FLORIDA ARMY NATIONAL GUARD

FINAL ENVIRONMENTAL ASSESSMENT FOR THE M270 MULTIPLE LAUNCH ROCKET SYSTEM (MLRS) EXPANDED TRAINING USE AREAS AT AVON PARK AIR FORCE RANGE, FLORIDA

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FINDING OF NO SIGNIFICANT IMPACT (FNSI)
FOR
THE M270 MULTIPLE LAUNCH ROCKET SYSTEM (MLRS) EXPANDED TRAINING USE AREAS AT AVON PARK AIR FORCE RANGE, FLORIDA

INTRODUCTION

The Florida Army National Guard (FLARNG) prepared an Environmental Assessment (EA) to identify and evaluate potential environmental effects associated with the expansion of maneuvering areas at Avon Park Air Force Range (APAFR), Florida for the M270 Multiple Launch Rocket System (MLRS). The MLRS, a powerful artillery rocket system, is a major weapon system of the Army National Guard (ARNG) and the Active Component of the U.S. Army. The 3-116th MLRS Battalion at APAFR needs to become certified as combat capable so that the unit will be ready to deploy to combat. The FLARNG prepared the EA in accordance with the National Environmental Policy Act (NEPA, 42 USC § 4321 to 4370e), the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA (CEQ Regulations, 40 CFR Parts 1500-1508), *Environmental Analysis of Army Actions* (32 CFR 651), and *Environmental Impact Analysis Process* (32 CFR 989).

1. Description of the Proposed Action and Alternatives

Proposed Action. The Proposed Action is to expand the 3-116th training and maneuver areas at APAFR to enable the 3-116th to conduct Battalion level MLRS training, fulfilling their training requirements to become certified as combat capable and ready. MLRS training requirements as specified in *Field Manual (FM) 6-60 Tactics, Techniques, and Procedures for MLRS Operations* (U.S. Army, 1999) for Battalion level MLRS training includes section, platoon, and battery certification for a minimum of six weekends per year and one 15-day annual training exercise. This would require the use of one to four maneuver areas per training event, although approval of all six maneuver areas would be optimum. Use of any of the six maneuver areas would provide flexibility for both APAFR and FLARNG. Having six maneuver areas available would allow for rotational use of the areas, so that the areas could recover. During the exercises, the launcher crews would locate suitable firing points within the maneuver area, simulate firing, and then quickly move to hide locations within the maneuver area. There would be no actual firing of rockets during these weekend exercises.

As part of the Proposed Action, the FLARNG would support long-term management of the maneuver areas to ensure the sustainability of the land and their ability to train on the maneuver areas through implementation of the Army's Integrated Training Area Management (ITAM) which is part of the Army's Sustainable Range Program. Policy for the ITAM program is established in Army Regulation 350-9. This regulation defines Headquarters Department of the Army, Major Army Command, and Installation responsibilities, management requirements, and general guidance to implement ITAM. The ITAM establishes procedures to achieve optimum, sustainable use of training lands by implementing a uniform land management that includes inventorying and monitoring land conditions, integrating training goals while minimizing adverse impacts, and providing for training land rehabilitation and maintenance.

Alternatives

In addition to the Proposed Action, the FLARNG analyzed a No Action alternative. Under the No Action alternative, the 3-116th would continue to train at APAFR at battery level. Battery training would consist of a battery being deployed to APAFR and traveling to one maneuver area with predetermined surveyed maneuver points. Once within the maneuver area, the launcher would be restricted in its movements. The launcher would move to a designated maneuver point and seek a hide location within a 100-meter radius of the maneuver point. Training would be limited to the use of a single maneuver area during a training event. The FLARNG would continue to use the maneuver points at APAFR for battery training. They would not be able to identify fire points and hide locations as specified in the Army training doctrine for the MLRS. They would be required to travel to predetermined, surveyed fire points and to maneuver within 100 meters of these points. They would be restricted to a single maneuver area during a training event. The 3-116th would not be able to achieve Battalion-level certification at APAFR. The No Action alternative training does not allow the unit to locate firing points and hide locations, which is part of the Army requirement for combat certification. The FLARNG MLRS unit would be required to continue to travel to Fort Stewart, Georgia for annual training.

2. Environmental Analysis

Based on the analysis contained in the EA, it has been determined that the known and potential impacts of the Proposed Action on noise, air quality, land use, earth resources, water resources, biological resources, socioeconomics, and environmental justice will not be significant. There will be no impacts associated with hazardous waste/hazardous materials or cultural resources.

The Proposed Action will not have disproportionately high or adverse human health and environmental effects on minority and low-income populations near the proposed site nor any adverse health or safety risks to children.

The Proposed Action (to use up to six maneuver areas at APAFR) would have no significant adverse effects on any of the resources evaluated in this EA. There would be no impacts associated with hazardous waste/hazardous materials or cultural resources. Minor, temporary impacts on air quality, noise, land use, earth resources, and socioeconomics would result during the maneuvering exercises. Management actions, which are part of the Proposed Action, would preclude direct effects to wetlands. Disturbance of vegetation and wildlife by training activities would occur at all maneuver areas, primarily from off-road vehicular traffic. Tracked vehicle use would occur only about 30 days (six weekends plus one two-week event) out of the year, providing some interval of opportunity for regeneration of damaged vegetative areas. The FLARNG entered into a formal consultation process with the U.S. Fish and Wildlife Service (USFWS) for several species that would be potentially impacted by the Proposed Action. Based on the USFWS Biological Opinion, there would be "No Effect" or "Not Likely to Adversely Affect" for all species except the eastern indigo snake, which may be adversely affected by tracked-vehicle use. The USFWS issued a permit for six incidental takes for this species. It is the USFWS's biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the species. No critical habitat has been designated for the eastern indigo snake; therefore, none will be affected.

There would be no cumulative effects associated with any of the resources evaluated, except air quality, land use, and biological resources. There would be an overall increase in annual air emissions from APAFR, but these would be extremely low (less than one percent of the total emissions for Polk and Highlands counties). Emission increases would be short-term during exercises or construction. Cumulative impacts to land use would result in a reduction in public access to the range. This impact would be short-term and negligible, when compared to land available for recreation in the local area. Cumulative effects to the indigo snake may occur since other actions at APAFR have also been determined to "Likely to Adversely Affect" this species. These cumulative effects would not jeopardize the continued existence of this species.

MLRS training would not require any irretrievable or irreversible commitments of any resource from either the FLARNG or APAFR.

FLARNG has coordinated the Proposed Action with Native American Tribes who have ancestral ties to APAFR in compliance with Executive Order (EO) 13175 - Consultation and Coordination with Indian Tribal Governments (05 January 2001) and the Annotated Policy Document for the DoD American Indian and Alaska Native Policy (27 October 1999). FLARNG has determined that the Proposed Action would not impact Native American Tribes or any cultural resource.

The Florida Fish and Wildlife Conservation Commission expressed concern for the foraging habitat of the red-cockaded woodpecker (RCW). The FLARNG has agreed to incorporate avoidance considerations outlined in the APAFR Endangered Species Management Plan as they relate to the Proposed Action. Specifically, the Proposed Action will not occur within a 200-foot buffer of any RCW cavity trees or RCW cluster centers, and transient activities such as vehicle maintenance and hand digging within the vicinity of RCW nesting habitat will be limited to two hours or less per day. Also, there will be no assembly area operations, combat support areas, or camouflage netting within the vicinity of RCW nesting habitat. Activities within MA-3 (Delta) may result in noise disturbance to foraging RCWs in 12 acres of foraging habitat. However, the disturbance will be limited to a maximum of 25 days per year. The USFWS stated in their Biological Opinion that potential noise-related effects will be minimal and will not significantly impact RCW foraging habits. Other potential impacts noted by the USFWS included damage to lateral roots of forage trees as a result of vehicular travel and soil compaction, although there is no direct correlation with tree vigor or mortality. The USFWS states that considering the low frequency of training activities throughout the year and the relatively small area of affected foraging habitat within MA-3 (approximately 9 percent of the total area), impacts to forage trees are expected to be negligible. The USFWS supported the FLARNG's determination that the Proposed Action "may affect, but is not likely to adversely affect" the RCW.

MLRS units will be required to strictly adhere to the guidelines provided in the APAFR Soldier's Handbook regarding protection of these resources during training.

Direct effects to wetlands would not occur due to management actions, which are part of the Proposed Action. Disturbance of vegetation and wildlife by training activities would occur at all maneuver areas primarily from off-road vehicular traffic. Tracked vehicle use would occur only about 30 days (six weekends plus one two-week event) out of the year, providing some interval of opportunity for regeneration of damaged vegetative areas.

The eastern indigo snake may be adversely affected by tracked vehicle use. The FLARNG will follow *Standard Protection Measures for the Eastern Indigo Snake* (2002). The FLARNG vehicle and equipment operators will be instructed to avoid all snakes and gopher tortoise burrows if at all possible. Vehicle speeds will remain under 25 miles per hour. Training units will be educated to recognize the eastern indigo snake. If any snake is encountered, it will be avoided or allowed to leave the area on its own before vehicle or equipment use is resumed. The FLARNG will conduct an annual survey of gopher tortoise burrows (habitat for the eastern indigo snake) and will submit an annual monitoring report to the USFWS no later than 30 September each year. Upon locating a dead, injured, or sick individual of a federally listed species, initial notification must be made to the USFWS.

The Army's Integrated Training Area Management (ITAM) Program has the primary responsibility of minimizing impacts to soil and vegetation during and after military training activities. Measures taken by the Land, Rehabilitation, and Maintenance (LRAM) component of ITAM include soil amendments such as acidity neutralization and fertilization; revegetation; and use of erosion-control measures. After heavy training exercises are conducted, areas needing rehabilitation are identified and placed on a schedule to receive soil amendments or reseeding, as needed. Following troop training, impacted areas are fertilized and planted with stabilizing grasses, legumes, or native species. Temporary erosion-control methods such as silt fences or hay bale diversions are employed on an as-needed basis during periods of heavy troop training and inclement weather to avoid excessive siltation to water bodies and other sensitive areas. In addition to the LRAM and other ITAM programs that are responsible for minimizing the effects that training activities have on soil and vegetation, training units also have the responsibility of restoring training areas to ensure that no environmental impacts result from their training activities. After training is completed, training units restore training areas to original conditions, which may include regrading rutted soils and occasionally re-seeding disturbed areas.

In summary, all the potential impacts from the Proposed Action discussed above are considered minor, temporary, and insignificant. The measures discussed above will be taken by FLARNG to minimize and manage these potential impacts. The Proposed Action is not expected to result in any impact that would be adverse enough to necessitate mitigation measures to reduce such an impact to below significant levels.

Mitigation: No mitigation measures will be necessary to reduce any adverse environmental impacts to below significant levels because of the management actions identified as part of the Proposed Action in Section 3.3.1 of the EA.

3. Regulations

There are no indications that implementation of the Proposed Action would violate any Federal, State, or local environmental laws or regulations, including the National Environmental Policy Act or the Council on Environmental Quality regulations.

4. Commitment to Implementation

The National Guard Bureau (NGB) and FLARNG affirm their commitment to implement this EA in accordance with NEPA. Implementation is dependent on funding. The FLARNG and the NGB's Environmental Programs, Training, and Installation Divisions will ensure that adequate funds are requested in future year's budgets to achieve the goals and objectives set forth in this EA.

5. Public Review and Comment

The Draft EA was available for public review and comment during 28 March through 28 April 2005. No public comments were received.

The Final EA and Draft Finding of No Significant Impact (FNSI) were made available for public review and comment from 14 Nov to 29 November 2005. No comments were received.

6. Finding of No Significant Impact

After careful review of the EA, I have concluded that implementation of the Proposed Action would not generate significant controversy or have a significant impact on the quality of the human or natural environment. This analysis fulfills the requirements of NEPA and the CEQ Regulations. An Environmental Impact Statement will not be prepared, and the National Guard Bureau and U.S. Air Force are issuing this Finding of No Significant Impact.

GERALD I. WALTER
Colonel, U.S. Army
Chief, Environmental
Programs Division
20 DEC 05
Date

MARYANN H. CHISHOLM
Colonel, U.S. Air Force
Chief, Programs Division (A7Z)
24 JAN 06
Date

7. Air Combat Command Addendum to the Finding of No Significant Impact

After careful review of the EA and Army Finding above, which are hereby incorporated by reference, I have concluded that implementation of the Proposed Action would not generate significant controversy or have a significant impact on the quality of the human or natural environment. For the sake of clarification, it should be noted that public access to the Range is controlled in accordance with AFI 13-212. This analysis fulfills the requirements of NEPA and the CEQ Regulations. Air Combat Command has independently evaluated the EA, which is hereby approved as to scope and content as consistent with the Air Force EIAP requirements. An Environmental Impact Statement will not be prepared, and the Air Combat Command is issuing this Finding of No Significant Impact.

MARYANN H. CHISHOLM
Colonel, U.S. Air Force
Chief, Programs Division (A7Z)

26 Jan 06
Date

FINAL ENVIRONMENTAL ASSESSMENT FOR THE M270 MULTIPLE LAUNCH ROCKET SYSTEM (MLRS) EXPANDED TRAINING USE AREAS AT AVON PARK AIR FORCE RANGE, FLORIDA

Prepared For

Florida Army National Guard
Department of Military Affairs
Avon Park Air Force Range, Florida

November 10, 2005

ENVIRONMENTAL ASSESSMENT

M270 MULTIPLE LAUNCH ROCKET SYSTEM (MLRS) EXPANDED TRAINING USE AREAS AT AVON PARK AIR FORCE RANGE, FLORIDA

FLORIDA ARMY NATIONAL GUARD

Reviewed by:

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LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS

μ/m^3	Micrograms per Cubic Meter
18 ASOG DET 1 OL A/CEV	Environmental Flight
3-116th	Florida Army National Guard 3rd Battalion, 116th Field Artillery
AAGTC	Avon Park Air-Ground Training Complex
AAMDC	32nd Army and Missile Defense Command
ACC	Air Combat Command
AFB	Air Force Base
AFI	Air Force Instruction
AFRIMS	Air Force Restoration Information Management System
AIRFA	American Indian Religious Freedom Act
ALOC	Administration and Logistics Operations Center
AO	Area of Operations
AOC	Area of Concern
APAFR	Avon Park Air Force Range
APYA	Avon Park Youth Academy
ASOG	Air Support Operations Group
ASP	Ammunition Supply Point
AST	Aboveground Storage Tank
AT	Annual Training
ATCAA	Air Traffic Control Airspace
ATV	All Terrain Vehicles
AUM/ha	Animal Unit Month per Hectare
AvPCI	Avon Park Corrections Institute
BDU	Simulated Bomb Unit (Bomb Dummy Unit)
BOC	Battery Operations Center
BRAC	Base Realignment and Closure Commission
C&D	Construction and Demolition
CAA	Clean Air Act
CAMP	Corrective Action Management Plan
CAP	Central Accumulation Point
CAS	Close Air Support
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CP	Command Post
CSAR	Combat Search and Rescue
CY	Calendar Year
dB	Decibels
dBA	A-Weighted Decibels
DFC	Desired Future Condition
DoD	Department of Defense
DOT	Department of Transportation
DRMO	Defense Reutilization and Marketing Organization
EA	Environmental Assessment
ENSO	El Niño-Southern Oscillations
EOD	Explosive Ordnance Disposal
EPCRA	Emergency Planning and Community Right-to-Know Act
ERP	Environmental Restoration Program
FAA	Federal Aviation Administration
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FEMA	Federal Emergency Management Agency

LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS CONT'D

FGS	Florida Grasshopper Sparrow
FLARNG	Florida Army National Guard
FM	Field Manual
FNAI	Florida Natural Areas Inventory
FNSI	Finding of No Significant Impact (Army acronym)
FO	Forward Observers
FONPA	Finding of No Practicable Alternative
FONSI	Finding of No Significant Impact (Air Force acronym)
FORSCOM/ARNG/USAR	U.S. Army Forces Command/Army National Guard/U.S. Army Reserves
FP	Firing Point
FSJ	Florida Scrub Jay
FW	Fighter Wing
FWC	Florida Fish and Wildlife Conservation Commission
GIS	Geographic Information System
GPS	Global Positioning System
HE	High Explosive
HEMAT	Heavy Expanded-Mobility Ammunition Trailer
HEMTT	Heavy Expanded-Mobility Tactical Truck
HHSB	Headquarters and Headquarters Service Battery
HIMARS	High Mobility Artillery Rocket System
HMMWV	High Mobility Multi-Wheeled Vehicles
HMU	Habitat Management Units
HQ	Headquarters
hrs	Hours
HSWA	Hazardous and Solid Waste Amendment
HUD	Housing and Urban Development
HWMP	Hazardous Waste Management Plan
HWTTF	Hazardous Waste Thermal Treatment Facility
Hz	Hertz
INRMP	Integrated Natural Resources Management Plan
IP	Individual Permit
JIFE	Joint Integrated Fires Exercise
kg	Kilogram
km^2	Square Kilometers
Kpa	Soil-vehicle ground pressure
L_{dn}	Day-Night Average Sound Level
L_{eq}	Equivalent Sound Level
$L_{eq(24)}$	24-hour Equivalent Noise Level
L_{max}	Maximum Sound Level
LAA	Likely to Adversely Affect
LQG	Large-quantity Generator
MA	Maneuver Area
MAP	Management Action Plan
MBS	Munitions Burial Site
MLRS	Multiple Launch Rocket System
mm	Millimeter
MOA	Military Operations Area
mph	Miles per Hour
MU	Management Unit
MUTA	Multiple Unit Training Assembly
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NDAA	National Defense Authorization Act
NE	No Effect

LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS CONT'D

NEI	National Emissions Inventory
NEPA	National Environmental Policy Act
NGB	National Guard Bureau
NHPA	National Historic Preservation Act
NLAA	Not Likely to Adversely Affect
NO_2	Nitrogen Dioxide
NPL	National Priorities List
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRIS	National Register Information System
NSLP	National Soils Landscape Positions
NWI	National Wetlands Inventory
O_3	Ozone
OB/OD	Open Burn/Open Detonation
OPAREA	Operational Area
Pb	Lead
PM_{10}	Particulate Matter Less Than 10 Microns in Diameter
$PM_{2.5}$	Particulate Matter Less Than 2.5 Microns in Diameter
POL	Petroleum, Oil, and Lubricants
Ppm	Parts per Million
PSD	Prevention of Significant Deterioration Program
RA	Restricted Area
RCRA	Resource Conservation and Recovery Act
RCW	Red-cockaded Woodpecker
RETS	Remoted Target Systems
ROI	Region of Influence
RRPR	Reduced Range Practice Rocket
RTLA	Range and Training Land Analysis
SAP	Satellite Accumulation Point
SEL	Sound Exposure Level
SER	Significant Emissions Rate
SFCC	South Florida Community College
SFWMD	South Florida Water Management District
SHPO	State Historic Preservation Officer
SHWT	Seasonal High Water Table
SO_2	Sulfur Dioxide
SRP	Sustainable Range Program
SWMU	Solid Waste Management Unit
TACPs	Tactical Air Controller Parties
$TiCl_4$	Titanium Tetrachloride
TOC	Tactical Operations Center
TSB	Training Support Battalion
U.S.	United States
U.S.C.	United States Code
UMCP	Unit Maintenance Control Point
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	Underground Storage Tank
UTES	Unit Training Equipment Site
UXO	Unexploded Ordnance
VA	Veterans Administration

LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS CONT'D

VOC	Volatile Organic Compound
WSF	Weapon Safety Footprint
WWII	World War II

EXECUTIVE SUMMARY

This document describes the potential consequences to the human and natural environment from the implementation of various alternatives considered by the Florida Army National Guard (FLARNG) for the expansion of maneuvering areas at Avon Park Air Force Range (APAFR), Florida for the M270 Multiple Launch Rocket System (MLRS). The 3-116th MLRS Battalion at APAFR needs to become certified as combat capable so that the unit will be ready to deploy to combat. The role of the MLRS battalion in combat is to provide close support to maneuver units, protect the force with counter fire, attack operational targets for the division, corps, Marine air ground task force, or joint task force commander, and operate in support of theater missile defense. Expanded maneuver training at APAFR would permit the 3-116th Battalion to accomplish all phases of required training and to permit certification.

In order for a commander to deem his unit ready for combat, the unit must pass an annual certification on tasks stipulated in Army training doctrine Field Manual (FM) 6-60, which provides the methods and standards for MLRS training. Each level, from the highest, or battalion, to battery, platoon, and section, must demonstrate proficiency in specific tasks designed to replicate the unit's wartime functions. For example, when occupying a new area, Army doctrine states that each section "moves to a new firing area and selects firing points and hide areas" (U.S. Army, 2004). MLRS launcher crewmembers must train to develop their skills in firing and hide area selection, as well as in navigation and positioning, which are the fundamental MLRS field crew skills in accordance with FM 6-60. Each launcher section chief is responsible for final selection and verification of the firing points and hide areas. Should a section not be able to perform the tasks properly during the annual certification, the commander would deem the section unfit for combat and the section would be retrained. Each battery and platoon must pass similar evaluations. These tasks are performed over six weekends and one 15-day annual training exercise per year.

Expansion of training and maneuvering for the 3-116th at APAFR would provide an environment in which the Battalion would be able to accomplish all phases of required training, including firing point and hide area selection, in order to pass annual certification. Battalion level training includes section, platoon, and battery certification for up to eight tactical field exercises. The typical training event for the FLARNG is conducted on a weekend. Under the typical scenario, the 3-116th would require six weekends per year and one 15-day annual training exercise. These exercises would require the use of one to four maneuver areas per weekend training exercise and four during the 15-day annual training. Currently, the 3-116th is limited to a scaled-down version of battery certification at APAFR.

ENVIRONMENTAL IMPACT ANALYSIS PROCESS

This document was prepared in accordance with the requirements of the National Environmental Policy Act (NEPA) of 1969, and NEPA regulations of the Council on Environmental Quality (CEQ) of 1978, the Army, and the Air Force (40 Code of Federal Regulations [CFR] Part 1508, 32 CFR Part 651, 32 CFR Part 989, respectively). The FLARNG is the lead agency and the Air Force is a cooperating agency.

After considering the potential environmental impacts described in this document, the FLARNG will decide whether to implement the Proposed Action, an alternative action, or to select the No Action Alternative. Approval of up to four out of the proposed six maneuver areas would allow the 3-116th battalion to train at APAFR and to permit certification as ready to deploy.

PURPOSE AND NEED FOR THE PROPOSED ACTION

Purpose

The purpose of the action is to expand maneuvering opportunities at APAFR, providing the FLARNG with the training capability necessary to certify the MLRS Battalion as combat-ready. Expanded maneuver training at APAFR would permit the 3-116th Battalion to accomplish all phases of required training and to permit certification. The current training and maneuver area is suitable only for limited training.

Need for the Action

Currently, the 3-116th can train only a battery or smaller element (such as a section) at a given time on APAFR. This means that the FLARNG can schedule only one maneuver area during a weekend training exercise, severely impacting the unit's ability to certify its mission proficiency. Travel to and from the training areas is allowed only on specifically designated roads and trails. Maneuvering is allowed only within circles having a 100-meter radius at predetermined, surveyed, and marked maneuver points. The launcher crewmembers and section chiefs are not afforded the opportunity to develop the fundamental skill of selecting suitable firing points and hide areas. Due to these restrictions on training areas and limits on the numbers of personnel and equipment in the field, the 3-116th MLRS cannot currently accomplish full combat-capable certification at APAFR.

The use of up to four maneuver areas simultaneously, the ability to select firing points and hide locations, and the six weekends and one 15-day annual training exercise, as analyzed in this EA, would allow the Battalion to train fully for certification. The Battalion is currently certified during a 15-day annual training exercise at Fort Stewart, Georgia. This does not allow the section, platoon, and battery the level of practice and skill development as required by Army training doctrine, which includes six weekends of exercises.

Proposed Action and Alternatives

The Proposed Action is to expand the 3-116th training and maneuver areas at APAFR to enable the 3-116th to conduct Battalion level MLRS training, fulfilling their training requirements to become certified as combat capable and ready. Battalion level MLRS training includes section, platoon, and battery certification for a minimum of six weekends per year and one 15-day annual training exercise. This would require the use of one to four maneuver areas per training event, although approval of all six maneuver areas would be optimum. Use of any of the six maneuver areas would provide flexibility for both APAFR and FLARNG. For example, if only four were provided and if APAFR had a scheduling conflict with one area, the FLARNG would not have sufficient maneuver areas available. Having six maneuver areas available would allow for

rotational use of the areas, so that the areas could recover. During the exercises, the launcher crews would locate suitable firing points within the maneuver area, simulate firing, and then quickly move to hide locations within the maneuver area. There would be no actual firing of rockets during these weekend exercises.

As part of the Proposed Action, the FLARNG would support long-term management of the maneuver areas to ensure the sustainability of the land and their ability to train on the maneuver areas through implementation of the Army's Integrated Training Area Management (ITAM) Program. Policy for the ITAM program is established in Army Regulation 350-4. This regulation defines Headquarters Department of the Army, Major Army Command, and Installation responsibilities, management requirements, and general guidance to implement ITAM. The ITAM establishes procedures to achieve optimum, sustainable use of training lands by implementing a uniform land management that includes inventorying and monitoring land conditions, integrating training goals while minimizing adverse impacts, and providing for training land rehabilitation and maintenance.

Alternatives to the Proposed Action would include limiting the number of proposed maneuver areas or excluding some from consideration.

The No Action Alternative would be for the 3-116th to continue training at APAFR at the battery level. Battery training would consist of a battery being deployed to APAFR and traveling to one maneuver area with predetermined, surveyed maneuver points. Once within the maneuver area, the launcher would be restricted in its movements. The launcher would move to a designated maneuver point and seek a hide location within a 100-meter radius of the maneuver point. Training would be limited to the use of a single maneuver area during a training event. The No Action Alternative training does not allow the unit to locate firing points and hide locations, which is part of the Army requirement for combat certification. The FLARNG MLRS unit would be required to continue to travel to Fort Stewart, Georgia, for annual training. Fort Stewart ranges from 355 to 392 miles from the home stations of the 3-116th. These distances exceed the 25 percent travel rule (or 80 miles) from the home station for weekend training. This Alternative does not meet the FLARNG MLRS need for consistent realistic training and does not support Army doctrinal requirements for combat-ready MLRS units.

ENVIRONMENTAL CONSEQUENCES

This document analyzes each of the potential environmental consequences that could occur as a result of implementing the alternatives. Ten categories of environmental resources were used to analyze the possibility of environmental impacts and to measure the magnitude of those impacts. Each of the 10 resources analyzed is described in the following text. A brief summary of the anticipated environmental consequences is included.

Noise

Noise, often defined as unwanted sound, is one of the most common environmental issues associated with human activities, especially around areas supporting military training. Based on numerous sociological surveys and recommendations of federal interagency councils, the most

common benchmark is a Day-Night Average Sound Level of 65 dBA (A-weighted decibels). Public annoyance is the most common impact associated with exposure to elevated noise levels. When subjected to Day-Night Average Sound Levels of 65 dBA, approximately 12 percent of persons so exposed will be "highly annoyed" by the noise. At levels below 55 dBA, the percentage of annoyance is correspondingly lower (less than 3 percent). The percentage of people annoyed by noise never drops to zero, but at levels below 55 dBA, the noise is reduced enough to be essentially negligible (Finegold et al., 1994).

Primary sources of noise in the MAs during these training activities would be tracked- and wheeled-vehicle traffic and movement. To assess potential noise associated with the use of the proposed maneuver areas by a firing battery, vehicle use scenarios were developed for the largest (MA 2 with 670 acres) and smallest (MA 3 with 133 acres) areas. This is because the size of the MA affects how noise sources are distributed spatially within the area and outside the MA boundary.

The maximum noise level over a 24-hour period ($L_{eq(24)}$) ranged from 61.5 dBA for the largest MA to 68.3 dBA for the smallest MA at 100 feet from the boundary of the maneuver area. Noise from the other MAs at 100 feet would be between this range. Noise levels quickly decreased further from the MA boundary to less than 60 dBA at 1,000 feet from the MA boundary. Due to the conservative nature of the scenarios, actual levels resulting outside the MA would be expected to be lower. Noise resulting from maneuver area activities is well below the 65 dBA benchmark, except for the area immediately near (within 100 feet of) the MA boundary.

Air Quality

Air quality is determined by the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions. Pollutant concentrations are compared to the National Ambient Air Quality Standards (NAAQS) and state air quality standards to determine potential effects. These standards represent the maximum allowable atmospheric concentration that may occur and still protect public health and welfare, with a reasonable margin of safety. The NAAQS identify maximum allowable concentrations for the following criteria pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter less than 10 microns in diameter (PM_{10}), and lead (Pb) (40 CFR 50).

Based on measured ambient air pollutant concentrations, the USEPA designates whether or not counties within the United States are meeting the NAAQS. If so, the county is said to be in "attainment." Because APAFR is within Polk and Highlands Counties and these counties are in attainment, then APAFR is in attainment.

An air emissions inventory qualitatively and quantitatively describes the amount of emissions from a facility or within an area. Emissions inventories are designed to locate pollution sources, define the type and size of sources, characterize emissions from each source, and estimate total mass emissions generated over a period of time, normally a year. These annual rates are typically represented in tons per year. Emissions generated from the proposed project were calculated and compared to the combined emissions from Highlands and Polk Counties. The contribution of the MLRS training to the annual regional emission estimate is less than 1 percent, which is below the established threshold of 10 percent for the combined counties.

Traffic on unpaved roads creates dust based on the weight of the vehicles used as well as the amount of time the vehicles are operating. This "fugitive dust" would increase during training events by approximately 82 tons per year for the Proposed Action. This would be a short-term temporary impact that would occur only on weekends or during the 15-day annual training.

Land Use

Land use generally refers to the way land is developed and used in terms of the kind of human activities that occur, such as residential, commercial, industrial, agricultural, military, and recreational uses. APAFR is a strategic defense installation and is managed for military activities. Other uses, such as cattle grazing, timber management, and recreation are permitted if they do not interfere with military use.

The Proposed Action would expand the use of APAFR for military training by approximately 2.5 percent, if all six MAs were used. These areas would be closed to recreational users during training exercises, which would occur up to 22 days per year. Timber management practices would likely change to accommodate the MLRS mission. There would be minimal impacts to cattle grazing.

Noise is one of the major factors in determining appropriate land uses. Noise levels during maneuvering are below the 65 dBA benchmark, except close (100 feet) to the maneuver area boundary. These noise levels are compatible with the current use of APAFR as a military installation and with the regional land use adjacent to MAs 1 and 6, which is agricultural. Impacts would be minimal due to the short duration and the relatively low levels remaining within the APAFR boundary. The closest noise sensitive area is the cantonment area, where personnel maintain offices. Noise generated from maneuvering at this distance from the MA boundaries would not be perceptible from the baseline noise, which is predominantly from aircraft use of the range.

Earth Resources

Earth resources include physical features, predominant soil types, natural soil landscape positions, and soil-water processes at APAFR. For the analysis, MLRS mission activity impact scenarios were developed that would conservatively estimate the amount of proposed maneuver area (MA) that would be impacted by vehicle movements. Based on the scenarios, a screening index was developed to evaluate potential soil disturbance, including rutting and compaction.

Based on the scenarios, most of the soils within the six MAs would be highly sensitive to soil compaction and rutting. This impact would be minor because of the limited area (only 2.5 percent of the range) proposed for maneuvering. The management actions that will be part of the Proposed Action would reduce these impacts. These actions include maintenance to roads and trails, preventing overuse of MAs through rotation of the MAs to allow for recovery, planting vegetation after training exercises to minimize erosion, avoiding wet areas, and implementing soil recovery protocols to alleviate damage caused by rutting and compaction.

Water Resources

The majority of vehicular traffic would take place along constructed and established roads in designated upland (non-wetland areas). No direct effects on wetlands are anticipated due to the management actions that will be incorporated into the Proposed Action. During maneuver training, military troops and vehicles would avoid sensitive resources, including wetlands, seepage slope wetland areas, and surface waters. To avoid accidental contact with wetland resources, APAFR will provide the launch and other vehicles with global positioning system (GPS) coordinates of these sensitive areas. Wetland boundaries that are not obvious (for example, along a road or stream) would be marked.

There may be some indirect effects, which cannot be quantified, due to the random nature of the maneuvering and the use of multiple MAs. Soil rutting and compaction may alter the flow of water, which can lead to secondary impacts to vegetative cover. This is observed when water flow is channeled away from plant communities and water and nutrient supplies are diverted elsewhere. As part of the Proposed Action, the FLARNG would support long-term management of the MAs to prevent long-term degradation.

Biological Resources

Use of the maneuver areas would potentially result in an increase in successional or introduced plant species, an increase in annual plants, and a decrease in long-lived perennials (FLARNG, 1996). A tracked vehicle does not always remove vegetation with each pass, but where this does occur because of locked-tracked turns or multiple passes, natural revegetation would occur if the area were left undisturbed for a period of time (FLARNG, 1996). Disturbance from vehicular traffic may favor early successional plant species and wildlife that utilize these habitats.

Small mammals and herpetofauna (for example, snakes and frogs) may be disturbed by tracked-vehicle traffic. Tracked vehicles may directly injure or kill small animals, or indirectly injure, kill or displace them as a result of collapsing burrows in which they live, or destroy their nests and eggs in the ground. The eastern indigo snake occurs throughout APAFR and is often associated with gopher tortoise burrows. This species may be affected by tracked-vehicle use. The FLARNG would take measures to minimize the potential for impact from tracked vehicles to the indigo snake. Annual surveys of the MAs for gopher tortoise burrows, and subsequent relocation of the inhabitants, or alternately, marking the burrows as an area to be avoided during training will minimize tracked-vehicle impacts. Given that tracked-vehicle use at APAFR would occur about 30 days out of the year, which is about 8 percent of the total number of days in a year, over 90 percent of the time there would be no tracked vehicle operations and therefore no potential impact to small mammals and reptiles. Additionally vehicle speeds would remain under 25 miles per hour, slow enough to sight and avoid indigo snakes. Thus, while tracked vehicles may affect individuals at certain times of the year, this activity would not result in long-term, adverse impacts to populations of indigo snakes. Education and instruction on how to identify and avoid indigo snakes is part of the current training for the FLARNG at APAFR. All FLARNG MLRS operators are required to see a video on the environmental resources at APAFR and how to avoid potential problems. The FLARNG has developed a *Soldier's Field Card*, which is a guide to protecting the natural and cultural resources at APAFR.

Portions of all the MAs contain Habitat Management Units (HMUs) for the red-cockaded woodpecker (RCW), a federally listed endangered species. HMUs were identified in the *Plan for Management of the Florida Grasshopper Sparrow, Florida Scrub jay, and Red-cockaded Woodpecker at Avon Park Air Force Range, Florida* (U.S. Air Force, 2000a) as areas that are both currently occupied with and have the potential for occupation of three bird species, which are either threatened or endangered. However, there are no RCW-inhabited trees in the proposed MAs. Additionally, none of the MAs contain HMUs for the Florida scrub jay (FSJ) or the Florida grasshopper sparrow.

Other federally listed threatened or endangered species noted to occur in surrounding areas but not confirmed at APAFR would not be affected by the Proposed Action. These species include the sand skink, the bluetail mole skink, the Highlands tiger beetle, and the snail kite. Species not known to nest at APAFR such as the wood stork would not be affected by MLRS tracked-vehicle use. Tracked-vehicle use would not occur in forage area for this species. The Florida panther is not known to utilize APAFR and thus would not be affected by the Proposed Action.

There are no protected plants or Florida Natural Areas Inventory rare plant species occurring on any of the MAs. Four of the MAs contain from one to two invasive plant species.

Hazardous Material and Hazardous Waste Management

Impacts associated with hazardous materials and waste from ground troop movements are related to the production and disposal of graywater (shower and sink wash water) during field operations and the use, disposal, and spill management of petroleum, oils, and lubricants (POLs) associated with vehicle maintenance and fueling.

Graywater would be produced and disposed during field operations. Use, disposal, and spill management associated with POL during vehicle fueling and maintenance would occur. Adherence to established management requirements and regulations for handling and disposal would be required across all Alternatives. No adverse impacts associated with Environmental Restoration Program (ERP) sites or storage tanks are anticipated under any Alternatives, since ground movement of troops and vehicles would avoid these areas.

Cultural Resources

Cultural resources comprise prehistoric or historic sites, districts, buildings, structures, objects, and other evidence of human activity. These include: archaeological resources, historic architectural and engineering resources, and traditional cultural properties. Archaeological resources are locations where human activity has altered the earth or left deposits of physical remains such as stone tools, bottles, structure ruins. Historic architectural and engineering resources include standing buildings, dams, canals, bridges, and roads. Buildings generally must be 50 years or older, although military structures from the Cold War era (1946 to 1989) can be considered significant if they are of exceptional importance to the Cold War military mission. Traditional cultural properties are associated with the practices and beliefs of a living community. Significant cultural resources are those that are eligible or potentially eligible for inclusion in the National Register of Historic Places (NRHP), or that are important to traditional groups as outlined in the *American Indian Religious Freedom Act* (AIRFA), the *Native American*

Graves Protection and Repatriation Act (NAGPRA), Executive Order 13007, *Indian Sacred Sites,* and Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*. Cultural resources that are unevaluated for NRHP-eligibility are treated as potentially eligible until evaluation is complete. The evaluation is accomplished through surveys and research on identified artifacts accomplished by professional archeologists.

The six MAs have been surveyed according to standard State Historic Preservation Officer (SHPO) procedures for Florida. The surveys identified a total of 10 cultural resources, none of which are considered to be eligible for the NRHP. In the case of inadvertent discovery of cultural resources during the Proposed Action, FLARNG would initially follow the *Soldier's Field Card – A Guide to Protecting Natural and Cultural Resources, Avon Park Air Force Range, Florida* (FLARNG, no date). This requires the soldiers to report to the Environmental Flight any artifacts uncovered during training activities and to mark the location. To continue maneuver training in the discovery area, the FLARNG would comply with procedures identified in chapters 5 (Construction Monitoring Procedures) and 8 (Native American Concerns) of the APAFR Cultural Resources Management Plan (U.S. Air Force, 2003b). If, in consultation with the Florida SHPO, any inadvertently discovered cultural resources were determined to be NRHP-eligible, these would be marked, identified on maps, and avoided by the MLRS units during training. No vehicles or bivouac sites would be permitted on or within NRHP-eligible sites or within 200 feet of marked cemeteries or human burials. The FLARNG would identify and avoid cultural sites in the MAs as requested by the Miccosukee Tribe in their 18 October 2005 letter.

Socioeconomics

The primary focus of socioeconomics is on the sectors of the economy associated with agriculture and recreation, since these form the basis of the socioeconomic resources of APAFR. Increased government expenditures at APAFR for military purposes would result in an increase in community-based employment of two full-time jobs and a decrease in visitors to APAFR for hunting and recreation–a small loss (two full-time jobs) in community-based employment that would offset the positive change attributable to increased military use. There would be annual revenue reductions of approximately $6,000 and $8,000 to the forestry (timber management) and fish and wildlife programs, respectively, which are considered minor. The impacts to cattle grazing program revenues would be negligible.

Environmental Justice and Protection of Children

Executive Order 12898, *Environmental Justice*, was issued by the President on 11 February 1994. Environmental justice, as it pertains to this document, includes identification of minority and low-income populations and a determination as to whether the proposed federal action or any of the alternatives would have disproportionately high and adverse health or environmental effects on these populations.

