly higher quality as it has been more regularly maintained removing excessive vegetative growth because it is the canal closest to the active runway 02/20. Small fish and other aquatic life can access the canal, but quality is still not high because dredging has removed most aquatic vegetation that would serve as habitat and cover for various wildlife. Canal One is an upland cut ditch that is minimally used by wildlife. The mitigation area will provide benefits to fish and wildlife at a higher capacity than the canals due to improved shoreline attributes through the restoration and enhancement of the mangrove fringe and herbaceous wetlands.

Community structure has been altered from natural and man-made activities in the canals in the Proposed Action area. Maintenance dredging may have increased water availability in Canal Two, but it has adversely impacted the development of either an instream or streamside vegetative community. Canal Three has developed into a wetland environment; however, the vegetation that exists at the site is predominately cattails and lacks diversity. The mitigation site by contrast will support a more diverse and healthy community structure. The value of the community will be enhanced by removing hindering concrete rip rap, planting mangroves and wetland shrub and herbaceous species among existing, established wetland vegetation.

Wetland mitigation will also promote natural ecological conditions such as exclusion of invasive vegetation, hydrological relationship restoration, increased wildlife use, and increased corridors between habitats. The mitigation is considered low risk because

successful restoration probability is high based on the type of restoration (i.e. concrete removal and vegetation installation). Wetland and floodplain habitat improvements will result, and no net loss of wetland function will occur with compensatory mitigation.

Permitting through SJRWMD necessitates that whenever portions of a system, such as constructed basins, structures, stormwater ponds, and canals, may affect a wetland or other surface water (such as the Banana River or Survival Canal), reasonable assurance must be provided that the action will not adversely impact the functions that wetlands and other surface waters provide to fish and wildlife and listed species. The existing canals provide minimal stormwater storage and habitat function. The stormwater piping system in the Proposed Action area has been designed to minimize impacts to fish and wildlife species, wetlands and the floodplain. The functional loss of habitat is necessary to improve aircraft/airfield safety and minimize Bird Aircraft Strike Hazard (BASH) concerns. SJRWMD has issued a General Permit with no mitigation requirements, and has concurred that the Proposed Action with Best Management Practices (BMPs) will not adversely affect wetlands or surface waters. The USACE required mitigation for loss of jurisdictional waters (0.73 acres), and mitigation was approved for estuarine wetland shoreline restoration along approximately 2,500 linear feet which will benefit wetlands and floodplains by improving habitat quality, reducing erosion potential, and removing unnatural concrete rip rap that impedes floodwaters (Appendix D). There is no net loss of wetlands, and the mitigation will improve the shoreline adjacent to a Florida Outstanding Water Body, the Banana River, which in turn will result in beneficial water quality. Even though waters will be lost that could be used as habitat, there is no preferable alternative identified that would meet the purpose and need and alleviate the safety hazards from standing/surface water at the airfield.

No significant adverse impacts are anticipated to wetlands or floodplains. Beneficial impacts to wetlands are anticipated in addition to no net loss of wetlands with compensatory restoration mitigation.

4.1.1.2 Essential Fish Habitat

Project activities would generally occur on previously disturbed and developed land that is vegetated primarily with grass. Some of the existing vegetation surrounding the canals would be removed as a result of the fill activities, but would be re-vegetated with grasses that would become maintained through mowing. The three canals that are dredged for maintenance would be converted to piped systems, however no Essential Fish Habitat (EFH) would be adversely affected due to the Proposed Action.

EFH within the Proposed Action area consists of mangroves near the mouths of Canal Two and Three. The 45 SW improved habitat quality for the mangroves beginning approximately six years ago with its invasive vegetation removal program per Executive Order 13112, *Invasive Species*. The mangroves that are found along the mouths of the canals were historically impacted by Brazilian pepper and/or Australian pine and cogon grass. Now only occasional invasive seedlings are encountered and treated with herbicide. Additionally, invasive vegetation will be removed at the mitigation site of which the water interface with mangrove presence is classified as EFH. Mangrove areas found at PAFB have been previously identified by NMFS to be EFH. Mangroves at the mouths of the two canals will be avoided and the pipe termini will be set at least 20 ft from them with installation of wing wall rip rap flow dissipaters that will minimize erosion. Native vegetation such as red mangrove, buttonwood, switchgrass, and sea purslane will be

planted for shoreline restoration in accordance with the approved mitigation plan (Appendix D). The approximately 2,500 linear ft mitigation site will be planted with over 1,000 plants, and existing mature mangrove health will be improved as concrete rip rap is removed and roots are able to migrate into the previously impacted areas.

The Proposed Action activities are not anticipated to impact seagrass (EFH) found in the Banana River when appropriate BMPs such as silt fencing are implemented during constuction. No seagrass or hard bottom (EFH) are found in the drainage canals as they are either dredged or full of cattail and none are found in the connecting Survival Canal as it is fairly deep and influenced by freshwater runoff from PAFB. Excavation work will be controlled such that turbidity doesn't affect downstream waters and EFH managed species of snapper, brown and pink shrimp, and bluefish will not be impacted. Canal One has the least significant connection to the Banana River, no EFH, and is considered upland cut. Canals Two and Three do have mangroves at their mouths that are considered EFH, however the pipe/stormwater design, compensatory mitigation plan approved by USACE and SJRWMD, and BMPs proposed during construction will result in no significant impacts to EFH. The AF/ 45 SW notified the NMFS of the Proposed Action and then the USACE forwarded the permit package for review. The NMFS stated that they had no Conservation Recommendations under the Magnuson-Stevens Act, agreed with the 45 SW opinion of no significant affect to EFH, noted that their concerns of shoreline erosion had been addressed, and requested to act in an advisory capacity for the shoreline restoration mitigation part of the Proposed Action based on prior experiences with restoration projects (Appendix A). Although regulated waters will be impacted with conversion to piped systems, the approved mitigation, in accordance with permit conditions and EO 11990, will result in no adverse effects to EFH due to the Proposed Action.

4.1.1.3 Threatened, Endangered and Special Concern Species

In the Region of Influence (ROI), there is no formally designated critical habitat, as defined under Section 4 of the ESA. The current threatened, endangered, and sensitive species present within PAFB boundaries include: Florida manatee, American alligator, Atlantic loggerhead turtle, Atlantic green sea turtle, leatherback turtle, hawksbill turtle, gopher tortoise, Eastern indigo snake, roseate spoonbill, piping plover, little blue heron, reddish egret, snowy egret, tricolored heron, white ibis, southeastern American kestrel, Arctic peregrine falcon, American oystercatcher, bald eagle, wood stork, brown pelican, black skimmer, and least tern. All of these animals could occasionally be found in the ROI, and specific requirements that will minimize impacts to these species are listed below.

Wood Stork

The wood stork has been observed foraging in some canals at PAFB outside of the Proposed Action area but has not been observed in the canals proposed for piping because of the lack of suitable foraging quality. The 45 SW used the USACE's Central and North peninsular Florida wood stork key and years of observations to make the determination of no adverse affect to the wood stork from the Proposed Action. The 45 SW opinion was that the USFWS didn't need to be consulted. However, the SJRWMD visited the site and thought that Canal Two had the potential to be used by wood storks, and would contact USFWS for their opinion. The 45 SW then contacted the USFWS informally, provided background data and information that supported the "not likely to affect" opinion, and the USFWS agreed with the 45 SW opinion (Appendix

B). No concentrations of freshwater fish with shallow-water fluctuating seasonal short and long hydroperiods occur within the three canals. No mosaic of submerged or emergent aquatic vegetation is present within any of the three canals that would provide nursery habitat for prey. Routine BASH harassment in the airfield area also makes it unlikely that a wood stork would forage in the Proposed Action area. The Proposed Action is beneficial to migratory birds as it should serve to decrease bird/aircraft strikes through removal of waters near the runway that may attract them. The presence of wood stork is not expected, and no impacts are anticipated to wood storks.

Florida Manatee

Florida Manatees occasionally utilize the Survival Canal, however, no impacts are anticipated to the species due to the Proposed Action as manatees are unable to access the canals due to impedance at the mouths with sedimentation and mangrove growth. Pipe termini will be fitted with manatee exclusion grates, set no more than eight-inches apart, as a regulatory requirement. BMPs, such as siltation curtains/booms, will be used to prevent erosion and sediment transport to the Survival Canal and the Banana River that could impact seagrass beds (manatee food source) and water quality. The *Standard Manatee Conditions for In-water Construction (2011)* will be followed such that siltation/turbidity curtains will not allow entanglement of the species, and workers will be trained on manatee protection requirements. The presence of manatees near the canals is very rare, and no impacts to manatee are anticipated.

Sea Turtles

Several T&E sea turtle species have historically utilized PAFB Atlantic Ocean shorelines for nesting, and an active program for sea turtle nest monitoring occurs with close coordination with regulatory agencies. Research has demonstrated that females will avoid highly illuminated beaches and therefore postpone nesting (Witherington, 1992). Likewise, disorientation (loss of bearing) has caused hatchling mortality, as the confused hatchlings move towards artificial light sources and dunes instead of the ocean.