In 1997, EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks (Protection of Children),* was issued to identify and address issues that affect the protection of children. Demographic data specific to the distribution of population by age were evaluated.

Resource impacts described in this document were reviewed to determine whether the project alternatives would cause adverse health or environmental effects on populations above accepted standards or thresholds. Based on this analysis, there would be no disproportionately high and adverse human health or environmental effects on minority or low-income populations or any adverse effects on children.

CONCLUSIONS

The 3-116th Battalion requires a minimum of four MAs where they can train all levels from Section up to Battalion according to Army doctrine in the MLRS. Training would occur over six weekends and one 15-day training event per year. Training doctrine requires that MLRS launch operators identify suitable firing points and hide points within a maneuver area. Currently, the 3-116th is limited to use of a single MA during a training event and must use only predetermined surveyed points and remain within a 100-meter radius of the maneuver point.

The Proposed Action to use up to six MAs at APAFR would have no significant adverse effects on any of the resources evaluated in this EA. There would be no impacts associated with hazardous waste/hazardous materials or cultural resources. Minor, temporary impacts on air quality, noise, land use, earth resources, and socioeconomics would result during the maneuvering exercises. Management actions, which are part of the Proposed Action, would preclude direct effects to wetlands. Disturbance of vegetation and wildlife by training activities would occur at all MAs primarily from off-road vehicular traffic. Tracked-vehicle use would occur only about 30 days (six weekends plus one two-week event) out of the year, providing some interval of opportunity for regeneration of damaged vegetative areas.

The eastern indigo snake may be affected by tracked-vehicle use. However, measures would be taken by the FLARNG to avoid any long-term impacts to the population or their habitats. Periodic surveys of the MAs for gopher tortoise burrows, and subsequent relocation of the inhabitants will minimize tracked vehicle impacts. Vehicle speeds would remain under 25 miles per hour, slow enough to sight and evade indigo snakes. Thus, while tracked vehicles may affect individuals at certain times of the year, this activity would not result in long-term, adverse impacts to populations of indigo snakes. Education and training awareness on how to identify and avoid indigo snakes is part of the current training at APAFR for FLARNG units.

Under the No Action Alternative, the FLARNG would continue to use the maneuver points at APAFR for battery training. They would not be able to identify fire points and hide locations as specified in the Army training doctrine for the MLRS. They would be required to travel to predetermined, surveyed fire points and to maneuver within 100 meters of these points. They would be restricted to a single MA during a training event. The 3-116th would not be able to achieve Battalion-level certification at APAFR. There would be no significant adverse impacts on any of the resources evaluated in this EA.

Based on the findings of this EA, the Proposed Action of expanding the maneuver training to the proposed six MAs would not result in significant impacts to any natural, cultural, physical, or socioeconomic resource, and would be preferred over use of less than six of the MAs or the No Action Alternative.

ENVIRONMENTAL ASSESSMENT ORGANIZATION

This Environmental Assessment (EA) addresses the Florida Army National Guard's Proposed Action to expand the 3rd Battalion of the 116th Field Artillery Regiment's (3-116th) Multiple Launch Rocket System (MLRS) training and maneuver area (MA) at Avon Park Air Force Range (APAFR), Florida. As required by 32 CFR 651 and NEPA, the potential environmental and socioeconomic effects of implementing this action have been analyzed.

The ***EXECUTIVE SUMMARY*** briefly described the Proposed Action, environmental and socioeconomic consequences, and management requirements.

A LIST OF ACRONYMS is provided immediately following the Table of Contents.

SECTION 1: ***PURPOSE AND NEED*** summarizes the purpose of and need for the Proposed Action, and discusses the scope of the document.

SECTION 2: ***SELECTION CRITERIA FOR ALTERNATIVE IDENTIFICATION*** discusses the development of alternatives to the Proposed Action and the No Action Alternative.

SECTION 3: ***PROPOSED ACTION AND ALTERNATIVES*** describes the Proposed Action to expand the 3-116th MLRS training and maneuver area at APAFR, Florida.

SECTION 4: ***AFFECTED ENVIRONMENT*** describes the existing conditions of each resource for which the Proposed Action and alternatives, including the No Action Alternative, are evaluated.

SECTION 5: ***ENVIRONMENTAL CONSEQUENCES*** presents the potential effects of implementing the Proposed Action and alternatives, including the No Action Alternative, on the resources described in Section 4, as well as management recommendations.

SECTION 6: ***CUMULATIVE EFFECTS AND IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES*** identifies actions that are being considered on or near the action area that may have a potential to interact with the Proposed Action in this EA, and discusses the potential for cumulative impacts on the resources described in Section 4.

SECTION 7: ***CONCLUSIONS*** summarizes the information presented in Section 5 and provides the conclusions of the EA.

SECTION 8: ***REFERENCES*** presents bibliographical information about the sources used to prepare the EA.

ENVIRONMENTAL ASSESSMENT ORGANIZATION CONT'D

SECTION 9: ***PERSONS AND AGENCIES CONTACTED*** lists the individuals and agencies consulted during the preparation of the EA.

SECTION 10: ***LIST OF PREPARERS*** provides information on the persons who prepared the EA.

SECTION 11: ***GLOSSARY*** provides definitions of key terms discussed in the EA.

APPENDIX A: MLRS Organization and Equipment
APPENDIX B: Detailed Description of the MLRS Battalion's Training Cycle
APPENDIX C: Selection Criteria Used in the Environmental Assessment for the Conversion of the 8-Inch Howitzer Weapon System to the Multiple Launch Rocket System
APPENDIX D: Technical Supporting Material for Air Quality
APPENDIX E: Technical Supporting Material for Land Use
APPENDIX F: Technical Supporting Material for Earth Resources
APPENDIX G: Technical Supporting Material for Water Resources
APPENDIX H: Technical Supporting Material for Biological Resources
APPENDIX I: Agency Correspondence
APPENDIX J: Sustainable Range Program/Integrated Training Area Management Program
APPENDIX K: FLARNG Coordination with U.S. Fish and Wildlife Service
APPENDIX L: Source Information for Map Features Associated with GIS Figures

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1. PURPOSE AND NEED

1.1 INTRODUCTION

The Florida Army National Guard (FLARNG) proposes to expand the 3rd Battalion of the 116th Field Artillery Regiment's (3-116th) Multiple Launch Rocket System (MLRS) training and maneuver area (MA) at Avon Park Air Force Range (APAFR), Florida. The purpose of this action is to provide comprehensive Battalion training for the 3-116th to meet existing Army training doctrine. The 3-116th needs to become certified as combat capable and ready to deploy to combat. The combat mission of the 3-116th is to provide long-range indirect fire support to the 1st Infantry Division using the MLRS. The MLRS is effective against critical enemy targets such as enemy air defense artillery, command and control, indirect fire support, or logistics assets.

APAFR is a 106,073-acre bombing and gunnery range located near the center of the state of Florida in Polk and Highlands Counties. It is approximately 10 miles east of the city of Avon Park and 15 miles northeast of city of Sebring and has been used by the FLARNG since the 1970s. As a military installation, APAFR has a long history of use beginning in 1942, when the War Department purchased approximately 107,000 acres from Consolidated Naval Stores Company (U.S. Air Force, 1997). Operation and maintenance at APAFR is the responsibility of the 20th Fighter Wing (FW) at Shaw Air Force Base (AFB), South Carolina. Command and Control of APAFR is the responsibility of the 18th Air Support Operations Group (ASOG) at Pope AFB, North Carolina. Figure 1-1 shows the key features of APAFR.

The background of the 3-116th and the MLRS is discussed in Section 1.2, followed by detailed descriptions of the purpose and need in Section 1.3 and 1.4, respectively. Sections 1.5 and 1.6 provide the regulatory framework for the Proposed Action and the public review process. Chapter 2 provides a discussion of the selection criteria used for evaluation of alternative MA locations. Chapter 3 provides a description of the Proposed Action and alternatives; Chapter 4 identifies the affected environment; Chapter 5 identifies any potential environmental impacts associated with the Proposed Action and alternatives; and Chapter 6 presents the cumulative effects of the Proposed Action on other actions identified in the area, as well as the irreversible and irretrievable commitment of resources. The appendices provide supplemental information. Appendix L provides the source information for map features associated with figures derived from the Geographic Information System (GIS).

1.2 BACKGROUND

The MLRS is a highly mobile, highly automated, self-loading and self-aiming, rapid-fire system that has the capability to fire surface-to-surface rockets and Army Tactical Missile Systems up to 300 km (Army National Guard, 2000). The crew of driver, gunner, and section chief can fire up to 12 rockets in less than 60 seconds (Army National Guard, 2000). The MLRS consists of the M270 launcher; launch pod/containers; ammunition resupply vehicles and trailers; and an automated command, control, and communications system (Army National Guard, 2000).

The 3-116th is the only MLRS unit in the FLARNG and is comprised of a Headquarters and Headquarters Service Battery (HHSB) and three firing batteries, each with six launchers.

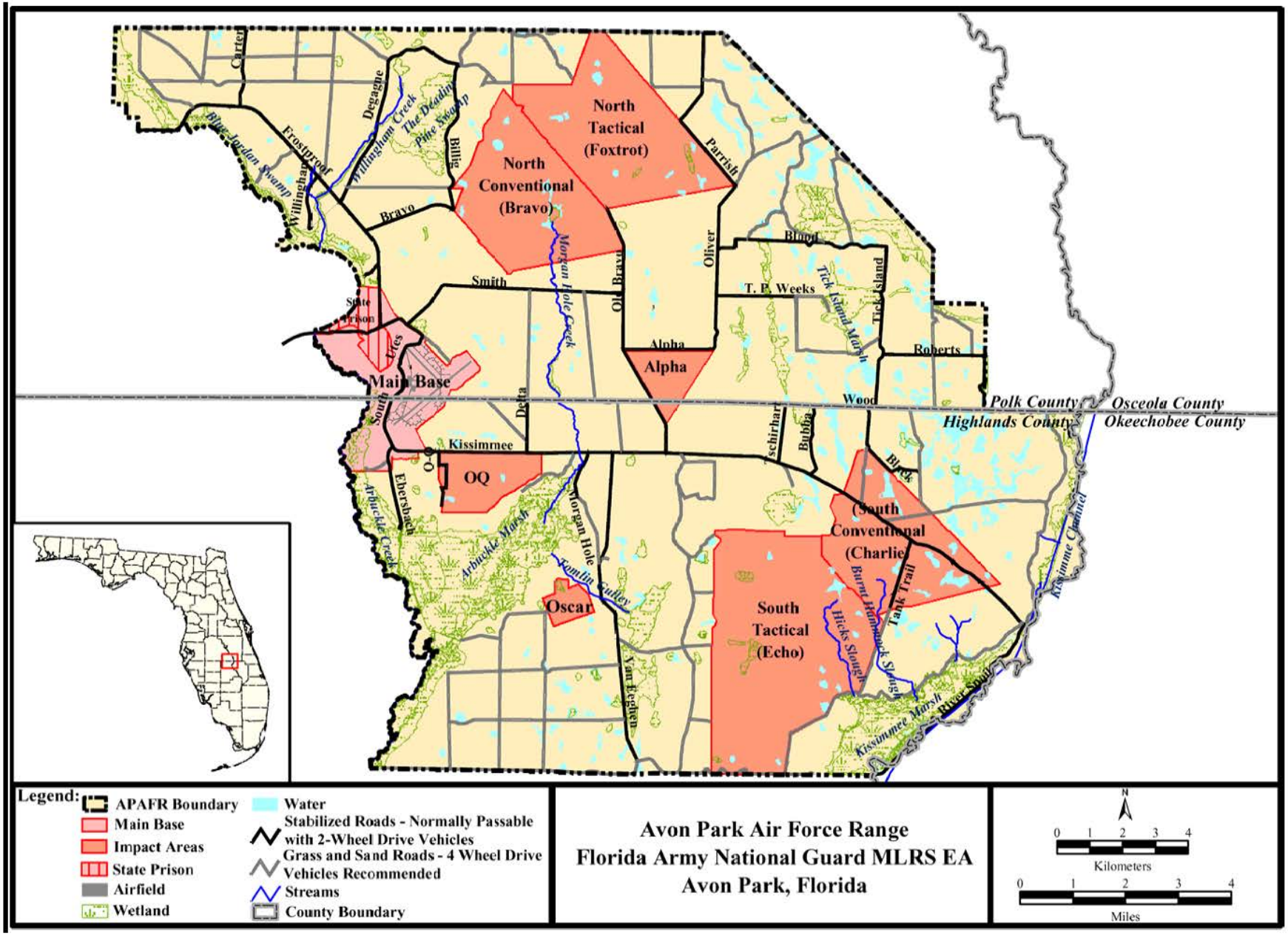

Figure 1-1. Avon Park Air Force Range Features

The 3-116th is headquartered at Plant City, Florida, and the three MLRS Batteries are located in Arcadia, Avon Park, and Wauchula, Florida. The main tactical vehicles, the M270 MLRS launchers, and other tracked vehicles are physically stationed at the FLARNG Unit Training Equipment Site (UTES) located at APAFR. This unit's higher headquarters is Detachment 1 of the 32nd Army and Missile Defense Command (AAMDC) "Blackjack East." The 32nd AAMDC Detachment 1 is based in Orlando, Florida, and falls within the authority and under operational control of United States (U.S.) Forces Command.

The 3-116th is one of the few assets available that can reach into the rear areas of enemy formations to disrupt their defenses or forestall or destroy an impending attack. Without this capability, the ground commander is left to surrender the initiative to the enemy by waiting until the enemy has come into the range of other weapons systems not capable of engaging the enemy at great distances. The outcome of the Gulf War, where the MLRS was used to great success, attests to the value of this tactical mobility.

The FLARNG has a long history of training at APAFR. Since the 1970s, the FLARNG has trained its personnel at APAFR in firing 105-mm, 155-mm, 8-inch howitzer guns, and the operation of the MLRS. The FLARNG entered into a license with the Air Force and became a full-time tenant of APAFR in August 1984.

The 3-116th previously trained at APAFR when it was equipped with M110A2 self-propelled howitzers. M110A2 howitzers were driven on existing roads from the UTES to 18 existing surveyed firing points (FP) located in the Delta and Bravo Ridge areas at APAFR. Off-road maneuvering was generally limited to within approximately 100-meters of roads and firing points. The howitzers had no ability to process targeting information and required a central data processing unit to locate targets and provide firing coordinates.

The Army National Guard Bureau (NGB) directed the conversion of the 3-116th battalion from the M110A2 8-inch howitzers to the MLRS as part of an Army-wide equipment upgrade. The FLARNG prepared an environmental assessment (EA) in 1996 entitled, *"Conversion of the 8-inch Howitzer Weapon System in the FLARNG, 3rd Battalion, 116th Field Artillery"* (FLARNG, 1996). A Finding of No Significant Impact (FNSI)[1] was signed in July 1997 (FLARNG, 1997). The FNSI applied to the conversion from the howitzers to the MLRS as well as MLRS training consistent with the howitzer battery training.

1.3 PURPOSE

The purpose of the action is to expand maneuvering opportunities at APAFR, providing the FLARNG with the training capability necessary to certify the entire MLRS Battalion as combat-ready. The role of the MLRS battalion in combat is to provide close support to maneuver units, protect the force with counter fire, attack operational targets for the division, corps, Marine air ground task force, or joint task force commander, and operate in support of theater missile defense. Expanded maneuver training at APAFR would permit the 3-116th Battalion, which is a Divisional and Corps asset, to accomplish all phases of required training

[1] FNSI is the Army acronym for Finding of No Significant Impact, the same as the Air Force's FONSI.

and to permit certification. The current training and maneuver area is suitable only for limited training. These limitations are detailed in the following section.

1.4 NEED

The 3-116th MLRS Battalion at APAFR needs to become certified as combat capable so that the unit will be ready to deploy to combat. In order for a commander to deem his unit ready for combat, the unit must pass an annual certification on tasks stipulated in Army training doctrine Field Manual (FM) 6-60, which provides the methods and standards for MLRS training. Each level, from battalion to section, must demonstrate proficiency in specific tasks designed to replicate the unit's wartime functions. For example, when occupying a new area, Army doctrine states that each section "moves to a new firing area and selects firing points and hide areas" (U.S. Army, 2004). MLRS launcher crewmembers must train to develop their skills in firing and hide area selection, as well as in navigation and positioning, which are the fundamental MLRS field crew skills in accordance with FM 6-60. Each launcher section chief is responsible for final selection and verification of the firing points and hide areas. Should a section not be able to perform the tasks properly during the annual certification, the commander would deem the section unfit for combat and the section would be retrained. Each battery and platoon must pass similar evaluations.

Battalion level training includes section, platoon, and battery certification for up to eight tactical field exercises. The typical training exercise for the FLARNG is conducted on a weekend. Under the typical scenario, the 3-116th would require six weekends per year and one 15-day annual training (AT) exercise. The requirement for Battalion level training is the use of four maneuver areas simultaneously.

Currently, because of restrictions documented in the existing Mitigation Implementation Plan (FLARNG, 1999), the 3-116th is limited to a scaled-down version of battery certification. These restrictions limit the numbers of personnel and equipment in the field. This means that the FLARNG can schedule only one maneuver area during a weekend training exercise, severely impacting the unit's ability to certify its mission proficiency. Travel to and from the training areas is allowed only on specifically designated roads and trails. Maneuvering is allowed only within circles having a 100-meter radius at predetermined, surveyed, and marked maneuver points (Figure 1-2). The launcher crewmembers and section chiefs are not afforded the opportunity to develop the fundamental skill of selecting suitable firing points and hide areas. Due to these restrictions on training areas and limits on the numbers of personnel and equipment in the field, the 3-116th MLRS cannot currently accomplish full combat-capable certification at APAFR. Battalion certification now occurs at Fort Stewart, Georgia, during the 15-day annual training. Fort Stewart is 355 to 392 miles from the 3-116th home stations in central Florida. These distances are too far to travel during a weekend training exercise and does not afford the section, platoon, and battery with the required level of practice and skill development as required by Army training doctrine, which includes six weekends of exercises, in addition to the AT.

The use of up to four maneuver areas simultaneously, the ability to select firing points and hide locations, and eight tactical exercises over six weekends and one 15-day annual training event, as analyzed in this EA, would allow the Battalion to train fully for certification.

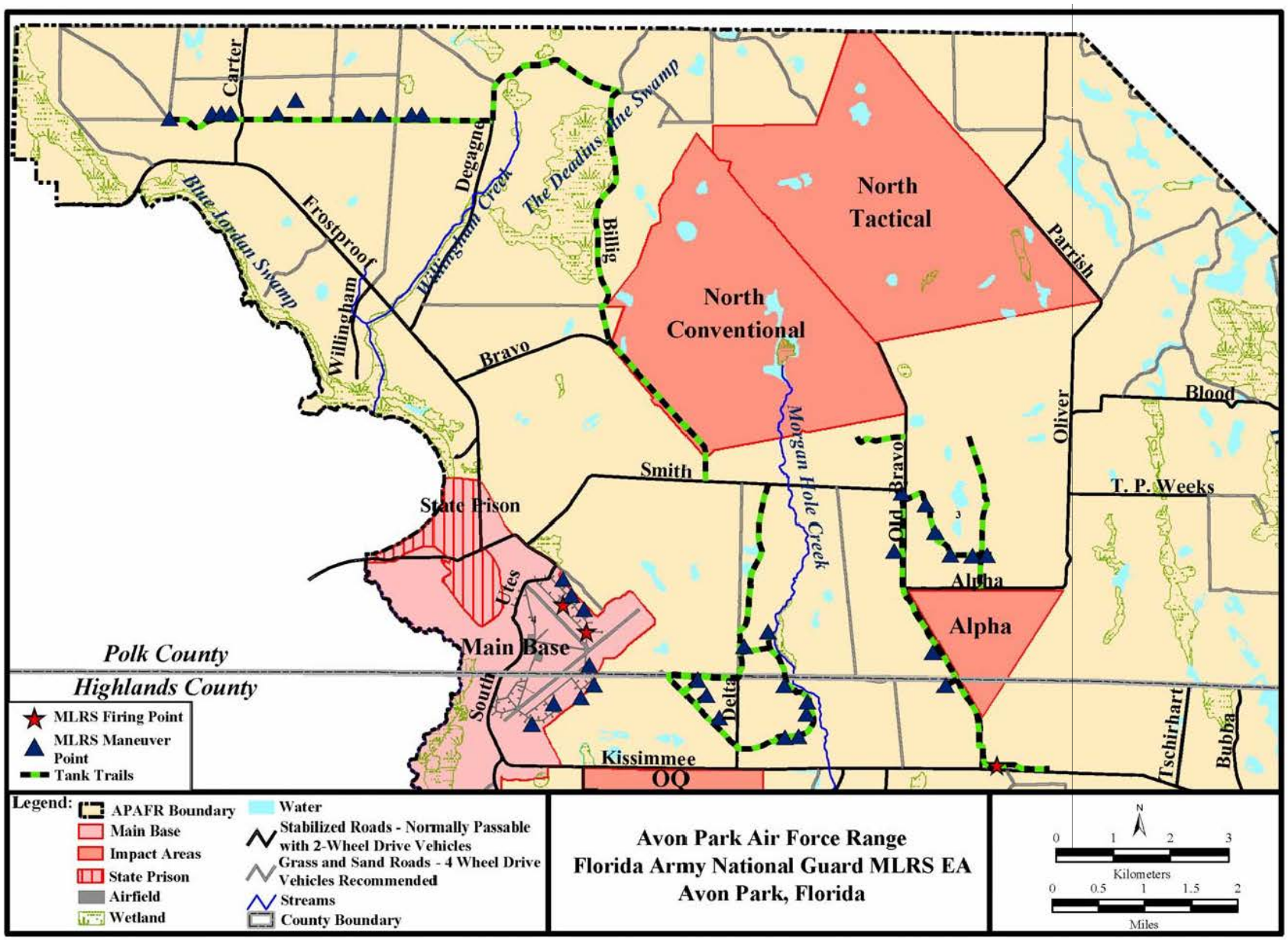

Figure 1-2. Current Multiple Launch Rocket Maneuver Areas

1.5 REGULATORY FRAMEWORK

This EA examines the potential impacts on the environment that would result from the FLARNG's proposed battalion level field training of the MLRS at APAFR. The FLARNG is the proponent of the action and has prepared this document under the National Environmental Policy Act of 1969 (NEPA) and NEPA regulations of the Council on Environmental Quality (CEQ), the Air Force, and the Army (40 Code of Federal Regulations [CFR] Part 1508, 32 CFR Part 989, 32 CFR Part 651, respectively). The FLARNG is the lead agency and the Air Force is a cooperating agency. Should the Environmental Assessment result in a Finding of No Significant Impact (FNSI), both the National Guard Bureau and the Headquarters Air Combat Command (ACC) would sign a joint FNSI. If wetlands or floodplains were affected, a Finding of No Practicable Alternative (FONPA) would be incorporated into the FNSI (FONSI).

1.6 AGENCY AND PUBLIC REVIEW PROCESS

The Preliminary Draft EA is provided to federal, state, local agencies and officials, and tribal leaders for input and comments. These comments will be addressed in a revised Draft EA. The Draft EA will be available for a 30-day public review to solicit comments on the analysis presented in the Draft EA. The FLARNG will prepare and publish newspaper advertisements announcing the availability of the Draft EA for public and agency review. In addition, the FLARNG public affairs office will distribute a news release to media outlets. The Draft EA will be posted on the following web site: http://www.dma.state.fl.us/cfmo/default.asp and will also be available at area libraries, including Avon Park, Sebring, Lakeland, and Bartow. All written comments received during the public comment period will be considered during preparation of the Final EA. Private address information provided with the comments will be used solely to develop a mailing list for the Final EA distribution and will not otherwise be released.

2. SELECTION CRITERIA FOR ALTERNATIVE IDENTIFICATION

The FLARNG identified MLRS operational criteria and APAFR assisted the FLARNG by identifying maneuver area environments most suitable for MLRS maneuvers.

2.1 OPERATIONAL SELECTION CRITERIA AND CONSIDERATIONS

The 3-116th identified several operational selection criteria, which were used to evaluate alternatives for MLRS maneuver training.

- Onsite unit-level maintenance facilities and infrastructure.
- Training range that can support maneuver training.
  - A minimum of four MAs that would accommodate a firing battery and would provide required separation (1,640 feet) between firing points.
  - Ability to use up to four MAs simultaneously.
  - MA would need to have some cover so that the launchers can hide, although tree density should be open enough to allow for maneuvering.
  - MA should be relatively dry so that the launchers would not get bogged down in wet areas.
  - Adequate capacity on range to support a minimum of six training weekends per year and one 15-day annual training exercise.
- As stated in U.S. Army Forces Command/Army National Guard/U.S. Army Reserves (FORSCOM/ARNG/USAR) Regulation 350-2, "Optimally, travel time to and from (home station) should not be more than 25% of the total multiple unit training assembly (MUTA) hours planned." This means that the training range should be within 80 miles of MLRS units based in Plant City, Arcadia, Avon Park, and Wauchula, Florida.

Based on these criteria and the evaluation performed for the EA for the Conversion from the Howitzer to the MLRS at APAFR (see Appendix C), three locations were evaluated that had sufficient training area and maintenance facilities and infrastructure: Camp Blanding, Florida; Fort Stewart, Georgia; Eglin AFB, Florida; and APAFR, Florida. As shown in Table 2-1, all locations except APAFR exceeded the 80 mile travel criteria for the MLRS units located in Central Florida. APAFR was the only location that met all the criteria.

Table 2-1. Distance to Alternative Locations from the 3-116th Unit's Home Station

Location	Home Station	Distance (miles)
Camp Blanding Joint Training Center, Florida	Plant City, FL	178
	Avon Park, FL	142
	Arcadia, FL	203
	Wauchula, FL	178
Fort Stewart, Georgia	Plant City, FL	392
	Avon Park, FL	355
	Arcadia, FL	395
	Wauchula, FL	370
Eglin AFB, Florida	Plant City, FL	388
	Avon Park, FL	439
	Arcadia, FL	454
	Wauchula, FL	430

2.2 ENVIRONMENTAL SELECTION CRITERIA AND CONSIDERATIONS

Once the FLARNG had narrowed the location down to APAFR, APAFR's Environmental Flight performed a screening analysis to identify the best areas for MLRS training on APAFR while avoiding problematic areas. The screening analysis was performed in two steps. The first was to give a weighted score to all parts of the Range for suitability for track vehicle training, based on soils, training environment, and other factors. The second step was to remove those areas where elements of the landscape, both cultural and natural, might impede training because of human safety, environmental laws, or other constraints.

In the first step, soils were analyzed for suitability for training based on three factors: compatibility, hydrology, and erodibility. A map was developed for each of these three factors and areas were given a suitability score for that factor from 1 to 10, with 10 being the best, depending on the soil's suitability for track vehicles. For instance, highly erodible soils were given a low score because they were assumed to erode under heavy track vehicle use, while more stable soils were given a higher score. These three maps were overlaid and integrated into a weighted analysis, so that a single soils suitability map was produced and areas were scored from 1 to 10.

Additionally in the first step of analysis, the training environment desired by the FLARNG was identified from the landscape through a series of unusual analysis techniques. Based on the MLRS operational criteria, it is necessary to have a training area where a track vehicle could fire rockets out in the open, and then within a specified amount of time, be able to turn, run, and hide in a wooded area. APAFR staff calculated the distance that a vehicle could maneuver during this time period to be about 400 meters from shoot to hide. Using the Geographic Information System (GIS), a plant community area was converted to a line in order to identify "edges" between trees and open areas. This edge was then buffered by 200 meters to either side to get those areas most suited to the shoot-and-hide scenario. The buffered areas were given a score from 1 to 10 and added to the soils part of the analysis to generate a new consolidated map. This addition was also weighted so that the final map had scores between 1 and 10, with soils comprising about 65 percent of the score and training environment 35 percent. This weighting was used because suitable soils are more important to the training mission than the visual landscape.

This first step resulted in a map showing suitability scores for possible areas for training between 1 and 10. However, no part of the range resulted in at a score higher than 9.5.

During the second step of the analysis, areas of the range were "removed" that were constrained by cultural and natural resource law. Safety and current operations were also factored into the selection process. The areas removed included air-to-ground ranges and safety buffer areas, the cantonment area, Environmental Restoration Program sites, jurisdictional wetlands, habitat management units for three threatened and endangered bird species, soil units on which rare plants depend, and clusters of archeological sites. APAFR has eight documented federally listed threatened and endangered species. Of these, three (the endangered Florida grasshopper sparrow, the endangered red-cockaded woodpecker, and the threatened Florida scrub jay) were deemed imperiled and the *Plan for Management of the Florida Grasshopper Sparrow, Florida Scrub jay, and Red-cockaded Woodpecker at Avon Park Air Force Range, Florida* (U.S. Air Force, 2000a) was developed for them. For this reason, APAFR focused on these three species in the MA selection process. This resulted in a composite map with a scale from 1 to 10; however, none of the remaining areas had a score of more than 7.

From this map, clusters of areas that received a score of 5, 6, or 7 were examined for suitability for the MAs. Eight areas were chosen and the Environmental Flight staff went out to each area to further study it. At a meeting to discuss the screening process, the FLARNG requested that three additional areas out of the original eight areas, which appeared to be similarly suitable, be included in the analysis. The FLARNG and APAFR determined that six sites were suitable, both operationally and environmentally.

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3. PROPOSED ACTION AND ALTERNATIVES

The Proposed Action is to expand the 3-116th training and maneuver area at APAFR to enable the 3-116th to conduct Battalion level MLRS training, fulfilling their training requirements to become certified as combat capable and ready. Battalion level MLRS training includes section, platoon, and battery certification for a minimum of six weekends per year and one 15-day annual training exercise. This would require the use of one to four MAs per weekend training exercise, which would be used simultaneously. Final scheduling would be determined through coordination with APAFR and would be based on the overall scope of the individual FLARNG exercise and any scheduling or environmental constraints present at the time of the request.

This section describes the requirements for comprehensive Battalion training. Section 3.1 summarizes the Battalion organization and explains the activities common to all MAs. Section 3.2 summarizes Battalion training and certification common to all Alternatives. Section 3.3 describes the Preferred Alternative, and Section 3.4 describes the No Action Alternative. Section 3.5 discusses alternatives considered but not carried forward for detailed analysis. Section 3.6 provides a list of Other Regulatory and Permit Requirements, and Section 3.7 provides a summary of potential impacts.

Two appendices provide additional proposal details. Appendix A includes the MLRS Table of Organization and Equipment. Appendix B provides Battalion level concept of operation details with specific field assets, personnel, and activities associated with Battalion training action.

3.1 BATTALION ORGANIZATION AND TRAINING FOR COMBAT

In an MLRS battalion, the battalion is the top command level, followed respectively by the battery, platoon, and finally section. The battalion consists of personnel and equipment organized into three firing batteries and one support battery called the Headquarters and Headquarters Service Battery (HHSB) (Figures 3-1 and 3-2).

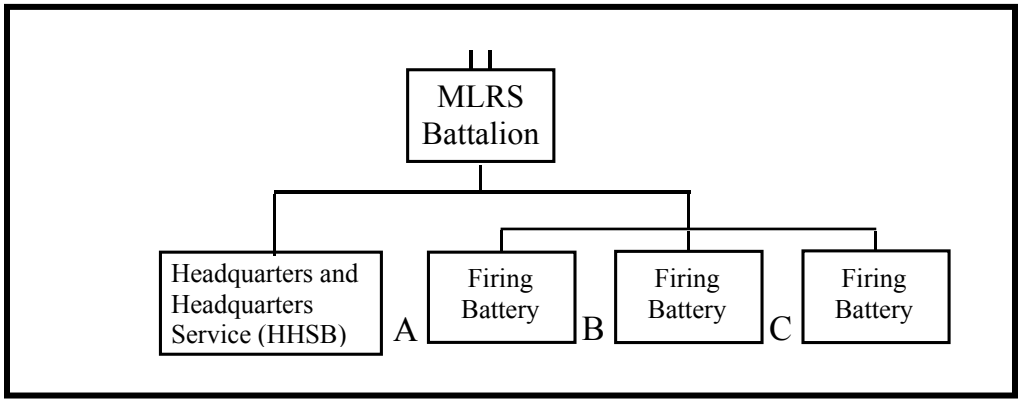

Figure 3-1. MLRS Battalion Organization

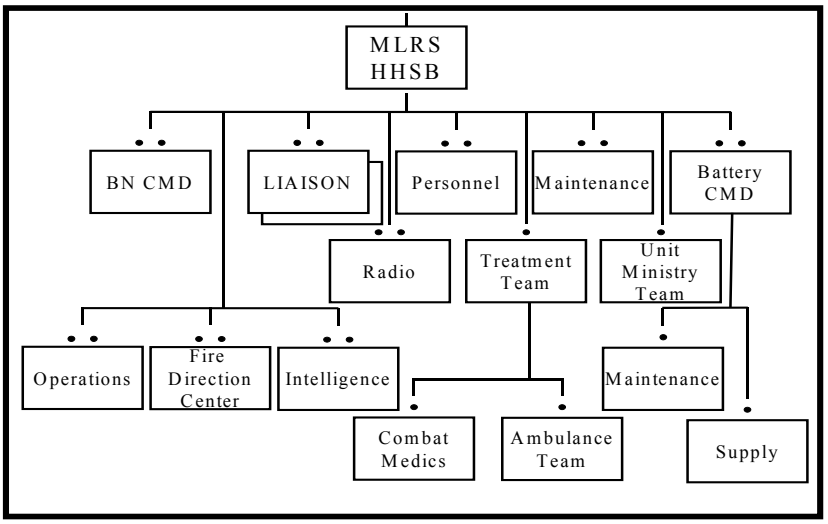

Figure 3-2. Headquarters and Headquarters Service Battery

The battalion command level plans and integrates the battalion's support to a division, organizes and plans the deployment of each of the battalion's firing batteries, and supports the firing batteries by controlling the support battery. When operating in the field, the battalion command operates out of a Tactical Operations Center (TOC) and the battalion support units out of the Administrative and Logistic Operations Control Center (ALOC). Each of the firing batteries has two firing platoons, one support platoon, and a command section (Figure 3-3). The command section operates within the operating area of the respective battery and the support section generally locates at the battery ALOC. The platoons are comprised of three firing sections, each with one MLRS rocket launcher tracked vehicle (M270 launcher) and a command section with a command post tracked vehicle (M557) and High Mobility Multi-Wheeled Vehicles (HMMWVs).

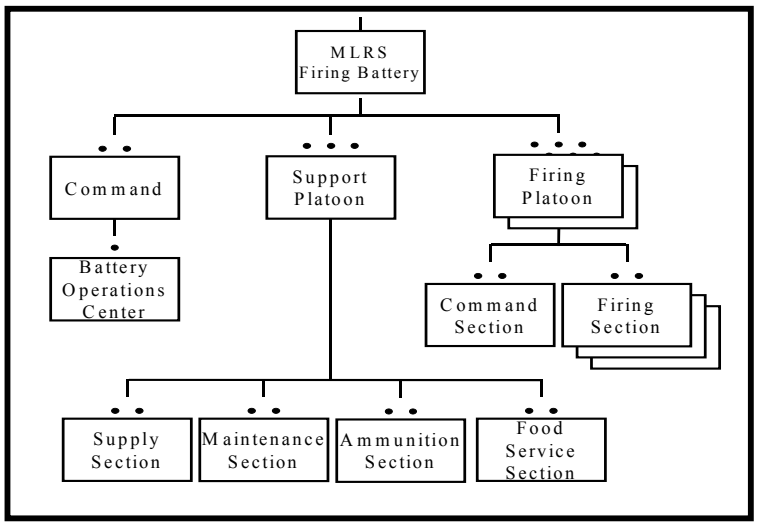

Figure 3-3. MLRS Firing Battery

During a battle or realistic training, the firing sections receive target information from the battalion and battery command sections, move out of hiding to a previously identified firing position, aim the rockets at the targets, fire the rockets, and retreat to a new hiding location. MLRS doctrinal training stresses minimal track signatures to avoid detection by enemy aircraft. For this reason, during maneuver training, the MLRS typically utilizes existing roads and tank trails approximately 75-90 percent of the time and goes off-road approximately 10-25 percent of the time when executing "hide," "load," and "firing" exercises (Army National Guard, 2000).

Each crew in the battalion is self-contained and needs to be trained in maneuvering, targeting, and firing, unlike a traditional artillery unit, which has a large supporting staff performing data analysis and direction.

As such, the MLRS is substantially superior to most artillery units that must remain close to a central data processing center for targeting information. The MLRS contains inherent data processing capability that allows it to move about the battlefield and protect the launcher and its crew. Because of the immense signature given off by the firing rocket (Figure 3-4) and the lack of defensive weapons, munitions, or armor at the section level, the sections' survivability depends on their ability to move and select new firing and hiding points. Although Figure 3-4 is designed to demonstrate the very visible signature of the rocket, the 3-116th does not plan to fire rockets at night at APAFR.

Figure 3-4. MLRS Firing

When the MLRS fires, as above, the rockets leave a thermal signature that can be seen by opposing forces, so training for rapid relocation of the system after simulated firing is key to survival. There would be no night firing of live rockets at APAFR.

The battalion must meet the Army doctrinal training requirements prescribed in Army FM 6-60 as described in Section 3.2 below and detailed in Appendix B. For this reason, MLRS training down to the section level prior to deployment is critical. This training is the foundation that ensures every member of the battalion is ready to face challenges in combat.

Training is particularly important at the section level of the battalion because of the lethality of the weapon system and its vulnerability after firing (Figure 3-4). Since the MLRS is an unguided rocket for up to 300 kilometers, it is critical that the section chief is fully trained and rehearsed to hit the enemy target and avoid friendly soldiers, while maintaining mobility and ensuring survivability of his crew and launcher. To be successful, a section also needs support provided by the units of the ALOC, such as ammunition, fuel, food, water, communications, control, coordination, and a host of other services. To ensure mission success, the 3-116th must have realistic training for the full command and logistics structures of the Battalion. All training must be accomplished within the constraints of Army National Guard training: one weekend per month and two weeks per year. Both weekend and annual training events are further constrained by both personnel and unit travel time. To begin a training event, each soldier musters from his home or normal job and travels to a marshalling area to pick up his equipment and meet his unit. The unit then travels to the training location, conducts its training and maintenance, and redeploys in the same fashion in reverse order. Each battalion training event, with the exception

of the 15-day annual training, would occur during the 12 scheduled MUTAs, the basic National Guard training weekends. Training weekends typically run from Friday evening to Sunday afternoon. In some cases, the MUTA would begin on a Thursday evening to accommodate advance party coordination, logistics, travel, and mustering the unit personnel to APAFR for training. Although the FLARNG trains during 12 MUTAs (typically weekends) per year, not all MUTAs require the use of MAs.

3.2 BATTALION TRAINING AND CERTIFICATION

The training events described below include spatial and temporal requirements and are common to all comprehensive battalion training actions. This training and certification is not being performed at APAFR now. Appendix B contains details regarding MLRS battalion organization, operations, and training.