To minimize impacts to sea turtles from artificial lighting, night work would not be authorized during sea turtle nesting season (1 May – 31 October), unless work is required to prevent impacts to airfield operations or safety. In this situation, a light management plan would be required per the 45 SW Instruction 32-7001, *Exterior Lighting Management* to minimize any impacts to sea turtles in accordance with the ESA and associated 45 SW Biological Opinion (May 2008). The plan would need to be reviewed and approved by 45 CES Environmental and the USFWS before night work commenced. Additionally the *Sea Turtle and Smalltooth Sawfish Construction Conditions* will be followed such that all siltation barriers will not allow entanglement by either species should there be an extremely rare occurrence of their presence. Impacts to sea turtles from Proposed Action activities are not anticipated.

Eastern Indigo Snake

Eastern indigo snake have not been observed on PAFB, however burrows are present so there is a small chance that they could exist on PAFB property. The *USFWS Standard Protection Measures for the Eastern Indigo Snake* will be followed such that workers will be trained on the potential for their existence near the construction site and avoidance measures required to avoid impact should there be an unanticipated chance presence. Impacts to indigo snake from Proposed Action activities are not anticipated.

4.1.1.4 Migratory Birds

A beneficial impact to migratory birds would be anticipated from the drainage improvements. Based on observations by PAFB environmental personnel, migratory birds that use the surface waters (canals) within the airfield area for foraging or resting are minimal in number especially when active harassment is routinely occurring with the Bird/Aircraft Strike Hazard (BASH) program. However, short-term, intermittent impacts to feeding/foraging/resting will occur due to construction of culverts/pipes and noise activity. With final construction, the canals will be removed from use as habitat for foraging and resting, but the outcome of the Proposed Action should be a reduction in bird/aircraft strikes, thereby resulting in overall beneficial impact to migratory birds.

4.1.1.5 Fish and Other Fauna

Excavation work would occur in small segments to prevent fish kills. Fish usually swim to undisturbed waters, and are anticipated to avoid the work area. The practice of working in small segments instead of large segments in one day is anticipated to lessen the chance for a large fish kill due to suffocation with heavy sediments in the water column.

In order to avoid attracting wildlife to the work site, the contractor would keep the construction area, including storage areas, free from accumulation of waste materials or rubbish at all times. All waste materials generated by construction activities would be hauled off at the end of each workday and disposed. Upon completion of the project, the contractor would leave the work site in a clean and neat condition, satisfactory to the Contracting Officer.

The American Alligator has been sighted along the shoreline of the Banana River. However, due to its ability to evade human activity, this species is not anticipated to be adversely affected. Turtles, birds, fish and other organisms may be in the canals to be excavated. Ospreys, catfish, raccoon, rabbits, etc., have been observed using the canals proposed for pipe conversion as well as the mitigation site. Generally, noise rather than the sight of machines appears to cause disturbance to wildlife. The combination of increased noise levels and human activity would likely cause temporary displacement of some animals that forage, feed, or nest within a 15-meter radius (or greater for more sensitive species) of noise sources. 45 SW personnel/biologists would perform a walk down of the Proposed Action area prior to commencement of activities to locate any wildlife that would not be able to flee. If animals or eggs are identified that would be harmed by excavation, the 45 SW biologists would remove/relocate the wildlife to a safer area. Significant adverse impacts from Proposed Action activities are not expected to occur to fish and fauna.

4.1.2 No Action Alternative

Under the No Action Alternative, no changes to existing drainage canals or low-lying areas would occur. No significant impacts to biological resources would be anticipated as a result of the No Action Alternative, although wildlife would continue to be attracted to the airfield from the standing/surface waters. The presence of wildlife, particularly migratory birds, is considered a safety hazard to airfield operations and routine BASH would continue to be performed to prevent habituation by birds. The No Action Alternative would not cause significant adverse effects to protected or other native wildlife.

4.2 Water Resources

Water resources in the ROI include surface waters such as the low-lying areas of the airfield, drainage canals, and adjacent jurisdictional waters including the Survival Canal and the Banana River. Portions of the Proposed Action area are located within the 100-year and 500-year floodplain. AFI 32-7041, *Water Quality Compliance*, identifies essential AF actions to achieve and maintain compliance with the Clean Water Act, and other applicable Federal, State, and local water quality standards. It requires adherence to applicable State and local water quality standards when they are more stringent than Federal standards. Dredge and fill permits under Section 404 of the Clean Water Act require minimization of turbidity during operations and monitoring for turbidity after operations with removal of curtains/blankets/booms after there are no turbidity conditions. A General Permit through SJRWMD has been obtained. A Dredge and Fill Permit with approved mitigation plan has been issued to the 45 SW by the USACE. A Water Quality Certification will be obtained. All wetland areas and surface waters outside of the specific limits of construction must be protected from erosion, siltation, scouring, or excess turbidity. All permit conditions will be followed to avoid and minimize impacts to water resources.

4.2.1 Proposed Action

Water resources could potentially be affected by the Proposed Action activities if soil erosion occurs from land disturbance during construction. Prior to and during such activities, erosion and sediment control measures would be designed and implemented to retain sediment on-site and prevent violations of State and Federal water quality standards through siltation fences or other BMPs such as NPDES monitoring. In addition, the contractor must implement BMPs as necessary and correct any erosion or shoaling causing adverse impacts to water resources. No significant impacts are anticipated to water resources.

A National Pollutant Discharge Elimination System (NPDES) Permit will be obtained if one acre or greater is disturbed with a Notice of Intent for Storm Water Discharges prior to associated construction activity and a Notice of Termination when all construction activities have been completed. A General Permit covers alteration of uplands, Florida Coastal Zone Management and water quality certification requirements because a Clean Water Act (CWA) Section 404 permit is required for dredge and fill activities, some of the canals that will be piped ultimately drain into the Banana River, and the mitigation site is located adjacent to the regulated Banana River.

Stormwater runoff from industrial facilities, parking lots, and roadways is the primary cause of non-point source pollution at PAFB. Run-off contaminated with petroleum products (oils and grease) from asphalt surfaces and other hazardous materials/wastes from outdoor storage yards/work areas can discharge to surface waters during an intense rainfall. The potential for stormwater non-point source pollution at PAFB is minimized by storage of run-off in retention ponds and swales, and BMPs to reduce exposure of potential contaminants to stormwater. Although the canals were originally designed for stormwater conveyance, they are not permitted because they are over 60 years old. Pipe design, flow dissipater installation, and proper BMPs will minimize impacts to water resources. Living shoreline restoration at the mitigation site will improve water quality and reduce erosion potential. No significant adverse effects to

water resources are anticipated due to canal conversion to piped systems and compensatory mitigation, and some beneficial effect is anticipated from the mitigation activities.

4.2.2 No Action Alternative

Under the No-Action Alternative, routine maintenance of the canals would continue to occur. BMPs must be implemented to minimize impacts to water resources. All pipe outfalls that connect with the Banana River should be closed with a turbidity curtain during the cleaning process until waters are no longer turbid to prevent sediment flushing. Prior to and during construction, erosion and sediment control measures would be required to prevent violations of state water quality standards. The canals must only be cleaned out to their original depths to remove vegetation blockages. Canal slopes and depths must not be modified from their original design during routine canal maintenance. All disturbed areas must be restored to prevent erosion and sedimentation into the canals. No significant impacts to water resources would be expected from the No Action Alternative.

4.3 Safety and Health

4.3.1 Proposed Action

The Proposed Action would reduce ponding of water and convert open surface water canals near the runway to underground piped systems, thereby improving pilot/aircraft safety by minimizing bird/aircraft strike hazards and hydroplaning risks.

AFI 91-202, *The US Air Force Mishap Prevention Program,* requires development and implementation of procedures and plans to prevent and reduce mishaps. Compliance with this Instruction will provide an overarching environment of safe practices as it covers all operational aspects of the Air Force from aviation to ground to munitions safety including hazard abatement and a series of evaluations and inspections to ensure safety standards are being met.

OPLAN 91-212, *Bird Hazard Reduction Plan,* requires a course of action for reduction of bird attractants to the airfield area and active harassment protocol to prevent habituation by birds. Surface water removal will be removing attractants which should result in reduced bird use on the airfield and in turn reduce hazard potential.

AFI 91-301, *Air Force Occupational and Environmental Safety, Fire Protection, and Health* program summarizes AF requirements for the protection of health and safety. Common safety hazards associated with heavy equipment operation and construction activities would exist in addition to precautions necessary for workers. All appropriate regulations, including Occupational Safety and Health Administration (OSHA) regulation 29 CFR 1926, *Safety and Health Regulations for Construction*, would be followed during project activities to minimize potential impacts. Table 3-1 identifies specific guidance for maintaining safety and health standards during the implementation of the Proposed Action. Additionally, all work in the airfield area will obtain airfield construction waivers that must be coordinated through PAFB Airfield Operations to maintain safe conditions for aircraft and crew and construction personnel. No significant adverse impacts are

anticipated to safety and health, and beneficial effects are anticipated with reduction in BASH risk.

4.3.2 No Action Alternative

Under the No-Action Alternative, routine maintenance of the canals would continue to occur. The BASH risk would not be reduced and continued harassment would be required to keep birds from feeling comfortable using the PAFB airfield area. Additionally, the surface waters would remain open thereby continuing the risk of a plane skidding off the runway and falling into the canals due to an aircraft malfunction/pilot error scenario. Although the No Action Alternative is not anticipated to increase risk and cause significant impacts to safety and health based on pilot/aircraft safety standards and an active BASH program, the risk will remain status quo and the Proposed Action is preferred because it will reduce risk.