Section Training

The first type of event is a section certification and occurs over the course of two weekends. This certification requires use of a training area for static tasks such as donning chemical protection gear, first aid, radio use and protocol, land navigation, and weapons maintenance and a separate MA as listed in the first two columns in Table 3-1. The majority of the battalion would remain in the static area while all sections (total of 18) are rotated through the maneuver area for training. Each section would move from the UTES to an MA. Each section may occupy a different MA or multiple sections may use a single MA. Once established, the section does not move to any other MA during the training weekend. The personnel and equipment used during a typical section-training weekend is shown in Table 3-2.

Platoon Certification

The second type of event is a platoon certification and is accomplished over the course of two weekends as listed in columns four and five in Table 3-1. During this event, half of the leaders in the battalion evaluate the units in the other half of the battalion while the remaining units train for subsequent evaluations. This event requires the entire battalion to be in the field. For platoon certification, both platoons in a battery move from the UTES to an MA. Each battery would generally occupy a different MA. Typically, they would travel to the MA early Saturday morning, perform their training and in the afternoon or late evening, and then move to a different MA. Two platoons in a battery may move together, but it is more typical to move one platoon at a time. The units move to a rally point, and then move together as a platoon. Next, they go to a release point within the MA and then move to their own Operational Area (OPAREA). The Battery Headquarters (HQ), consisting of a Headquarters Section and a Battery Operations Center (BOC), moves separately either before or after the platoons. Usually, once a Battery HQ moves, a platoon takes over the Battery HQ's responsibility. The personnel and types of equipment required during a typical training weekend for platoon certification is shown in Table 3-2.

Table 3-1. Annual Temporal and Spatial Training Requirements per Training Event

	Section Certification	Section Certification	Platoon Certification	Platoon Certification	Annual Training	Battery Training[2]	Battery Training
Field Time	24 hours	24 hours	24 hours	24 hours	10 days	24 hours	24 hours
Total Time	48 hours	48 hours	48 hours	48 hours	15 days	48 hours	48 hours
A Battery	1 MA	1 MA	1 MA	1 MA	1 MA	1 MA	1 MA
B Battery			1 MA	1 MA	1 MA	1 MA	1 MA
C Battery			1 MA	1 MA	1 MA	1 MA	1 MA
HHS Battery (HHSB)[1]			1 MA	1 MA	1 MA	1 MA	1 MA
Total	**1 MA**	**1 MA**	**4 MAs**	**4 MAs**	**4 MAs**	**1-4 MAs**	**1-4 MAs**

[1]The HHS Battery may locate with one of the firing batteries, using one less MA.
[2] From one to three firing batteries may train during the same weekend.

Annual Training

The third type of training event is the 15-day annual training, which is shown in the Annual Training column in Table 3-1. This critical training represents the full spectrum of requirements necessary for combat success, including approximately 181 vehicles. During this event, the entire battalion remains in the field conducting maneuver training. The battalion maneuvers through the training area and is presented with different training scenarios. Consequently, the battalion needs an additional area large enough to hold three firing batteries through which to rotate the battalion. During the conduct of the maneuver training, each battery is removed individually to fire inert rockets during a strictly controlled live fire exercise. Annual training requires four MAs for training of the battalion plus a live fire area and a corresponding impact area for the inert rockets for approximately 10 days. The live firing of rockets was addressed in a previous EA (FLARNG 1996) and is not part of this Proposed Action. Although the required training tasks are different, the personnel and equipment requirements for the 15-day annual training are the same as for the platoon certification shown in Table 3-2.

Table 3-2. Maneuver Area Assets for Various Types of Battalion Training

Vehicles (Tracked)[1]	Type of Vehicle	Section Certification[2]	Battery Training[3]	Platoon Certification	
				Battalion Resources	Battalion TOC and ALOC (HHSB)
M270 (T)	Launcher	2	6	18	
M985	Ammunition Truck		12	36	
M989	Ammunition Trailer		12	36	1
M577 (T)	Command Post Carrier	1	3	9	3
M978	Fuel Tanker		2	6	1
M97x	Wrecker			3	
M88 (T)	Recovery Vehicle			3	1
2.5 Ton Truck	Truck			9	9
5 Ton Truck	Truck			3	
HMMWV	Light Vehicle	2	4	21	22
# events/year		2	2	2	2
Personnel		9	69	273[4]	116
MAs used		1	1-4	3	1

[1] T=Tracked. If not tracked, then it is wheeled.
[2] Typically, two sections would go out at a time to a single MA.
[3] Resources for a single battery.
[4] Number of personnel per MA would be 91.

Battery Training

The fourth type of training event is battery training. After the annual training in which each battery is evaluated, the evaluators, along with the battery commander and the battalion commander, may determine that his battery is insufficiently prepared for deployment to combat. Each battery commander may then potentially need two weekends to retrain his soldiers to the proper standard as listed in columns seven and eight in Table 3-1. The personnel and equipment requirements for a single battery training during one weekend are shown in Table 3-2. The amount of retraining each battery needs is at the discretion of the battery commander. If retraining were to occur at the same time, the four batteries (three firing and one HHSB) would need a maximum of four MAs per weekend. However, depending on the retraining needs, they could need from one to four MAs.

A single battery could use one MA, with the battalion-level resources located in the same MA. Depending on the need, multiple batteries may go out one weekend and use up to four MAs. For the platoon certification, the battalion would prefer to schedule four MAs for the units, so that they could rotate to an additional MA during the exercise. The HHSB would still require one MA, for an optimum of five MAs during a weekend training event. If only four MAs are available (the minimum requirement), then the firing batteries would rotate through each other's MA. The resources required for the Annual Training event would be the same as for the platoon certification.

The FLARNG would continue to use the existing maneuver points (see Figure 1-2) during training exercises. Although these points are not adequate for the launchers, they could be used for wheeled vehicles. For example, if one of the firing batteries scheduled either MA 1 or 2 for weekend training (Figure 3-5), they could set up the HHSB at some of the maneuver points in the northwestern corner of APAFR as shown in Figure 1-2. The FLARNG would continue to schedule the currently approved maneuver points and use them as prescribed in the FONSI and mitigation plan (FLARNG, 1996 and 1999) with travel to existing firing points and remain within a 100-meter radius of any firing point for the duration of the exercise.

During the 15-day Annual Training, each of the three firing batteries would conduct a highly controlled "live fire" with reduced range practice rockets (RRPR). This activity is included in this description of battery training, but is not part of the Proposed Action. The live firing of rockets was evaluated in a previous EA (FLARNG, 1996). Live fire would occur over an approximately 72-hour period, with four hours needed per section. Each section would rotate to Firing Point A-6 (Figure 1-2) on the main airfield at different times. This Firing Point (A-6) has been approved for MLRS live fire by APAFR and has an associated safety fan (FLARNG, 1997). Each section would fire three rounds for a total of 54 rounds from the launcher into the approved high explosive (HE) impact area on Bravo range. The rounds are non-energetic once they have expended their propellant with the exception of a smoke marking charge. The section would return to the hide area within the MA once the rocket firing was completed. This rotation would continue over the three-day period until all sections completed their live fire training. Because this element of the Proposed Action has been approved by APAFR and resulted in a FNSI, it will not be addressed in Section 5, the "Environmental Consequences" of this EA. It is discussed in Section 6 of this document under Cumulative Impacts.

3.3 PREFERRED ALTERNATIVE – USE OF ANY OF SIX MANEUVER AREAS

Up to four MAs are required, as shown in Table 3-1, but six MAs would provide for flexibility and rest and rotation of the areas. Thus, six sites were identified through the selection process described in Chapter 2 that would be able to support battalion maneuver training. All other potential maneuver areas were eliminated based on the selection criteria in Section 2 of this document in accordance with 32 CFR 989, Section C. These six proposed areas each: provide a suitable size MA; offer sufficient cover; are relatively dry; and avoid sensitive environmental areas. The resulting six MAs are shown in Figure 3-5. Table 3-3 provides information on each of the six MAs.

Table 3-3. Proposed Battalion Maneuver Areas for MLRS

Maneuver Area (see Figure 3-5)	Acres[1]	Wetland Acres
1-Big Plantation	534	124
2-Willingham	642	17
3-Delta	133	2
4-Bubba	428	35
5-Alexander	324	37
6-Ramsey	473	119
Total	**2,533**	**334**

[1]To convert acres to square kilometers, multiply by 0.00405

Under this alternative, any of the six MAs (Figure 3-5) would individually or collectively be scheduled and used during a given training exercise. The FLARNG would provide a preliminary training schedule for the year in advance, and would coordinate the scheduling with APAFR for the six weekends and one 15-day annual training event. Scheduling would be subject to change by the FLARNG and APAFR, as well as to the operating restrictions (such as high fire index, very wet conditions, and the presence of other users on particular areas) and the availability of the range. Regardless of the number of MAs scheduled per month, the MLRS battalion would only schedule training areas at APAFR for one weekend per month.

3.3.1 Avoidance Measures and Management Actions

During the identification of the proposed MAs, a number of elements were identified and incorporated into the Proposed Action to avoid or minimize potential impacts to sensitive species and habitats while still allowing the 3-116th to fulfill its training requirements. These measures to avoid endangered species are not mitigation measures for this FLARNG proposal; rather, they are elements of the *Plan for Management of the Florida Grasshopper Sparrow, Florida Scrub Jay, and Red-cockaded Woodpecker at Avon Park Air Force Range, Florida* (U.S. Air Force, 2000a). Safety, operations, and future mission capabilities were also factored into the selection process.

Army Regulation 350-4 establishes policy for the Army's Integrated Training Area Management (ITAM) program. This regulation defines Headquarters Department of the Army, Major Army Command, and Installation responsibilities, management requirements, and general guidance to implement ITAM. (An expanded program description is offered in Appendix J). The ITAM

establishes procedures to achieve optimum, sustainable use of training lands by implementing a uniform land management that includes inventorying and monitoring land conditions, integrating training goals while minimizing adverse impacts, and providing for training land rehabilitation and maintenance.

In July of 2003, the ITAM Program was reconfigured under the Army's Sustainable Range Program (SRP). The SRP promotes environmental stewardship through the development and transfer of management tools and solutions for sustainable, ready, compliant and realistic training ranges. These programs reinforce the commitment on the part of the FLARNG to address the physical impacts on the landscape associated with damage/loss of vegetation and forest resources, compaction of soil, rutting of the surface, and erosion and sedimentation control.

As part of the Proposed Action, the FLARNG would support long-term management of the MAs to ensure the sustainability of the land and the DoD's ability to train on the maneuver areas through implementation of an ITAM program. This management would include the following measures by the FLARNG.

- Inspect each scheduled MA for vegetation damage and soil erosion before and after each training period.
- Monitor activities and existing conditions of the maneuver areas and maintain trails and roads, which could include positioning shale, limestone, rock, or material suitable to APAFR near road-trail intersections to maintain usability and access. MLRS will travel to MAs on any existing roads/trails designated by APAFR.
- Restore and maintain eroded areas caused by MLRS training activities.
- Prevent overuse of MAs to preclude unnecessary vegetation damage or erosion.
- Harden track vehicle turning points as required.

In conjunction with the Army's expanded SRP, the Range and Training Land Analysis (RTLA) details biological field collection methodologies and analyses at ITAM installations to monitor changes and capture trends occurring on DoD training lands. The RTLA will provide the FLARNG with management procedures that inventories and monitors land conditions. This management would include, as part of the Proposed Action, the following measures by the FLARNG.

- Implement a comprehensive baseline field reconnaissance of the proposed MAs by establishing controls for monitoring and comparatively analyzing soil resource impacts. Baseline conditions for each control would be documented with replicable photopoints and soil physical and chemical testing parameters.
- Develop soil recovery implementation protocols for each of the proposed MAs to alleviate to the degree possible soil compaction and rutting damage.

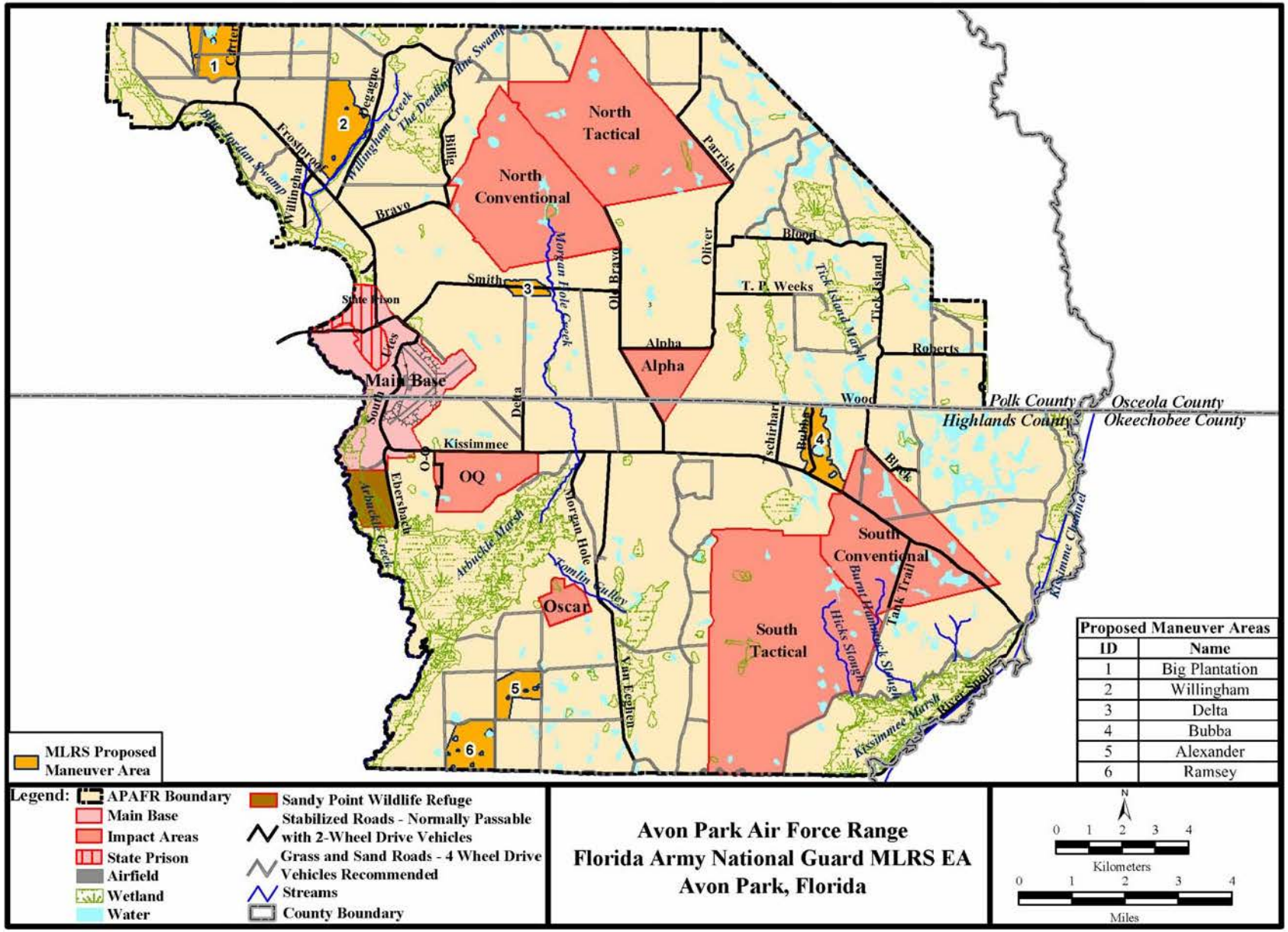

Figure 3-5. Proposed Maneuver Areas 1–6

Because of the inherent data processing capability of the M270 launcher and the need to avoid sensitive areas, coordinate data on locations of significant natural resources and environmental restoration sites would be provided to the FLARNG by APAFR. Boundaries that are not obvious (that is, those that are delineated with roads, streams, or trails, for example) will be clearly identified by distinct natural landmarks (such as a large burned-out pine tree) or signs. No vehicles or bivouac sites would be permitted within or on significant structures, or within 200 feet of marked cemeteries or human burial sites. The FLARNG would identify and avoid cultural sites in the MAs as requested by the Miccosukee Tribe in their 18 October 2005 letter (see Appendix I).

APAFR is home to populations of threatened and endangered species, including the Florida grasshopper sparrow (FGS) (*Ammodramus savannarum*), Florida scrub jay (FSJ) (*Aphelocoma coerulescens*) and red-cockaded woodpecker (RCW) (*Picoides borealis*). APAFR worked in close partnership with the U.S. Fish and Wildlife Service (USFWS) and the Florida Fish and Wildlife Conservation Commission (FWC) to develop a plan for the management of these species at APAFR (U.S. Air Force, 2000a). Avoidance considerations related to the Endangered Species Management Plan, which are part of the Proposed Action, include:

- RCW cavity trees are marked by APAFR staff. Because of the sensitivity of the bird, the USFWS requires certain restrictions within 200 feet of the outermost cavity trees within clusters. Vehicle maintenance would be limited to two hours or less during the training weekend; there would be no assembly area operations, combat support areas, or camouflage netting; and hand digging would be limited to two hours or less per day.
- There would be no MLRS maneuvering within a 750-foot radius of an active bald eagle nesting tree between 1 October and 15 May. Eagle nesting trees are located and mapped/ Maps of eagle nesting trees would be made available to the MLRS unit.
- APAFR would train MLRS units on how to recognize indigo snakes and instructions to not harm this species. The FLARNG requires that their MLRS units see a training video and provides a training pamphlet to MLRS units before using APAFR, which instruct the units to not kill snakes. If a snake is encountered, the unit is to avoid it and call APAFR's Environmental Flight.
- The MAs will be surveyed annually for gopher tortoise burrows, which will be marked. The FLARNG will submit to the USFWS an annual report of training activities and annual observations of effects to indigo snakes and their habitat.
- The FLARNG will contact the USFWS and the FWC if a dead, sick, or injured indigo snake is found. Contact information is provided in the Biological Opinion, a copy of which is provided in Appendix K.

Other management actions that will be implemented as part of the Proposed Action to reduce potential impacts to sensitive habitats include:

- Movement of all vehicles to and from maneuvering areas would be confined to established tank trails or roads and maximum speed for tracked vehicles or vehicles in convoy would be 25 miles per hour (mph).

- When moving within maneuvering areas, vehicles would not be restricted to tank trails. However, when maneuvering off trails, sharp turns would be avoided, to protect the environment. Every effort would be made to avoid damage to drainage ditches, road shoulders, and cultivated forest stands without detracting from the tactical training of the unit.
- Tracked vehicles are stationed at the UTES at APAFR and do not move off this site. Other vehicles would be washed down after an exercise and prior to leaving APAFR, to remove any soil and vegetation. This will prevent the spread of invasive and exotic species.

To reduce potential erosion, which may impact surface water quality, the following considerations would be applied.

- Track vehicles would only cross paved roads at specified locations to prevent damage to pavement.
- Global positioning system (GPS) information, signage, and stakes would be employed to avoid wet areas in the maneuvering areas, and, before the exercises, drivers would receive coordinate data on wetland locations that would be avoided.

The area known as "Alpha Plus" (composed of the central Alpha impact area [Figure 1-2] and approximately 200 acres to the north) has been identified by the Navy as the preferred location for the air-to-ground training associated with the Fleet Readiness Training Program. The proposed MAs are located outside the Navy's preferred training area for safety reasons and to avoid conflicts in use.

3.4 NO ACTION ALTERNATIVE

The No Action Alternative is included as a baseline from which to compare the impacts of the Proposed Action. The No Action Alternative means that the Proposed Action would not take place and that the 3-116th would continue to train at APAFR at the battery level. They would not be able to use MLRS firing and survivability tactics but would be restricted to using the tactics applicable to the 8-inch howitzer battery. Battery training would consist of a battery being deployed to APAFR and traveling to one of the MAs shown in Figure 1-2. Once within the MA, the launcher would be restricted in its movements. The launcher would move to a designated maneuver point and seek a hide location within a 100-meter radius of the maneuver point (Figure 1-2). Training has been limited to the use of a single MA during a training event. No-Action Alternative training does not allow the unit to locate firing points and hide locations, which is part of the Army requirement for combat certification. The FLARNG MLRS unit would be required to continue to travel to Fort Stewart, Georgia, for annual training and certification. This Alternative does not meet the FLARNG MLRS need for consistent realistic training and does not support Army doctrinal requirements for combat ready MLRS units.

3.5 ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD

The following Alternatives were considered for MLRS Battalion level training but were not carried forward for analysis in this Environmental Assessment.

3.5.1 Battalion Level Training at APAFR Without Maneuvering

Combat has demonstrated that a key component to the MLRS survivability is its ability to maneuver and hide after firing. Training in the selection of a hide location and the rapid action and successful maneuvering following a launch is essential to MLRS survivability. Training without maneuvering would not exercise critical skills and would not meet operational requirements for battalion level combat certification.

3.5.2 Simulation Training Without Field Maneuvering

Simulation plays a role in training and is used by the FLARNG at depots. Simulation is a training technique in which real world systems are replicated by a model (DoD, 2003). Simulation cannot replicate the physical conditions of combat and cannot replace the field training necessary for combat certification. Simulation training alone would not meet operational requirements for battalion level combat certification.

3.5.3 Alternative Locations for Battalion Level Training

Fort Stewart and Camp Blanding were considered for MLRS training during the conversion of the 8-inch howitzer battalion to an MLRS battalion. These locations used were not suitable for an MLRS battalion and were eliminated from further environmental review for MLRS battalion level in 1997 because they did not meet operational requirements (FLARNG, 1996, 1997). These requirements are listed in Appendix C. Fort Stewart, Georgia, Camp Blanding, Florida, and Eglin AFB, Florida, are too far from the home stations of the MLRS battalion in central Florida. This precludes their use for weekend training because of the extensive travel time. These locations do not meet training requirements and have not been carried forward as feasible alternatives at this time in this environmental analysis.

3.5.4 Use of HIMARS in Place of the MLRS

The High Mobility Artillery Rocket System (HIMARS) is a prototype system that consists of a launcher mounted on a 5-ton truck that fires the same battlefield missiles as the MLRS. The MLRS is typically mounted on a 25-ton tracked vehicle. HIMARS is being evaluated by the Army and Marines for potential future applications. This system is currently under test and has not been approved for production or deployment and therefore is not a viable alternative to the existing MLRS. The FLARNG has an existing requirement for MLRS Battalion level training. If a HIMARS is fielded and is eventually considered for deployment with the FLARNG, separate environmental documentation would be prepared for battalion level training with the HIMARS.

3.5.5 Use of MAs Inside the APAFR Impact Areas

APAFR is an active Air Force air-to-ground training range that is used by Air Force, Navy, and Marine pilots to train in the use of air-to-ground munitions. MAs inside the APAFR impact areas were eliminated from further consideration because of either non-compatibility with current use (primarily air-to-ground bombing) or the presence of unexploded ordnance.

3.5.6 Alternative Maneuver Areas Within APAFR

Through the site selection process identified in Chapter 2, all other potential maneuver areas were eliminated in accordance with 32 CFR 989, Section C.

3.6 OTHER REGULATORY AND PERMIT REQUIREMENTS

This EA has been prepared in compliance with the National Environmental Policy Act, other federal statutes, such as the Clean Air Act, the Clean Water Act, Endangered Species Act, and the National Historic Preservation Act, Executive Orders, and other applicable statutes and regulations.

Consultation with the Florida State Historic Preservation Officer (SHPO), in compliance with Section 106 of the *National Historic Preservation Act* (NHPA), would be completed prior to beginning on-the-ground activities in any of the MAs. Based on cultural resources surveys, there were no National Register-eligible sites or cultural resources found.

The FLARNG consulted with the USFWS on potential impacts to threatened and endangered species. The FLARNG will adhere to the terms and conditions identified in the USFWS Biological Opinion (Appendix K).

The FLARNG will coordinate with the U.S. Army Corps of Engineers on potential wetland issues. The FLARNG has incorporated management actions into the proposed action to prevent impacts to wetlands and any associated permitting.

The FLARNG would require a Noticed General Permit from the South Florida Water Management District if there is a requirement to install culverts as part of road maintenance activities.

3.7 SUMMARY OF IMPACTS

According to the analysis in this EA, implementation of the Proposed Action at any of the Alternative locations would not result in significant impacts to any of the resource categories. A comparative summary of the potential environmental consequences of the MLRS expanded training Alternatives and the No Action Alternative is presented in Table 3-4.

Table 3-4. Summary of Environmental Consequences of the Alternatives

Preferred Alternative						No Action Alternative
MA-1	**MA-2**	**MA-3**	**MA-4**	**MA-5**	**MA-6**	
Noise						
During FLARNG training, noise levels less than MA-3; greater than MA-2.	Noise levels for the largest MA were used to develop a range. Maximum $L_{eq(24)}$ 61.5 dBA at 100 feet from site edge. All other levels well below Noise Zone II thresholds.	Noise levels for the smallest MA were used to develop a range. Maximum $L_{eq(24)}$ 68.3 dBA at 100 feet from MA boundary. Levels at sites further from MA well below Noise Zone II thresholds.	During FLARNG training, noise levels less than MA-3; greater than MA-2.	During FLARNG training, noise levels less than MA-3; greater than MA-2.	During FLARNG training, noise levels less than MA-3; greater than MA-2.	No change from current conditions.
Air Quality						
No regulatory thresholds exceeded. Contribution of MLRS training to annual regional emission is .05% to .57%	No regulatory thresholds exceeded. Contribution of MLRS training to annual regional emission is .05% to .57%	No regulatory thresholds exceeded. Contribution of MLRS training to annual regional emission is .05% to .57%	No regulatory thresholds exceeded. Contribution of MLRS training to annual regional emission is .05% to .57%	No regulatory thresholds exceeded. Contribution of MLRS training to annual regional emission is .05% to .57%	No regulatory thresholds exceeded. Contribution of MLRS training to annual regional emission is .05% to .57%	No emissions increases would occur at APAFR.

Table 3-4. Summary of Environmental Consequences of the Alternatives Cont'd

Preferred Alternative						No Action Alternative
MA-1	**MA-2**	**MA-3**	**MA-4**	**MA-5**	**MA-6**	
Land Use						
Expands military training use of Range by 0.5%. May result in closure of Management Unit (MU) 1 or entire range to public or other military uses during field exercises, lasting up to 22 days, not continuously. Timber management practices would likely change to accommodate the MLRS mission. Maximum loss of 392 acres of pine plantation that would not be replanted, which represents 2.6% of total acreage of pine plantation on APAFR. Impacts to cattle grazing would be negligible.	Expands military training use of Range by 0.6%. May result in closure of MU 2 or entire range to public or other military uses during field exercises, lasting up to 22 days not continuously. Timber management practices would likely change to accommodate the MLRS mission. Impacts to cattle grazing would be negligible.	Expands military training use of Range by 0.1%. May result in closure of MUs 3, 3A, and 4 or entire range to public or other military uses during field exercises, lasting up to 22 days not continuously. Timber management practices would likely change to accommodate the MLRS mission. Impacts to cattle grazing would be negligible.	Expands military training use of Range by 0.4%. May result in closure of MUs 8, and 10 or entire range to public or other military uses during field exercises, lasting up to 22 days not continuously. Timber management practices would likely change to accommodate the MLRS mission. Impacts to cattle grazing would be negligible.	Expands military training use of Range by 0.3%. May result in closure of MU 12 or entire range to public or other military uses during field exercises, lasting up to 22 days not continuously. Timber management practices would likely change to accommodate the MLRS mission. Impacts to cattle grazing would be negligible.	Expands military training use of Range by 0.5%. May result in closure of MU 12 or entire range to public or other military uses during field exercises, lasting up to 22 days not continuously. Timber management practices would likely change to accommodate the MLRS mission. Maximum loss of 188 acres of pine plantation that would not be replanted, which represents 1.3% of total acreage of pine plantation on APAFR. Impacts to cattle grazing would be negligible.	No changes in land use would occur.

Table 3-4. Summary of Environmental Consequences of the Alternatives Cont'd

Preferred Alternative						No Action Alternative
MA-1	**MA-2**	**MA-3**	**MA-4**	**MA-5**	**MA-6**	
Earth Resources						
Soil Compaction Impact Potentials						
Approximately 83 acres are severely and 442 acres are highly sensitive to soil compaction which accounts for about 98 percent of the MA; proposed MLRS training could impact soil resources. Soil resource management practices as defined by the RTLA component of the ITAM program will be implemented by the FLARNG to prevent and repair soil compaction damage.	Approximately 4 acres are severely and 662 acres are highly sensitive to soil compaction which accounts for about 99 percent of the MA; proposed MLRS training could impact soil resources. Soil resource management practices as defined by the RTLA component of the ITAM program will be implemented by the FLARNG to prevent and repair soil compaction damage.	Approximately 1 acre is severely and 109 acres are highly sensitive to soil compaction which accounts for about 83 percent of the MA; proposed MLRS training could impact soil resources. Soil resource management practices as defined by the RTLA component of the ITAM program will be implemented by the FLARNG to prevent and repair soil compaction damage.	Approximately 7 acres are severely and 421 acres are highly sensitive to soil compaction which accounts for about 100 percent of the MA; proposed MLRS training could impact soil resources. Soil resource management practices as defined by the RTLA component of the ITAM program will be implemented by the FLARNG to prevent and repair soil compaction damage.	No acres are severely and approximately 343 acres are highly sensitive to soil compaction which accounts for about 100 percent of the MA; proposed MLRS training could impact soil resources. Soil resource management practices as defined by the RTLA component of the ITAM program will be implemented by the FLARNG to prevent and repair soil compaction damage.	Approximately 7 acres are severely and 495 acres are highly sensitive to soil compaction which accounts for about 99 percent of the MA; proposed MLRS training could impact soil resources. Soil resource management practices as defined by the RTLA component of the ITAM program will be implemented by the FLARNG to prevent and repair soil compaction damage.	No earth resource soil compaction impacts are anticipated.
Soil Rutting Impact Potentials						
No acres are severely and approximately 525 acres are highly sensitive to soil rutting which accounts for about 98 percent of the MA; proposed MLRS training could impact soil resources. Soil resource management practices as defined by the RTLA component of the ITAM program will be implemented by the FLARNG to prevent and repair soil rutting damage.	No acres are severely and approximately 666 acres are highly sensitive to soil rutting which accounts for about 99 percent of the MA; proposed MLRS training could impact soil resources. Soil resource management practices as defined by the RTLA component of the ITAM program will be implemented by the FLARNG to prevent and repair soil rutting damage.	No acres are severely and approximately 110 acres are highly sensitive to soil rutting which accounts for about 83 percent of the MA; proposed MLRS training could impact soil resources. Soil resource management practices as defined by the RTLA component of the ITAM program will be implemented by the FLARNG to prevent and repair soil rutting damage.	No acres are severely and approximately 428 acres are highly sensitive to soil rutting which accounts for about 83 percent of the MA; proposed MLRS training could impact soil resources. Soil resource management practices as defined by the RTLA component of the ITAM program will be implemented by the FLARNG to prevent and repair soil rutting damage.	No acres are severely and approximately 344 acres are highly sensitive to soil rutting which accounts for about 100 percent of the MA; proposed MLRS training could impact soil resources. Soil resource management practices as defined by the RTLA component of the ITAM program will be implemented by the FLARNG to prevent and repair soil rutting damage.	No acres are severely and approximately 502 acres are highly sensitive to soil rutting which accounts for about 99 percent of the MA; proposed MLRS training could impact soil resources. Soil resource management practices as defined by the RTLA component of the ITAM program will be implemented by the FLARNG to prevent and repair soil rutting damage.	No earth resource soil rutting impacts are anticipated.

Table 3-4. Summary of Environmental Consequences of the Alternatives Cont'd

Preferred Alternative						No Action Alternative
MA-1	**MA-2**	**MA-3**	**MA-4**	**MA-5**	**MA-6**	
Water Resources						
No impacts to ground water, floodplains, or constructed features. May impact water quality because of erosion. No direct impacts to wetlands that constitute 23% of this MA. Indirect effects to wetland hydrology and wetland vegetation from tracked vehicles. Proposed management practices would offset or minimize the potential for any adverse impacts.	No impacts to ground water, floodplains, or constructed features. May impact water quality because of erosion. No direct impacts to wetlands that constitute 2.5% of this MA. Indirect effects to wetland hydrology and wetland vegetation from tracked vehicles. Proposed management practices would offset or minimize the potential for any adverse impacts.	No impacts to ground water, floodplains, or constructed features. May impact water quality because of erosion. No direct impacts to wetlands that constitute 1.5% of this MA. Indirect effects to wetland hydrology and wetland vegetation from tracked vehicles. Proposed management practices would offset or minimize the potential for any adverse impacts.	No impacts to ground water, floodplains, or constructed features. May impact water quality because of erosion. No direct impacts to wetlands that constitute 8% of this MA. Indirect effects to wetland hydrology and wetland vegetation from tracked vehicles. Proposed management practices would offset or minimize the potential for any adverse impacts.	No impacts to ground water, floodplains, or constructed features. May impact water quality because of erosion. No direct impacts to wetlands that constitute 11% of this MA. Indirect effects to wetland hydrology and wetland vegetation from tracked vehicles. Proposed management practices would offset or minimize the potential for any adverse impacts.	No impacts to ground water, floodplains, or constructed features. May impact water quality because of erosion. No direct impacts to wetlands that constitute 25% of this MA. Indirect effects to wetland hydrology and wetland vegetation from tracked vehicles. Proposed management practices would offset or minimize the potential for any adverse impacts.	No impacts to groundwater, surface water, floodplains, wetlands or constructed features.
Biological Resources						
There are 107 acres of RCW HMU on this MA. There are no protected animals nesting on this MA. There are no protected plants, or FNAI rare plant species occurring on this MA. There are two invasive plant species on this MA.	There are 12.5 acres of FSJ HMU and 670 acres of RCW HMU on this MA. There are no protected animals nesting on this MA. There are no protected plants, or FNAI rare plant species occurring on this MA. There are no invasive plant species on this MA.	There are 133 acres of RCW HMU and 12 acres of RCW forage area on this MA. There are no protected animals nesting on this MA. There are no protected plants, or FNAI rare plant species occurring on this MA. There is one invasive plant species on this MA.	There are 428 acres of RCW HMU on this MA. There are no protected animals nesting on this MA. There are no protected plants, or FNAI rare plant species occurring on this MA. Two invasive plant species occur on this MA.	There are 15 acres of FSJ HMU and 343 acres of RCW HMU on this MA. There are no protected animals nesting on this MA. There are no protected plants, or FNAI rare plant species occurring on this MA. One invasive plant species occurs on this MA.	There are 24 acres of FSJ HMU and 509 acres of RCW HMU on this MA. There are no protected animals nesting on this MA. There are no protected plants, or FNAI rare plant species occurring on this MA. There are no invasive plant species on this MA.	There are no impacts to biological resources.
HM/HW						
Graywater would be produced and disposed during field operations. Use, disposal, and spill management associated with POL during vehicle fueling and maintenance would occur. Adherence to established management requirements and regulations for handling and disposal would be required across all Alternatives. No adverse impacts associated with Environmental Restoration Program (ERP) sites or storage tanks are anticipated under any Alternatives, since ground movement of troops and vehicles would avoid these areas. Should a stray rocket impact an ERP site, APAFR's Environmental Flight would be notified. APAFR EOD would recover inert rockets from impact area following established procedures.						No impacts to hazardous materials and waste.

Table 3-4. Summary of Environmental Consequences of the Alternatives Cont'd

Preferred Alternative						No Action Alternative
MA-1	**MA-2**	**MA-3**	**MA-4**	**MA-5**	**MA-6**	
Cultural Resources						
One historic site is not NRHP-eligible; no other cultural resources have been identified in the course of 100 percent survey. All acreage is in low probability areas.	Three sites and six isolates located during 100 percent survey are not NRHP eligible. High probability area lies along Willingham Creek; the remainder of the MA is low probability.	100 percent inventory revealed no cultural resources; 28 acres are in medium or high probability areas, the remainder in low probability areas.	Three isolates located during 100 percent survey are not NRHP eligible. All acreage is in low probability areas.	100 percent inventory revealed no cultural resources. All acreage is in low probability areas.	100 percent inventory revealed no cultural resources. All acreage is in low probability areas.	Impacts not expected. Resources would continue to be managed in compliance with Federal law and Air Force regulations.
Socioeconomic						
Increased government expenditures at APAFR for military purposes can be expected to result in an increase in community-based employment of 2 full-time jobs and a decrease in visitors to APAFR for hunting and recreation–a small loss (2 full-time jobs) in community-based employment that would offset the positive change attributable to increased military use. Can expect annual revenue reductions of approx. $6,000 and $8,000 to the forestry and fish and wildlife programs, respectively and negligible impacts to grazing program revenues.	Impacts similar to those associated with MA-1.	Impacts similar to those associated with MA-1.	Impacts similar to those associated with MA-1.	Impacts similar to those associated with MA-1.	Impacts similar to those associated with MA-1.	No impacts to socioeconomics.
EJ						
No disproportionately high and adverse human health or environmental effects on minority or low-income populations.						

EOD = Explosive Ordnance Disposal; $L_{eq(24)}$ = 24-hour Equivalent Noise Level; POL = Petroleum, Oil, and Lubricants

4. AFFECTED ENVIRONMENT

This chapter contains a description of the current environmental conditions of the areas that would likely be affected by the Alternatives, if one were implemented. The areas include APAFR, the counties adjacent to APAFR, and two air quality control regions. These areas may vary for each resource and are identified in the resource sections as the Region of Influence or ROI.

The establishment of firing points and the firing of RRPR was previously analyzed for potential environmental impacts (FLARNG, 1996). No changes in firing points or live fire will occur with this Proposed Action. This proposal is limited to ground maneuvering in the proposed maneuver areas and there will be no live firing within those areas. Airspace issues were assessed but eliminated from further consideration because there were no potential impacts to this resource from the Proposed Action. Since the action involves only maneuvering on the ground, there would be no airspace management issues involved. Safety issues were also eliminated from further analysis because all maneuver operations and maintenance activities would continue in accordance with applicable and published Air Force and Army safety regulations and standards, technical orders, and specific range operating procedures.

The resources that could be impacted and will be analyzed in the EA include: noise, air quality, land use, earth resources, water resources, biological resources, hazardous materials and waste, cultural resources, socioeconomics, and environmental justice.

4.1 NOISE

4.1.1 Definition of the Resource

Noise is considered to be unwanted sound that interferes with normal activities or otherwise diminishes the quality of the environment. It may be intermittent or continuous, steady or impulsive. It may be stationary or transient. Stationary sources are normally related to specific land uses (housing tracts or industrial plants, for example). Transient noise sources move through the environment, either along established paths such as roads, or randomly (such as military vehicles operating in a maneuver area). Responses to noise are widely diverse, varying according to the type of noise, the characteristics of the sound source, the sensitivity and expectations of the receptor, the time of day, and the distance between the noise source and the receptor (a person or animal).

Sound is a physical event consisting of minute vibrations that travel through a medium such as air and are sensed by the human ear. Sound frequency is measured in cycles per second or hertz (Hz). Low frequency sounds are heard as rumbles or roars, and high frequency sounds are heard as screeches. Sound measurement is further refined through the use of "A-weighting." Some sound meters are calibrated to emphasize frequencies in the 1,000 to 4,000 Hz range because the human ear is most sensitive to frequencies in this range. Sounds measured in this frequency with these meters are described in terms of A-weighted decibels (dBA).

The duration of a noise event and the number of times noise events occur are also important considerations in assessing noise impacts.

The word "metric" is used to describe a standard of measurement. As used in environmental noise analysis, there are many different types of noise metrics. Each metric has a different physical meaning or interpretation and each metric was developed by researchers attempting to represent the effects of environmental noise.

Noise associated with the proposals assessed in this EA is described in terms of single event and time-averaged metrics.

Single Event Noise Metrics

The highest sound level measured during a single noise event is the maximum sound level (L_{max}). This is the sound level actually sensed by the ear. Maximum sound level is important in judging how significantly a noise event interferes with conversation, sleep, or other common activities. However, L_{max} alone may not represent how intrusive a noise event is because it does not consider the length of time that the noise persists.

The Sound Exposure Level (SEL) metric combines both the intensity and duration of a noise event into a single measure. SEL does not directly represent the sound level heard at any given time. However, it does provide a measure of the total exposure of the entire event. Its value represents all of the acoustic energy associated with the event, as though it was present for one second. Therefore, for sound events that last longer than one second, the SEL value will be higher than the L_{max} value. The SEL value is important because it is the value used to calculate other time-averaged cumulative noise metrics.

Time-Averaged Cumulative Noise Metrics

The number of times noise events occur during given periods is also an important consideration in assessing noise impacts. "Cumulative" noise metrics support the analysis of multiple, time-varying noise events. The most common are the equivalent sound level (L_{eq}) and the day-night average sound level (L_{dn}).

The L_{eq} metric reflects average continuous sound. It considers variations in sound magnitude over periods of time and reflects, in a single value, the acoustic energy present during the total time period. Common time periods for averaging are 8- and 24-hour periods.

The (L_{dn}) metric sums all individual noise events and averages the resulting level over a specified length of time. Normally, this is a 24-hour period. Thus, like L_{eq}, it is a composite metric representing the maximum noise levels, the duration of the events, and the number of events that occur. However, this metric also considers the time of day during which they occur. This metric adds 10 decibels (dB) to those events that occur between 2200 hours (10:00 P.M.) and 0700 hours (7:00 A.M.) to account for the increased intrusiveness of noise events that occur at night when ambient noise levels are normally lower than during the daytime. It should be noted that if no noise events occur between 10:00 P.M. and 7:00 A.M., the value calculated for L_{dn} would be identical to that calculated for a 24-hour equivalent noise level ($L_{eq(24)}$). This

cumulative metric does not represent the variations in the sound level heard. Nevertheless, it does provide an excellent measure for comparing environmental noise exposures when there are multiple noise events to be considered.

Average Sound Level metrics are the preferred noise metrics of the Department of Housing and Urban Development (HUD), the U.S. Department of Transportation (DOT), the Federal Aviation Administration (FAA), the U.S. Environmental Protection Agency (USEPA), and the Veteran's Administration (VA). Scientific studies and social surveys have found that Average Sound Level metrics are the best measure to assess levels of community annoyance associated with all types of environmental noise. Therefore, their use is endorsed by the scientific community and governmental agencies (ANSI, 1980 and 1988; USEPA, 1974; FICUN, 1980; FICON, 1992).

To assess noise effects, the U.S. Army Center for Health Promotion and Preventive Medicine has defined three noise zones to be considered in land use planning. These zones are described by the noise levels to which they are exposed, and, based on sociological considerations, compatible land uses are recommended. These zones are summarized in Table 4-1. In general, within Zone I, where very few people will be bothered by noise levels, unrestricted land use is indicated. In Zone II, as outdoor noise levels increase and more people become annoyed by the noise, restrictions or qualifications are placed on certain land uses, specifically regarding residential development. In Zone III, as noise levels escalate, fewer and fewer compatible land uses are indicated.

Table 4-1. Land Use Planning Guidelines

Noise Zone	Population Highly Annoyed	Noise Level (L_{dn})
I	<15%	<65
II	15 – 39%	65 – 75
III	>39%	>75

For noise considerations, the land areas comprising the APAFR constitute the Region of Influence (ROI).

4.1.2 Existing Conditions

In general, elevated noise levels do not extend beyond the APAFR boundaries. APAFR is an air-to-ground and ground-to-ground gunnery range. Noise exposure around APAFR results primarily from aviation activities, which occur on a continuing basis. These operations include fixed- and rotary-wing aircraft flight and the delivery of air-to-ground ordnance. Under current conditions, the noise metric considered is L_{dn}. While the Air Force's noise model (MR_NMAP) and the Army's noise model (B-NOISE) incorporate some general climatological data (average temperature and humidity), they do not consider varying complex data such as temperature inversions, wind speed, and wind direction. If such conditions are adverse, sound can be carried at greater distances than might be expected on average.

The FLARNG, with a location on APAFR, also conducts maneuver training using the MLRS. Noise resulting from these activities is intermittent, confined to relatively small and contained areas, and involves only small segments of the 3-116th at any one time. Currently, available

training areas are subject to the same constraints that were placed on the unit when training with howitzers.

Aviation related noise occurs around MacDill Auxiliary Airfield and throughout the Restricted Airspace overlying the range impact areas. Around the airfield, approximately 554 acres of land are exposed to noise levels of 65 L_{dn} or greater. Under the Restricted Airspace specifically associated with these proposals (R-2109A and R-2901B), time averaged noise levels range from approximately 45 to 49 L_{dn} (Wyle Report, 2003).

Maneuver training currently conducted by the FLARNG involves the use of heavy wheeled- and tracked-vehicles, but their movement is generally limited to existing roads and trails, and their immediate vicinity (FLARNG, 1996).

Although some additional noise on APAFR results from routine human presence and activities as well as vehicular traffic, noise from aircraft operations and their associated activities dominates the acoustic environment on APAFR.

4.2 AIR QUALITY

Identifying the affected area for an air quality assessment requires knowledge of air emissions sources, pollutant types, emissions rates and release parameters, proximity to other emissions sources, and local as well as regional meteorological conditions. Refer to the Appendix D for a review of air quality regulatory requirements and associated methodologies used for emissions calculations plus a description of local meteorological conditions.

4.2.1 Definition of the Resource

Air quality is determined by the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions. The levels of pollutants are generally expressed on a concentration basis in units of parts per million (ppm) or micrograms per cubic meter (μ/m^3). For the air quality analysis, the Region of Influence (ROI) centers on Highlands and Polk Counties; this ROI has been chosen since the proposed activities would occur specifically in these counties.

Pollutant concentrations are compared to the National Ambient Air Quality Standards (NAAQS) and state air quality standards to determine potential effects. These standards represent the maximum allowable atmospheric concentration that may occur and still protect public health and welfare, with a reasonable margin of safety. The NAAQS identify maximum allowable concentrations for the following criteria pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter less than 10 microns in diameter (PM_{10}), and lead (Pb) (40 CFR 50). In the case of SO_2, the state of Florida has established more stringent standards (Florida Administrative Code [FAC] 62-204.240 (1)(a-b)). Details of the NAAQS and the state of Florida air quality requirements are provided in the Appendix D, Air Quality.

Based on measured ambient air pollutant concentrations, the USEPA designates whether or not areas of the United States are meeting the NAAQS. Those areas demonstrating compliance with

the NAAQS are considered in "attainment," while those that are not are known as "nonattainment." Those areas that cannot be classified on the basis of available information as meeting or not meeting the NAAQS for a particular pollutant are "unclassifiable" and are treated as attainment until proven otherwise. APAFR is in an attainment area.

4.2.2 Existing Conditions

Regional Air Quality

The Florida Department of Environmental Protection operates air quality monitors in Polk and Highlands Counties. Over the years of record, there have been no violations of the federal or state standards. This contributes to the fact that all of the counties in the state of Florida have been designated attainment for the NAAQS.

The Clean Air Act (CAA) also establishes a national goal of preventing degradation or impairment in attainment areas. As part of the Prevention of Significant Deterioration Program (PSD), areas were designated as Class I, II, or III. Congress designated national parks and wilderness areas where any appreciable deterioration in air quality is considered significant as Class I areas. There are three designated PSD Class I areas in the state: Chassahowitzka National Wildlife Refuge Wilderness Area, Everglades National Park, and St. Marks Wilderness Area (Figure 4-1). However, none of these areas are within 62 miles of APAFR, the required facility distance for Class I areas. Class II areas are those where moderate, well-controlled industrial growth could be permitted. Class III areas allow for greater industrial development. The area surrounding APAFR is classified as Class II. Currently there are no designated Class III areas in the United States. Under the PSD program, before a new major source of air emissions is constructed, its emissions are estimated to determine if significant emissions rate (SER) thresholds are exceeded. If a source is to be modified, then its emissions are evaluated and compared to the SER thresholds to determine if modifications are significant. The SER thresholds are used to ascertain whether pollution controls or air quality dispersion modeling are necessary for the construction project (USEPA, 1990).

Details regarding PSD air quality evaluations are provided in Appendix D, Air Quality.

Baseline Emissions

An air emissions inventory qualitatively and quantitatively describes the amount of emissions from a facility or within an area. Emissions inventories are designed to locate pollution sources, define the type and size of sources, characterize emissions from each source, and estimate total mass emissions generated over a period of time, normally a year. These annual rates are typically represented in tons per year. Inventory data establishes relative contributions to air pollution concerns by classifying sources and determining the adequacy as well as necessity of air regulations. Accurate inventories are imperative for development of appropriate air quality regulatory policy.

The latest available air emissions inventory for APAFR quantifies emissions from Stationary Sources based on 1999 (calendar year) activity (U.S. Air Force, 2001a). Stationary sources include equipment/processes such as boilers, electric generators, surface coating, and fuels

handling operations. The purpose of the inventory was to ensure that APAFR was in compliance with the applicable requirements of the CAA and state air quality regulations. Emissions data from mobile sources were obtained from a mobile source emission inventory for calendar year 1997 and based on information supplied by the various Department of Defense (DoD) agencies using the range (U.S Air Force, 2000). Mobile sources include motor vehicles, aerospace ground support equipment, and aircraft operations.

For the analysis of air quality impacts, a threshold of individual pollutant emissions not exceeding 10 percent of the combined total for Highlands and Polk Counties with respect to the corresponding individual pollutant was selected (Shipley Associates, 1995). For comparison purposes, the USEPA's 1999 National Emissions Inventory (NEI) data for Highlands and Polk Counties are presented in Table 4-2. Summaries of the air emissions inventories are presented in Table 4-3. The county data includes emissions data from point sources (a stationary source that can be identified by name and location), area sources (a point source whose emissions are too small to track individually, such as a home or small office building, or a diffuse stationary source, such as wildfires or agricultural tilling), and mobile sources (any kind of vehicle or equipment with gasoline or diesel engine, an airplane, or a ship). Emissions associated with vehicle exhaust and fugitive dust are the main issues generated by the Proposed Action and will be the focus of the air analysis.

Table 4-2. 1999 NEI Data for Highlands and Polk Counties

County	Pollutants (tons/year)				
	CO	NO_2	SO_2	VOCs	PM_{10}
Highlands					
Point Source	29.54	507.85	334.87	270.93	80.48
Non-road	7,973.65	556.04	54.22	1,272.92	84.24
On-road	15,618.11	2,234.98	85.66	1,412.15	70.90
Area Source	10,007.95	306.44	105.89	2,150.81	9,736.49
Highlands – Total	**33,629.26**	**3,605.31**	**580.64**	**5,106.81**	**9,972.11**
Polk					
Point Source	4,553.65	10,751.88	34,114.65	4,993.73	4,444.14
Non-road	38,487.46	3,428.65	356.43	3,929.94	369.45
On-road	106,444.33	13,365.92	521.58	10,774.69	399.26
Area Source	39,235.55	2,341.42	596.69	12,669.76	27,830.99
Polk - Total	**188,720.98**	**29,887.87**	**35,589.34**	**32,368.11**	**33,043.84**
Combined Total	**222,350.24**	**33493.18**	**36,169.98**	**37,474.92**	**43,015.96**

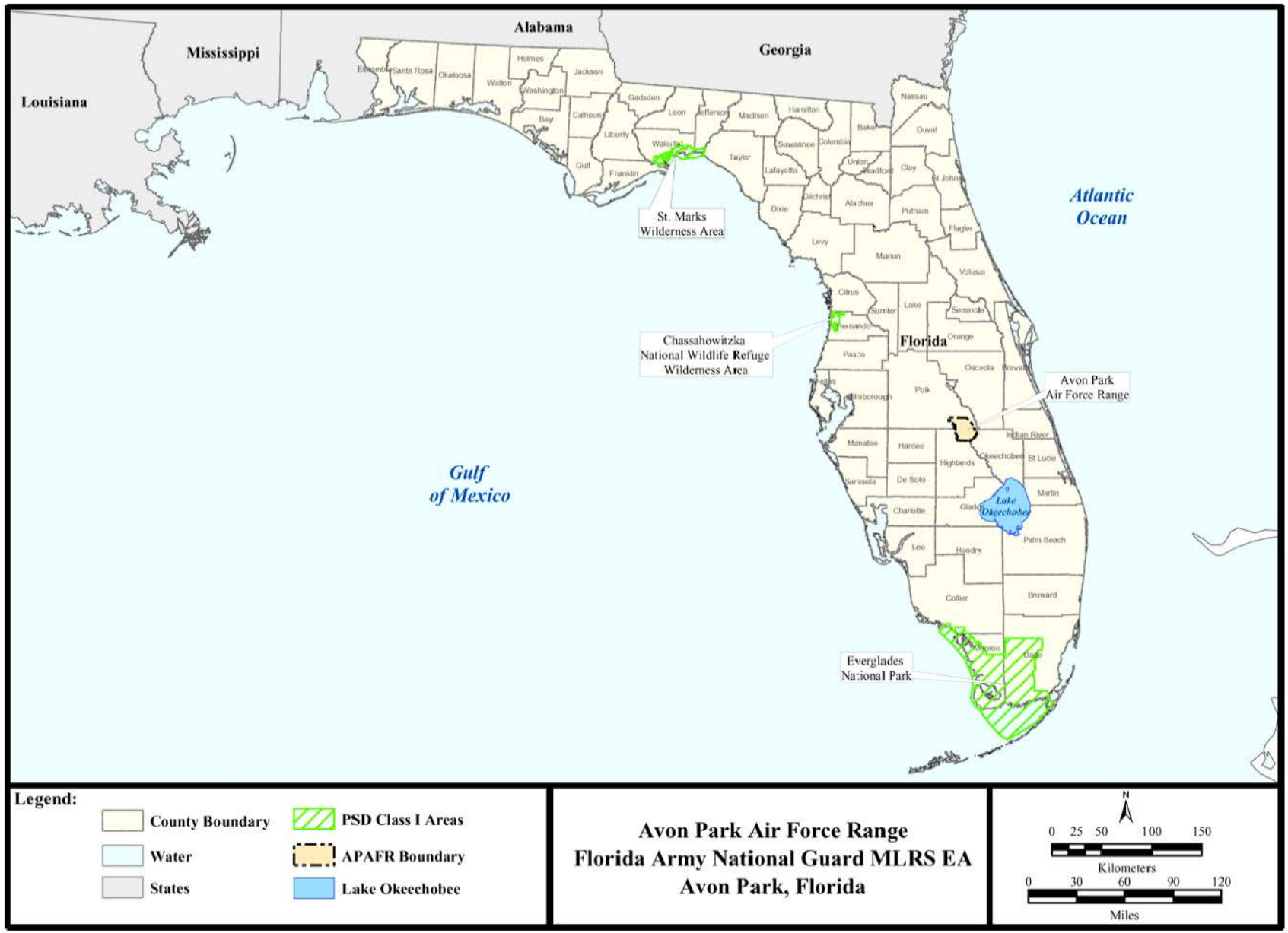

Figure 4-1. Designated Class I Areas in Florida

Table 4-3. Baseline Emissions Inventory for APAFR

Source Category	Pollutants (tons/year)					
	CO	NO_2	SO_2	VOCs	PM_{10}	Lead
Stationary Sources (1999)						
Degreasers	0.00	0.00	0.00	0.03	0.00	NR
Fuel Dispensing	0.00	0.00	0.00	0.16	0.00	NR
Fuel Storage Tanks	0.00	0.00	0.00	0.23	0.00	NR
Internal Combustion	1.27	0.99	0.06	0.13	0.07	NR
OB/OD	0.01	0.00	0.00	0.00	0.00	NR
Paint/Chemical Use	0.00	0.00	0.00	0.10	0.02	NR
Range Ordnance*	0.04	0.04	0.00	0.00	1.72	0.01
Welding	0.00	0.00	0.00	0.00	0.01	NR
Woodworking	0.00	0.00	0.00	0.00	0.04	NR
Stationary Sources – Total	**1.32**	**1.03**	**0.06**	**0.65**	**1.86**	**0.01**
Mobile Sources (1997)						
Aircraft	121.60	287.40	7.90	14.90	8.20	0.00
Onroad/Offroad Vehicles	17.80	3.10	0.00	2.10	0.00	0.00
Fugitive Dust**	0.00	0.00	0.00	0.00	169.5	0.00
Mobile Sources – Total	**139.40**	**290.50**	**7.90**	**17.00**	**177.70**	**0.00**
APAFR Combined Total	**142.00**	**292.52**	**8.02**	**18.30**	**179.70**	**0.01**

APAFR stationary sources: (U.S. Air Force, 2001a)
APAFR mobile sources: (U.S. Air Force, 2000)
* Emissions calculated based on CY2000 data
** Emissions from onroad/offroad vehicles traveling on dirt roads
NR = not reported
OB/OD = Open burn/open detonation of munitions
VOC = Volatile organic compound(s)

4.3 LAND USE

4.3.1 Definition of the Resource

Land use generally refers to the way land is developed and used in terms of the kind of human activities that occur, such as residential, commercial, industrial, agricultural, military, and recreational uses. This section discusses land uses on APAFR, which include military, agricultural, recreational, and natural resources management. It begins with a description of the regional land use surrounding APAFR because land use on APAFR has the potential to affect off-range areas.

Plans, guidelines, and intergovernmental agreements guide both the regional and APAFR land use. Intergovernmental coordination involves the evaluation of relationships between the Proposed Action and the objectives of federal, state, and local land use plans, policies, and controls, including required permits and approvals.

APAFR has several cooperative agreements with state and federal agencies, which are mutually beneficial to all parties. For example, fish and wildlife management activities and support agreements are developed to ensure appropriate resource stewardship while not interfering with the

weapons training mission. No direct habitat improvements are carried out on active ranges or in areas where the result could increase the hazard to aircraft flying operational missions. These agreements are briefly described in Appendix E, Land Use.

4.3.2 Existing Conditions

4.3.2.1 Regional Land Use

As depicted in Figure 4-2, APAFR is situated between the southeastern part of Polk County and the northeastern part of Highlands County in central Florida. The eastern boundary of the range borders Osceola and Okeechobee counties. The Kissimmee River follows the county lines and is adjacent to the southern portion of the range's eastern border. Towns within the vicinity of the range include Alcoma, Babson Park, and Frostproof within Polk County and Plains, De Soto City, Sebring, and Avon Park within Highlands County. The city of Avon Park, located 9 miles to the west of the range, is the closest large populated area, with 21,000 residents (Avon Park Chamber of Commerce, no date). The major urbanized land uses are centered within a triangular area formed by the major transportation corridors (U.S. 60 and U.S. 27) as shown in Figure 4-2.

The general land use pattern surrounding the range may be characterized as agricultural, rangeland, upland forests, and water bodies, with the predominant use being agricultural. Scattered residences occur in the vicinity of the range, including some large residential subdivisions. Specifically, large residential areas within the restricted airspace areas are as follows.

- Indian Lake Estates, a low-density single-family residential development is located between Highways 60 and 630 and Lake Weohyakapka. Amenities include a golf course and fishing dock. Incidental commercial development occurs along Highway 60.
- River Ridge, a western-style resort with amenities such as a marina, skeet-shooting range, equestrian trails, convention halls, and airstrip, is located along Highway 60 north east of the range.
- Mobile home and other single-family residential subdivisions occur along Highway 630, between Rudy Lake and Weohyakapka Lake in areas previously used for agricultural purposes.

Other low-density (two to four dwelling units per acre) residential subdivisions occur in Highlands County surrounding the range. Development intensity increases along the highway corridors, particularly U.S. 27, to include commercial development (Polatti, 2003).

Polk, Highlands, Okeechobee, and Osceola Counties all maintain current comprehensive plan documents. The future land use designations for each of these counties, in the vicinity of the range, are agricultural. However, each county permits low-density residential use within this designation.

Several special land use areas occur in the vicinity of the range. Notably, Lake Arbuckle is located on the northwestern side of the range (the eastern edge of this lake forms the boundary of the range). The state of Florida purchased approximately 13,000 acres from private landholders on the west side of this lake to be used as a wildlife management area and a state park. Visitors to the park use the lake for recreational pursuits (U.S. Air Force, 1999).

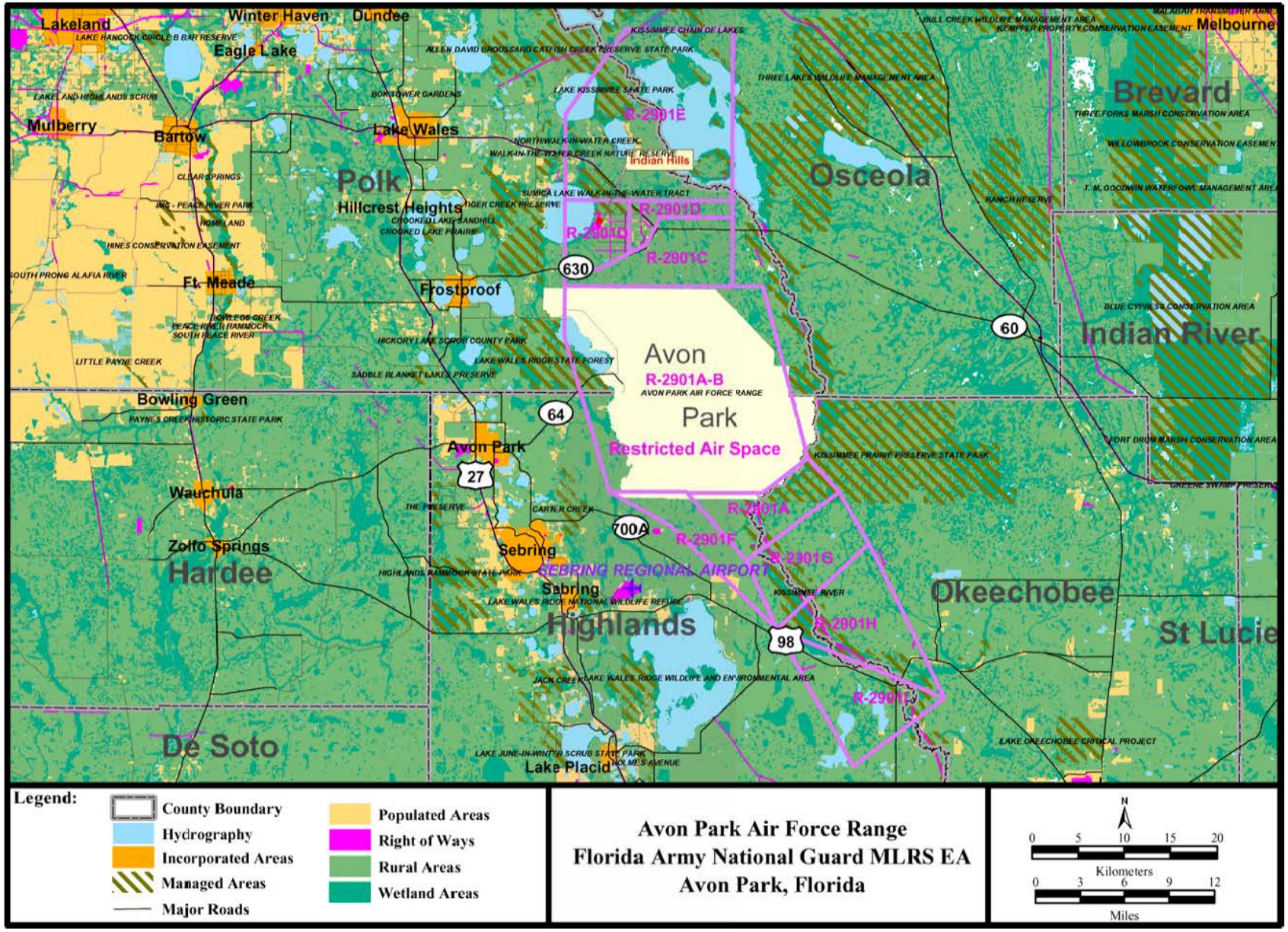

Figure 4-2. Regional Land Use Surrounding APAFR

The Florida National Scenic Trail was one of eight national scenic trails designated by Congress in 1983. At 1,300 miles long and stretching from the Gulf Islands National Seashore in the Panhandle of Florida to the Big Cypress National Preserve in the southwestern portion of the state, the trail is considered one of the nation's premier long-distance hiking trails. To date, approximately 684 miles of the planned 1,300 mile trail have been prepared and opened for public use, including an approximately 11-mile stretch located within the APAFR. In coordination with dozens of land managers, the U.S. Department of Agriculture (USDA) Forest Service has the primary responsibility of maintaining the trail route (Wimmer, 2003).

Other special land use areas within the vicinity of the range include the Lake Wales Ridge State Forest and National Wildlife Refuge. Lake Wales Ridge refers to the narrow ridge that runs north and south through the Florida Peninsula. The state of Florida has partnered with the U.S. government and private land trusts for many years, seeking to purchase sensitive natural areas along the Ridge (Leonard, 2003).

Located within Polk County, the Lake Wales Ridge State Forest, administered by the state of Florida, is approximately 20,000 acres in size and offers hiking and equestrian opportunities, as well as canoeing, picnicking, and primitive camping (Florida State Parks, 2003). The Lake Wales Ridge National Wildlife Refuge was so designated by the U.S. Fish and Wildlife Service (USFWS) in 1993 and encompasses about 19,000 acres in Highland County (Florida State Parks, 2003). Lake Kissimmee State Park is located on the southwestern banks of the lake (the third largest in Florida) and comprises about 6,000 acres. There are abundant opportunities for fishing, bird watching, picnicking, camping, boating, and hiking (Florida State Parks, 2003).

Lands managed by the federal government include the APAFR and the Lake Wales Ridge National Wildlife Refuge. Lands managed by the state government include preserves, parks, creeks, rivers, lakes, forests, and conservation easements including the Kissimmee State Park and the Lake Wales Ridge State Forest.

The Florida Department of Environmental Protection (FDEP) Division of Recreation and Parks manages the Kissimmee Prairie Preserve State Park, which is located in south-central Florida, primarily in Okeechobee County, and encompasses approximately 54,000 acres (shown previously on Figure 4-2. Kissimmee Prairie Preserve State Park offers year-round camping and scenic hiking. Highlands Hammock State Park is located in south-central Florida near the town of Sebring. Comprised of 9,000 acres, Highlands Hammock State Park offers year-round camping, hiking, mountain biking, and prime habitat for native species.

Other natural areas managed by the state of Florida or other regional entities include Allen David Broussard Catfish Creek Preserve, Kissimmee River, Kissimmee Chain of Lakes, Bowlegs Creek, Clear Springs, Fisheating Creek Conservation Easement, and the Lake Wales Ridge Wildlife and Environmental areas.

Lands managed by county governments include creeks, rivers, lakes, parks, and preserves. These areas typically include day use visitor areas with picnicking and nature viewing opportunities. Some of these areas include the Hickory Lake Scrub County Park, Peace River Park, and Highlands County Parks and Recreation Department Preserve. Also underlying the airspace are a variety of lands managed by private organizations, including biological stations, creeks, avenues, preserves, and gardens. Some of these areas include the Archbold Biological

Station, Saddle Blanket Lakes Preserve, Venus Flatwoods Preserve, and the Bok Tower Gardens, which underlies Placid-3.

4.3.2.2 APAFR Land Use

APAFR is a strategic defense installation and is managed for military activities. Other uses are permitted if they do not interfere with military use. APAFR covers approximately 106,000 acres with four major land use types: military use, commercial use, recreation, and natural resources management. This section describes each of these major land use types on APAFR.

Military Use

The range is used for air-to-air combat and air-to-ground bombing and gunnery training by DoD air crews, as well as other DoD military units for a variety of training activities, including aircrew training in fixed- and rotary-wing aircraft, artillery firing, troop maneuvers, search and rescue operations, joint service exercises, and other ground training exercises. There are periodic range clearances involving explosive ordnance disposal (EOD) of munitions on the range. Military use areas include the main base (or cantonment), impact areas (sometimes referred to as "ranges" in other documents), and training areas (Figure 4-3).

The main base occupies approximately 1,600 acres and includes the airfield complex as well as management and administration facilities. There are 35 buildings and facilities within the main base area, including the Unit Training Equipment Site (UTES) where the FLARNG locates and maintains its vehicles. The airfield, designated MacDill Auxiliary Field, consists of one 8,000-foot runway (150 feet wide), which can support aircraft weighing up to 150,000 pounds. There is one additional 5,000-foot runway (150 feet wide), which has no arresting barriers and is not maintained or swept. It is used by fixed-wing aircraft conducting special operations and only during extreme emergency situations. Rotary-wing aircraft are authorized to use this runway. There is an unpaved 3,000-foot assault strip parallel to and east of the main runway. It is used for tactical operations.

In 1951, the U.S. Bureau of Prisons began operation of a prison on the main base (USACE, 1999). This prison, the Avon Park Correctional Institution, is now owned and operated by the state of Florida. It usually houses 1,200 to 1,300 inmates. The Avon Park Youth Academy, a facility for approximately 200 troubled youths, is operated by a contractor for the Florida Department of Juvenile Justice and is on land deeded to Highlands County.

There are seven ordnance impact areas occupying approximately 21,000 acres where the majority of the military missions occur or where they occurred historically. These impact areas, other military training areas, and major mission features are shown in Figure 4-3. The impact areas are designated as either conventional or tactical areas. A conventional impact area has specific targets that require the aircrews to fly specific flight patterns. Tactical areas are designed for aircrews to practice aircraft combat tactics.

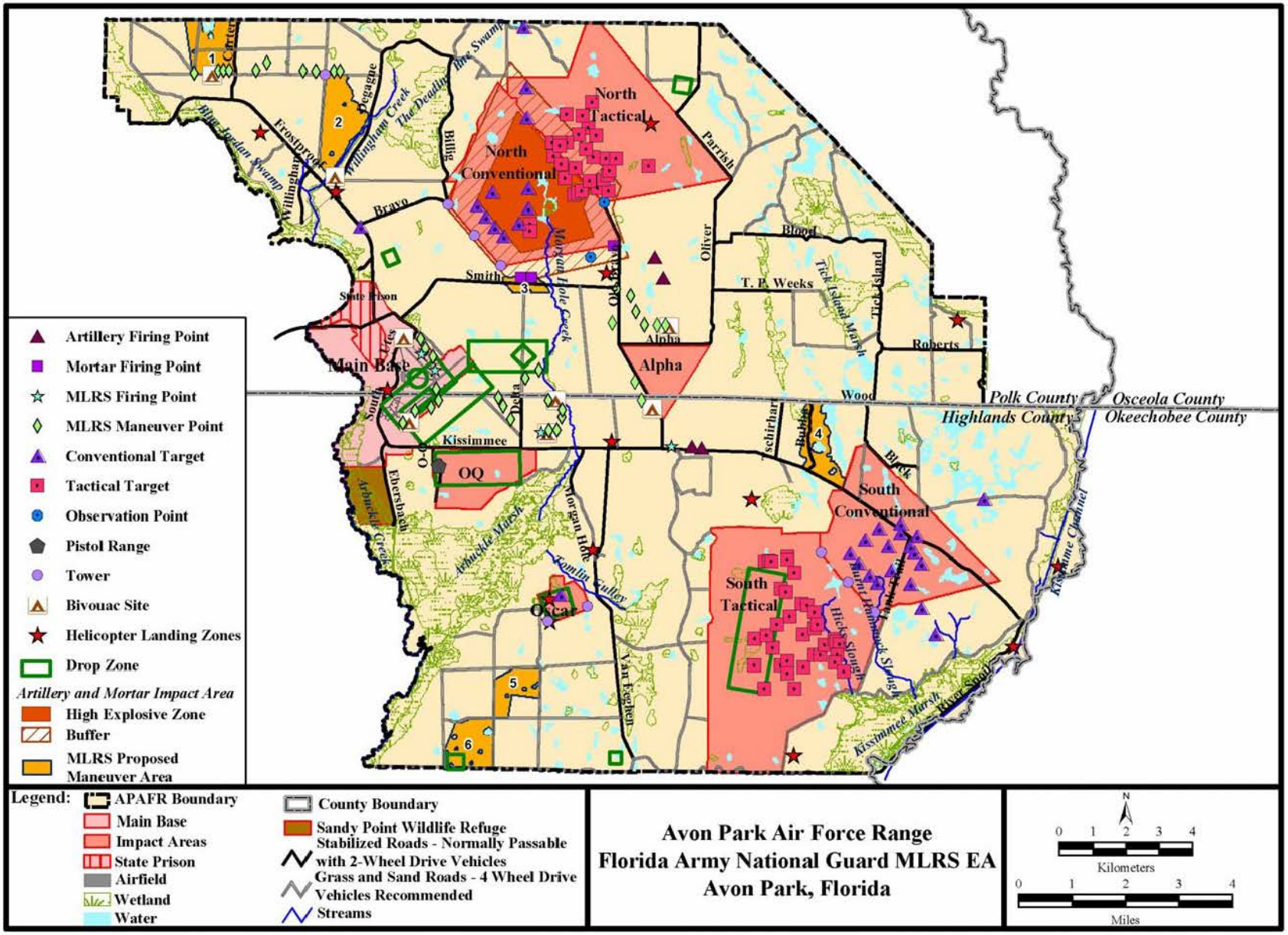

Figure 4-3. Mission Areas on APAFR

The range includes two scorable, tactical, air-to-ground ordnance impact areas (Echo and Foxtrot) and two scorable, conventional, air-to-ground ordnance impact areas (Charlie and Bravo). These areas are also named for the location and type of impact area to North Conventional (Bravo), North Tactical (Foxtrot), South Conventional (Charlie), and South Tactical (Echo). The former Delta impact area is now part of the Charlie impact area and is used for tactical training.

In the northeast corner of the Alpha impact area, now inactive, is an 11-acre site that was used for open burning and open detonation of munitions. The area is currently managed under a Resource Conservation and Recovery Act (RCRA) permit.

A wide variety of practice and high-explosive (HE) ordnance is delivered at APAFR by many different air-based platforms, although the primary ordnance used is inert or practice rounds. The most common bomb used at APAFR is the BDU-33, a 25-pound inert practice bomb. Other small practice bombs used at APAFR include the MK-106 (10-pound) and the MK-76 (25-pound). Heavier bombs called "heavies" include MK-82 (500-pound), BDU-38 (750-pound), and MK-84 (2,000-pound), or their equivalents. Inert laser-guided bombs such as the GBU-10 (500-pound) or GBU-12 (2,000-pound) are also used on a limited number of targets at the Foxtrot and Echo impact areas. A 2.75-inch rocket is an air-to-ground ordnance used at APAFR. Aircraft machine guns fire the 7.62-millimeter (mm) and .50-caliber projectile ordnance. Practice and high explosive (or live) rounds fired at APAFR include 20-, 30-, 40-, and 105-mm rounds. The Hellfire antitank missile is another type of HE ordnance used by helicopters at APAFR (Beers, 2003).

The FLARNG uses training areas outside the ordnance impact areas that include access trails, firing points, maneuvering points, mortar points, and bivouac areas (Figure 4-3). Ground training includes infantry, field artillery, and air defense using artillery, mortars, machine guns, and small arms.

The range has 14 helicopter landing zones and 15 drop zones; a 3,000-foot dirt assault strip; land navigation areas; and ground training areas (Delta, Bravo Ridge, and Willingham) where the majority of the ground training activities occur (Figure 4-3).

Use of the ordnance impact areas and training areas by all units is governed by the Moody AFB Supplement 2 to AFI 13-212, Vol. 1, Weapons Ranges, dated 31 July 1997 (U.S. Air Force, 1997a). APAFR is in the process of revising this supplement, which will be issued as Pope AFB Supplement 2 to AFI 13-212. It describes the responsibilities for use of APAFR and establishes overall safety and procedural standards for weapons delivery and operations at APAFR.

APAFR is in the process of developing a Range Comprehensive Plan that will provide the vision and strategy for the future use of APAFR (Galloway, 2003).

Agricultural Use

Agricultural use of the range includes 96,000 acres for cattle grazing and about 37,000 acres for forest management. Each of these land use types are described in this section.

Cattle Grazing. Cattle grazing occurs on 90 percent of APAFR through nine leases with six individuals (U.S. Air Force, 2004a) (Figure 4-4). The grazing leases are for an initial period of 5 years with a single 5-year renewal option. Grazing also serves to reduce fuels, which reduces the fire hazard on the range. The only areas of the range where grazing is precluded is a portion of the main base around the airfield, Bravo and Charlie impact areas, and portions of Echo and Foxtrot impact areas (Figure 4-4). Table 4-4 shows the acres of cattle grazing areas within each of the proposed MAs. APAFR's Range Management Guidelines are included as Appendix B of the Draft Final APAFR Integrated Natural Resources Management Plan (INRMP) (U.S. Air Force, 2004a). These guidelines describe the requirements for managing beef cattle on APAFR without adversely impacting the growth of native grasses. They provide the general and specific land use regulations for each lease that the lessee must adhere to. APAFR uses a one herd, multiple pasture grazing system that provides an adequate rest and recovery period for the grasses. This management strategy confines all cattle to one herd per lease unit.

Table 4-4. Grazing Lease Areas (in Acres) within Proposed MLRS Maneuver Areas

Lease Number [1]	Acres of Lease	Maneuver Area						Total acres in MAs
		1	2	3	4	5	6	
1		534						534
3					428			428
6			642					642
7				133				133
9						324	473	797
Total		534	642	133	428	324	473	2,533

[1] See Figure 4-4

The cattle carrying capacity of APAFR varies from year to year but averages about 4,000 head annually. This number of cattle comprises about 1.9 percent of the combined total current estimated number (206,700 head) of cattle and calves in Highlands and Polk Counties (Florida Agricultural Facts, 2002).

Cattle remain on the range at all times during missions. Generally, leaseholders have greater access rights than the general public. On occasions there have been restrictions on access for a period of 48-72 hours; however ,in the past, access was virtually unrestricted (Ebersbach, 2003). Leaseholders are not allowed into impact areas during a mission.

All necessary infrastructure required for the grazing operations (including fence maintenance) is provided and maintained by the APAFR with funds provided by the individuals leasing the property.

Forestry/Timber Harvesting. APAFR contains just over 37,000 acres of forest cover that includes: 16,700 acres of slash pine plantations; 7,370 acres of longleaf pine; 7,252 acres of south Florida slash pine; 800 acres of sand pine; and 5,000 acres of cypress and mixed hardwoods (Figure 4-5). Approximately 15,000 acres of pine plantation are intensively managed.