4.4 Conflicts with Federal, State, or Local Land Use Plans, Policies, and Controls

The Proposed Action would have no impact on existing land use and presents no conflicts with Federal, regional, state, or local land use plans, policies, or controls.

4.5 Energy Requirements and Conservation Potential

Existing energy sources are considered adequate to meet the requirements of the Proposed Action.

4.6 Natural or Depletable Resource Requirements and Conservation Potential

Other than the use of vehicle fuels for construction activities, the Proposed Action requires no significant use of natural or depletable resources.

4.7 Irreversible or Irretrievable Commitment of Resources

Although the Proposed Action would result in some irreversible and irretrievable commitment of resources such as fuel and labor, this commitment of resources is not significantly different from that necessary for regular activities taking place on PAFB in general.

4.8 Adverse Environmental Effects that Cannot be Avoided

Adverse environmental effects from the Proposed Action that cannot be avoided include construction-related emissions of fugitive dust and exhaust products; temporary displacement of wildlife during construction due to noise and construction activities; some destruction of existing vegetation; loss of a small amount of regulated waters that

would be mitigated to minimize harm to wetlands; and minor sediment runoff into surrounding areas during construction activities. However, through implementation of the program actions, best management practices, and permit conditions described within this document, these effects are anticipated to have a less than significant impact on environmental resources.

4.9 Relationship Between Short-Term Uses of the Human Environment and the Maintenance and Enhancement of Long-Term Productivity

The Proposed Action would improve stormwater drainage at the PAFB airfield. This action would not eliminate any options for future use of the area.

4.10 Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. Environmental Justice analysis needs be applied only to adverse environmental impacts (USAF, 1997). Based on preliminary guidance provided by the Federal Interagency Working Group on Environmental Justice, adverse may be defined as "having a deleterious effect on human health or the environment that is significant, unacceptable, or above generally accepted norms." Adverse human health effects include bodily impairment, infirmity, illness, or death. Adverse environmental effects may include ecological, cultural, human health, economic, or social impacts when interrelated to impacts on the natural or physical environment.

The Proposed Action area is not located adjacent to minority populations or low-income population centers, and indirect impacts to such communities located in the surrounding areas were not identified during the analysis of the Proposed Action. The drainage improvements would not produce excessive pollution or create a hazardous situation that would affect the surrounding community, regardless of economic background. Therefore, it is concluded that the Proposed Action would not result in disproportionately high or adverse human health or environmental effects on minority or low-income populations. The Proposed Action alternatives would not substantially affect human health or the environment and would not exclude persons from participation, deny persons the benefits, or subject persons to discrimination because of their race, color, or national origin. In accordance with EO 12898, the public will have the opportunity to review this EA and comment on its actions accordingly.

4.11 Cumulative Impacts Summary

Cumulative impact as shown in 40 CFR 1508.7 is "…the impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result

from individually minor but collectively significant actions taking place over a period of time."

Potential cumulative impacts of the proposed project activities are evaluated by determining (1) whether the Proposed Action would have an impact on a given resource and (2) what is the incremental impact of the Proposed Action when added to other past, present, and reasonably foreseeable future actions. Environmental analysis will be conducted as required for any future major Federal actions on PAFB.

Past, present and future activities at PAFB include construction, demolition, shoreline (beach and river) restoration projects, canal dredging, infrastructure and facility renovation, modernization, and maintenance. All impacts due to these activities, such as ground disturbance, air emissions, wildlife disturbance, stormwater runoff, and noise, are short-term in nature due to discrete periods of work that generally last only a few days to a few months per activity. Cumulatively, these short-term impacts when dispersed across years, can lead to long-term impacts if site restoration doesn't occur, activity is escalated and results in almost no time for natural equilibration/remediation, and/or established thresholds are exceeded due to the collective impacts. Future proposed activities at PAFB in the next five years include three major construction projects (Air Force Technical Application Center and Laboratory Facility, Main Gate Relocation, and Fire/Crash Rescue Facility), at least ten minor construction/renovation projects, approximately twelve demolition projects, and approximately ten natural resource habitat restoration projects. Specifically, future impacts, although difficult to forecast due to unpredictability of several variables (weather, flora/fauna behaviors, funding, etc.), are anticipated to have the same short-term effects, such as increased air emissions, noise, waste generation, and instability of ground cover during construction/demolition. These short-term effects aren't anticipated to be long-term effects because as buildings are constructed, the same amount of square footage must be demolished, air emissions must be analyzed in reference to all activities occurring at the same time to allow for planning to prevent pollutant threshold limit exceedence, stormwater management factors within all designs sustained sediment and erosion control, and minimal increases of impervious surfaces across PAFB will occur as projects are in place to remove abandoned pavement across the base as well as the fact that PAFB is reaching capacity for development due to several restrictions due to the airfield and force protection/anti-terrorism distances/setbacks for facilities.

The Proposed Action activities, when combined with other past, present and future activities in the area, are not anticipated to cause air pollutant thresholds to be tripped, aren't expected to adversely affect T&E species or cultural resources, won't increase safety and health risks, won't cause incompatible changes to land use, won't create problems will the handling of hazardous waste and materials, and are not anticipated to cause a cumulative water quality degradation problem due to more calculating stormwater designs that limit discharges and untreated waters to receiving waters. Cumulative impacts are not anticipated to be significant because both long-term and short-term impacts anticipated at PAFB will not meet the intensity or severity to quality as significant adverse effects on the human environment as the majority of the disturbances will occur on previously developed land and all regulations, policies, and permits will be followed.

As related to water resources, the only potential resource that may sustain some adverse effects will be due to stormwater. It is understood past construction has created

stormwater pollutant loading, present construction is complying with stormwater regulations that generally require pre-treatment prior to discharge, and future construction will be more stringent as regulations are finalized that require significant reductions in Total Maximum Daily Loads (TMDLs) and stormwater design with pre-treatment in all cases except in the event of severe flooding. Cumulative impacts to water resources such as slightly degraded water quality, although not significant, would exist due to past prior discharges that had limited pre-treatment and future discharges during flooding events. Canals 1 to 3 drain into the jurisdictionally regulated Banana River, and this will not change under the Proposed Action. When compared to the thousands of sources of discharge that drain into the Banana River watershed throughout tens of thousands of acres of surrounding land mass, the stormwater pollutant discharge from the three canals (identified in the Proposed Action) is an insignificant amount. However, the modifications to existing airfield drainage will result in several beneficial cumulative impacts including: increased deterrence of birds on the airfield (reduce strike risk and injury/death to pilots and birds), reduced aircraft/pilot safety risk with elimination of surface waters near the active runway 02/20, and enhancements to the more biologically productive Banana River shoreline with compensatory mitigation in accordance with permit conditions and EO 11990. No significant cumulative impacts should occur as construction has been coordinated with all appropriate external and internal agencies, and approved by the regulatory agencies in accordance with applicable laws. Some short-term air emissions will occur with construction, but will not contribute to the cumulative Brevard County emissions to a degree to cause any significant adverse effect. Water quality in the Proposed Action area, contained by turbidity curtains, will have short-term negative impacts, but after construction is complete positive effects will result such that water quality will improve with greater native vegetation cover establishment and storm flow dissipaters within the pipe design. Cumulative impacts will be contributed by PAFB development, however these impacts will not be significant.

5.0 Conclusion

The AF conducted an assessment of the potential environmental consequences of the airfield safety and drainage improvements at PAFB. This action is being proposed in order to improve stormwater management and prevent standing water, flooding, and bird attractants to improve aircraft, pilot and wildlife safety. Using the selection criteria of avoidance of Essential Fish Habitat (EFH), and cost to value analyses, the alternative to pipe the entire canal lengths, which would include removal of mangroves (EFH) near the canal mouths, was eliminated from consideration because it will result in impacts to EFH and involve much higher costs and planning effort without a comparable amount of added value for safety and drainage improvements. The only other viable alternative considered to the Proposed Action was the No Action Alternative, where no improvements to airfield drainage would occur.

No significant environmental impacts were identified that would require the completion of an Environmental Impact Statement. However, some less than significant impacts were identified and are summarized below in Table 5-1, along with minimization measures and applicable regulatory guidance.

Table 5-1: Environmental Assessment Summary Matrix

Resource Category	Potential/Known Impact(s)	Impact Minimization Measure(s) and Applicable Guidance
Air Quality	Short-term impacts to air quality from particulate matter, CO, SO_2 and NO_x	Periodically water construction site and restrict vehicle speeds for dust control and idling for emission reduction.
Biological Resources	Potential impacts to native plant communities, T&E animals, and SSC	Survey and identify T&E animals and SSC and native habitats prior to activities. Stake off all areas of avoidance. Follow the permit requirements and mitigation plan.
Biological Resources	Potential disturbance of birds protected by the MBTA and ESA	Where possible, avoid work during nesting season in areas where nests are found. Relocate nests/eggs in accordance with the 45 SW Federal Depredation Permit.
Biological Resources	Spread of invasive species	Follow Invasive Species Management Plan in the 45 SW INRMP.
Biological Resources	Artificial lighting impacts to sea turtles	Avoid night work unless authorized. Compliance with 45 SWI 32-7001
Biological Resources	Floodplain protection	Comply with EO 11988
Biological Resources	Wetland protection	Comply with EO 11990
Cultural Resources	Degradation of archeological resources	Cease project activities if human remains or cultural artifacts are unearthed and notify 45 SW archeologist/CRM.
Geology, Soils, and Water Resources	Soil erosion, siltation and pollution of surface waters	Obtain and comply with stormwater NPDES permit for activities that disturb 1 acre or more; implement BMPs; obtain and comply with Dredge and Fill Permit, General Permit and mitigation plan.
Land Use and Zoning	CZMA compliance	Project subject to Federal consistency review and determination.
Infrastructure and Transportation	Potential damage to underground or aboveground utilities from heavy equipment	Obtain dig permit prior to ground disturbance.
Safety and Health	Safety risk due to construction (equipment and workers) within the airfield area	Obtain construction waiver and coordinate with Airfield Operations and the Control Tower.
Noise	Short-term noise impacts to workers and surrounding personnel	Use administrative or engineering controls and PPE where necessary.