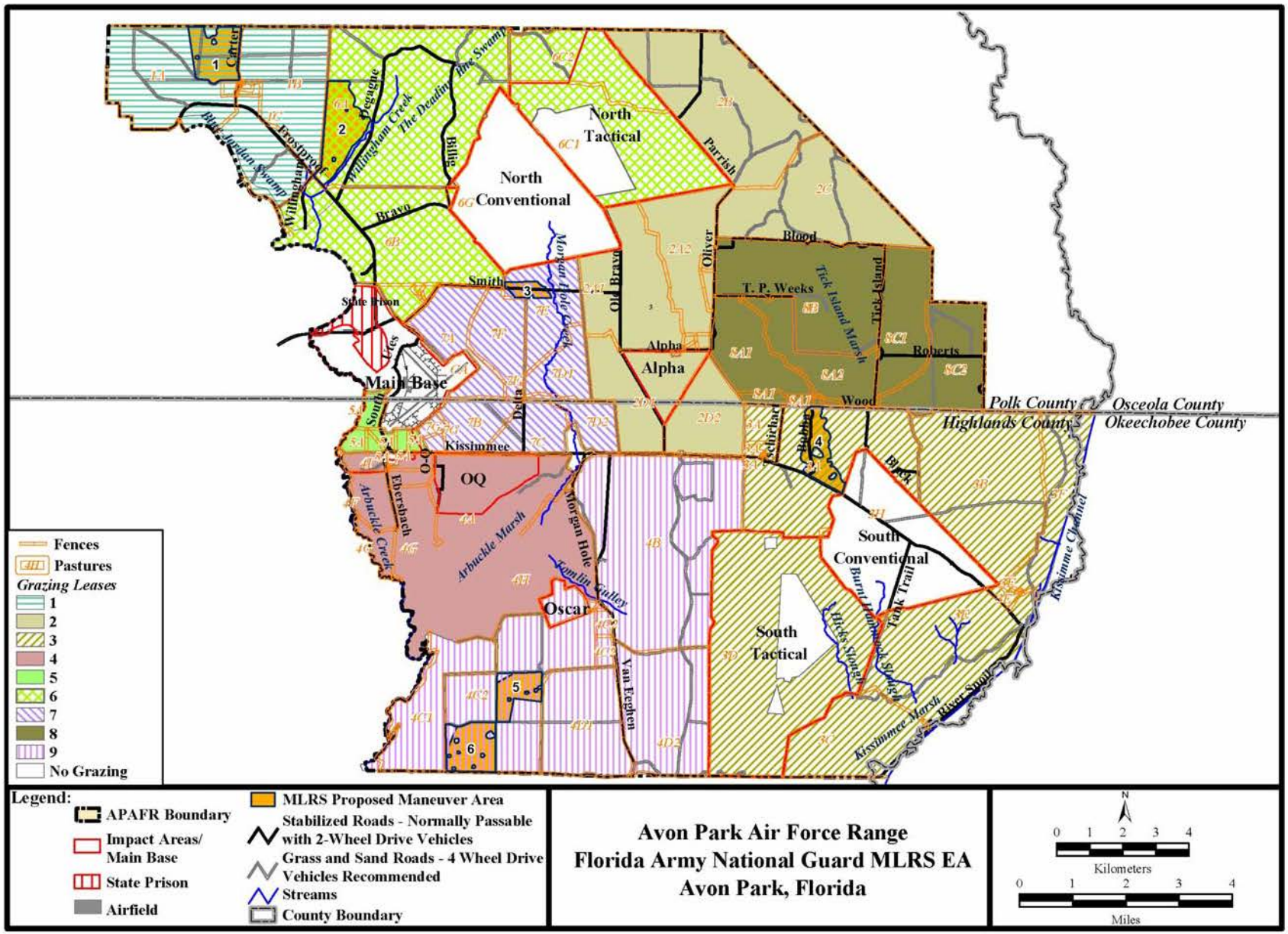

Figure 4-4. Cattle Grazing Activities on APAFR

Timber harvest also minimizes available fuels and serves as a fire control measure. Table 4-5 shows the forestry management areas within the proposed MAs. From FY1997 through FY2001, the number of tons of timber sold has averaged 26,478 (Olsen, 2003). Of the timber harvested on the range, 75 percent is for saw timber or ply-logs with 25 percent for pulp and mulch. Most of the timber harvested is slash pine with some longleaf pine. The timber for pulp/mulch is usually transported to mulch/chip mills within a 30-mile radius of the range, while timber for saw wood and ply-logs is transported up to 215 miles from APAFR (Olsen, 2003). Timber harvesting occurs five to six times per year and is controlled through contracts with the APAFR Environmental Flight.

Table 4-5. Forestry Management Areas within the Proposed Maneuver Areas

	Maneuver Area						
Type of Area	**1**	**2**	**3**	**4**	**5**	**6**	**Total acres in MAs**
Pine Flatwoods		73	<1	7	77	36	193
Pine Plantations	392	300	107	12	126	203	<1,148
Total	392	373	107	<27	203	239	<1,341

Recreation

Public access is provided on approximately 82,000 acres of APAFR for outdoor recreational activities, including hunting, fishing, camping, horseback riding, hiking, bird watching, and nature study. Public recreation access requires purchase of an Outdoor Recreation Permit and is conditional depending on military activity, the season, and the type of recreation. The Natural Resources Section of the Environmental Flight routinely publishes a Public Recreation Map that identifies the types of recreation permitted, their locations, and the regulations controlling their use. Because APAFR is an active training range, it has been divided into 19 separate public management units, in part, to control public access within the range (Figure 4-6).

Public access to the range for recreation is limited from noon on Thursdays through 8:00 P.M. on Mondays throughout the year, except during the period from the end of October to mid-December, and except when superseded by special announcements of mission or other activities. The actual dates may change from year to year, based on hunting seasons. Hunting is permitted from approximately mid-September through the end of April on all open management units.

An important measure used by APAFR to understand usage of any particular unit is the tally of weekend reports filed in a given year that references the particular management units that were visited and the type of activity engaged in. Table 4-6 provides a tally of actual weekend reports representing the visitors to each unit for a particular recreational activity for the 52-week reporting period from 5 August 2002 to 21 July 2003.

Data in Table 4-6 are summarized from the weekend weekly report database provided by APAFR.

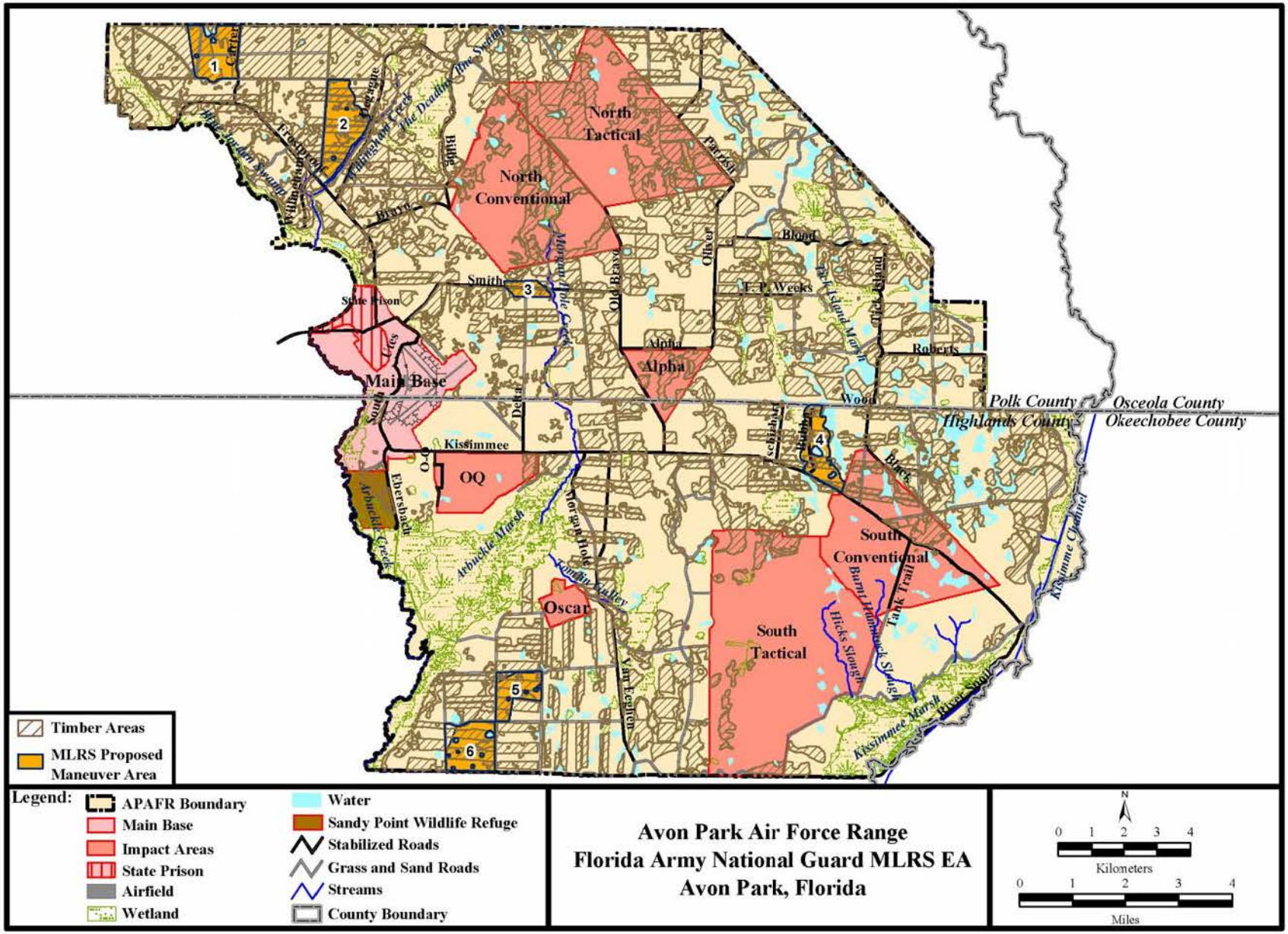

Figure 4-5. Timber Harvesting Areas at APAFR

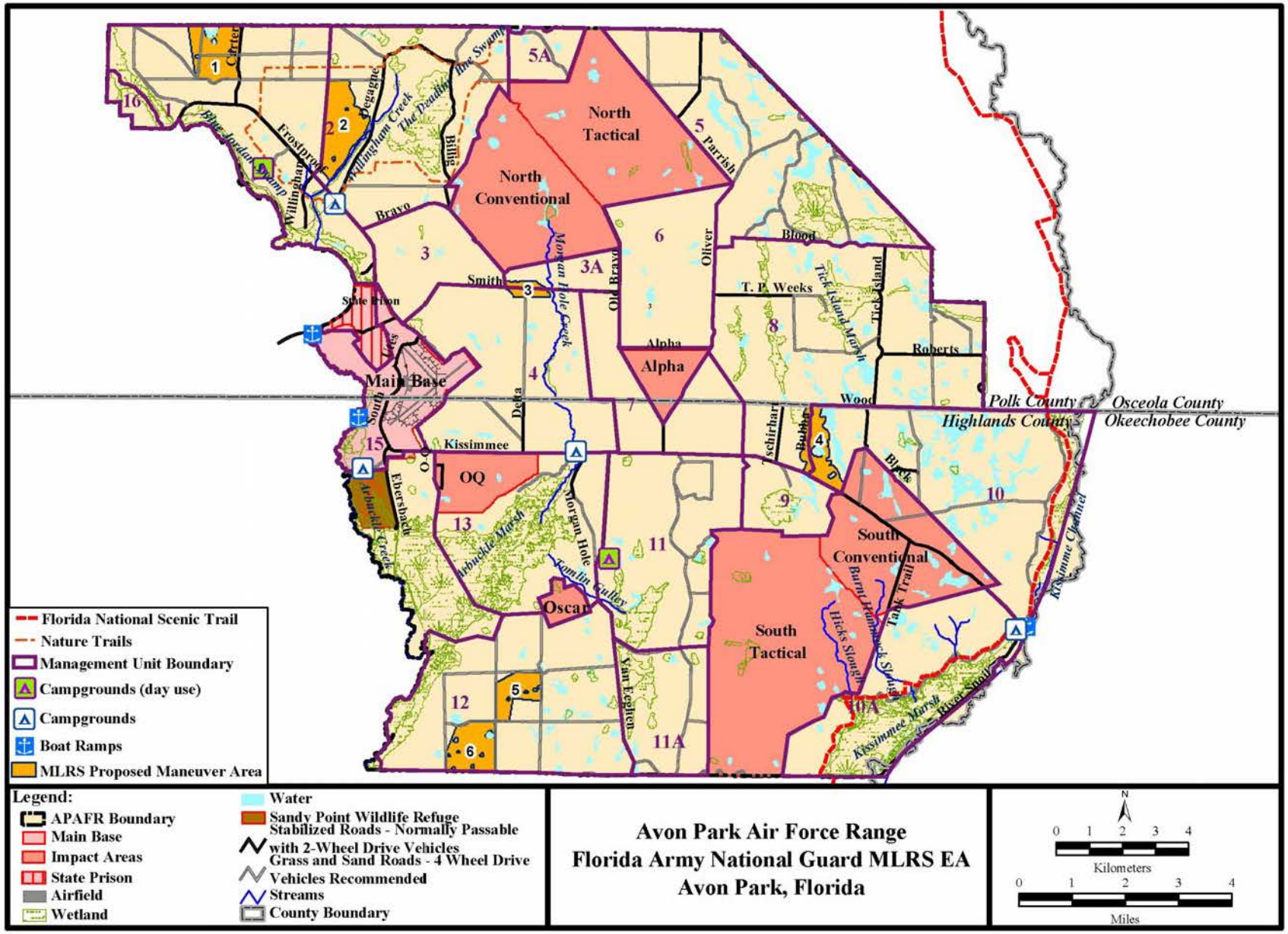

Figure 4-6. Recreation Management Units on APAFR

Table 4-6. APAFR Distribution of Reported or "Marked" Recreational Activity Choices by Management Unit – Tally of 52 Weeks (August 2002–July 2003)[1]

Unit	Acres	% of Total Acres	Brd W	Btng	Cmp	Fish	Hik	Hrse	Hunt	ScHunt	Oth	Sum	%
1	5,977	7.4%	36	3	267	45	28	1	697	206	23	1,306	9.3%
2	7,818	9.7%	19	5	223	34	21	0	529	159	11	1,001	7.1%
3	2,131	2.6%	23	1	168	34	11	0	475	133	11	856	6.1%
3A	777	1.0%	10	0	45	13	5	0	82	41	4	200	1.4%
4	5,993	7.4%	2	0	13	8	7	0	13	14	2	59	0.4%
5	6,988	8.7%	11	2	163	30	8	0	389	95	4	702	5.0%
5A	840	1.0%	6	0	34	8	1	0	81	24	4	158	1.1%
6			1	0	4	1	0	0	6	1	1	14	0.1%
7	2,846	3.5%	9	1	133	20	7	0	216	87	2	475	3.4%
8	10,044	12.4%	20	5	238	73	13	0	590	153	5	1,097	7.8%
9	1,335	1.7%	8	1	47	14	1	0	113	30	2	216	1.5%
10	7,309	9.0%	39	43	453	256	45	1	778	221	17	1,853	13.2%
10A	5,125	6.3%	31	31	458	203	35	1	658	175	10	1,602	11.4%
11	5,191	6.4%	10	5	238	65	6	0	401	104	7	836	6.0%
11A	2,470	3.1%	7	4	155	28	3	0	235	66	3	501	3.6%
12	7,383	9.1%	24	3	362	84	20	0	713	175	14	1,395	9.9%
13	5,385	6.7%	35	7	489	152	15	0	750	170	13	1,631	11.6%
15	2,815	3.5%	0	0	14	0	0	0	71	5	1	91	0.6%
16	348	0.4%	0	0	2	1	0	0	45	2	0	50	0.4%
Total:	80,777	100.0%	291	111	3,506	1,069	226	3	6,842	1,861	134	14,043	100.0%
% of Total:			2.1%	0.8%	25.0%	7.6%	1.6%	0.0%	48.7%	13.3%	1.0%	100%	

[1]Table taken from: Environmental Impact Statement for Navy Air-To-Ground Training, Avon Park Air Force Range, Check Copy Draft, September 2004, Prepared by U.S. Department of the Navy (U.S. Navy, 2004).
Brd W = Bird Watching Btng = Boating Cmp = Camping Fish = Fishing Hik = Hiking Hrse = Horseback Riding
Hunt = Hunting ScHunt = Scouting for Hunting Locations Oth = Other

The second reason is that guests often accompany the compliant visitor who fulfills the report-filing requirement, but the presence of guests is not captured on the report. The data summarized have not been adjusted to attempt to account for full usage of the range. It is noted that some report filers visited multiple units and engaged in several types of recreational activities.

Table 4-6 displays the type of recreational activity engaged in by the permit filer; bird watching, boating, camping, fishing, hiking, horseback riding, hunting, scouting for hunting locations, and other activities. Analysis of the weekly reports for the 52-week reporting period from 5 August 2002 to 21 July 2003 indicated that the primary recreational activities were hunting (49 percent), camping (25 percent), and scouting for hunting (13 percent). Some units are relatively more popular for certain types of activity that generate the lion's share of permit revenues. For example, units 10 and 10A comprise about 15 percent of the total range acreage and account for the largest share of relative usage, approximately 25 percent, dominated by hunting, scouting for hunting locations, camping, and fishing. These units are also noteworthy in that they are the major choice location for boating compared to the other units. Units 13, 12, and 1 had high utilization (11.6 percent, 9.9 percent, and 9.3 percent, respectively) and the dominant activities were hunting,

scouting for hunting locations, and camping. Unit 4 was closed for a major part of the last year (2003), which resulted in only a 0.4 percent use for the period. The area has since reopened.

The current and forecasted status of each management unit is available on a weekly basis (or sooner, if necessary) through the Natural Resources section, where visitors must check in. Public access is prohibited in Bravo, Foxtrot, Alpha, Echo, and Oscar impact areas, and Management Unit 6. The public has restricted access on the Charlie and OQ impact areas and the main cantonment, where they must travel on designated roads only.

Hunting. APAFR sends out about 3,000 applications annually (up to four persons can apply for permits on a single application) and issues about 2,000 permits each year (2,069 in 2003). Each permit allows all forms of recreation, including hunting. Annual harvests during recent years (1999-2001) for primary game species included 481 white-tailed deer, 1,075 wild hogs, 875 bobwhite quail, and 350 wild turkeys. Hunting deer using dogs occurs at APAFR with approximately 1,000 "dog hunters" engaging in this activity. Opportunities to hunt are limited to 2,000 permits per year, drawn by lottery. Chosen permit-holders are allowed to bring guests most weekends (Lichtler, 2003).

Camping. Public camping is allowed in three areas (Figure 4-6), designated as Willingham Morgan Hole, and Fort Kissimmee. Austin Hammock Campground in the main base area near Sandy Point Wildlife Refuge is for military personnel use only. There are also two day-use areas, Arnold Hammock and Tomlin Hammock Lake (Figure 4-6).

Other Recreational Uses. There are four hiking trails, covering approximately 36 miles as shown on Figure 4-6. These are associated with Lake Arbuckle, Sandy Point Wildlife Refuge, and the Kissimmee River. An 11-mile portion of the Florida National Scenic Trail crosses the installation and is open for public access. Based on the weekend weekly reports, hiking users constituted less than 2 percent of all recreation users.

Fishing can occur at any area on APAFR where access is allowed. Based on the weekly recreation reports, approximately 43 percent of the fishing occurs in management units 10 and 10A, which afford access to the Kissimmee River. Other popular fishing areas include Tomlin Hammock Lake, Submarine Lake, and Little Lake.

Bird watching and wildlife observation occur on APAFR. Management units 1, 10, 10A, and 13 see the majority of the users (approximately 48 percent). There is a 30-foot observation tower at Lake Arbuckle (Management Unit 1), which is a popular bird watching site.

Natural Resources Management

Although APAFR is an important strategic defense installation and is managed for military activities, it also contains native plant and animal communities because of restricted access and limited development. Even though it is managed as a military range, more than 50 percent of the land at APAFR meets the Florida Natural Areas Inventory (FNAI) standard as a "natural area" (Orzell, 1997). A wide range of research and monitoring studies have been and are being conducted at APAFR and surrounding natural areas. APAFR has implemented natural resource

programs to enhance native game, wildlife, protected species, and other native plants and animals on the range.

There are 13 state-protected plant species, two of which are also federally protected, and 15 state-protected animal species (11 of which are also federally protected) located on or near APAFR (U.S. Air Force, 2000). However, only eight federally listed species have been documented on APAFR. As part of the natural resources program at APAFR, personnel conduct long-term monitoring and field surveys of many of the protected species. APAFR manages areas and habitat for a number of protected species, primarily through the continuous application of fire. APAFR burns about 25,000 acres annually (Ebersbach, 2003). APAFR has an active program aimed at surveying for and eradicating exotic (non-native) and invasive plants. An invasive plant is one with rapid growth that spreads quickly over large areas and displaces native plants. Nuisance and exotic animal species, such as feral hogs, alter habitats at APAFR and are managed primarily through public and military hunting. There is also a trapping program supported by volunteers to remove hogs from the range.

Natural resources management activities at APAFR are guided by APAFR's final draft INRMP for the period 2003-2007 (U.S. Air Force, 2004a) and the Endangered Species Management Plan (U.S. Air Force, 2000). The final draft INRMP for the period 2003–2007 provides strategic guidance for management of natural resources on APAFR (U.S. Air Force, 2004a). It identifies desired future conditions (DFCs) for each type of ecosystem, which represent the vision of how that particular part of the landscape should look in the future. The plan describes practices and standards for managing the resources within designated landscape association management areas. The plan is based on an ecosystem approach to land management. Ecosystems on APAFR have been delineated and described based on landscape associations, which take into account plant communities, soils, hydrology, topography, elevation, and numerous other factors. These associations are described in more detail in Section 4.4.

APAFR's Endangered Species Management Plan identifies habitat management units (HMUs) for three threatened and endangered species of birds, including the Florida scrub jay, the Florida grasshopper sparrow, and the red-cockaded woodpecker (U.S. Air Force, 2000). Based on the size and quality of the identified habitat areas, and combined with locally generated data on habitat needs, population goals are established in consultation with the U.S. Fish and Wildlife Service and the Florida Fish and Wildlife Commission. These areas are described in more detail in Section 4.8.

4.4 EARTH RESOURCES

4.4.1 Definition of the Resource

This section identifies the physical features, predominant soil types, natural soil landscape positions, and soil-water processes at APAFR.

4.4.2 Existing Conditions

Physical Features

APAFR is located within the Osceola Plain, Okeechobee Plain, and Bombing Range Ridge physiographic provinces of central Florida. The Osceola and Okeechobee Plains are generally characterized as a relatively flat, monotonous marine terrace within the Kissimmee River Valley. Maximum elevations of 90 to 95 feet are reached along the northern edge of the Osceola Plains. The Okeechobee Plain occurs along the eastern boundary of the APAFR and is one of the most reliefless parts of the United States. Elevations on the Okeechobee Plain range from 30 to 40 feet at the northern boundary to 20 feet at Lake Okeechobee (White, 1970). The Bombing Range Ridge is a highland area within the Osceola Plain that is characterized as a geologic relic of a large marine sandbar feature created by the Atlantic. The Bombing Range Ridge occupies portions of Polk and Highlands Counties and is almost solely contained within the APAFR. The north-south trending ridge is approximately 21 miles long, 3 to 4 miles wide, with maximum elevations ranging from 125 to 145 feet (Campbell, 1986). Because of increased elevation and variable slope gradients, the ridge feature is generally better drained than surrounding flatland areas.

APAFR is bounded to the west by the Lake Wales Ridge (approximately 1 mile from the range boundary at the closest point) and to the east by lower lying marine scarps. The characteristics of these geologic features are primarily a product of fluctuations in sea level and solution of subsurface limestone formations (Campbell, 1986; White, 1958). All the proposed MLRS maneuver area lands are within the Osceola Plain physiographic province.

Soils

Soils are classified according to the U.S. Department of Agriculture's National Cooperative Soil Survey classification, which includes soil order, suborder, great group, subgroup, family, and series. Soil orders are the most general classification, providing very broad soil information on a small spatial scale, whereas soil series provide detailed data on a large spatial scale including series descriptions, taxonomic class, typical soil horizons, range of characteristics, geographic setting, drainage, soil water, vegetation, and other features. Soil series provide trends and range of conditions that are common to a soil. Although soil series descriptions provide a fine level of detail, a range of variability may occur for site-specific soils. In this section, soils data are presented at the soil order and soil series classification levels.

Of the seven soil orders in Florida, five occur on the APAFR proposed MLRS maneuver areas, including Alfisols, Entisols, Histosols, Inceptisols, and Spodisols (Figure 4-7). Detailed definitions of these soil orders are presented in *Keys to Soil Taxonomy* (USDA, 1998). A summary of the soil orders and the percentage of each type of soil within the proposed maneuver areas are shown in Table 4-7.

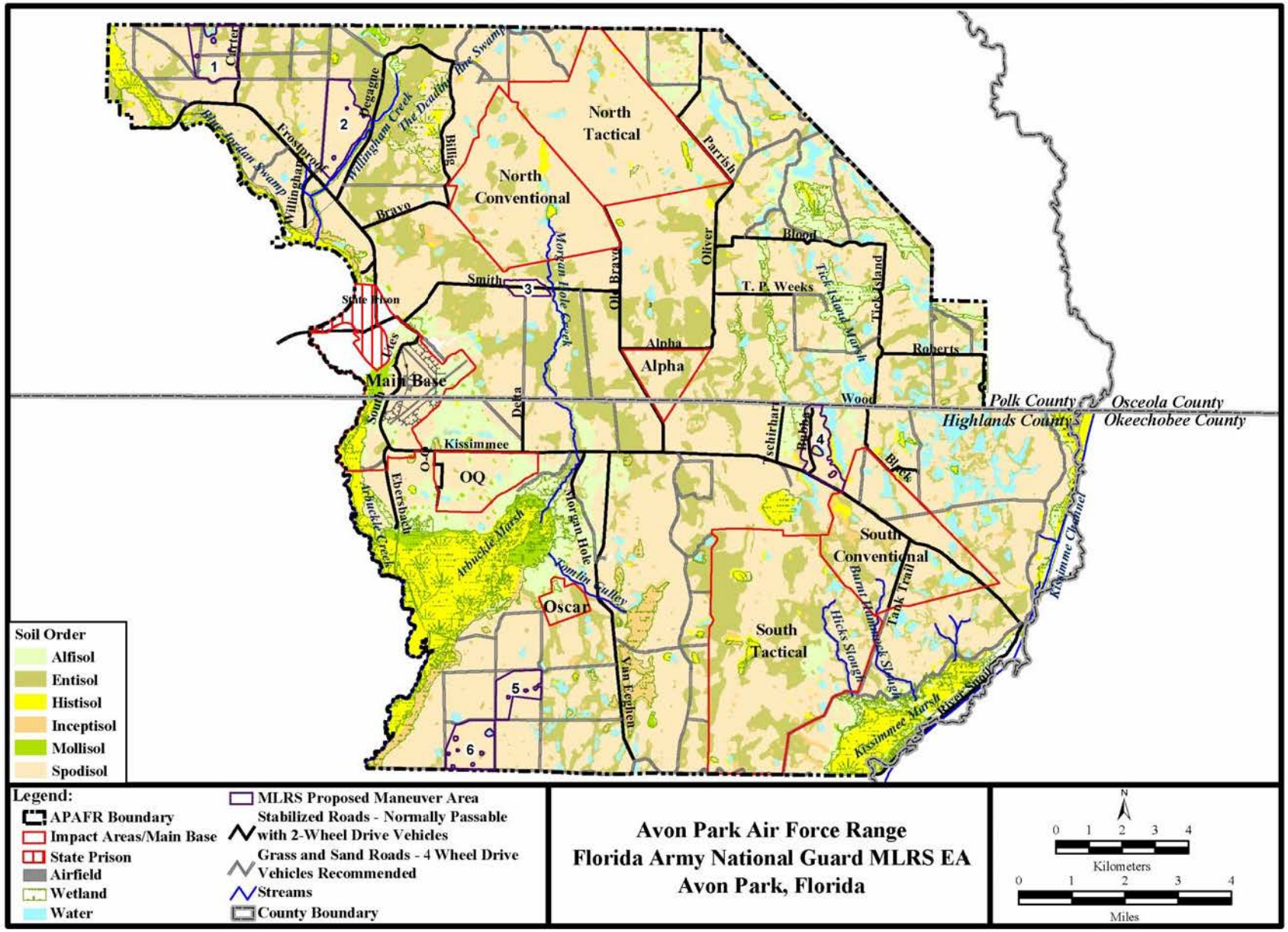

Figure 4-7. Proposed MLRS Maneuver Areas Soil Orders

Table 4-7. APAFR Soil Order Characteristics and Percent Distribution within Proposed MLRS Maneuver Areas

Soil Order	General Characteristics	MA-1	MA-2	MA-3	MA-4	MA-5	MA-6
Alfisols	Sandy mineral soils with light colored surface layers and darker colored clayey soils. Movement of clays to lower depths, which forms a barrier to water movement. Topsoils typically less than 8 inches. May remain moist for three months.	6.70	0.0	0.0	0.0	0.0	0.0
Entisols	Sandy mineral soils with little organic matter. Water holding capacity is low. Most lack a subsoil.	15.55	0.56	0.58	1.53	0.06	1.40
Histosols	High organic content and are frequently referred to as mucks or peat soils. Develop in extremely wet environments.	0.0	0.0	0.0	0.03	0.0	0.0
Inceptisols	Moist soils that generally occupy river floodplains and marshes. Poorly drained.	0.0	0.02	0.0	0.0	0.0	0.0
Spodisols	Poorly drained soils in which organic matter, aluminum, and/or iron have leached downward and accumulated in a lower layer. Topsoil is normally no thicker than 6-8 inches.	77.76	99.42	99.43	98.43	99.94	98.55

MA = Proposed MLRS maneuver area

Spodisols comprise greater than 98 percent of MAs 2 through 6 and 78 percent of MA-1. Details of the APAFR proposed maneuver area soil series that occur within each of the maneuver areas are provided in Table 4-8.

Table 4-8. Soil Series that Occur within the Proposed Maneuver Areas (Acres)

Soil Series	MA-1	MA-2	MA-3	MA-4	MA-5	MA-6	Total
Alfisol Soil Order							
Malabar Sand	35.68	0.00	0.00	0.00	0.00	0.00	**35.68**
Entisol Soil Order							
Basinger Sand	80.33	2.98	0.01	5.92	0.19	6.64	**96.07**
Basinger Sand, Freq. Flood	2.65	0.56	0.76	0.64	0.00	0.00	**4.61**
Pompano Sand, Freq. Flood	0.00	0.03	0.00	0.00	0.00	0.00	**0.03**
Totals	**82.98**	**3.57**	**0.77**	**6.56**	**0.19**	**6.64**	**100.71**
Histisol Soil Order							
Samsula Muck	0.00	0.00	0.00	0.13	0.00	0.00	**0.13**
Inceptisol Soil Order							
Placid Sand	0.00	0.16	0.00	0.00	0.00	0.00	**0.16**
Spodisol Soil Order							
Immokalee Sand	28.44	0.00	0.00	0.00	0.74	0.00	**29.18**
Myakka Sand	378.17	637.81	109.11	421.07	323.54	465.75	**2,335.45**
Narcoossee Sand	2.45	0.00	0.00	0.00	0.00	0.00	**2.45**
Ona Fine Sand	5.88	0.00	22.90	0.00	0.00	0.00	**28.78**
Totals	**414.94**	**637.81**	**132.01**	**421.07**	**324.28**	**465.75**	**2,395.86**
Water	0.00	0.00	0.00	0.00	0.00	0.18	**0.18**
Grand Totals	**533.60**	**641.54**	**132.78**	**427.76**	**324.47**	**472.57**	**2,532.72**

MA = Proposed MLRS maneuver area

The Myakka Sand soil series comprises approximately 93 percent (2,336 acres) of the total proposed MLRS maneuver area lands. Myakka Sand (State Soil of Florida) consists of deep and very deep, poorly to very poorly drained, soil that formed in sandy marine sediments and occurs in depressions, floodplains, and flatwoods (Appendix F, Figure F-5).

National Soils Landscape Positions

The National Soils Landscape Positions (NSLP) system was developed by the South Florida Water Management District (SFWMD) to classify the complex variability of soil-landscape interactions in South Florida. This NSLP classification is based on the depth and duration of the seasonal high water table, soil morphology, and geographical location of the soil. The NSLP types that occur within the proposed maneuver areas are summarized in Table 4-9, illustrated in Figure 4-8, and discussed in the following subsections.

Table 4-9. National Soils Landscape Positions that Occur within the Proposed Maneuver Areas (Acres)

NSLP Types	MA-1	MA-2	MA-3	MA-4	MA-5	MA-6	Totals
Knolls	2.41	0.00	0.00	0.00	0.00	0.00	**2.41**
Flatwoods	357.70	638.80	116.52	417.01	321.53	465.11	**2,316.67**
Flats	167.88	0.00	15.99	4.58	2.94	0.00	**191.39**
Muck Depression	0.00	0.00	0.00	2.42	0.00	0.00	**2.42**
Sand Depression	5.61	2.75	0.27	3.76	0.00	7.47	**19.86**
Total	**534.60**	**643.55**	**135.78**	**431.77**	**329.47**	**478.58**	**2,532.75**

Approximately 92 percent of the proposed maneuver area lands (2,317 acres) are within the flatwoods NSLP type.

These landscape positions were adapted from the publication *Soil Classification Database: Categorization of County Soil Survey Data Within the SFWMD Including Natural Soils Landscape Positions* produced by the South Florida Water Management District in cooperation with the U.S. Department of Agriculture, Natural Resources Conservation Service (SFWMD, 2001).

Flatwoods

Flatwoods are relatively flat areas with poorly drained, hydric or non-hydric soils that developed on sandy marine sediments. This landscape position is generally vegetated by scattered pines and palmetto and grasses understory (Figure 4-8). Flatwoods soils are generally those that developed in sandy marine sediments. These soils frequently have a subsurface spodic and/or argillic horizon that restricts downward water flow through the soil profile. APAFR soils that typically occupy flatwoods include Satellite, Daytona, EauGallie, Immokalee, Myakka, Norcoossee, Ona, Pomello, and Wabasso series. During most years, the water table ranges from 6 to 1.5 feet below the surface for periods of up to four months, beginning in June and ending in September. These areas discharge runoff gradually into associated natural drainways, marshes, swamps, and ponds. Ecological communities that occupy the flatwoods include cabbage palm flatwoods, upland hardwood hammocks, wetland hammocks, cabbage hammocks, and oak hammocks.

APAFR Flatwoods (SAIC, 2002)

APAFR Muck Depression (SAIC, 2002)

APAFR Flat Wet Prairie (SAIC, 2002)

APAFR Sand Depression Pond (SAIC, 2002)

Figure 4-8. APAFR Natural Soil Landscape Positions

Flats

Flats (also known as sloughs) are poorly drained, low relief, hydric soils areas that developed on sandy marine sediments. Flats typically provide transition zones between higher elevation flatwoods and depression area sinks; they also occur within floodplains. APAFR soils that typically occupy flats include Felda, Holopaw, Winder, Basinger, Pompano, Valkaria, Placid, Chobee, Floridana, Oldsmar, and St. Johns series. For five to 10 months during most years the seasonal high water table ranges from the surface to 12 inches below the surface. Based on site drainage conditions, some areas may only be inundated for less than a few weeks during the wet season. Ecological communities that occupy flats include prairies cutthroat seeps, cabbage palm hammock, and tropical hammocks. A common type of flat on the APAFR is the wet-dry prairie. This system is dominated by an open expanse of grasses, sedges, rushes, and scattered pines and cypress (Figure 4-8). These areas are saturated during the wet season and serve as natural drainways for stormwater runoff.

Knolls

Knolls are upland, non-hydric, well to somewhat poorly drained soils that developed in sandy marine sediments. These features often occur with Flatwoods or along higher ridges. APAFR soil series that frequently occur on knoll features include Adamsville, Archbold, Astatula, Satellite, Daytona, Norcossee, Pamello, and Zolfo. The seasonal high water table is at depths of

18 to 72 inches below the surface during the months of June through November. Ecological communities that occupy knoll include sand pine scrub, oak hammocks, and upland hammocks.

Depressions

Depressions represent landscape sink areas that function as collection reservoirs for surface runoff and groundwater seepage. Water tends to remain within these features for extended periods of time. Two types of depressions that occur within the APAFR include sand and muck depressions. These areas are illustrated in Figure 4-8 and discussed in the following subsections.

Muck Depression

Muck depressions are sink areas comprised of hydric soils with an organic surface that overlies sandy marine sediments. Typically these very poorly drained wetland soils occupy areas in proximity to flatwoods and flats and within frequently flooded alluvial floodplains. APAFR histisol, inceptisol, and alfisol soil series that typically occupy muck depressions include Hontoon, Kaliga, Samsula, Sanibel, and Tequesta. For most years, the seasonal high water table ranges from 6 inches below to 24 inches above the soil surface. Annual periods of high water table generally occur for 7 to 11 months from June to April. Ecological communities that occupy muck depressions include cypress swamps, ponds, wetland hardwood hammocks, swamp hardwoods, shrub bog-bay swamps, and sawgrass marshes (Figure 4-8).

Sand Depression

Sand depressions are sink areas comprised of hydric soils that are sandy throughout their profile. Sand depressions differ from muck depressions in that they generally do not have an organic muck surface (Figure 4-8). Frequently these very poorly drained soils occupy areas in proximity to flats and flatwoods and within frequently flooded alluvial floodplain areas with sandy surfaces. APAFR soils that typically occupy sand depressions include Basinger, Chobee, and Felda. For most years, the seasonal high water table ranges from 12 inches below to 24 inches above the soil surface. Annual periods of high water table generally occur for 7 to 10 months from June to March. Ecological communities that occupy muck depressions include cypress swamps, marshes, ponds, wetland hardwood hammocks, swamp hardwoods, shrub bog-bay swamps, and sawgrass marshes.

Soil-Water Process

Soil Erosion

Extreme storm events that characterize south Florida can have dramatic affects on soil erosion and sediment transport processes. The subtropical setting of the APAFR is subject to occasional impacts from hurricanes and tropical storms capable of producing short duration rainfall in excess of 20 inches. These extreme rainfall events also frequently occur during the wet season between May and September when soils are saturated and seasonally high water tables are present. The additional water produced by these events creates potential extremes in flow rates and depth that could result in significant soil erosion and sediment transport, particularly at man-made structures such as canals, water control structures, roads, and road-water crossings.

Because of the relative flatness of the terrain and dominance of native vegetative cover, soil erosion by water and/or wind vectors is not a significant issue for APAFR.

In areas where human disturbances remove native cover and expose bare ground that contains silt and clay materials, rainsplash erosion and minor sheet flows may move sediments directly to receiving waterways. This may result in localized water quality impairment and habitat degradation. Unpaved roads and road-water crossings may present a more significant source of erosion and sediment deposition for APAFR (Thompson et al., 1995; Bilby et al., 1989; Bilby, 1985; and Rothwell, 1983).

Road-water crossings represent constructed features that frequently provide a discharge point for eroded road sediments (Figure 4-9). Stormwater flowing down an unpaved road, even at gentle slopes of 1 to 2 percent, may generate a volume and velocity or runoff sufficient to erode loose road surface materials and delivery sediments to discharge points.

Road analysis data necessary to determine specific erosion susceptibility of the APAFR road network were not available. No road-stream crossings were identified; however, approximately 0.39 miles of road within MA 1 travels through wetland areas. A summary of road-water crossings associated with the proposed MLRS maneuver areas is presented in Table 4-10.