6.0 DOCUMENTATION CITED

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7.0 LIST OF PREPARERS

Keitha Dattilo-Bain
Senior Environmental Planner/Biologist (United States Air Force, civilian)
M.S., Biological Oceanography, Florida Institute of Technology, 1999
B.S., Environmental Science, Mary Washington College, 1994
Years Experience: 17

Susan Pearsall
M.S., Biology, University of Alabama in Huntsville, 1999
B.S., Zoology, Auburn University, 1993
Years Experience: 15

Vincent P. Greenwade
Geographic Information Systems Analyst
A.A., General Studies, Brevard Community College, 1999
Years Experience: 9

APPENDIX A
INFORMAL CONSULTATION WITH
NATIONAL MARINE FISHERIES SERVICE

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
263 13th Avenue South
St. Petersburg, Florida 33701-5505
(727) 824-5317; FAX (727) 824-5300
http://sero.nmfs.noaa.gov/

December 23, 2008 F/SER4:GG/pw

Mr. Robin Sutherland
Chief, Environmental Planning
45 CES/CEVP
1224 Jupiter St. MS 9125
Patrick AFB, Florida 32925-3343

Attention: Ms Keitha Dattilo-Bain

Dear Mr. Sutherland:

NOAA's National Marine Fisheries Service (NMFS) reviewed the request from the 45th Space Wing for an essential fish habitat (EFH) consultation concerning the proposed replacement of shallow, open canals with pipes and culverts as part of a drainage project at Patrick Air Force Base along the Banana River, Brevard County, Florida. According to your letter, the work is needed to reduce aircraft hazards from the steep drop offs presented by the canals and from wildlife and bird strikes. The Air Force believes the proposed work would not have substantial adverse impacts on EFH or federally managed fishery species. As the nation's federal trustee for the conservation and management of marine, estuarine, and anadromous fishery resources, the following comments and recommendations are provided pursuant to authorities of the Fish and Wildlife Coordination Act and the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act).

Impacts to Essential Fish Habitat
Aquatic resources at the mouth of the canals and on the adjoining shoreline include sea purslane (*Sesuvium* sp.), sea oxeye daisy (*Borrichia frutescens*), glasswort (*Salicornia virginica*), red mangrove (*Rhizophora mangle*), and black mangrove (*Avicennia germinans*). Although seagrass is not found in the canals, it occurs in the receiving waters (Banana River).

The South Atlantic Fishery Management Council (SAFMC) identifies habitats at the proposed project site and receiving waters as EFH for several species, including gray snapper (*Lutjanus griseus*), brown shrimp (*Farfantepenaeus aztecus*), and pink shrimp (*Farfantepenaeus duorarum*). Seagrass, mangroves, or sand/shell bottom are EFH for one ore more life stages of these species. SAFMC also designates seagrass and mangroves as a Habitat Area of Particular Concern (HAPC) for gray snapper and other species within the snapper/grouper complex; HAPCs are subsets of EFH that are rare, particularly susceptible to human-induced degradation, especially important ecologically, or located in an environmentally stressed area. The project area also includes bluefish (*Pomatomus saltatrix*). Bluefish are managed by the Mid-Atlantic Fishery Management Council (MAFMC), and that council designates estuarine areas as EFH for this species. Detailed information on the EFH requirements of fishery species managed by SAFMC is provided in a comprehensive amendment to the fishery management plans prepared in 1998; details about

the EFH requirements of the species managed by MAFMC are included in separate amendments to individual fishery management plans.

Seagrass and mangroves directly benefit the fishery resources of the Banana River by providing nursery habitat and are part of a habitat complex that supports a diverse community of fish and invertebrates. Seagrass and mangroves also provide important water quality maintenance functions (such as pollution uptake) and produce detritus (decaying organic material) that is an important component of marine and estuarine food chains. The cumulative loss of these habitats has and continues to reduce overall fishery production within Florida waters.

Replacing small canals with pipes and culverts may not significantly impact mangroves and receiving waters under normal hydrologic conditions. But before coming to an overall conclusion for the project, NMFS requests analysis of the potential for erosion of the shoreline near the outfalls during periods of high discharge. This analysis may show that increasing the distance between the terminus of the pipe and mangroves may be necessary to avoid or least minimize impacts to mangroves from erosion. If the analysis shows that erosion of EFH is unavoidable, compensatory mitigation may be necessary. The mitigation could include removing rubble from the shoreline, planting mangroves, or improving hydrological connections between Survival Canal and Banana River. NMFS would be happy to work with the 45th Space Wing to design a mitigation project should one prove necessary.

We appreciate the opportunity to provide these comments early in the process and look forward to further consultation during the permitting process. Please direct related questions to the attention of Mr. George Getsinger at our Northeast Florida Office. He may be reached at 9741 Ocean Shore Drive, St. Augustine, Florida 32080, by telephone at (904) 461-8674, or by email at George.Getsinger@noaa.gov.

Sincerely,

Pam Willis

/ for

Miles M. Croom
Assistant Regional Administrator
Habitat Conservation Division

cc: (via electronic mail)

AFSPC, Keitha.Dattilo-Bain@patrick.af.mil
COE, Tamy.S.Dabu@usace.army.mil
EPA, Eric.H.Hughes@usace.army.mil
FWS, John_Milio@fws.gov
F/SER4, David.Dale@noaa.gov
F/SER47, George.Getsinger@noaa.gov

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
263 13th Avenue South
St. Petersburg, Florida 33701-5505
(727) 824-5317; FAX (727) 824-5300
http://sero.nmfs.noaa.gov/

June 30, 2011 F/SER4:GG/pw

(Sent via Electronic Mail)

Colonel Alfred Pantano, Commander
Jacksonville District, Corps of Engineers
Regulatory Division, North Permits Branch
P.O. Box 4970
Jacksonville, Florida 32232-0019

Attention: Tamy Dabu

Dear Colonel Pantano:

NOAA's National Marine Fisheries Service (NMFS) reviewed public notice SAJ-2011-01395 (SP-TSD) dated June 20, 2011. U.S. Air Force 45th Space Wing located at Patrick Air Force Base (PAFB), Brevard County, Florida, requests authorization to install culverts and to fill two canals contiguous to the Banana River in order to meet runway safety standards. Work would involve culverting and filling 0.73 acres of surface waters and placing 103 cubic yards of riprap in the Banana River at the southern end of Rescue Road. As compensatory mitigation, PAFB proposes to enhance approximately 2,690 linear feet of Banana River shoreline. Enhancement would entail removing debris from the shoreline and planting desirable wetland plant species, such as bulrush, sea oxeye daisy, buttonwood, and red mangroves. The initial determination of the Jacksonville District is that this project would not have a substantial adverse impact essential fish habitat (EFH) or federally managed fishery species. As the nation's federal trustee for the conservation and management of marine, estuarine, and anadromous fishery resources, the following comments and recommendations are provided pursuant to authorities of the Fish and Wildlife Coordination Act and the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act).

Consultation History
PAFB initiated EFH consultation on this project during 2008. By letter dated December 23, 2008, NMFS provided PAFB with general comments aimed at finalizing the EFH consultation. At that time, NMFS did not foresee any issues with the project, however, before coming to that overall conclusion, NMFS requested analysis of the potential for erosion of the shoreline near the outfalls during periods of high discharge and discussion of measure that may be necessary to avoid or least minimize impacts to mangroves from erosion. If the analysis showed that erosion of EFH was unavoidable, compensatory mitigation would be necessary, and that mitigation could include removing rubble from the shoreline, planting mangroves, or improving hydrological connections between Survival Canal and Banana River.

Recommendations
Since 2008 has discussed the project with NMFS and on November 4, 2009, biologist from NMFS and the Jacksonville District performed a pre-application inspection of the proposed project areas and the

mitigation site. Although our concerns regarding shoreline erosion have been addressed through project design modifications and no EFH conservation recommendations are offered, NMFS requests that it be consulted for technical expertise in the design and implementation of the proposed living shoreline mitigation. NMFS has provided technical assistance on similar mitigation projects (living shoreline projects in South Daytona Beach, Castillo de San Marcos and St. Augustine-St. Johns County Airport Authority, Saint Johns County, and Fernandina Beach Municipal Marina, Nassau County) and believes that continued consultation regarding PAFB's proposed mitigation may reduce impacts to living marine resources during construction and to help ensure the long-term success of this mitigation.

We appreciate the opportunity to provide these comments. Please direct related questions to the attention of Mr. George Getsinger at our Northeast Florida Office. He may be reached at 9741 Ocean Shore Drive, St. Augustine, Florida 32080, by telephone at (904) 461-8674, or by email at George.Getsinger@noaa.gov.