Figure 4-9. APAFR Unpaved Road-Wetland Crossing

A total of 33 culvert and low-water crossings were identified within the six proposed maneuver areas (Table 4-10). Data regarding the specifications and conditions of these crossing structures were not available.

Table 4-10. Potential Road-Water Crossings within the Proposed MLRS Maneuver Areas

Crossing Type/Features	MA-1	MA-2	MA-3	MA-4	MA-5	MA-6	Totals
Crossing Type							
Streams (number)	0	0	0	0	0	0	**0**
Wetlands (number)	5	0	0	0	0	0	**5**
Crossing Features							
Culverts (number)[a]	1	1	4	3	5	2	**16**
Low Water Crossings (number)	9	0	0	1	0	7	**17**
Total	**10**	**1**	**4**	**4**	**5**	**9**	**33**

Source: APAFR GIS Database
MA = Proposed MLRS maneuver area
[a] Total number of culverts within or adjacent (100 foot buffer) to proposed MLRS maneuver areas and total miles of wetland intersected

Soil Moisture

Soil moisture is the portion of soil water that supports vegetation. The moisture content of soil horizons varies with the seasons; a soil may be continuously moist in all or some horizons throughout the year or for part of the year. At APAFR, soil moisture is a primary limiting factor that determines the form and function of ecosystems. Changes in soil moisture can alter the vegetation composition of ecosystems and subsequently the availability of wildlife habitats. The soil moisture content in the proposed Alternative MAs is based on the presence of hydric soil regimes.

A hydric soil is a soil formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. These soils are typically anaerobic (lacking oxygen) because of frequent durations of water saturation, inundation, or both for periods that exceed a few days.

Based on fluctuations in surface (flooding and ponding) and subsurface (water table) hydrology, some hydric soils may have non-hydric phases. The presence of a soil on the hydric list as published by the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) does not necessarily mean it is hydric. Water table fluctuations can have a significant effect on the hydrologic regime of ecosystems. Estimated hydric and non-hydric soil series, based on the NRCS published list of hydric soils, are identified in Table 4-11.

Table 4-11. Hydric and Non-Hydric Soils for Soil Orders at APAFR

Soil Order	Hydric Soil Series	Non-Hydric Soil Series
Alfisols	Bradenton, Felda, Holopaw, Malabar, Tequesta, Winder	—
Entisols	Basinger, Pompano, Valkaria	Adamsville, Archbold, Astatula, Satellite
Histisols	Hontoon, Kaliga, Samsula	—
Inceptisols	Placid, Sanibel	—
Spodisols	EauGallie, Immokalee, Myakka, Oldsmar, St. Johns, Wabasso	Daytona, Narcoossee, Ona, Zolfo

MA = Proposed MLRS maneuver area

A summary of hydric and non-hydric soils within the proposed maneuver areas is presented in Table 4-12.

Table 4-12. APAFR Hydric and Non-Hydric Soils within the Proposed MLRS Maneuver Areas

Soil Moisture Regimes	Maneuver Area (Acres/Percent of MA Total Acres)					
	MA-1	MA-2	MA-3	MA-4	MA-5	MA-6
Hydric	525/98	642/100	110/85	428/100	324/100	472/100
Non-Hydric	8/2	0/0	23/17	0/0	0/0	0/0

MA = Proposed MLRS maneuver area

For five out of the six proposed maneuver areas, hydric soils occur on approximately 98 percent or greater of the land area; for Maneuver Areas 2, 4, 5, and 6, the percent of land area that is hydric soil is estimated to be at or near 100 percent.

Although swamp and marsh hydric soils are generally well defined, transition area pine flatwoods and upper flats may encompass hydric and non-hydric areas. A study by Comerford et al. (1996) investigated Florida pine flatwoods associated with cypress swamps to determine if these intervening pine ecosystems meet the hydrologic criteria of a wetland. Water table monitoring wells were installed and depths were measured every two weeks within the 104-acre study area. Results indicate that water table depths of 6 to 8 inches below the surface promoted reduced (anaerobic) conditions in surface soils. It was further determined that 20 to 56 percent of the pine flatwoods spodisol soils met the hydrologic definition of a wetland depending on the hydric criteria used.

Water Table

The water table is generally defined as the upper surface of the saturated zone. Fluctuations of the water table over time are highly dependent on the balance between rainfall and evapotranspiration; lateral and subsurface drainage exhibit a somewhat limited role (Bliss and Comerford, 2002). Soil water tables are extremely dynamic features and exhibit wide and diverse fluctuations. Seasonal fluctuations within some soils may exceed several feet. Generally well-drained soils have shorter periods of high water table levels and longer periods of low water table levels than poorly drained soils. The seasonal high water table (SHWT) is the shallowest depth to free water that stands in an unlined borehole or where the soil moisture tension is zero for more than a few weeks. Generally the water table tends to move in the direction of maximum slope.

SHWT depth estimates are based on the U.S. Department of Agriculture's Natural Resources Conservation Service published soil survey data (USDA, 2003). The NRCS data provide range estimates of seasonal high water table depths; however, there is an understanding that site-specific data can be quite variable.

In the low, flat terrain of APAFR, the water table is typically less than 10 feet below the surface and generally parallels the configuration of the ground surface but with far less relief. The

maximum depth below the surface in Highlands County is approximately 60 feet. The estimated SHWT for the proposed MLRS maneuver areas are summarized in Table 4-13 and illustrated in Figures 4-10 through 4-12.

Table 4-13. Estimated Seasonal High Water Table Distribution Among the Proposed MLRS Maneuver Areas (Acres)

SHWT (inches)*	MA-1	MA-2	MA-3	MA-4	MA-5	MA-6	Totals
0 or Above	0.00	0.00	0.00	0.13	0.00	0.00	**0.13**
0 – 6	0.00	0.16	0.00	0.00	0.00	0.00	**0.16**
6 – 12	118.67	3.58	0.77	6.56	0.19	6.64	**136.41**
12 – 18	412.49	637.81	132.01	421.07	324.28	465.75	**2,393.41**
24 – 42	2.45	0.00	0.00	0.00	0.00	0.00	**2.45**
42 – 60	0.00	0.00	0.00	0.00	0.00	0.00	**0.0**
>80	0.00	0.00	0.00	0.00	0.00	0.00	**0.0**
Blank	0.00	0.00	0.00	0.00	0.00	0.18	**0.18**
Totals	**533.61**	**641.55**	**132.78**	**427.76**	**324.47**	**472.57**	**2,532.74**

MA = Proposed MLRS maneuver area
* Depth in relation to the soil surface

For Maneuver Areas 1 through 6, the SHWT is estimated to be between 12 and 18 inches below the surface for approximately 94 percent of the land (2,393 acres) that comprises the maneuver areas; about 5 percent of the total maneuver area lands (136 acres) had a SHWT between 6 and 12 inches below the surface. None of the maneuver areas had lands with SHWT greater than 42 inches below the surface.

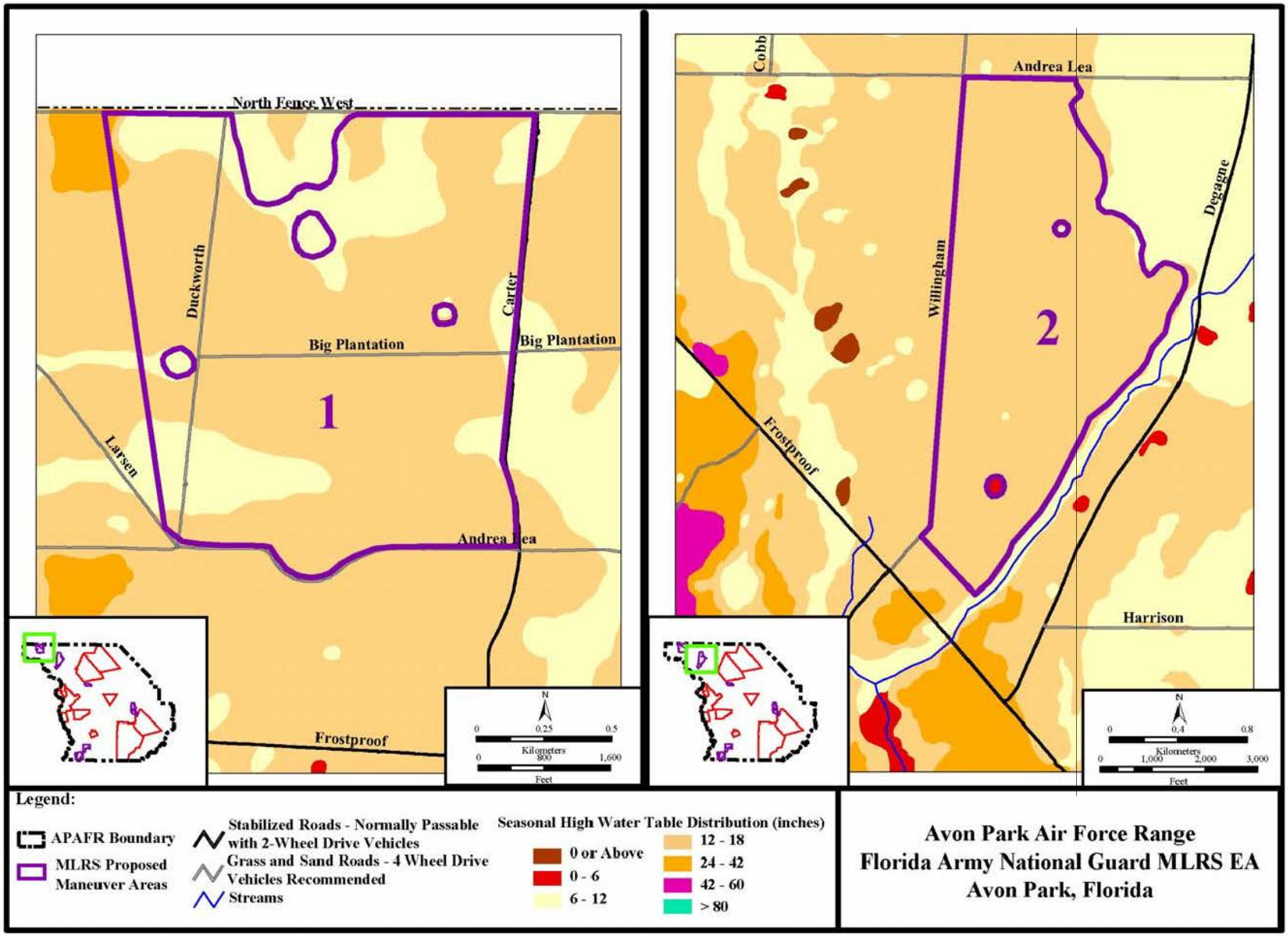

Figure 4-10. Proposed MLRS Maneuver Areas 1 and 2 Seasonal High Water Table Levels

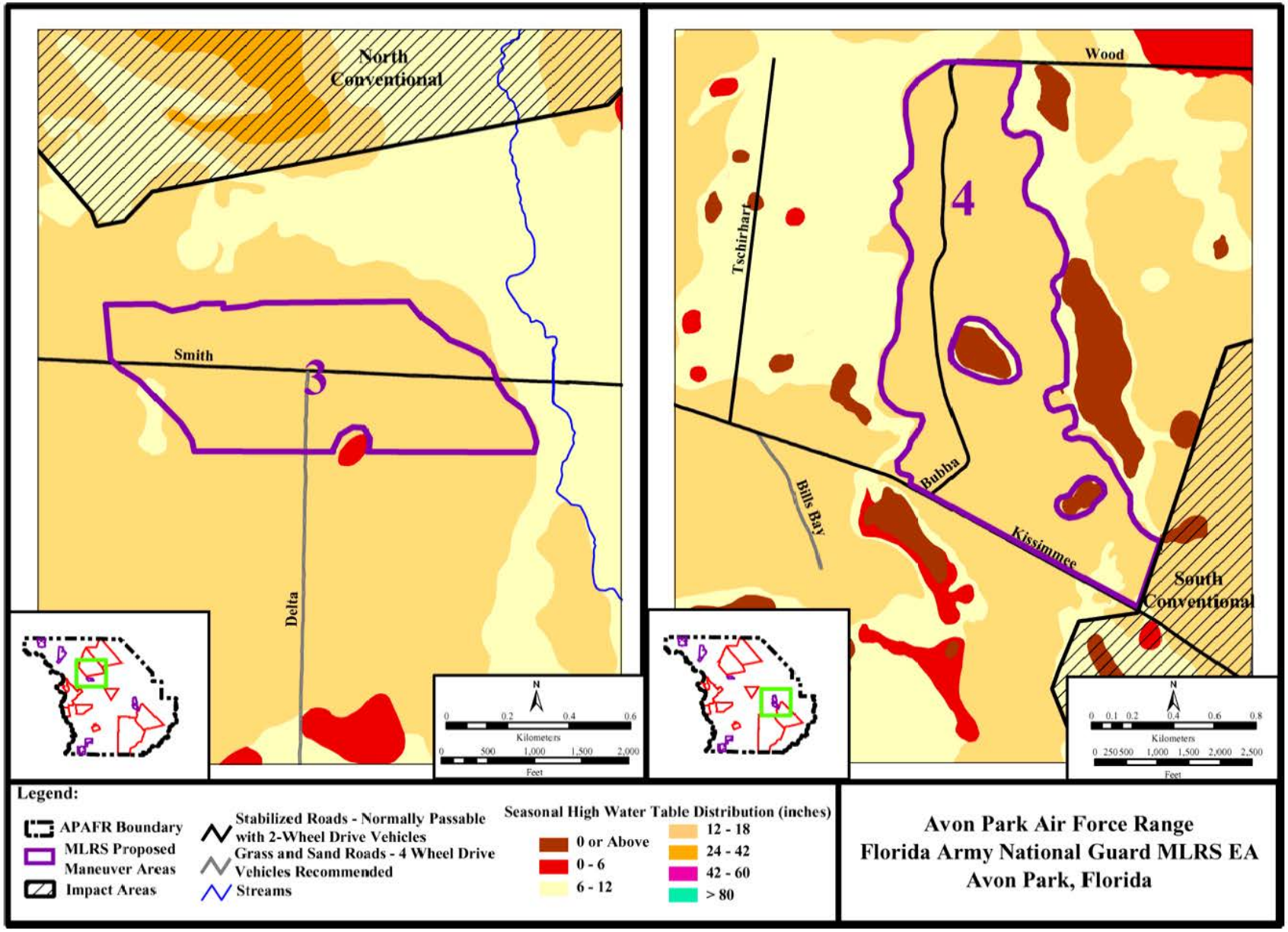

Figure 4-11. Proposed MLRS Maneuver Areas 3 and 4 Seasonal High Water Table Levels

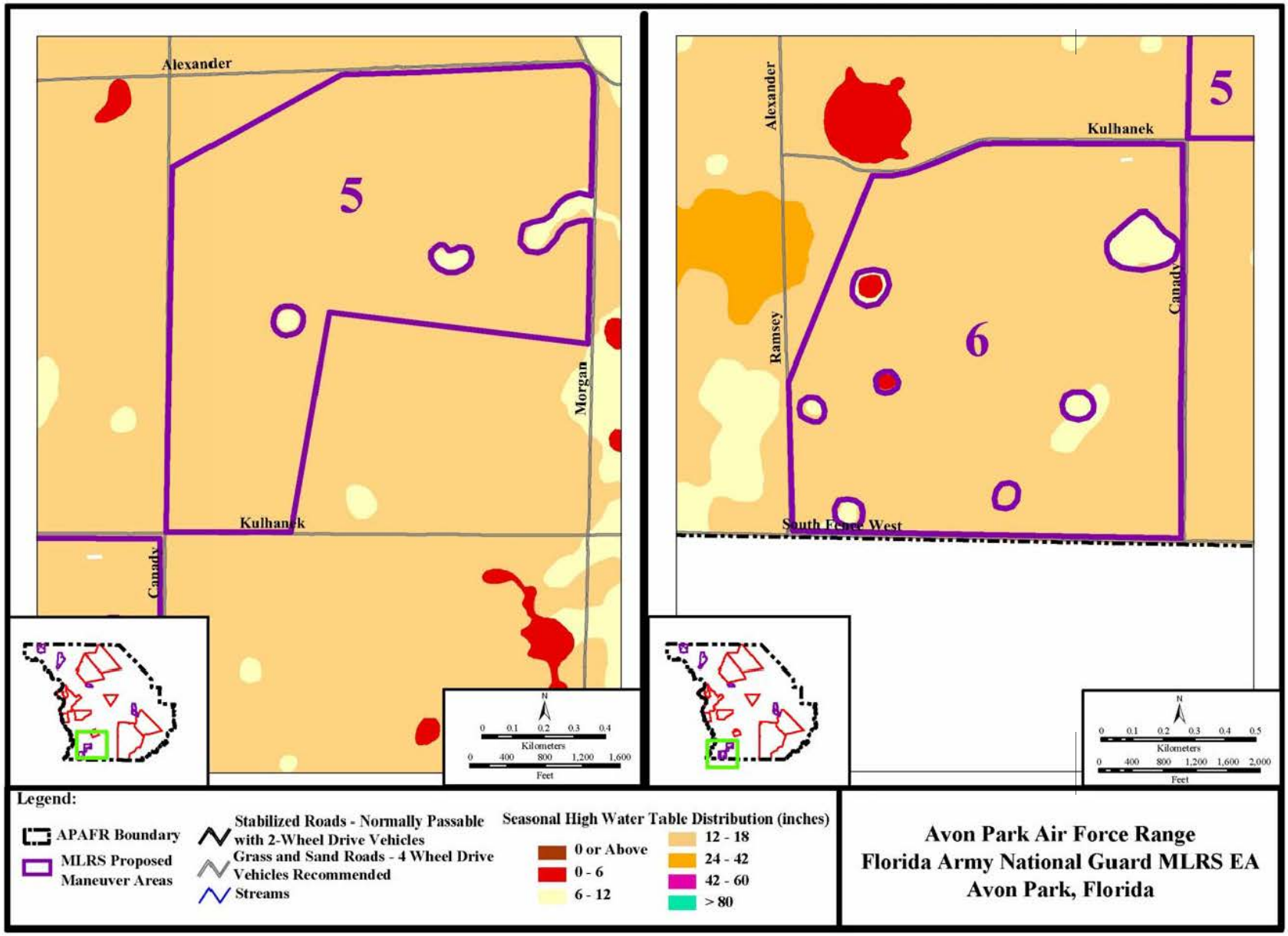

Figure 4-12. Proposed MLRS Maneuver Areas 5 and 6 Seasonal High Water Table Levels

4.5 WATER RESOURCES

4.5.1 Definition of the Resource

This section discusses water resources, including groundwater, surface water, wetlands, floodplains, and constructed water features. The discussion of the hydrologic cycle focuses on the effects of precipitation and evaporation upon the distribution of water in streams, lakes, ponds, wetlands, and other waters on or below the surface of the land. This section addresses the hydrologic system, flooding regime, source of water, and soil moisture levels. The hydrologic character of the surrounding landscape association often determines the presence of wetland communities.

4.5.2 Existing Conditions

Avon Park lies within the Kissimmee River Drainage Basin with Lake Arbuckle, Arbuckle Creek, and Morgan Hole Creek serving as the major surface water features at APAFR. Many low-lying wetlands and floodplains (discussed later in this chapter) are associated with the riparian (river bank) areas of these waterways. Currently, the state of Florida and the U.S. Army Corps of Engineers (USACE) have embarked upon a program to restore the natural hydrology of the Kissimmee River floodplain.

U.S. Geological Survey (USGS) topographical maps and aerial photographs reveal approximately 15 small, circular ponds or lakes on the flatland prairie in the eastern portion of the range (USGS, 2004). APAFR is located within the Kissimmee River drainage basin, which covers the eastern third of Polk County. The basin is drained by a series of small shallow streams, which flow into the Kissimmee River. The majority of the Kissimmee River Basin lies east of the groundwater divide that separates the Southern West-Central Florida Groundwater Basin from the Southern East-Central Florida Groundwater Basin. The lakes and swamps that exist within the river basin provide storage for floodwater, thereby reducing flood crests and velocities, lowering the potential impacts of severe floods.

Marsh associations are characterized by frequent, long-term flooding, with much of these areas having nearly permanent inundation. Some of the hydric hammocks and cypress swamps are above the water level at Arbuckle Creek during the winter dry season, and at these times the creek retreats to its channel in a few places.

In the relatively flat landscape that encompasses most of APAFR, the vegetative community pattern is controlled primarily by hydrology. Hydrology of vegetative communities is determined primarily by topography and to a lesser extent by soil characteristics, groundwater movement, and watershed area. In general, the hydrologic regime of ecological communities at APAFR can be influenced by one or more of three water sources (groundwater seepage, local precipitation, and drainage patterns) and larger, sometimes off-site, flooding by flowing surface water. Surface water flow at Avon Park is derived primarily from stormwater runoff.

Bombing Range Ridge creates two watersheds, one east of the ridge and the other west of the ridge. Both watersheds have runoff from the ridge to low, flat areas, with low runoff rates and extensive areas of wetlands. The eastern watershed lacks defined hydrology with water moving primarily by overland flow. Overland flow is aided in some locations by fragmented sloughs.

The western watershed functions similarly with overland flow, but differs from the eastern watershed by having some defined watercourses consisting of creeks and continuous sloughs that empty into Lake Arbuckle or Arbuckle Creek.

According to the Federal Emergency Management Agency (FEMA), approximately 27 percent, or 28,380 acres, of the entire range is located within the 100-year floodplain (FEMA, 2004). The portions of the range that are located within the 100-year floodplain are primarily located along the Kissimmee River and Arbuckle Creek.

Groundwater

Groundwater sources provide Florida with 87 percent of its drinking water. At APAFR, groundwater beneath the property is found within three different aquifers: the Surficial Aquifer, the Intermediate Aquifer, and the Floridan Aquifer. Table 4-14 provides general Hydrogeologic units of APAFR. A more complete description of these systems is found in Appendix G, Water Resources.

Table 4-14. Hydrogeologic Units of Avon Park

Hydrogeologic Unit	Geologic Time Scale	Formation or Group	Lithology	Thickness (feet)
Surficial Aquifer	Holocene and Pleistocene	Anastasia Formation, Nashua Formation, Pamlico Formation, and Undifferentiated Deposits	Sand, clayey sand, clay, minor shells, silt, and clayey silt	20-100
Intermediate Aquifer	Miocene and Pliocene	Hawthorne Formation	Sand, silty sand, shells, and silty calcareous clay	20-50
Floridan Aquifer	Eocene (early-middle-late)	Avon Park Formation, Ocala Group, and Oldsmar Formation	Limestone, dolomitic limestone, gypsum, and dolostone	300-1500

Source: Adapted from USGS, 2004 data

Groundwater in the shallow aquifer beneath the property generally flows in a northwesterly direction. The Floridan Aquifer is a very productive system that supports multiple uses, including potable water supply, because of its high-quality groundwater (USGS, 2004). Water is discharged from the water table aquifer through lateral seepage stream or lake, evapotranspiration, or movement downward to the Floridan Aquifer in the sinkhole lakes. Hydraulic conductivity is used to measure the rate at which water can move through a soil profile. At APAFR, hydraulic conductivity has been found to range from 5 feet to 30 feet per day. Recharge to the Surficial Aquifer is mainly by precipitation.

There are four 8-inch water supply wells located on the range in the main base area. These wells are owned by the state of Florida and are operated and maintained by the Avon Park Correctional Institute that supplies Avon Park Air Force Range with potable water. No wells are located within a 1-mile radius of any of the Alternatives.

Surface Water

The range supports acres of open water over several intermittent freshwater lakes, ponds, wetlands, marshes, and hammocks. Lake Arbuckle is the largest of the lakes at APAFR. The range consists of large lakes that lie entirely within the Osceola Plain, but are influenced by proximity to the eastern base of the Lake Wales Ridge, a large, open water body, which exhibits a rather broad band of deep lakeshore marsh indicative of lowering and regulation of water levels. This area is characterized by deeply inundated cypress (*Taxodium distichum*) swamp forest, with some red maple (*Acer rubrum*). Some areas along the lake have a deeply inundated hydric hammock zone above the swamp forest, and higher islands in this zone, naturally protected from fire, have some small areas of natural mesic hammock. Avon Park also includes permanent water bodies such as Lake Arbuckle, Lake Weohyakapka, Lake Istopoga, Lake Rosalie, and lakes associated with the Lake Wales Ridge and Kissimmee Chain of Lakes. The likely water sources for certain lakes are diffuse seepage and seepage-fed streams such as Livingston Creek and Blue Jordan Swamp.

The range also supports major streams and associated swamps and marshes primarily fed by surface runoff, with little seepage influence. This is typified by stream valleys, which are characteristically marshy with scattered cypress swamps and hydric hammock fringes. Arbuckle Marsh, associated with Arbuckle Creek, can serve as an example.

MA-2 (Willingham), MA-3 (Delta), and MA-5 (Alexander) do not contain any surface waters. Several unnamed ponds exist within the other MAs: MA-1 (Big Plantation) has a large pond totaling 5.3 acres, MA-4 (Bubba) contains 4 ponds that total 9.4 acres, and MA-6 (Ramsey) contains 6 smaller ponds totaling 1.4 acres.

The geology of APAFR is characterized by a water table at or near the surface for the majority of the year. The dissolution of its limestone bedrock by acidic ground water has caused many land irregularities such as caverns, sinkholes, and a “honeycomb” structure caused by voids in the limestone (USACE, 1996).

Water quality is a measurement of the chemical and physical characteristics of a water mass that describes its suitability for specific uses. The state of Florida has developed and retains primacy for surface water quality standards for all waters of the state (FAC 62-301 and 62-302) in accordance with the provisions of the Clean Water Act. A scoring system based on the data in the *Florida Water Quality Assessment, 2000 305 (b) Report* is used by Florida Department of Environmental Protection (FDEP) to rate the quality of surface waters of the state (FDEP, 2002). The FDEP is tasked with preserving and maintaining the quality of Florida’s waters. Florida surface waters were rated as follows.

- Fully Meets Use
- Partially Meets Use
- Does Not Meet Use
- Insufficient Data

Applying the above system, the state rated the surface water quality of rivers, streams, creeks, bayous, and bays on the range. The report delineated large basins and numerous sub-basins for each of the five water districts in the state.

Surface waters quality at APAFR are classified as Class III freshwaters with designated uses of recreation and the propagation and maintenance of a healthy, well-balanced population of fish and wildlife (Florida Administrative Code 62-302) by state standards. The criteria used to determine the state classification for Class III is provided in Appendix G, Water Resources.

Wetlands

This section discusses wetland resources found within the Region of Influence (ROI). Executive Order 11990, *Protection of Wetlands,* affords special protection to areas defined as wetlands. Under the Executive Order, wetland resources are protected against long- and short-term adverse impacts associated with any alterations and modifications of wetlands. This analysis also assesses qualitative and quantitative characteristics of these resources and their relative locations to the areas of proposed activities.

Wetlands are defined in the USACE Wetland Delineation Manual as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (USACE, 1987).

Wetland resources are protected under Section 404 of the Clean Water Act (33 U.S.C. Section 1344).

Wetlands are areas of transition between terrestrial and aquatic systems where the water table is usually at, or near, the surface, or the land is covered by shallow water (USFWS, 1979). These areas are sensitive habitat and are inundated (water covered), or where water is present either at or near the surface of the soil for distinguishable periods of time throughout the year. Local hydrology and soil saturation largely affects soil formation and development, as well as the plant and animal communities found in wetland areas (USEPA, 1995).

Wetlands are often categorized by water patterns (the frequency or duration of flooding) and location in relation to upland areas and water bodies. Wetland hydrology is considered one of the most important factors in establishing and maintaining wetland processes (Mitsch, 1993). Wetlands exhibit a characteristic hydroperiod, or seasonal pattern of water levels, that defines the rise and fall of surface and subsurface water. Wetland vegetation and soils act as water filters, intercepting surface water runoff and pollutants that would otherwise degrade rivers, streams, and lakes (Dahl, 2000). This process aids in the removal of excess nutrients, pollutants, and sediments from the water. Abiotic and biotic environmental factors such as morphology, hydrology, water chemistry, soil characteristics, and vegetation contribute to the diversity of wetland community types. The term "wetlands" encompasses marshes, swamps, bogs, and similar areas.

Wetland communities comprise approximately 54,262 acres (or 60 percent) of the installation and include wet flatwoods, cutthroat seepage slopes, swamps, marshes, and ponds (Orzell & Bridges, 1995). A site assessment of the range conducted by USACE, St. Louis District,

revealed extensive wetland systems at APAFR under federal jurisdiction (USACE, 1996). A second study performed by USACE, Jacksonville District, addressed operation and maintenance activities having the potential to impact 905 acres of jurisdictional wetlands annually (USACE, 1994). Both studies, coupled with National Wetlands Inventory (NWI) data, were used to determine the location and extent of wetlands at APAFR. An Individual Permit (IP) issued by the USACE (under 199403839 (IP-LC)) was used to assist in identifying wetland areas (USACE, 1994). Figures 4-13 through 4-15 show the jurisdictional wetland areas and major surface water features at APAFR.

Fewer plant species are able to flourish in low-oxygen soil environments in areas where water regimes are more frequent, exhibiting standing water and hydric soils. Certain areas support rare, threatened, or endangered plants. A comprehensive list of these plants is provided in Appendix G, Water Resources. According to the NWI survey, the majority of the range is designated as wetlands; however, the NWI maps have not been "ground truthed" for APAFR and therefore, their accuracy is uncertain.

Table 4-15 identifies jurisdictional wetland areas (in acres) in the proposed maneuver areas. Wetlands at APAFR are classified based on the hierarchical system developed by the U.S. Fish and Wildlife Service (Cowardin et al., 1979) and encompass three wetlands systems: Palustrine, Lacustrine, and Riverine. Palustrine Systems include inland marshes, swamps, and by definition, floodplains. Lacustrine Systems may include freshwater marshes, aquatic beds, and wetlands associated with lakes. Riverine Systems typically include riverbanks, streams, freshwater marshes, and freshwater aquatic beds. More detailed definitions of these wetland classifications are provided in Appendix G, Water Resources.

Table 4-15. Wetland Areas in the Proposed Maneuver Areas

Land Area	Maneuver Areas					
	MA-1	MA-2	MA-3	MA-4	MA-5	MA-6
Jurisdictional Wetlands (Acres)*	124	17	2	35	37	119
Total Land Area (Acres)	534	642	133	428	324	472
Percentage of Jurisdictional Wetlands to Total Land Area	23%	2.6%	1.5%	8%	11.4%	25.2%

MA= Maneuver Areas
*Identified during a 1997 assessment (prior to SWANCC v. USACE)

The wetland areas studied in this assessment were evaluated prior to the 9 January 2001 U.S. Supreme Court decision as it applies to isolated wetlands (Solid Waste Agency of Northern Cook County v. Army Corps of Engineers). As a result, a portion of the wetland areas identified in Table 4-15 may no longer be under the jurisdiction of the U.S. Army Corps of Engineers.

Low lying wetlands and floodplains are associated with the river and creek drainageways on the range, including Kissimmee Marsh in the southeast along the Kissimmee River floodplain, Tick Island Marsh in the east, Deadins Pine Swamp in the northwest, the Morgan Hole Creek marsh-swamp complex between Arbuckle Creek and Morgan Hole Creek in the southwest, and Long Cypress off the west edge of the Bombing Range Ridge.

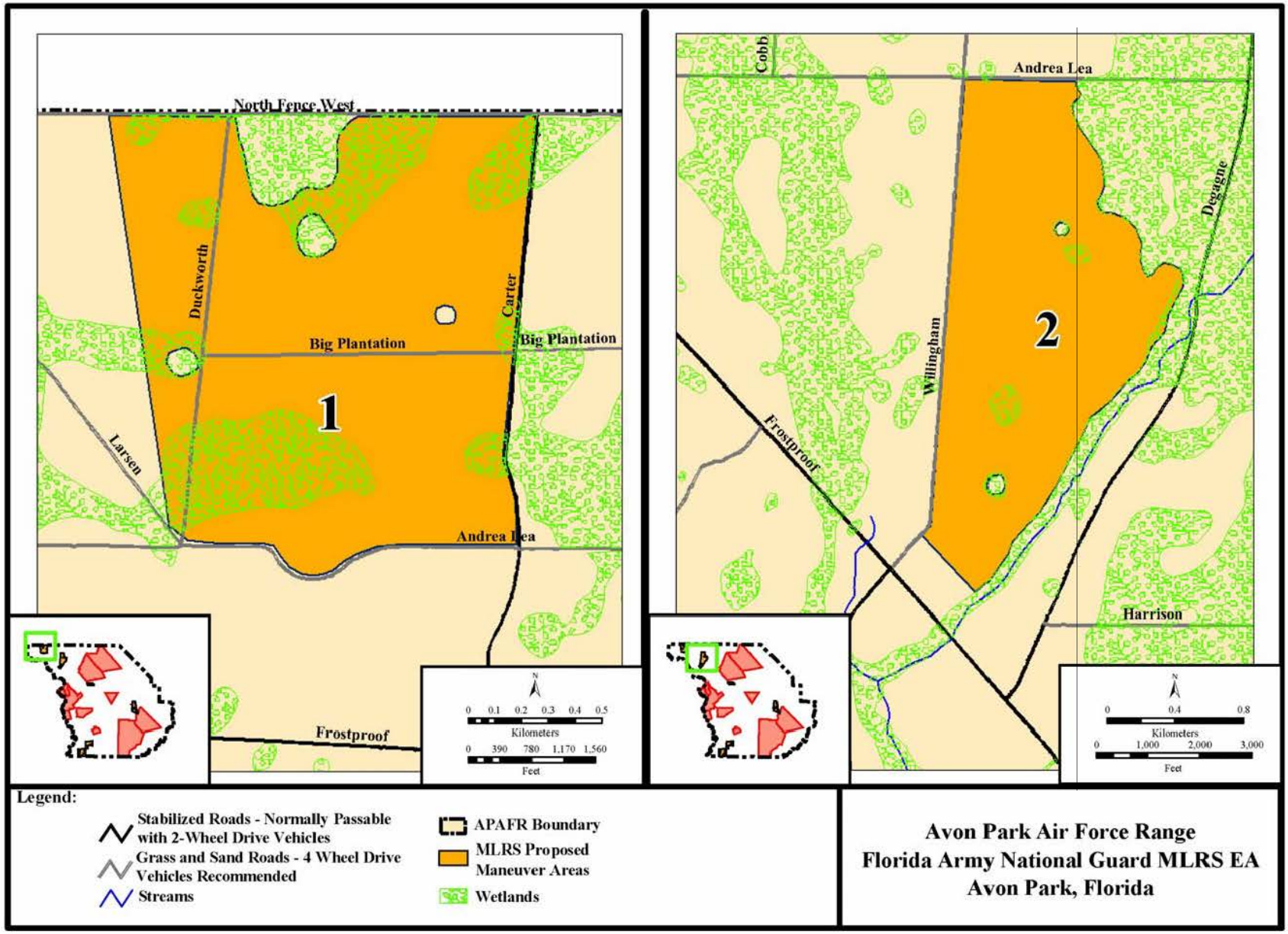

Figure 4-13. Jurisdictional Wetland Areas in Association With the Proposed Action and Alternatives (MAs 1 and 2)

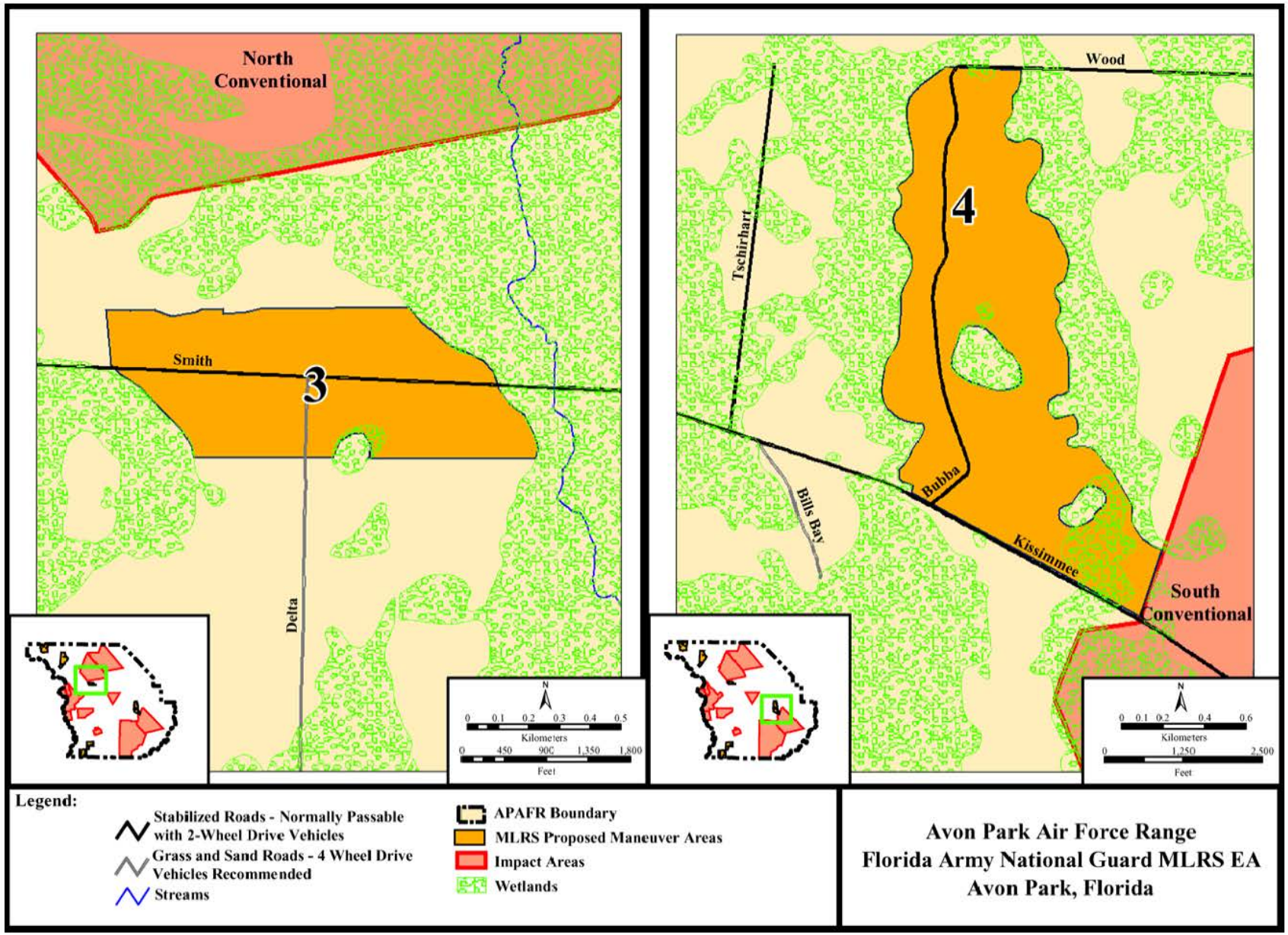

Figure 4-14. Jurisdictional Wetland Areas in Association With the Proposed Action and Alternatives (MAs 3 and 4)

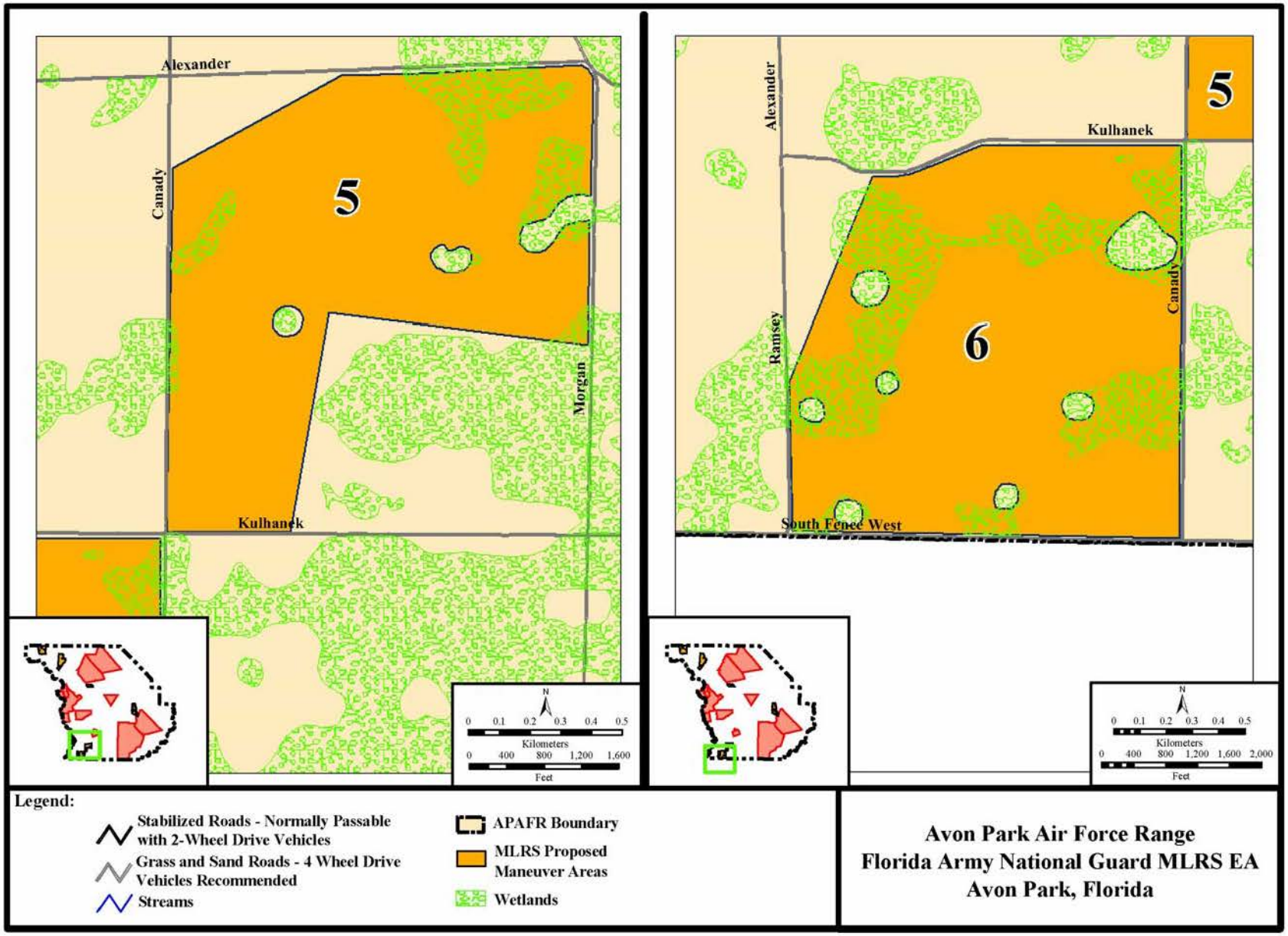

Figure 4-15. Jurisdictional Wetland Areas in Association With the Proposed Action and Alternatives (MAs 5 and 6)

Floodplains

A floodplain is the lowland area adjacent to rivers, lakes, or other water bodies. These areas are often inundated during periods of high precipitation and storm events. Floodplains store water and impede the velocity of the rivers typically associated with intense storm events. These areas also act as filters to trap sediments and pollutants. Executive Order 11988, *Floodplain Management*, affords special protection to areas classified as floodplains. This Executive Order protects against any potential long- and short-term adverse impacts relating to the use and modification of floodplain areas. The Flood Insurance Administration, under the direction of the Federal Emergency Management Agency, has mapped most of the known floodplains at APAFR, which are shown in Figure 4-16. As indicated on the Figure, there are no floodplains in any of the proposed MAs.