Sincerely,

/ for

Miles M. Croom
Assistant Regional Administrator
Habitat Conservation Division

cc:

COE, Tamy.S.Dabu@usace.army.mil
AFSPC, Keitha.Dattilo-Bain@patrick.af.mil
EPA, Eric.H.Hughes@usace.army.mil
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APPENDIX B
INFORMAL CONSULTATION WITH U.S. FISH AND WILDLIFE SERVICE

From:	Heath_Rauschenberger@fws.gov
To:	Dattilo-Bain, Keitha Civ USAF AFSPC 45 CES/CEAO
Cc:	Todd_Mecklenborg@fws.gov
Subject:	RE: PAFB airfield project- SJRWMD site visit
Date:	Wednesday, May 11, 2011 2:16:21 PM

Hi Keitha,
Thank you for your call and for providing the information in the email included below. Based upon the information you provided and after reviewing the Corps' Wood Stork Key for Central and North Peninsular Florida (September 2008), the USFWS does not object to the AFB's determination of no effect for wood storks and would concur with a not likely to adversely affect determination as this project would key to one or the other (depending on whether or not the habitat was SFH) due to it being less than 0.5 acres,.

Please let me know if you have any questions.
Thanks,
Heath

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
Heath Rauschenberger, PhD
Regulatory Compliance Chief
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"Dattilo-Bain, Keitha Civ USAF AFSPC 45 CES/CEAO" <Keitha.Dattilo-Bain@patrick.af.mil>

05/09/2011 09:56 AM To
<Todd_Mecklenborg@fws.gov>
cc
<Heath_Rauschenberger@fws.gov>
Subject
RE: PAFB airfield project- SJRWMD site visit

Thanks Todd. Good luck with everything. I'll forward to the e-mail noted below. v/r, Keitha Dattilo-Bain, 321-494-5286

-----Original Message-----
From: Todd_Mecklenborg@fws.gov [mailto:Todd_Mecklenborg@fws.gov]
Sent: Saturday, May 07, 2011 9:33 PM
To: Dattilo-Bain, Keitha Civ USAF AFSPC 45 CES/CEAO
Cc: Heath_Rauschenberger@fws.gov
Subject: Re: PAFB airfield project- SJRWMD site visit

Hello Keitha,

I have been moved to a new program and will no longer be involved with regulatory issues. Forward the email to Jaxregs@fws.com. Heath Rauschenberger is the new regulatory chief as he will assign a new project biologist.

Have a great day.

Todd Mecklenborg, Fish & Wildlife Biologist
U.S. Fish and Wildlife Service
600 Fourth Street South
Saint Petersburg, Florida 33701
(727) 820-3705
www.fws.gov/northfllorida/

"Dattilo-Bain, Keitha Civ USAF AFSPC 45 CES/CEAO" <Keitha.Dattilo-Bain@patrick.af.mil>

05/06/2011 05:04 PM To
<Todd_Mecklenborg@fws.gov>
cc
Subject
PAFB airfield project- SJRWMD site visit

Hello Todd- I heard through Ann Marie that the Service re-org may not have you involved with PAFB/CCAFS (45th Space Wing) projects? I'm e-mailing you because SJRWMD said they would probably be contacting you after a site visit today for an airfield (stormwater conveyance; non-permitted) canal culverting project because of their opinion of wood stork foraging habitat potential and cumulative effects. I wanted to let you know that the Air Force made the determination (through site assessment and use of the key) that the two canals aren't suitable wood stork foraging habitat and so didn't consult with USFWS. SJRWMD's opinion today is that one of the canals could be used by wood stork. PAFB is within the outskirts of one of the core foraging areas according to the USFWS map (dated 20100224), however the actual canal in question doesn't meet suitable foraging habitat qualities preferred by wood stork in the Air Force's opinion (photo attached). The canal is usually a minimum of 24 inches deep, but because we haven't had rain for a month the depth during the site visit today was about 12-18 inches. The canal isn't within 2500 ft of a colony and doesn't have a mosaic of submerged and/or emergent aquatic vegetation because it is maintained with steep banks and occasional dredging for airfield safety criteria. Prey are present (small fish) but not in concentrations. And the airfield discourages bird use through daily use of air cannons and scare shot (we have a USFWS depredation permit). The project will impact less than 0.5 acres and we are reducing pipe length and installing dissipaters to avoid mangroves at the canal's mouth and prevent downstream adverse effects with stormwater flushing. Incidentally, it is a pilot/aircraft safety driver that is pressing this project because the canal is near the active runway. When SJRWMD contacts you, would you please give me a call to discuss their opinion as we feel that the Air Force is the action agency and should be the one directly communicating with USFWS for our project.

Thank you!

Keitha Dattilo-Bain
45th Space Wing
45 CES/CEAO

Planning/Conservation
1224 Jupiter St, MS 9125
Patrick AFB, FL 32925

direct (321) 494-5286
fax (321) 494-5965
DSN 854-5286
[attachment "canal airfield view to W.JPG" deleted by Todd Mecklenborg/R4/FWS/DOI]

APPENDIX C

PERMITTING COORDINATION WITH USACE AND SJRWMD

From:	Dabu, Tamy S SAJ
To:	Benjamin (BJ) Bukata; Elois Lindsey
Cc:	Long, Eva M Civ USAF AFSPC 45 CES/CEAO; Steve Szabo; Dattilo-Bain, Keitha Civ USAF AFSPC 45 CES/CEAO; Roy Hoekstra; Dixon, Mark T Civ USAF AFSPC 45 CES/CEAN
Subject:	RE: SAJ-2011-01395 US Air Force PAFB canal fill mitigation proposal (UNCLASSIFIED)
Date:	Tuesday, July 12, 2011 3:40:26 PM

Classification: UNCLASSIFIED
Caveats: NONE

Good afternoon.
Thank you for forwarding the revised set of mitigation exhibits. This set of exhibits fulfills the details that the Corps is looking for in order to authorize the mitigation portion of the project.

Tamy Dabu, Project Manager
U.S. Army Corps of Engineers
Cocoa Section
400 High Point Drive, Suite 600
Cocoa, FL 32926
phone:(321)504-3771 extension 11
fax: (321)504-3803
tamy.s.dabu@usace.army.mil

Please assist us in better serving you!
Please complete the customer survey by clicking on the following link:
http://per2.nwp.usace.army.mil/survey.html.

-----Original Message-----
From: Benjamin (BJ) Bukata [mailto:BBukata@jonesedmunds.com]
Sent: Tuesday, July 12, 2011 2:50 PM
To: Dabu, Tamy S SAJ; Elois Lindsey
Cc: Long, Eva M Civ USAF AFSPC 45 CES/CEAO; Steve Szabo; Dattilo-Bain, Keitha Civ USAF AFSPC 45 CES/CEAO; Roy Hoekstra; Dixon, Mark T Civ USAF AFSPC 45 CES/CEAN
Subject: RE: SAJ-2011-01395 US Air Force PAFB canal fill mitigation proposal (UNCLASSIFIED)

Tamy and Elois:

Attached please find our final revised plans for the PAFB Airfield Fill/Grade mitigation project for your review and approval. Thanks.

BJ

From: Dabu, Tamy S SAJ [mailto:Tamy.S.Dabu@usace.army.mil]
Sent: Monday, July 11, 2011 1:24 PM
To: Dixon, Mark T Civ USAF AFSPC 45 CES/CEAN; Long, Eva M Civ USAF AFSPC 45 CES/CEAO; Dattilo-Bain, Keitha Civ USAF AFSPC 45 CES/CEAO; Benjamin (BJ) Bukata; Steve Szabo

Cc: Elois Lindsey
Subject: SAJ-2011-01395 US Air Force PAFB canal fill mitigation proposal (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Good afternoon.

This email is a follow up to my teleconference this morning and with my telephone discussion with Elois this afternoon.

Based upon my discussion with Elois, please forward the revised mitigation sketches to both Elois and me electronically.

Upon receipt and review of the revised sketches I will electronically notify Elois that these exhibits will fulfill the Corps mitigation so that SJRWMD may proceed with their authorization. (Please note that SJRWMD indicated that there are four items that are still pending submittal to them, not merely the mitigation details.)

Thank you for your time today.

Have a great week.

Tamy Dabu, Project Manager
U.S. Army Corps of Engineers
Cocoa Section
400 High Point Drive, Suite 600
Cocoa, FL 32926
phone:(321)504-3771 extension 11
fax: (321)504-3803
tamy.s.dabu@usace.army.mil

Please assist us in better serving you!
Please complete the customer survey by clicking on the following link:
http://per2.nwp.usace.army.mil/survey.html.

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
400 HIGH POINT DRIVE, SUITE 600
COCOA, FL 32926

REPLY TO
ATTENTION OF

Regulatory Division
North Permits Branch
Cocoa Section
SAJ-2011-01395 (SP-TSD)

September 21, 2011

United States Air Force
45 CES/CEA
C/o Mr. Patrick Giniewski
1224 Patrick Street
Patrick Air Force Base, FL 32953-3343

Dear Mr. Giniewski:

The U.S. Army Corps of Engineers (Corps) is pleased to enclose the Department of the Army permit, which should be available at the construction site. Work may begin immediately but the Corps must be notified of:

a. The date of commencement of the work,

b. The dates of work suspensions and resumptions of work, if suspended over a week, and

c. The date of final completion.

This information should be mailed to the Enforcement Section of the Regulatory Division of the Jacksonville District at Post Office Box 4970, Jacksonville, Florida 32232-0019. The Enforcement Section is also responsible for inspections to determine whether Permittees have strictly adhered to permit conditions.

IT IS NOT LAWFUL TO DEVIATE FROM THE APPROVED PLANS ENCLOSED.

Sincerely,

Donald W. Kinard
Chief, Regulatory Division

Enclosures.

St. Johns River
Water Management District

Kirby B. Green III, Executive Director • David W. Fisk, Assistant Executive Director • Mike Slayton, Deputy Executive Director
John Juilianna, Palm Bay Service Center Director, Regulatory

525 Community College Parkway S.E. • Palm Bay, FL 32909 • (321) 984-4940
On the Internet at floridaswater.com.

August 26, 2011

Patrick Giniewski
U.S. Air Force 45th SW
1224 Jupiter Street, MS9125
Patrick Air Force Base, FL 32925

Re: Letter of Consent
Shoreline Stabilization Project/ACOE mitigation plan
Permit #40-009-127565-1
(Please reference permit number on all correspondence.)

Dear Mr. Giniewski :

Thank you for submitting an application to the St. Johns River Water Management District to conduct plantings within 0.20-acres of the surface waters of the Banana River in accordance with ACOE requirements, and to construct a shoreline stabilization project within 0.008-acres of the surface waters of the Banana River. The plantings and shoreline stabilization project must be implemented in accordance with the Jones Edmunds figures 1-12 and 14, received by the District on July 27, 2011 and in accordance with the Jones Edmunds figure 14, received by the District on August 23, 2011. The plantings and revetment will occur along the Patrick Air Force Base shoreline, located in Section 10 and 15, Township 26S, Range 37East, Brevard County, Florida.

We have reviewed the information you provided and determined that the revetment project qualifies for consent to use state-owned submerged lands. The District bases this determination upon the fact that this shoreline protection project does not extend more than 10 feet waterward of the safe upland line pursuant to 18-21.005(1)(c)6 and 18-20.004(1)(e)7, *Florida Administrative Code (F.A.C.)*.

We have reviewed the information you provided and determined that the shoreline planting project qualifies for consent to use state-owned submerged lands. The District bases this determination upon the fact that the planting constitutes habitat enhancement to the Banana River pursuant to 18-21.005(1)(c)15 and 18-20.004(1)(e)10, *F.A.C.*

Providing your project is consistent with the above, please consider this the authority sought under Section 253.77, *Florida Statutes (F.S.)*, Chapter 18-20, and Chapter 18-21, Florida Administrative Code, to pursue this project.

This project involves the planting of appropriate wetland plants along the Banana River Shoreline, and the construction of 74 linear feet of a shoreline stabilization project.

For the construction of the revetment, the District recommends that you follow these guidelines:

a) The revetment must follow the natural contour of the shoreline.

b) Where appropriate, filter cloth must be placed underneath the entire revetment and securely tucked or anchored into the soil/sediments underneath and behind the revetment.

c) The toe of the revetment must be reinforced (e.g.: with large rocks) and trenched into the soils sediments.

d) Both ends of the revetment must turn back at the ends in order to prevent flanking.

e) The minimum and average weights of the rocks used for riprap should be 50 and 100 lbs., respectively, and the rocks should be approximately 1 to 3 feet in diameter.

f) The slope of the revetment must be 2:1 or less (flatter).

g) The revetment must not extend further than 10 feet waterward of the safe upland line of the Banana River. Note that this is a *maximum* distance allowed waterward of the MWL, and all efforts must be made to minimize impacts to the waterbody. The revetment must not extend further into the waterbody than is necessary to stabilize the shoreline, and stabilization should occur in uplands in lieu of shoreline wetlands where practicable.

h) For the entire duration of construction and until all new work is stabilized, the waterbody must be protected from sediment erosion and associated turbidity by the installation of a floating turbidity barrier or equivalent approved erosion control devices. This project must not result in any water quality violations.

i) No fill (other than clean coquina boulders) should be placed waterward of the safe upland line of the Banana River.

Prior to commencement of construction and/or activities authorized herein, you must obtain the U.S. Army Corps of Engineers (ACOE) permit if required by the ACOE. Any modification to the construction and/or activities authorized herein that may be required by the ACOE shall require reconsideration by and the prior written approval of the St. Johns River Water Management prior to commencement of construction and/or any activities on sovereignty, submerged lands.

This letter of consent in no way waives the authority and/or jurisdiction of any government entity, nor does it disclaim any title interest the state may have in the project site. Please check with your local government for specific requirements. Where

local governments have standards, the more stringent standards shall apply. This letter does not constitute authority to proceed with your project under Chapter 373, *F.S.*

Please retain this letter, as it constitutes consent to use sovereign submerged lands by the St. Johns River Water Management District. Please be aware that you are bound to the conditions set forth in the attached "General Consent Conditions". Your revetment may be inspected by authorized state personnel in the future to insure compliance with appropriate statutes and administrative codes.

If you have questions, please contact me at 321-984-4940.

Sincerely,

John Juilianna, Director
Palm Bay Service Center

Enclosures: General Consent Conditions

cc: Susan Moor
Elois Lindsey
Perry Jennings

St. Johns River
Water Management District
Kirby B. Green III, Director • David W. Fisk, Assistant Executive Director

4049 Reid Street • P.O. Box 1429 • Palatka, FL 32178-1429 • (386) 329-4500
On the Internet at floridaswater.com.

August 26, 2011

US Air Force 45 SW CES/CEA
1224 Jupiter St MS9125
Patrick AFB, FL 32925

SUBJECT: Permit Number 40-009-127565-1
PAFB Airfield Fill/Grade

Dear Sir/Madam:

Enclosed is your general permit as authorized by the staff of the St. Johns River Water Management District on August 26, 2011.

This permit is a legal document and should be kept with your other important documents. The attached MSSW/Stormwater As-Built Certification Form should be filled in and returned to the Palatka office within thirty days after the work is completed. By so doing, you will enable us to schedule a prompt inspection of the permitted activity.

In addition to the MSSW/Stormwater As-Built Certification Form, your permit also contains conditions which require submittal of additional information. All information submitted as compliance to permit conditions must be submitted to the Palatka office address.

Permit issuance does not relieve you from the responsibility of obtaining permits from any federal, state and/or local agencies asserting concurrent jurisdiction for this work.

Please be advised that the District has not published a notice in the newspaper advising the public that it is issuing a permit for this proposed project. Publication, using the District form, notifies members of the public (third parties) of their rights to challenge the issuance of the general permit. If proper notice is given by publication, third parties have a 21-day time limit on the time they have to file a petition opposing the issuance of the permit. If you do not publish, a party's right to challenge the issuance of the general permit extends for an indefinite period of time. If you wish to have certainty that the period for filing such a challenge is closed, then you may publish, at your own expense, such a notice in a newspaper of general circulation. A copy of the form of the notice and a list of newspapers of general circulation is attached for your use.

In the event you sell your property, the permit will be transferred to the new owner, if we are notified by you within thirty days of the sale and if you provide the information required by 40C-1.612, F.A.C. Please assist us in this matter so as to maintain a valid permit for the new property owner.

Thank you for your cooperation, and if this office can be of any further assistance to you, please do not hesitate to contact us.

Sincerely,

Martha DePalma
Regulatory Support Specialist I
Division of Regulatory Support

Enclosures: Permit with As-built Certification Form
Notice of Rights
List of Newspapers for Publication

cc: District Permit File

Consultant: Stephen M Szabo
Jones Edmunds & Associates Inc
3910 S Washington Ave Ste 210
Titusville, FL 32780

APPENDIX D

APPROVED MITIGATION PLAN THROUGH USACE PERMIT

APPROVED MITIGATION PLAN FOR PAFB AIRFIELD CANAL FILLING
ARMY CORPS OF ENGINEERS PERMIT (USACE) SAJ-2011-01395, 21 Sept 11

COMPENSATORY MITIGATON: On-site mitigation will consist of wetland enhancement to include hand and mechanical removal, with all equipment located in the uplands, of debris (concrete, etc.) from 2,512 linear feet of Banana River shoreline (parallel to PAFB's Rescue Road), and the subsequent planting of the shoreline area with desirable wetland plant species. The mitigation will include the perpetual maintenance of the 2,512 linear feet of shoreline with less than 5% exotic vegetation.

PERFORMANCE STANDARDS: To ensure there are no long-term adverse impacts to the on-site wetland enhancement area, the Permittee (USAF, 45 SW) shall achieve the following performance standards: 1) There should be at least an 80% cover of appropriate estuarine wetland species within the 2,512 linear feet wetland mitigation area, 2) less than 5% of Florida Exotic Pest Plant Council Category I and II invasive exotic plant species (http://www.fleppc.org) and shall include nuisance species primrose willow, dog fennel, Bermuda grass, Bahia grass, cattail, Melaleuca, Australian pine and Brazilian pepper along the 2512 linear feet of Banana River shoreline mitigation area, 3) at least 80% survival of herbaceous shoreline plantings and 50% survival of canopy plantings, and 4) natural recruitment of desirable wetland species in the ground cover, shrub and canopy within the 2,512 linear feet of wetland mitigation area. The Permittee will achieve the performance standards by the end of the 5-year monitoring period, with no maintenance during the 5th year of monitoring. A remediation program approved by the USACE will be required in the event that the performance standards have not been achieved.