Constructed Features

Avon Park has constructed several features to facilitate timber-harvesting activities and alleviate stormwater issues. The surface water runoff is directed by small creeks and gullies into Arbuckle Creek, located west of the range. Several stormwater conveyance pipes and structures have been installed to channel stormwater to designated areas. Stormwater runoff from the developed portions of Avon Park is collected by a system of earthen and concrete drainage ditches and canals in the cantonment that discharge into Arbuckle Marsh and Arbuckle Creek. These drainage ditches and canals receive runoff from four identified outfalls within the maintenance area of the range and approximately three outfalls from the main base area. Deep borrow pits and canals are common in areas of APAFR.

Dikes had been constructed at two locations at Arbuckle Marsh in an effort to raise the water level to support waterfowl habitat. This objective has altered the floodplain hydrology on the range. Recently, these dikes have been abandoned and the headgates are now left open to restore natural hydrology.

There are no constructed features in any of the proposed MAs (Margosian, 2004).

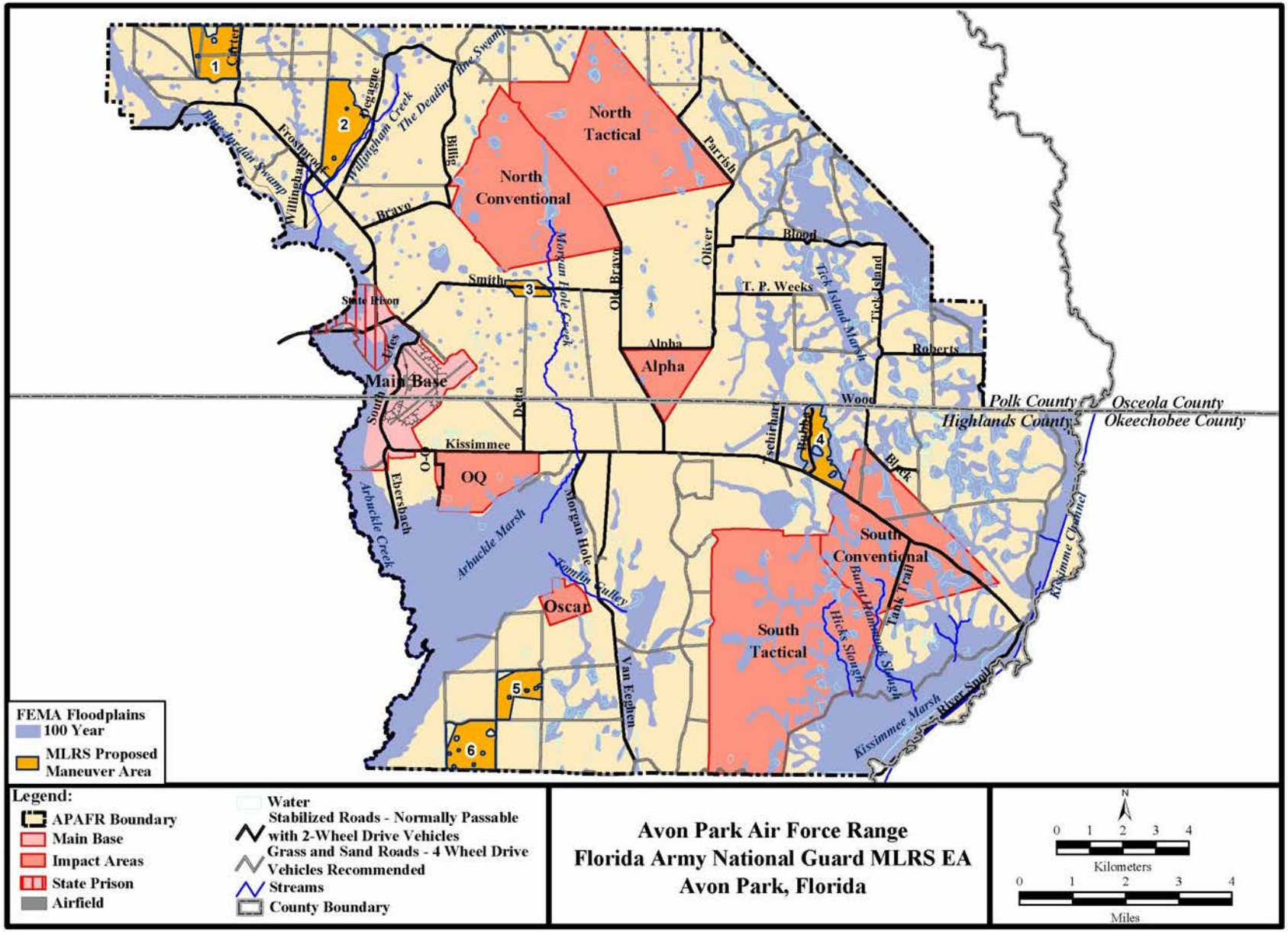

Figure 4-16. FEMA Floodplain Map

4.6 BIOLOGICAL RESOURCES

This section presents information on the biological resources located on APAFR. The major community types, including wetlands and their associated wildlife species are discussed. Also presented are listings of plants and animals of special concern, including those designated as threatened and endangered under the Endangered Species Act (1973, as amended, 16 U.S.C. 1531 *et seq*.). Scientific names for plant and animal species mentioned can be found in the Appendix H, Biological Resources.

4.6.1 Definition of the Resource

Although APAFR is an important strategic defense installation and managed for military activities, it also serves as an area for the conservation of biodiversity in south-central Florida, because of its restricted access (U.S. Air Force, 2000a). At 106,070 acres, APAFR is the largest controlled access area in the vicinity of the Lake Wales Ridge. When considered in combination with smaller protected parcels, APAFR provides 42 percent of the public conservation lands, home to 50 animal and plant species of special concern (U.S. Air Force, 2000a).

When the federal government purchased the land for APAFR in 1941, undeveloped land was common in central Florida. This is no longer the case, and much of the adjacent lands surrounding APAFR have been developed for a variety of human uses, such as exotic grass pastures, citrus groves, cities, and so on. Since its inception, APAFR has always maintained a diversity of native species because of much of its land area acting as a buffer between areas of military training, in general, and its limited accessibility and sparse development. Recent plant inventories indicate that over 1,000 vascular plant species are on site, representing approximately 40 percent of all native vascular species known to occur in south-central Florida (Orzell, 1997). More than 50 percent of APAFR meets the standard of the Florida Natural Areas Inventory as a "natural area" (Orzell, 1997). Additionally, APAFR provides a home to more than 25 percent of the population of federally endangered Florida grasshopper sparrows and contains one of the largest populations of both the endangered red-cockaded woodpecker and the threatened Florida scrub jay (U.S. Air Force, 2000a).

4.6.2 Existing Conditions

Approximately 82,393 acres of APAFR is characterized by seven upper-level vegetative plant communities, including upland communities of cutthroat grass communities, hardwood hammocks, wetlands, pine flatwoods, scrub, prairie, sandhills, and pasture. Within each of these plant communities are further subsets more specific to the types of vegetation present. Managed areas of pine plantations and tame grass pastures make up another 20,000 and 1,800 acres of APAFR, respectively. Freshwater aquatic communities, including streams, ponds, and lakes are also common across APAFR. Figures 4-17 through 4-19 illustrate the spatial distribution of various community types on APAFR.

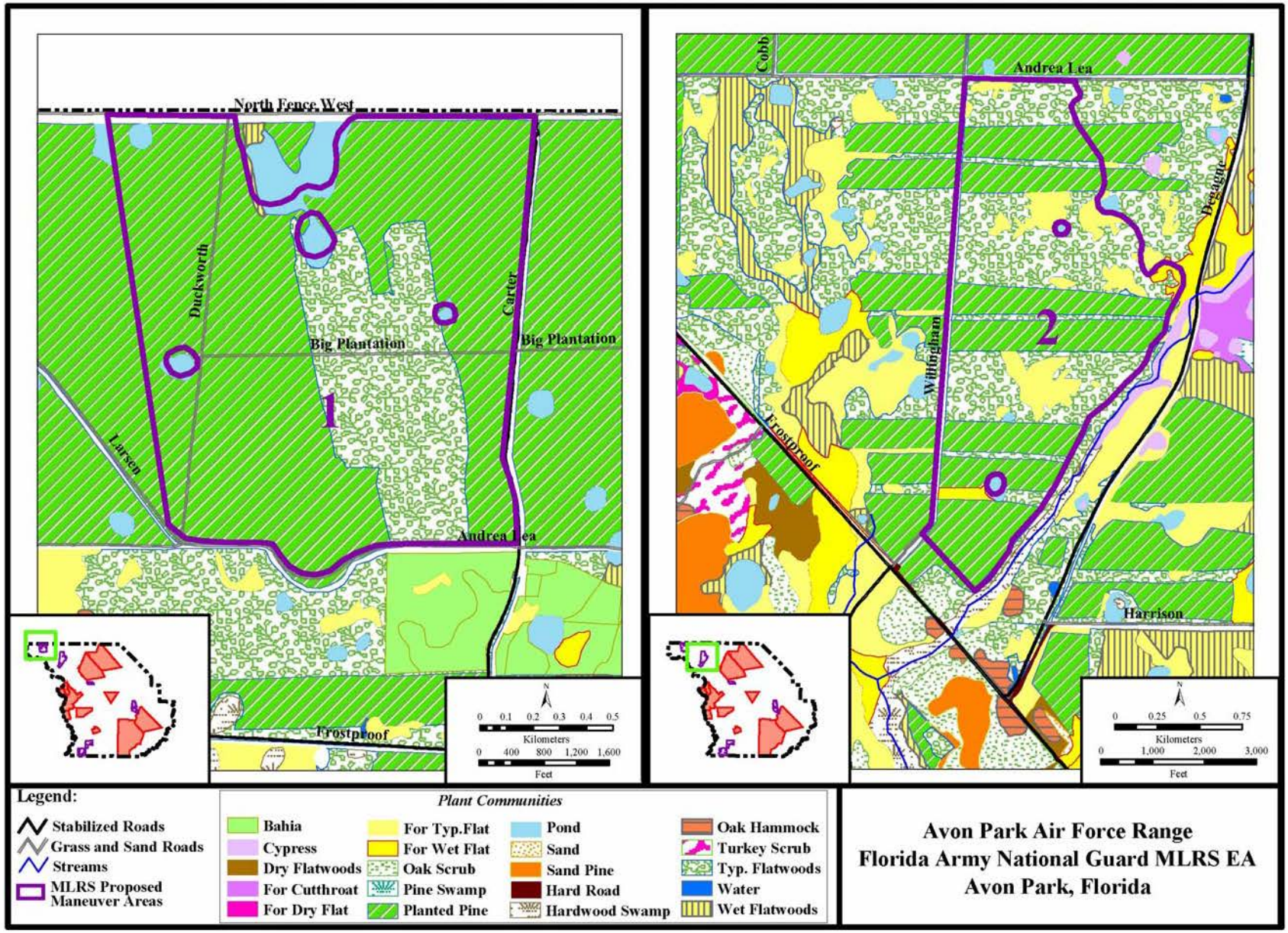

Figure 4-17. Avon Park Air Force Range Plant Communities (MAs 1 and 2)

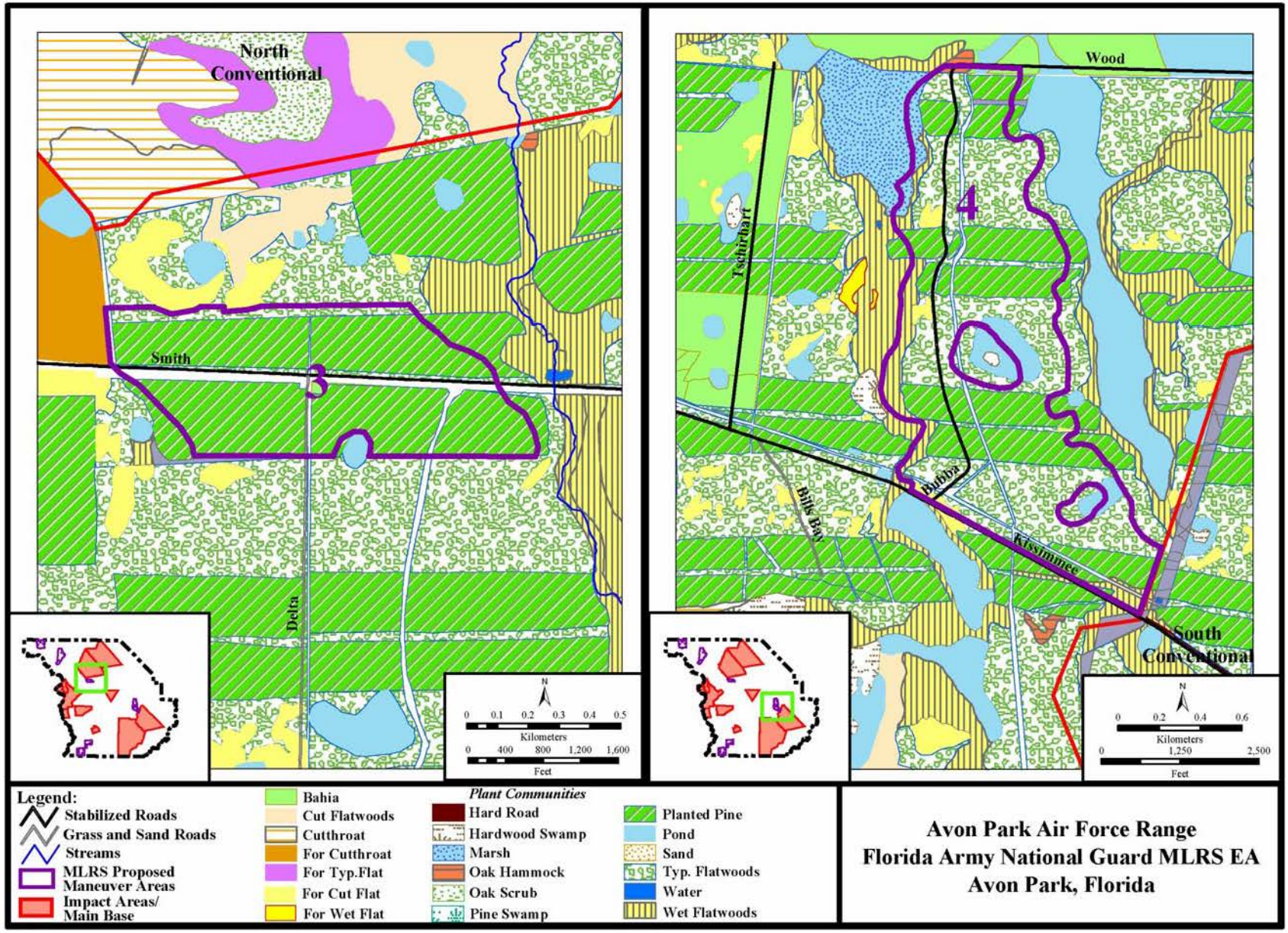

Figure 4-18. Avon Park Air Force Range Plant Communities (MAs 3 and 4)

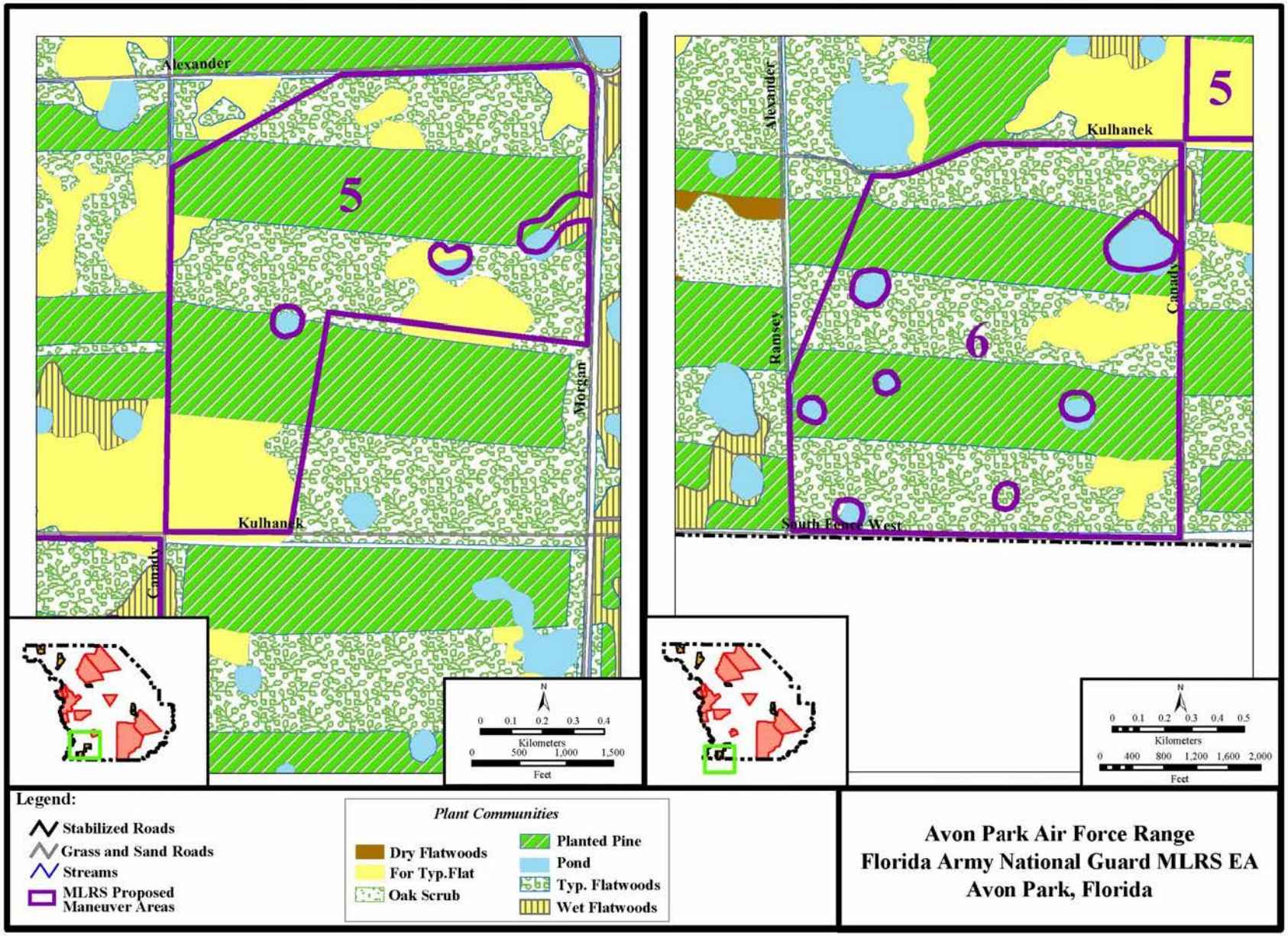

Figure 4-19. Avon Park Air Force Range Plant Communities (MAs 5 and 6)

Vegetation and Wildlife

In addition to the community descriptions below, more comprehensive discussions of these community types can be found in the following five references: FLARNG, 1996; FNAI and FDNR, 1990; Orzell, 1997; USFWS, 1999; and Bridges, 2000**.**

Community Descriptions

Cutthroat Plant Community

Cutthroat grass communities are generally found in seepage slope areas but may also occur in flatwoods, wet prairies, and depressional marshes, and include the cutthroat flatwoods and forested cutthroat flatwoods subclassifications. These communities are dependent on fire to maintain their open, graminoid-dominated character, and fire suppression and drainage represent the greatest threats to their integrity (USFWS, 1999). APAFR contains more than 14,300 acres of cutthroat grass communities, representing the largest extent remaining for these communities in south-central Florida. This community type is an important habitat of the Florida grasshopper sparrow, and many state-listed plant species are also found within it, including hartwrightia, southern red lily, and yellow fringeless orchid (USFWS, 1999).

Hammocks

Hammocks are areas where hardwoods are the dominant species in the overstory based on their ability to outcompete pine because of a variety of factors relating to hydrology, geography, soils, and disturbance history. Similar to pine flatwoods, hardwood hammocks may be divided into three groups based on hydrologic conditions and fire disturbance history (dry, mesic, and wet hammocks).

Dry hammocks often succeed a sandhill or scrub community that has not been disturbed by fire. In these communities, sand live oak, laurel oak, pignut hickory, live oak, saw palmetto, and American beautyberry are common. Once established, fire tends to be catastrophic in these communities, resulting in a change to dry prairie or dry flatwoods communities (Bridges, 2000). Dry hammocks are the most extensive of the hammock communities on APAFR, occupying 2,200 acres in the Kissimmee River Valley escarpment and on the Bombing Range Ridge.

Mesic hammocks often develop from mesic or wet pine flatwoods in the absence of fire disturbance. They are generally areas with a well-developed canopy containing species such as live oak, laurel oak, saw palmetto, marlberry, and shortleaf wild coffee. Mesic hammocks can tolerate infrequent, low-intensity fire regimes. On APAFR, mesic hammocks are limited in extent and account for a scant 50 acres in the southeast corner of APAFR.

Wet hammocks are a wetland community often found in close proximity to other wetland communities. Common species, in addition to oaks, include sweet bay magnolia, cabbage palms, dahoon holly, as well as many species of ferns. There are approximately 100 acres of wet hammock on APAFR near Eight Mile Hammock and the Arbuckle Creek floodplain.

Wetlands

Swamps

Swamp communities on APAFR are generally forested wetland areas fed by surface water associated with floodplains or where the water table is near or above the surface for an extended portion of the year (200 to 300 days per year). At APAFR, dome swamps and baygalls are the two predominant swamp communities. Both are hardwood-dominated because of minimal fire disturbance and inundated soils.

Dome swamps are shallow, circular depressional areas that visually appear as a dome because shorter, smaller trees grow in the shallower edge of the depression, with taller trees growing in the deeper waters of the center. Common species include pond cypress, swamp tupelo, sand pine, chain fern, maidencane, and various grasses and sedges.

Baygalls are often found at the base of sandy slopes and the edges of floodplains where they are fed by groundwater seepage or occasional flooding. They tend to be highly diverse hardwoods with closed canopies. Common species include sweetbay, swamp red bay, loblolly bay, dahoon holly, wax myrtle, maleberry, and cinnamon fern.

Marshes

In contrast to wetland communities dominated by forested canopies of hardwoods or pine, marshes are herbaceous systems. On APAFR, the predominant marsh types are floodplain marsh, depressional marsh, and wet prairies.

Floodplain marshes are geographically and hydrologically connected with riverine systems. At APAFR, floodplain marshes are associated with the Kissimmee River. Major species include sawgrass, buttonbush, and maidencane.

Depressional marshes are shallow, usually round depressions that are normally found throughout the flatwoods and prairies of Florida. Vegetation is generally segregated within this community by water depth and length of inundation. The edge of the depression marsh may contain saw palmetto, and maidencane, cutthroat grass, and St. John's wort where standing water exists. In deeper standing water, species such as sawgrass and pickerelweed may dominate. Fire is an important regulator of this community type, preventing hardwood encroachment and invasion.

Wet prairies are very diverse and variable because of short hydroperiods and inconsistent hydrologic conditions. Their herbaceous nature and shifting conditions may cause dominant species to rapidly shift between species adapted for flooded conditions to ones adapted for drought conditions. Common species include cutthroat grass, beakrushes, and flat sedges.

Seepage Slopes

Seepage slopes are wetland communities that are characterized by shrub thickets and boggy meadows where soils are saturated rather than inundated by downslope seepage. They generally occur where water percolating through well-drained soil types meets an impermeable layer and is

forced close to the surface. Common plant species include slash pine, dahoon holly, gallberry, wax myrtle, blueberry, fetterbush, possumhaw, cutthroat grass, and laurel greenbrier.

Pine Flatwoods

Pine flatwood ecosystems vary with hydrologic condition and can be divided into wet, mesic, and dry (or scrubby) flatwoods. Pine flatwoods are widespread on APAFR with longleaf pine and slash pine dominating the overstory in most areas. In some dry flatwood communities, sand pine may also be found. Pine flatwood forests and savannahs are usually a two-layered vegetative community with a moderately dense to sparse coniferous overstory, little understory, and a sparse to dense groundcover of grasses, forbs, and shrubs.

Wet flatwoods are characterized by a water table close to or above the surface where complete inundation of the soil lasts for a month or more. Cabbage palms and saw palmetto mix with pine in the overstory while various sedges, such as beakrush, nutsedge, and fimbry may be found dominating the groundcover with other grasses. Fire is an important disturbance element within wet flatwood communities, preventing succession into hardwood-dominated forests. Associated wildlife species include oak toad, cricket frog, chorus frog, black racer, rat snake, red-shouldered hawk, bobwhite, opossum, cottontail rabbit, cotton rat, cotton mouse, raccoon, striped skunk, bobcat, and white-tailed deer.

Mesic flatwoods are characterized by a water table near the surface. During the rainy season, water inundates the soil and will frequently stand on the surface for briefs periods. During the dry season, groundwater may be unobtainable for shallow rooted species. For many species found in mesic flatwoods communities, balancing the stress of water saturation during the rainy season and the stress of dehydration during the dry seasons presents a challenge to their survival. Similar to wet flatwood communities, mesic flatwoods are dependent upon fire to prevent succession toward a more hardwood-dominated community type. Mesic flatwoods can also be thought of as a mid-point between wet flatwoods and dry prairies or scrubby flatwoods. Differences among these communities are related to minor topographic changes, variations in fire history and site-specific hydrologic characteristics. Common plant species include St. John's wort, saw palmetto, dwarf huckleberry, fetterbush, dwarf wax myrtle, staggerbush, yellow-eyed grass, and cutthroat grass. Associated wildlife species include oak toad, little grass frog, narrowmouth toad, black racer, rat snake, southeastern kestrel, brown headed nuthatch, pine warbler, red-cockaded woodpecker, Bachman's sparrow, cotton rat, cotton mouse, wild hogs, raccoon, gray fox, bobcat, and white-tailed deer.

Dry flatwoods are characterized by relatively deep water tables (>30cm), an open sparse overstory, and a sparse shrubby understory with numerous patches of bare ground. Common plant species include scrub oak, live oak, dwarf live oak, myrtle oak, fetterbushes, and tarflower. Associated wildlife species include red widow spider, scrub wolf spider, Florida scrub lizard, six-lined racerunner, coachwhip, ground dove, loggerhead shrike, yellow-rumped warbler, eastern towhee, Florida mouse, and spotted skunk.

Scrub

Scrub communities are dense to sparse canopied communities found on areas of higher elevations with well-drained, sandy soils and low nutrient levels. Two types of scrub community, named for their dominant overstory species, occur on APAFR: sand pine scrub and oak scrub. Sand pine scrub communities are generally even-aged with canopy closures dependent on their fire history with an oak understory. Oak scrub communities are dominated by oak with little to no sand pine. Common plant species found in both communities include rusty lyonia, saw palmetto, scrub hickory, rosemary, ground lichens, nodding pinweed, pigeonwing, Curtiss' milkweed, and wiregrass. Associated wildlife species include: red widow spider, oak toad, Florida scrub lizard, six-lined racerunner, coachwhip, loggerhead shrike, Florida scrub jay, yellow-rumped warbler, eastern towhee, Florida mouse, and spotted skunk.

Dry Prairie

Dry prairies are grass-dominated areas nearly devoid of trees with a dense groundcover of wiregrass, saw palmetto, and shrubs. These areas would typically convert to mesic flatwoods if fire intervals and dense groundcover did not suppress tree growth. Two species of interest found on the dry prairies of APAFR are the Florida grasshopper sparrow and the wild coco. Other associated species include six-lined racerunner, black racer, coachwhip, turkey vulture, bobwhite quail, loggerhead shrike, eastern meadowlark, least shrew, harvest mouse, and the occasional Audubon's crested caracara.

Sandhills

Sandhills are savannah-like systems with a pine overstory and well-drained sandy soils low in nutrients. These are ecosystems that are considered to be forests maintained by frequent fires, which prevent succession towards hardwood hammock or scrub communities. Small but important areas of sandhills exist on APAFR and represent an outstanding high-quality example of this increasingly rare community type in south-central Florida (Bridges, 2000). APAFR sandhill areas are home to pigeonwing, a federally listed species. Common species include longleaf pine, slash pine turkey oak, scrub hickory, sand live oak, sand pine, saw palmetto, rusty lyonia, wiregrass, sandhill lupines, Florida alicia, and bluestems.

Table 4-16 shows the approximate acreages of the upper-level community types discussed above within the Proposed MLRS Maneuver Areas.

Table 4-16. Summary Acreages by Plant Community Within Proposed MLRS Maneuver Areas

Plant Community Type	Maneuver Areas						TOTAL
	1 – Big Plantation	2- Willingham	3-Delta	4-Bubba	5-Alexander	6-Ramsey	
Pine Flatwoods	127.3	336.6	14.1	235.7	195.5	274.5	1183.6
Pine Plantation	392.1	287.7	106.5	152.0	124.3	188.1	1,250.7
Hammock	0.0	0.0	0.0	1.3	0.0	0.0	1.3
Marshes and Swamps	7.8	3.1	0.1	21.9	1.7	4.5	38.9
Cutthroat Communities	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pastures and Developed	5.1	14.2	12.2	16.9	3.0	5.5	56.9
Total Land Area	532.3	641.6	132.9	427.8	324.5	472.6	2,531.4

4.6.2.1 Threatened and Endangered Species

There are 28 species of plants and wildlife designated as threatened or endangered by the federal government and/or the state of Florida that occur on or near APAFR. Federally listed species are protected under the Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531-1544, 16 U.S.C. 1531 *et seq*.). By ESA definitions, an *endangered* species is one that is in danger of extinction throughout all or a significant portion of its range. A *threatened* species is any species that is likely to become endangered in the future throughout all or a significant portion of its range. A *candidate* species has been petitioned for listing under the ESA. The listing of protected species under ESA is maintained and updated by the U.S. Fish and Wildlife Service (Title 50 CFR 17.11-12). For state listed animals, the Florida Fish and Wildlife Conservation Commission (FWC) bears this responsibility in accordance with Rule 68A-27 of the Florida Administrative Code (FAC). The Florida Department of Agriculture and Consumer Services maintains the list of state threatened and endangered plant species under state law (FAC, Chapter 5B-40).

APAFR actively conserves candidate, endangered, and threatened species that are federally listed. The Final Draft Integrated Natural Resources Management Plan (INRMP) (U.S. Air Force, 2004a) identifies an overall goal to "protect, restore, and maintain populations of native threatened and endangered plant and animal species within an ecosystem framework." The INRMP outlines specific standards and guidelines that restrict or limit management practices designed to provide adequate protective measures for the natural resources of APAFR while allowing realistic and critically important military training to occur. Consult the INRMP for more information on installation-wide standards and guidelines.

Plants

APAFR is presently home to 13 state-protected plant species, two of which are federally protected. For a discussion of individual plant species, life history requirements, and habitat association, refer to the INRMP. Table 4-17 lists the protected plant species known to occur on

APAFR. Figure 4-20 depicts the locations of threatened and endangered plant species on APAFR. None of the MAs contain threatened and endangered plant species.

Table 4-17. List of Rare, Threatened, or Endangered Plants Known to Occur on APAFR

Scientific Name	Common Name	Federal Status	State Status
Asclepias curtissii	Curtiss' milkweed	N	E
Clitoria fragrans	Pigeon-wing	T	T
*Coelorachis tuberculosa**	Piedmont jointgrass	N	T
Hartwrightia floridana	Hartwrightia	N	T
*Hypericum edisonianum**	Edison's ascyrum	N	T
Lechea cernua	Nodding pinweed	N	E
*Lilium catesbaei**	Southern red lily	N	T
*Matelea floridana**	Florida spiny-pod	N	E
Ophioglossum palmatum	Hand fern	N	E
Panicum abscissum	Cutthroat grass	N	T
*Platanthera integra**	Yellow fringeless orchid	N	T
Polygonella basiramia	Hairy jointweed	E	E
*Pteroglossaspis ecristata**	Wild coco	N	T

Source: U.S. Air Force, 2004a; FNAI, 2004
T = Threatened; E = Endangered; N = Not listed

Wildlife

APAFR is presently home to 15 state-protected wildlife species, 11 of which are also federally protected (Table 4-18). For a discussion of individual wildlife species, life history requirements, and habitat association, refer to the INRMP. A brief discussion on federally listed species on or near APAFR follows.

Federally Listed Species

The APAFR natural resources staff has established Habitat Management Units (HMUs) for three species addressed in the *Plan for Management of the Florida Grasshopper Sparrow, Florida Scrub Jay, and Red-cockaded Woodpecker at Avon Park Air Force Range, Florida* (U.S. Air Force, 2000a). HMUs delineate areas both currently occupied and with the potential for occupation for the Florida grasshopper sparrow (FGS) (*Ammodramus savannarum floridanus*), Florida scrub jay (FSJ) (*Aphelocoma coerulescens*), and red-cockaded woodpecker (RCW) (*Picoides borealis*). Table 4-19 shows the acreage of HMUs for the RCW in each of the proposed MAs; there are no HMUs for the FGS or FSJ in the proposed MAs. Figure 4-21 shows the RCW trees and the HMUs of the FGS and FSJ at APAFR.