WETLAND MONITORING AND REPORTING: To show compliance with the performance standards the Permittee must: 1) perform a time-zero monitoring event of the wetland mitigation area within 30 days of completion of the compensatory mitigation objectives identified above, 2) submit a time-zero report to the USACE within 30 days of completion of the monitoring event to include baseline conditions of the mitigation site prior to initiation of the compensatory mitigation objectives and a detailed plan view drawing of all created, enhanced and/or restored mitigation areas, 3) subsequent to completion of the compensatory mitigation objectives, perform annual monitoring for a minimum of 5 years, 4) submit an annual monitoring report to the USACE within 30 days of completion of the monitoring event (any semi-annual monitoring will be combined into once annual monitoring report, and 5) monitor the mitigation area and submit annual monitoring reports to the USACE until released in accordance with the Mitigation Release below. All reports must be in the wetland reporting format noted in the permit.

REMEDIATION: If the compensatory mitigation fails to meet the performance standards, the mitigation will be deemed unsuccessful. Within 60 days of notification to the USACE that it was unsuccessful, the Permittee shall submit an alternate compensatory mitigation proposal. The USACE reserves the right to fully evaluate, amend, and approve or reject the alternate proposal. Within 120 days of USACE approval the Permittee will complete the alternate mitigation proposal.

MITIGATION RELEASE: The Permittee's responsibility to complete the required compensatory mitigation, as set forth in Compensatory Mitigation section above, will not be considered fulfilled until mitigation success has been demonstrated and written verification has been provided to the USACE. A mitigation area which has been released will require no further monitoring or reporting by the Permittee; however the Permittee, Successors and subsequent Transferees remain perpetually responsible to ensure that the mitigation area remains in a condition appropriate to offset the authorized impacts.

PERPETUAL CONSERVATION: The Permittee shall maintain the 2,512 linear feet of Banana River shoreline mitigation area identified in the Compensatory Mitigation section above in a natural state, with less than 5 percent of exotic nuisance vegetation species, in perpetuity. The Permittee agrees that the only future utilization of these areas will be purely natural and the following activities will be prohibited except as required or authorized by this permit:
a) Construction or placing buildings, roads, signs, billboards, utilities or other structures on or above the ground. Elevated boardwalks, hiking trails and camping areas are permitted as long as they do not involve any other prohibited uses such as;
b) Dumping or placing soil or other material or dumping waste, trash or unsightly or offensive material,
c) Removal or destruction of trees, shrubs, or other vegetation,
d) Excavation, dredging or removal of peat, gravel, soil, rock in such a manner to affect the surface,
e) Surface use, except for purposes that permit the land or water area to remain predominately in its natural condition,
f) Activities detrimental to drainage, flood control, water conservation, erosion control, soil conservation, or fish and wildlife habitat preservation,
g) Acts or uses detrimental to such retention of land or water areas,
h) Acts or uses detrimental to the preservation of the structural integrity or the physical appearance of sites or properties of historical, architectural, or cultural significance.

REGULATORY AGENCY CHANGES: Should any other regulatory agency require changes to the work authorized or obligated to this permit, the Permittee is advised that a modification to this permit instrument is required prior to initiation of those changes. It is the Permittee's responsibility to request a modification of this permit from the USACE, Cocoa Regulatory Office.

Acceptance of this permit, as Permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

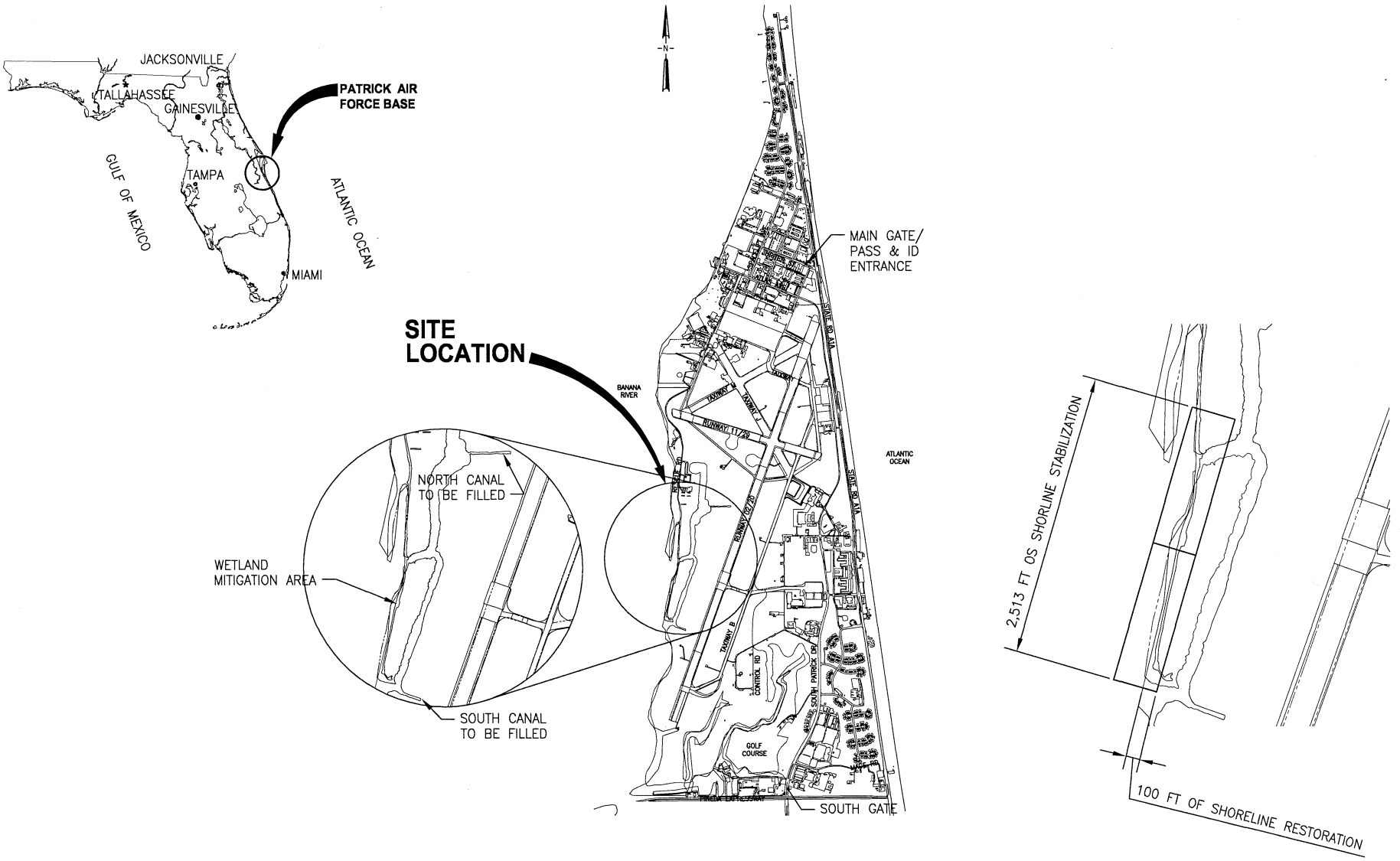


FIGURE 1
PROJECT LOCATION
PATRICK AIR FORCE BASE, FLORIDA
AIRFIELD FILL/GRADE
WETLAND MITIGATION

JONES EDMUNDS

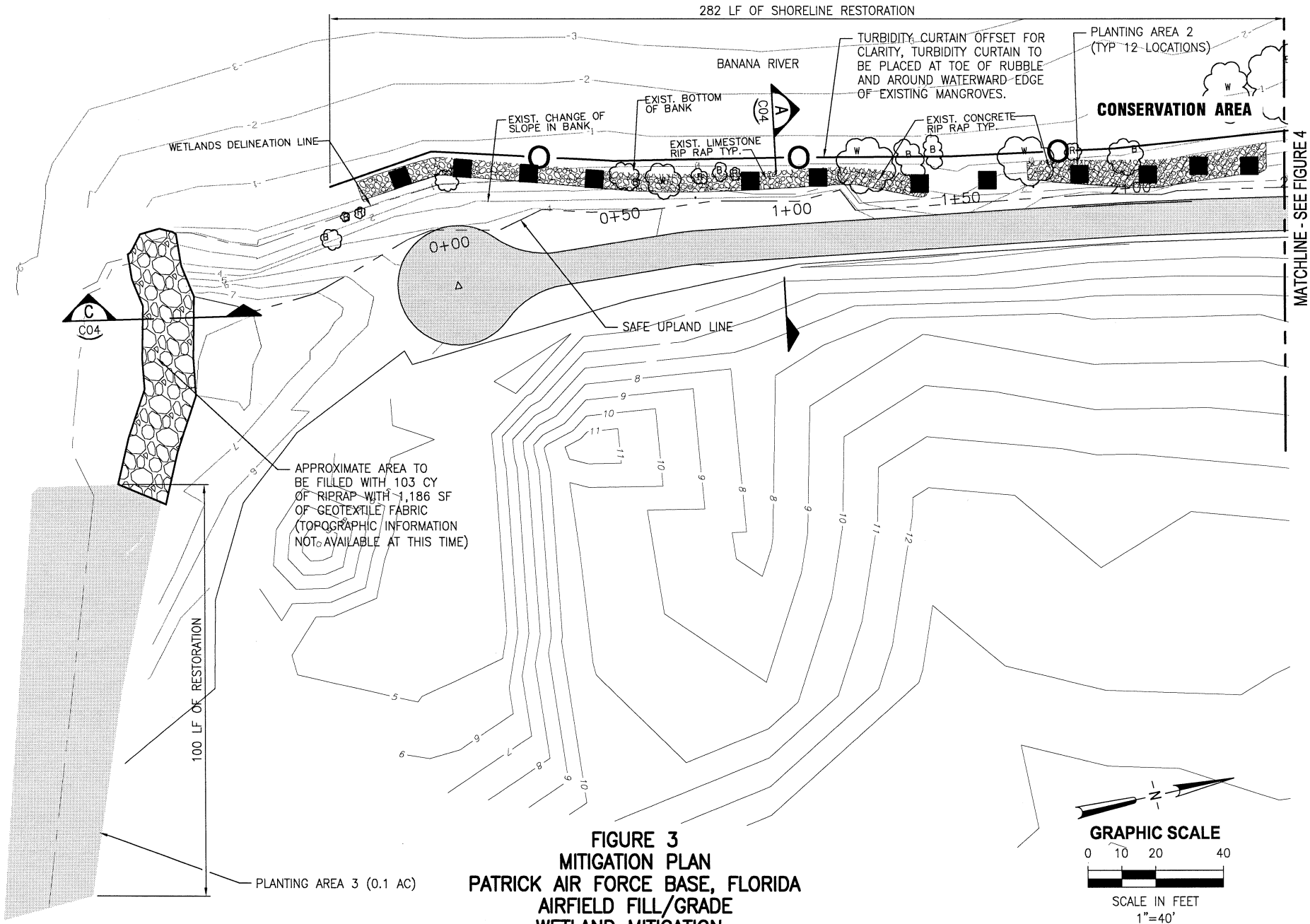
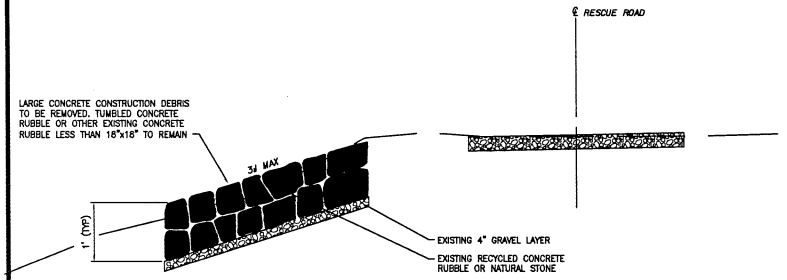


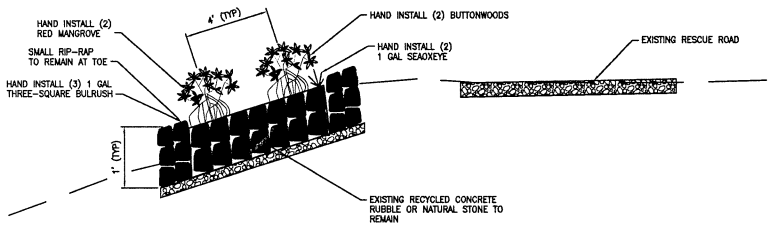
FIGURE 3
MITIGATION PLAN
PATRICK AIR FORCE BASE, FLORIDA
AIRFIELD FILL/GRADE
WETLAND MITIGATION

JONES EDMUNDS

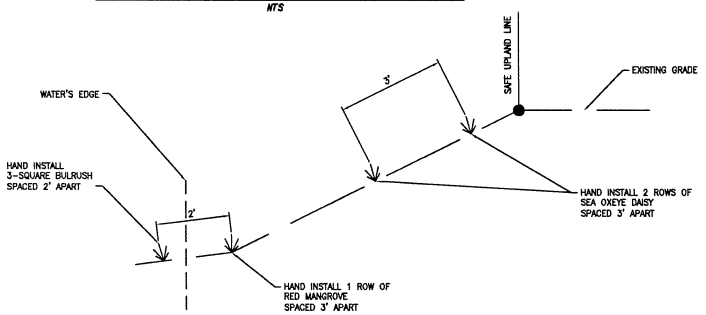
08705-019-01
LAST SAVED: 6/1/2011 9:05 AM KPEREZ \\Jeacad\drafting\19231 PAFB Airfield\001 Fill-Grade ERP\USACE\19231001-03.dwg
Plotted: 7/12/11 2:32pm MGaither



TYPICAL DEMOLITION SECTION FOR RUBBLE ALONG SHORELINE
NTS



TYPICAL RESTORATION SECTION FOR RUBBLE ALONG SHORELINE AREAS 1 AND 2
NTS



TYPICAL RESTORATION SECTION FOR SHORELINE RESTORATION AREA 3
NTS

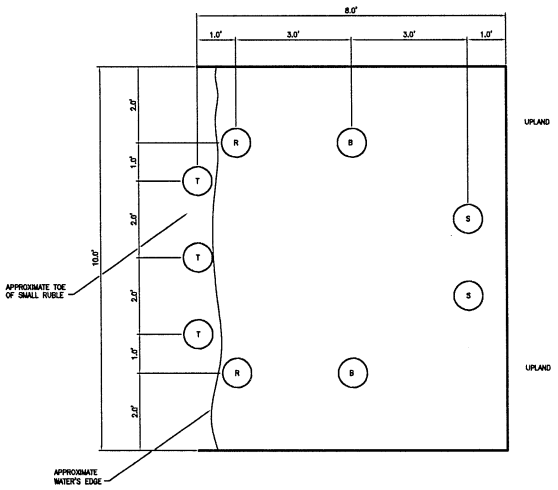
Planting plan for Mitigation Areas 1 and 2 (Combined)

Scientific Name	Common Name	Symbol	Number of Plants*	Size
Scirpus Americanus	Three-Square Bulrush	T	340	1 gal
Rhizophora Mangle	Red Mangrove	R	227	3 gal
Conocarpus Erectus	Buttonwood	B	227	3 gal
Borrichia Frutescens	Seaoxeye Daisy	S	227	1 gal

Planting plan for mitigation Area 3 (100 ft long)

Scientific Name	Common Name	of Plants*
Scirpus Americanus	Three-Square Bulrush	56
Borrichia frutescens	Seaoxeye Daisy	78
Rhizophora mangle	Red mangrove	38

*Includes 10% increase for potential mortality.



TYPICAL PLAN VIEW OF PLANTING PLAN FOR AREAS 1 AND 2
NTS

PLANTING NOTES

1. PLANTING QUANTITIES INCLUDE A 10% INCREASE FOR POTENTIAL MORTALITY.
2. ALL PLANT MATERIAL SHALL BE CONTAINER GROWN FLORIDA #1 OR BETTER AS OUTLINED BY GRADES AND STANDARDS FOR NURSERY PLANTS, DIVISION OF PLANT INDUSTRY, FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES.
3. SUBSTITUTIONS TO PLANTING SCHEDULES CAN BE MADE BY PROJECT SCIENTIST BASED ON PLANT AVAILABILITY AND FINAL SITE CHARACTERISTICS AFTER OBTAINING DISTRICT APPROVAL.
4. PLANTING CONTRACTOR SHALL PROVIDE DOCUMENTATION TO AIR FORCE PROJECT MANAGER AND PROJECT SCIENTIST THAT MITIGATION SITE WAS PLANTED ACCORDING TO DESIGN SPECIFICATIONS (SPECIES, QUANTITY, AND SIZE).
5. PROJECT CONTRACTOR IS SOLELY RESPONSIBLE FOR ANY IMPACTS TO PLANTED VEGETATION WITHIN THE MITIGATION SITES AS A RESULT OF CONSTRUCTION ACTIVITIES.
6. ALL INSTALLED PLANT MATERIAL SHALL COME WITH A SIX MONTH WARRANTY AND ANY PLANT MATERIAL THAT DIES WITHIN THIS PERIOD SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
7. WETLANDS MITIGATION SITE CONSTRUCTION SHALL BE SIMULTANEOUS OR PRIOR TO FILLING OF CANALS.
8. CONTRACTOR SHALL REMOVE SMALL RUBBLE AFTER LARGE RIP RAP IS REMOVED TO CREATE A SPACE FOR ROOT BALL OF PLANT MATERIAL TO BE INSTALLED. CONTRACTOR SHALL REMOVE PLANT MATERIAL FROM POT AND WRAP ROOT BALL W/ BURLAP THEN INSTALL. THE PURPOSE OF THE BURLAP IS TO PROTECT ROOT BALL FROM SOIL LOSS.
9. OWNER OR ITS CONSULTANT SHALL MARK ALL LARGE RIP-RAP TO BE REMOVED WITH SPRAY PAINT.
10. THE PROJECT SCIENTIST OR OWNER SHALL BE PRESENT TO ASSIST THE PLANTING CONTRACTOR IN SELECTING THE APPROPRIATE PLANTING LOCATION FOR SPECIFIC PLANT SPECIES AND METHODS DURING INSTALLATION.

FIGURE 14
PLANTING PLAN
PATRICK AIR FORCE BASE, FLORIDA
AIRFIELD FILL/GRADE
WETLAND MITIGATION

JONES EDMUNDS