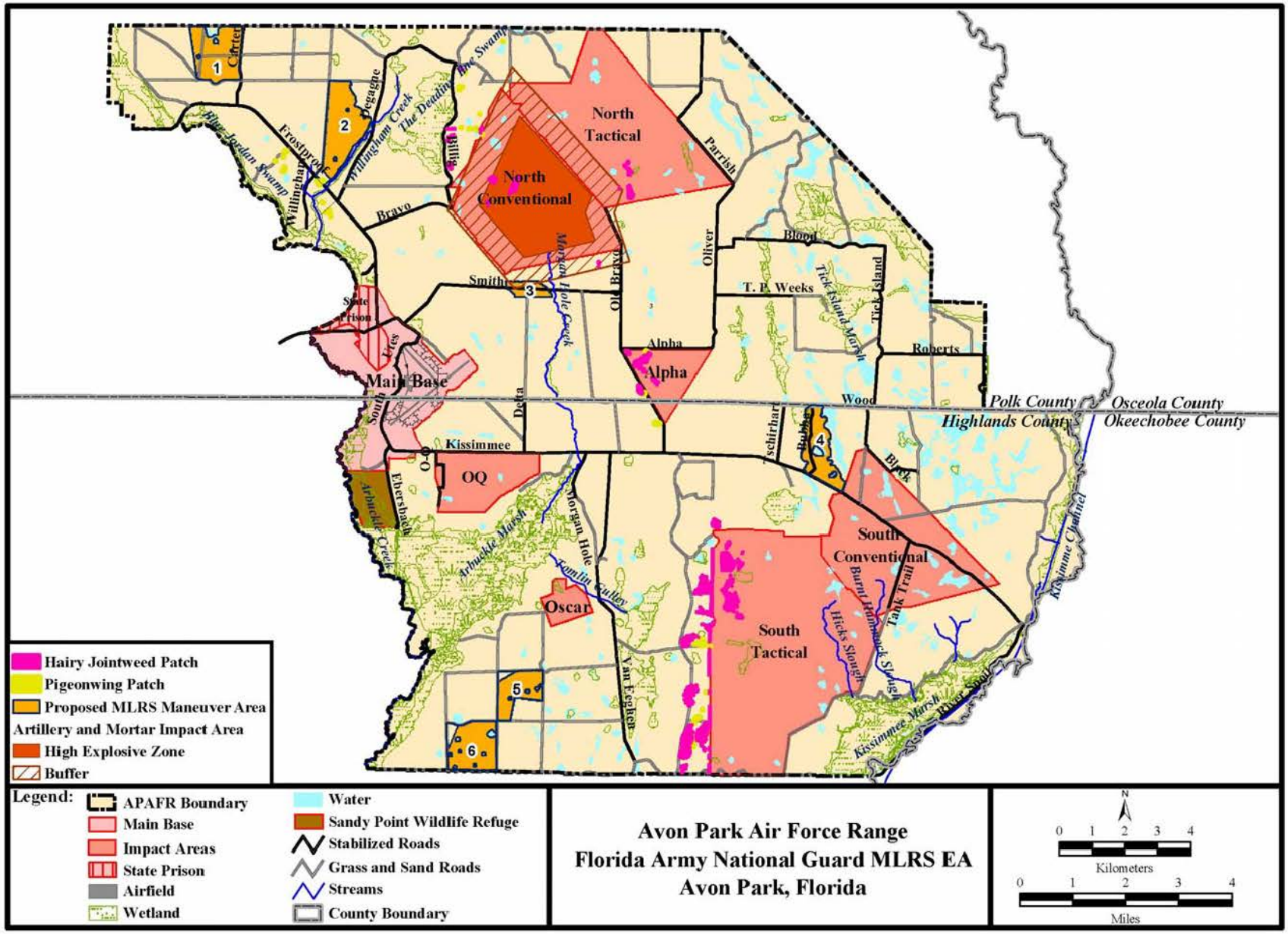

Figure 4-20. Locations of Threatened and Endangered Plant Species

Table 4-18. List of Rare, Threatened, or Endangered Animals on APAFR

Common Name	Scientific Name	Federal Status	State Status
Birds			
Florida grasshopper sparrow	*Ammodramus savannarum floridanus*	E	E
Florida scrub jay	*Aphelocoma coerulescens*	T	T
Southeastern American kestrel	*Falco sparverius paulus*	N	T
Florida sandhill crane	*Grus canadensis pratensis*	N	T
Bald eagle	*Haliaeetus leucocephalus*	T	T
Wood stork	*Mycteria americana*	E	E
Red-cockaded woodpecker	*Picoides borealis*	E	T
Audubon's crested caracara	*Polyborus plancus audubonii*	T	T
Snail kite[a]	*Rostrhamus sociabilis plumbeus*	E	E
Least tern	*Sterna antillarum*	N	T
Mammals			
Florida panther	*Puma concolor coryi*	E	E
Florida black bear	*Ursus americanus floridans*	N	T
Reptiles and Amphibians			
Eastern indigo snake	*Drymarchon corais couperi*	T	T
Blue-tailed mole skink[b]	*Eumeces egregious lividus*	T	T
Sand skink[b]	*Neoseps reynoldsi*	T	T
Insects			
Highlands tiger beetle	*Cicindela highlandensis*	C	N

Source: U.S. Air Force, 2004a; FNAI, 2004
[a] Species adjacent to but not documented on APAFR
[b] Species not documented on APAFR
C = Candidate for listing; E = Endangered; N = Not listed T = Threatened

Table 4-19. Acres of Habitat Management Units in Each MA

Sensitive Species Habitat	Maneuver Areas						TOTAL
	1 – Big Plantation	2- Willingham	3-Delta	4-Bubba	5-Alexander	6-Ramsey	
RCW HMU	107.3	641.5	132.8	427.8	324.4	472.6	2,106.4
RCW Forage Area	0.0	0.0	12.1	0.0	0.0	0.0	12.1
TOTAL	**107.3**	**641.5**	**144.9**	**427.8**	**324.4**	**472.6**	**2,118.5**

FSJ = Florida Scrub Jay; HMU = Habitat Management Unit; RCW = Red-cockaded Woodpecker

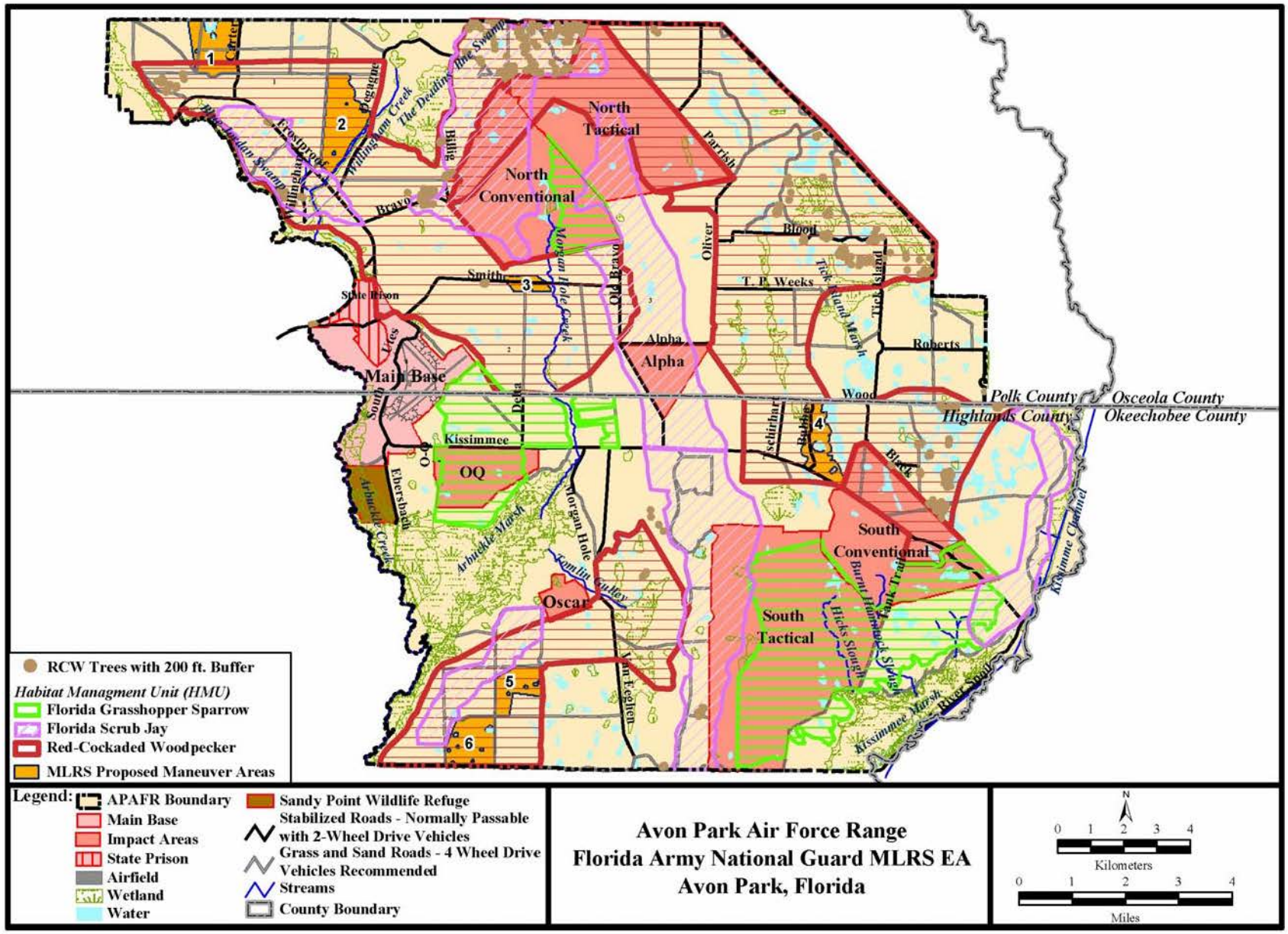

Figure 4-21. Locations of Threatened and Endangered Bird Species and Habitat Management Units

A brief discussion of each of the T&E species listed in Table 4-19 follows.

Florida Grasshopper Sparrow (*Ammodramus savannarum floridanus*)

The FGS is federally and state-listed as endangered with loss of habitat the primary reason for population decline. The FGS is endemic to the south-central dry prairie region of the state. Native dry prairie is characterized as flat, treeless, fire-dependent grasslands with scattered shrubs (U.S. Air Force, 2000a). APAFR maintains suitable habitat for the FGS, whose HMU at APAFR totals approximately 11,622 acres.

Florida Scrub Jay (*Aphelocoma coerulescens*)

The FSJ is federally and state-listed as threatened with population declines because of habitat loss from residential, commercial, and agricultural development. Four distinct APAFR populations are recognized with three of the four experiencing declines ranging from 36.4 percent to 58 percent from 1991 to 1999. The remaining group increased by 280 percent by expanding into areas not previously inhabited (U.S. Air Force, 2000a).

Red-cockaded Woodpecker (*Picoides borealis*)

The RCW is federally listed as endangered and state-listed as threatened. The RCW has a black cap, black nape, and a mostly black and white barred back. Males have a red patch behind the eye. RCWs inhabit open, mature pine forest in the southeastern United States and prefer to nest in mature longleaf pines. RCW populations at APAFR are considered stable, being relatively unchanged from 1970s populations. As of 2001, 42 RCW clusters were documented at APAFR with 20 of these clusters containing active cavity trees. Clusters are spread over the entire range with concentrated areas in the north-central/northwest, northeastern, and eastern part of the range (U.S. Air Force, 2000a).

Wood Stork (*Mycteria americanus*)

The wood stork is federally and state-listed as endangered with low reproductive success blamed for population declines. Alterations to quality feeding habitat are most likely linked with low reproductive success and the decline of this species in Florida where 35 percent of formerly used habitat is no longer suitable for the wood stork (U.S. Navy, 2004). Wood storks have been observed throughout APAFR, presumably to forage, but are not known to nest there (U.S. Navy, 2004).

Audubon's Crested Caracara (*Caracara cheriway*)

The crested caracara is an osprey-sized bird federally and state-listed as threatened. The crested caracara has a large head with a large bluish bill and red-orange bare facial skin, a white throat, a long whitish neck, and long yellowish legs. The bird is blackish brown overall with white patches showing at the end of the wings in flight. Loss of habitat is blamed for species declines. Crested caracaras are occasionally sighted at APAFR (U.S. Navy, 2004).

Bald Eagle (*Haliaeetus leucocephalus*)

The bald eagle is a large raptor that has been protected in the United States since the Bald Eagle Protection Act of 1940 (16 U.S.C. 668). The bald eagle is also federally and state-listed as threatened. Adult birds are mostly dark brown with a white tail and head and a large yellow bill and yellow feet. Bald eagles frequent APAFR, and two nesting locations are regularly used. The northern nesting site is on the northwestern portion of APAFR between the Deadins Pine Swamp and Arbuckle Lake, and the southern location is on the southeast portion of APAFR off Orange Hammock Trail south of the pine plantation on County Line Road (U.S. Navy, 2004).

Florida Snail Kite (*Rostrhamus sociabilis plumbeus*)

The Florida snail kite or Everglades snail kite is a medium-sized hawk federally and state-listed as endangered. Adult males are slate black to gray with a sharply hooked bill and a white patch above and below the upper tail. Adult females are similarly colored with some streaking on the breast and some white on the forehead and throat. No known population of Florida snail kites occurs at APAFR. Snail kites may pass through or near APAFR, traveling between large habitat areas to the north or south (the Everglades, for example) of APAFR (U.S. Navy, 2004).

Florida Panther (*Puma concolor coryi*)

The Florida panther is a federally and state-listed endangered species. Loss of habitat is the main reason for the population decline (U.S. Navy, 2004). A two-day survey for panther signs (tracks, scat, and so forth) did not find evidence of the species currently at APAFR. Counties bordering opposite areas of APAFR have verified sightings or signs of the Florida panther (Land et al., 2004).

Eastern Indigo Snake (*Drymarchon corais couperi*)

The eastern indigo snake is federally and state-listed as threatened. This snake attains lengths up to 8.5 feet, is blue-black in coloration and is non poisonous. Indigo snakes are known to use gopher tortoise burrows to escape weather extremes. Loss of habitat and decline in gopher tortoise populations are the leading causes in the decline of eastern indigo snake populations. At APAFR, this species occurs through several types of habitat, including oak scrub, pine plantation, oak hammock, pine flatwoods, sand pine scrub, dry prairie, hardwood swamp, and disturbed areas. Several sightings have occurred on or near roads (U.S. Navy, 2004).

Sand Skink (*Neoseps reynoldsi*)

The sand skink, a burrowing lizard, is federally and state-listed as threatened. This species has not been documented at APAFR but occurs in adjacent counties (U.S. Navy, 2004).

Bluetail Mole Skink (*Eumeces egregious lividus*)

The bluetail mole skink is federally and state-listed as threatened. Like the sand skink, no documented occurrences of this species exist for APAFR, but may possibly occur nearby (U.S. Navy, 2004).

Highlands Tiger Beetle (*Cicindela highlandensis*)

The Highlands tiger beetle is a candidate for listing as threatened or endangered by the USFWS. Though this species has not been documented at APAFR, its presence has been recorded in nearby Highlands and southern Polk Counties (U.S. Navy, 2004).

4.6.2.2 Migratory Birds

Migratory birds are protected by the *Migratory Bird Treaty Act* (1918, 16 U.S.C. Section 703, et seq) and *Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds* (2001). The Migratory Bird Treaty Act makes it unlawful to kill, capture, collect, possess, buy, sell, ship, import or export listed bird species including their parts, nests or eggs, unless an appropriate federal permit is obtained. Under Executive Order 13186, federal agencies are required within permitted law, availability of monies, budgetary limits and agency missions to:

- Support the conservation intent of the migratory bird conventions by integrating bird conservation principles, measures, and practices into agency activities, and by avoiding or minimizing adverse impacts on migratory bird resources.
- Prevent or abate pollution or detrimental alteration of the environment for the benefit of migratory birds.
- Design migratory bird habitat and population conservation principles, measures, and practices into agency plans and planning processes, and coordinate with other agencies and nonfederal partners in planning efforts.
- Provide notice to the USFWS in advance of conducting an action that is intended to take migratory birds.
- Minimize the intentional take of species of concern.
- Identify where unintentional take reasonably attributable to agency actions is having, or is likely to have, a measurable negative effect on migratory bird populations.

Currently, the DoD is exempt from having to obtain permits for incidental takes of migratory birds for military readiness activities (Bearden, 2005). The exemption was granted per the 2003 National Defense Authorization Act (NDAA) until regulations for the issuance of permits for incidental takings of migratory birds during military training exercises are finalized (Bearden, 2005). The Secretary of the Interior is developing the regulations as directed by the NDAA.

APAFR is not located in a major migratory bird flyway, though migratory waterfowl may be attracted to surface water and wetland habitats on or near the range. Significant water bodies in the study area include Lake Arbuckle, Arbuckle Creek, and the Kissimmee River. Numerous swamps and marshes throughout the area also provide aquatic habitat. A landfill, which may attract vultures, gulls and other raptors is located approximately 3.0 miles west of Bravo Range (347WG Det 1 1999). Doves, owls, crows, and a variety of small birds may occur on the MAs (347WG Det 1 1999). There are two normal migratory seasons, fall and spring.

4.6.2.3 Invasive and Exotic Species

The state of Florida has one of the highest numbers of introduced or non-native species in the country, primarily because of its subtropical climate and isolated topography (FDEP, 2004). Approximately 10 percent of the thousands of non-native plant species in Florida are considered "invasive," threatening to displace natural species or altering habitat processes such as water flow or fire susceptibility (FDEP, 2004).

Executive Order 11312 requires federal agencies to identify actions that may affect the status of invasive species and to use appropriate programs and authorities to:

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

The order also states that federal agencies are not to authorize, fund, or carry out actions that are likely to promote the introduction or spread of invasive species unless the agency has made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species and that all reasonable measures to minimize risk of harm will be taken in conjunction with the actions.

The FDEP is responsible for the control of invasive exotic species on public conservation lands as directed in §369.252, Florida Statutes.

Several invasive plant and animal species occur at APAFR, though the coverage of these species is low compared to the rest of central Florida, primarily attributable to the lower human disturbance at APAFR.

Invasive and exotic plants occurring at APAFR are presented in Table 4-20 by category and shown in Figures 4-22 through 4-24. Category I consists of invasive exotics that are altering native plant communities by displacing native species, changing community structures or ecological functions, or hybridizing with natives. Invasive exotics that have increased in abundance or frequency, but have not yet altered Florida plant communities to the extent shown by Category I species, are placed in Category II.

Table 4-20. Invasive and Exotic Plant Species Found at Avon Park Air Force Range

Scientific Name	Common Name
Category I	
Casuarina glauca	Australian pine
Dioscorea bulbifera	Air potato
Eichhornia crassipes	Water hyacinth
Eugenia uniflora	Surinam cherry
Hydrilla verticillata	Hydrilla
Hymenachne amplexicaulis	West Indian marsh grass
Imperata cylindrica	Cogon grass
Lantana camara	Lantana
Ligustrum sinense	Chinese privet
Lygodium japonicum	Japanese climbing fern
Lygodium microphyllum	Old World climbing fern
Macfadyena unguis-cati	Cat's claw vine
Melaleuca quinquenervia	Melaleuca
Nephrolepis multiflora	Asian sword fern
Panicum repens	Torpedo grass
Pistia stratiotes	Water lettuce
Psidium cattleianum	Strawberry guava
Rhodomyrtus tomentosa	Downy rose myrtle
Ruellia brittoniana	Mexican petunia
Schinus terebinthifolius	Brazilian pepper
Solanum viarum	Tropical soda apple
Syngonium podophyllum	Arrowhead vine
Tradescantia spathacea	Oyster plant
Urochloa mutica	Para grass
Category II	
Alternanthera philoxeroides	Alligator weed
Limnophila sessiliflora	Asian marsh weed
Phoenix reclinata	Senegal date palm
Pteris vittata	Chinese ladder brake fern
Rhynchelytrum repens	Natal grass
Sansevieria hyacinthoides	Bowstring hemp
Urena lobata	Caesar weed
Xanthosoma sagittifolium	Elephant ear

Source: U.S. Air Force, 2004a.

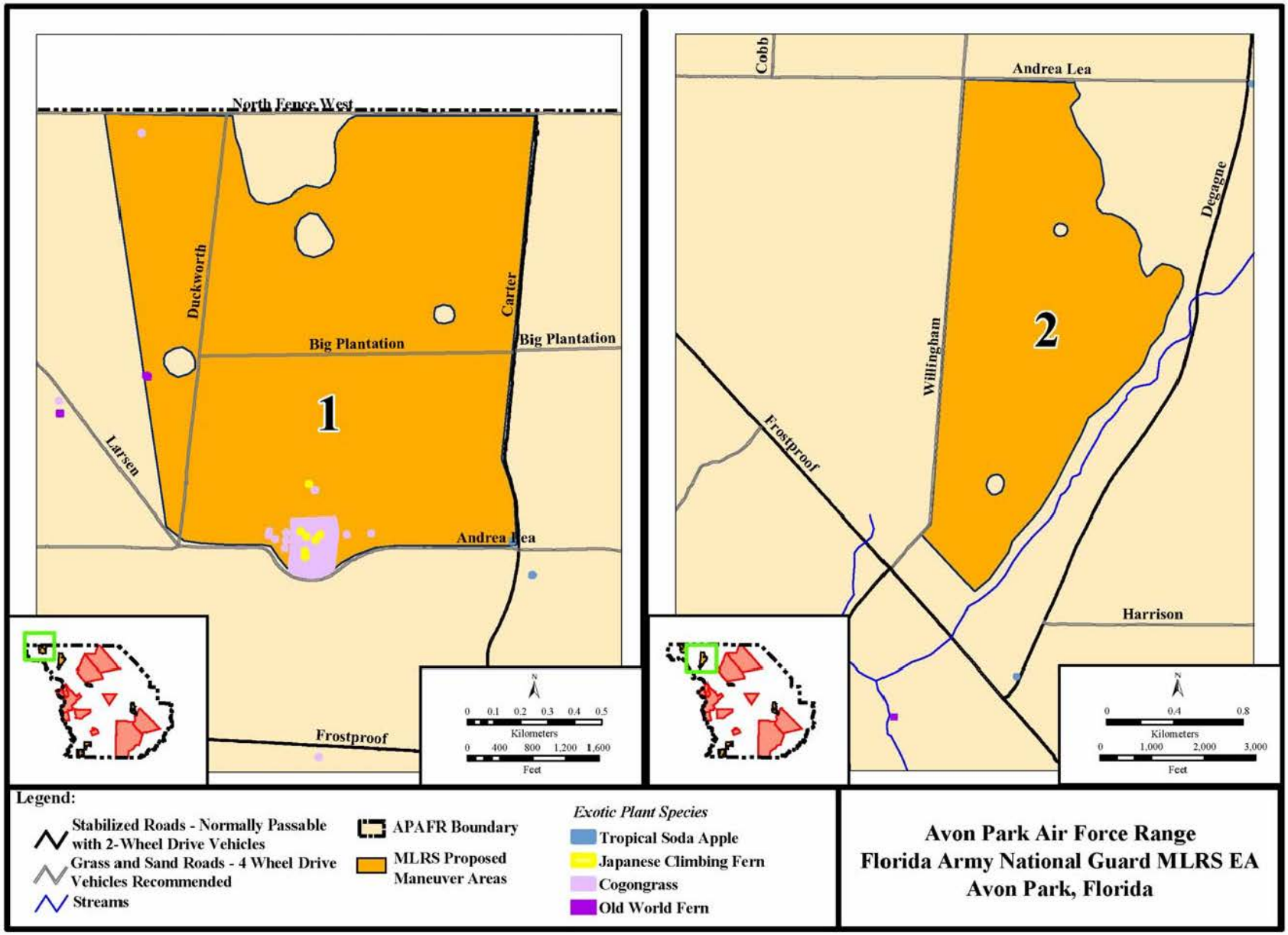

Figure 4-22. Invasive and Exotic Plant Species at APAFR (MAs 1 and 2)

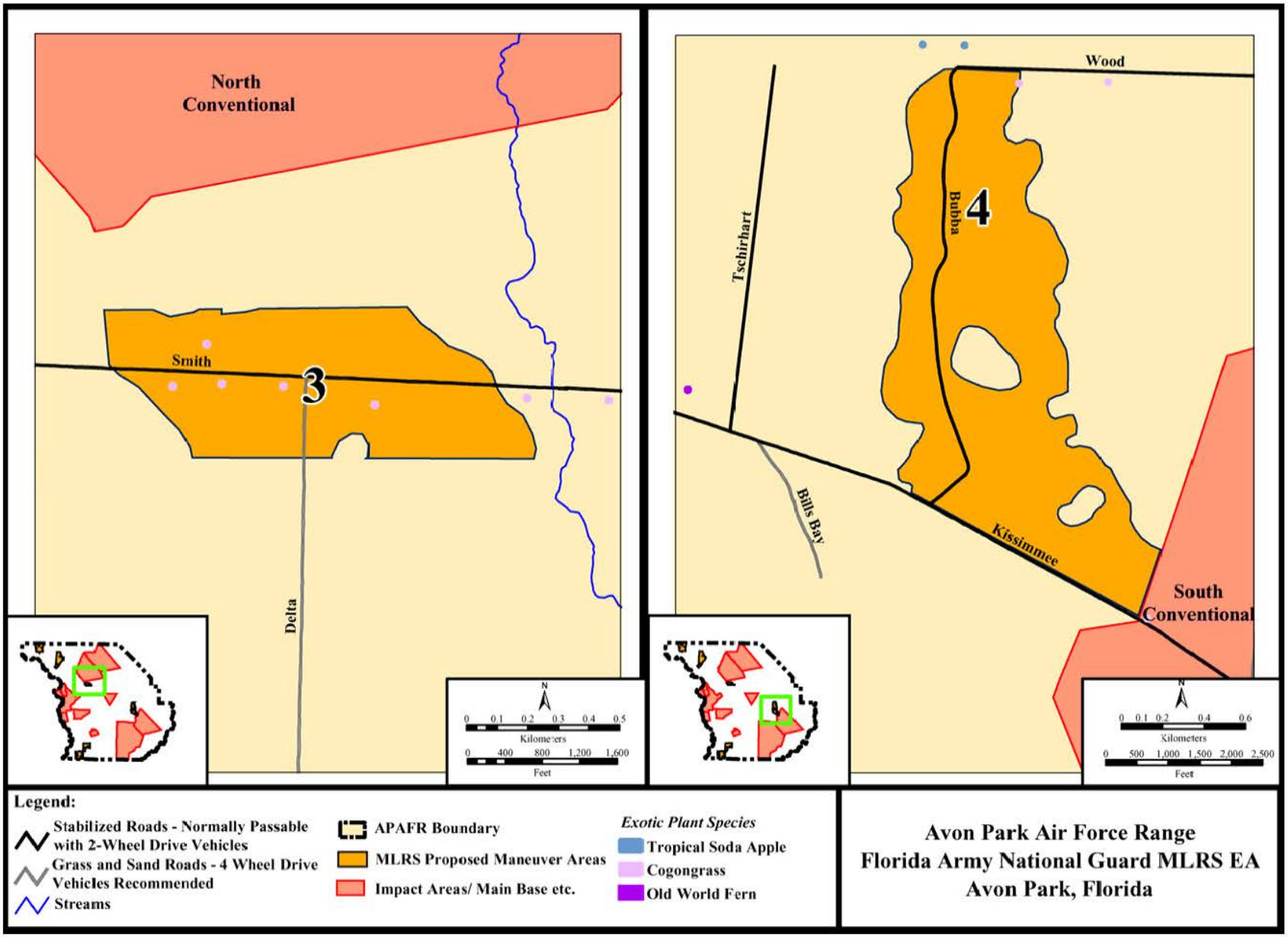

Figure 4-23. Invasive and Exotic Plant Species at APAFR (MAs 3 and 4)

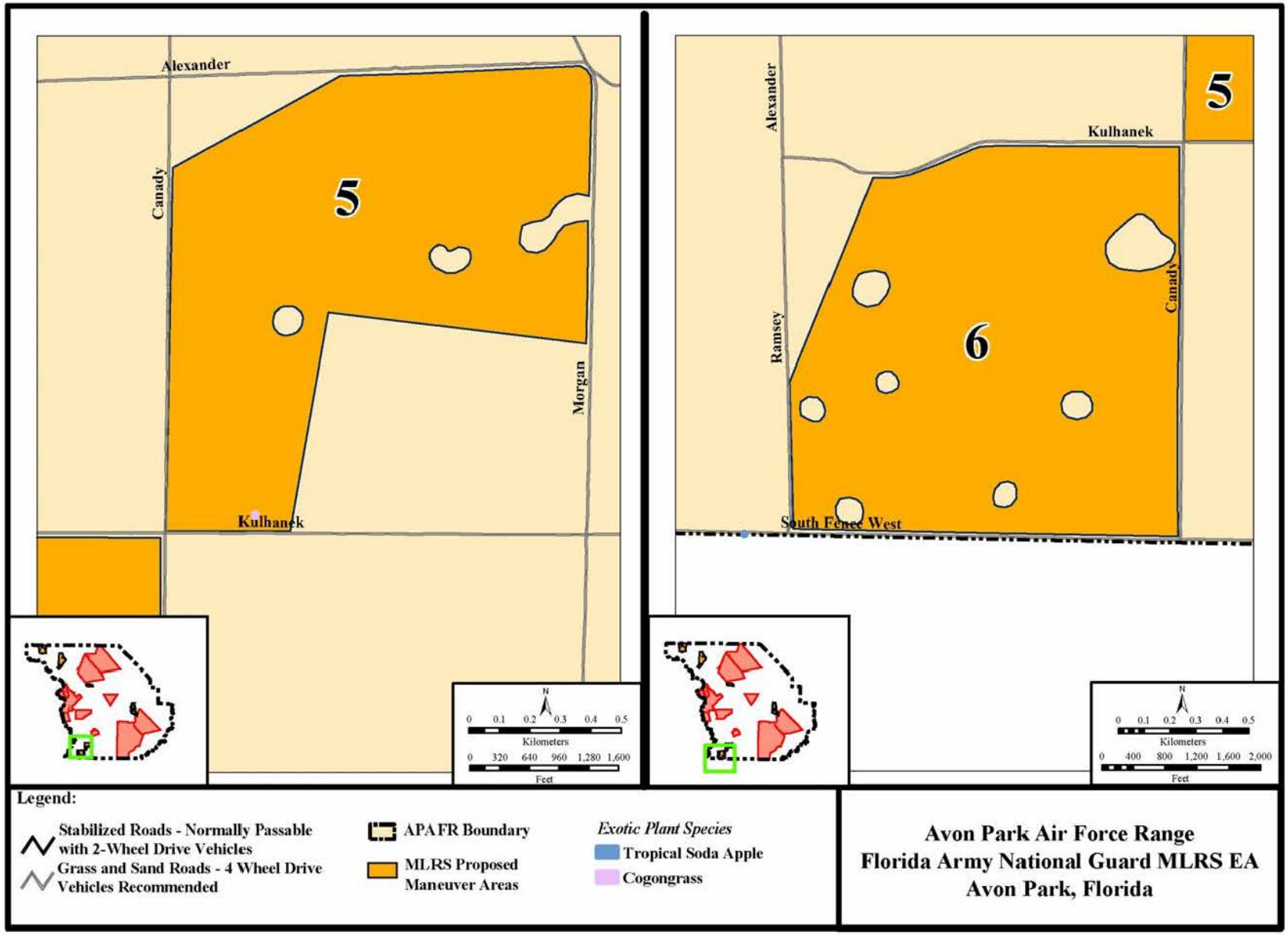

Figure 4-24. Invasive and Exotic Plant Species at APAFR (MAs 5 and 6)

Nuisance and Exotic Animal Species

Maintenance programs for native ecological systems at APAFR prevent the widespread establishment of nuisance or exotic animal species. Feral (that is wild) hogs are probably the most common non-native mammal species at APAFR and are controlled through hunting or trapping (U.S. Navy, 2004). The armored catfish (*Hypostomus plecostomus*) is known to occur on APAFR, and the FWC is exploring the possibility of the presence of the snakehead fish (*Channa marulius)* on APAFR. By virtue of their occurrence in other Florida freshwater systems and the mode by which they are introduced—aquarium releases—the potential exists for other aquatic invasive species to enter APAFR. Along with the snakehead fish and the armored catfish, the walking catfish (*Clarias batrachus*) and the grass carp (*Cyprinus carpio*) have been introduced into aquatic systems as a result of aquarium releases (U.S. Navy, 2004).

The Cuban treefrog (*Osteophilus septentrionalis*), Cuban brown anole (*Anole sagrei*) and the Indo-Pacific gecko (*Hemidactylus garnoti*) are some amphibian and reptile species that occur within the built up areas of APAFR (U.S. Navy, 2004).

Sub-tropical bird species noted to occur at nearby central Florida areas do not appear to be established at APAFR, possibly because of the distance between those more heavily populated areas and APAFR.

4.7 HAZARDOUS MATERIALS AND HAZARDOUS WASTE

4.7.1 Definition of the Resource

A hazardous material, listed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and the Emergency Planning and Community Right-to-Know Act (EPCRA) is defined as any substance that, because of quantity, concentration, or physical, chemical, or infectious characteristics, may present substantial danger to public health, welfare, or the environment. Examples of hazardous materials include petroleum products/fuels, natural gas, synthetic gas, and toxic chemicals.

Hazardous wastes, listed under the Resource Conservation and Recovery Act (RCRA), are defined as any solid, liquid, contained gaseous or semisolid waste, or any combination of wastes that pose a substantive present or potential hazard to human health or the environment. In addition, hazardous wastes must meet either a hazardous characteristic of ignitability, corrosivity, toxicity, or of reactivity under 40 Code of Federal Regulations (CFR) 261, or be listed as a waste under 40 CFR 263. This section also addresses storage tank management and activities associated with the installation's Pollution Prevention Program and Environmental Restoration Program (ERP).

The Region of Influence (ROI) for Hazardous Materials and Hazardous Waste Management comprises APAFR and all areas on the installation that store and/or use hazardous materials or generate and/or store hazardous waste.

4.7.2 Existing Conditions

Hazardous Materials Management

Hazardous materials are employed at APAFR to support a variety of mission activities, including airfield and range operations such as vehicle and aircraft operations. Industrial support operations are also provided at the base. These include petroleum, oil, and lubricants (POL) storage and dispensing operations, vehicle maintenance, target maintenance, and heating and air conditioning systems operations.

A variety of Air Force, federal, and state regulations define the responsibilities of Air Force units, associates, tenant units, and contractors working on APAFR. Under current policies, personnel at APAFR who are purchasing potentially hazardous materials are required to coordinate the purchase with the Environmental Flight (18 ASOG DET 1 OL A/CEV) and obtain a control number for the material. Personnel are also required to obtain a Material Safety Data Sheet for the purchased material and track material usage in order to support hazardous material reporting efforts.

APAFR employs installation-wide procedures to minimize the use of hazardous materials. Material minimization is achieved through worker training that identifies pollution prevention alternatives for specifically identified chemical uses and associated waste streams. These alternatives involve inventory reduction, product substitution, elimination, recycling, and reuse. Maintaining up-to-date hazardous materials inventories assists in managing hazardous material usage and limiting the maximum quantities in storage. Inventories provide data that can be used to eliminate or minimize chemical usage (U.S. Air Force, 2002). Table 4-21 lists hazardous materials used/stored at major locations on APAFR.

Table 4-21. Hazardous Material Inventory

Areas Associated With Industrial Activity	Area Description	Materials
Building 28	Vehicle Maintenance Battery Shop Washrack Service ramp	Oils/Lubricants Hydraulic fluids Batteries Paint Paint Thinners Solvents Detergents Antifreeze Recycle oil and filters
Florida Army National Guard Unit Training Equipment Site (UTES)	Vehicle Maintenance Steam Cleaning Pad Track Ramp Maintenance Small Storage Building Wash Rack	Oils/Lubricants Hydraulic Fluids Batteries Paint Paint Thinners Solvents Detergents Recycle Oil and Filters Antifreeze
Building 809	Former Vehicle Maintenance ATV and Airboat Storage	Aviation Gasoline (AVGAS)

Source: U.S. Air Force, 2002

APAFR has developed programs to comply with all federal and state hazardous materials reporting requirements. This effort has included submission to the state and local emergency planning committees/local fire departments of annual Tier II forms, which are updated inventories of chemicals or extremely hazardous substances in excess of specific threshold limits.

Petroleum Storage Tank Management

Underground storage tanks (USTs) and aboveground storage tanks (ASTs) containing petroleum fuels are regulated under Chapter 62-761, Florida Administrative Code (FAC). Two USTs are located on APAFR, but are managed by the Florida Army National Guard (FLARNG) at their Unit Training Equipment Site (UTES) facility. Based on yearly state inspections, no deficiencies are noted in the two USTs at the UTES facility. There is one active AST managed by the Air Force at APAFR. No deficiencies have been noted during yearly inspections (U.S. Air Force, 2002a).

A summary of the active storage tanks is presented in Table 4-22. The table also lists mobile fuel tankers and small, non-regulated ASTs. The small ASTs store diesel fuel used to run emergency generators.

Table 4-22. APAFR Petroleum Storage Tanks

Facility Location	Tank Capacity (gallons)	Contents	Type
Building 28	5,000	Gasoline	Double-wall AST
	5,000	Diesel	Double-wall AST
	1,200	Diesel	Mobile fuel tanker
Building 44	5,000	Aviation Gasoline	Double-wall AST
Building 66	3,000	Diesel	Mobile fuel tanker
UTES	2,500	Gasoline	Double-wall AST
	5,000	Diesel	Double-wall AST
Building 3044	270	Diesel	Generator fuel tank
Building 3043	270	Diesel	Generator fuel tank
Building 28	270	Diesel	Generator fuel tank
Bravo Range	280	Diesel	Generator fuel tank

Source: U.S. Air Force, 2002
Key: AST = aboveground storage tank, UST = underground storage tank, UTES = Unit Training Equipment Site

No reportable spills of petroleum products or fuels have occurred at APAFR within the past three years. APAFR adheres to procedures established in its *Spill Prevention and Response Plan* (U.S. Air Force, 1999a). This plan provides the organizational structure and procedure to prepare for and respond to discharges of oil and releases of hazardous substances, pollutants, and contaminants. The plan provides guidance to ensure that releases of hazardous substances or oil to the environment may be minimized and controlled. If a spill occurs, the primary goal, after the safety of personnel has been ensured, is containing the spill material as close to the source as possible. Spill response training is conducted annually and includes emergency response procedures for spills and leaks, emergency response procedures for fires and explosions, and spill reporting procedures and requirements (U.S. Air Force, 1999a).

Hazardous Waste Management

Hazardous wastes are generated as a result of routine mission activities. The primary hazardous waste generating activities at APAFR include vehicle and target setup and maintenance. Prior to their use on the range, targets are "sanitized" to remove hazardous constituents. Materials removed from targets include POLs, batteries, radioactive dials, refrigerants, antifreeze, and so on. Fluids, such as POLs, are tested to determine whether they should be disposed as hazardous or non-hazardous waste. Other materials, including batteries and refrigerants, are collected and recycled, when possible (Grebing, 2003).

APAFR is classified as a large-quantity generator (LQG) under federal regulations (EPA Identification Number FL8572128587). An LQG either produces 1,000 or more kilograms (kg) of hazardous waste per month (approximately 265 gallons, or 2,200 pounds) or produces 1 kg or more of acute hazardous waste per month. APAFR is classified as an LQG because it maintains a State permit for a postclosure care Hazardous Waste Thermal Treatment Facility (HWTTF) facility. (Note: The State permit and HWTTF are further discussed in Section 3.12.2.5) Based on actual hazardous waste generation rates, APAFR would qualify as a small quantity generator (generates between 100 and 1,000 kg of hazardous waste or produces less than 1 kg of acute hazardous waste per month); however, the conditions of the permit are the same as those of a LGQ (U.S. Air Force, 2004b). During its routine operations (primarily vehicle maintenance), APAFR stores and uses relatively small amounts of oils, paints, solvents, thinners, adhesives, gasoline, cleaners, batteries, acids, bases, and compressed gases. However, non-routine operations, such as target maintenance, turn-in of expired shelf-life chemicals and equipment, and ERP waste generation, have elevated the facility to LQG status (Grebing, 2003).

A draft hazardous waste management plan (U.S. Air Force, 2003a) has been prepared for APAFR that identifies hazardous waste generation areas and addresses the proper packaging, labeling, storage, and handling of hazardous material. The plan also addresses record keeping; spill contingency and response requirements; education and training of appropriate personnel in the hazards, safe handling, and transportation of the materials; and a waste analysis plan for each hazardous waste stream associated with the range. The development, maintenance, and implementation of the Hazardous Waste Management Plan (HWMP) are the responsibility of the Environmental Flight, as administered through the Hazardous Waste Program Manager. The overall responsibility of the hazardous waste management program (through which the HWMP is implemented) resides with Range Management.

Hazardous waste is collected and stored at several areas on APAFR. The Central Accumulation Point (CAP), located in Building 69, is used as the central collection point for APAFR, where hazardous waste may be stored for up to 90 days prior to off-site disposal. Non-hazardous wastes and universal wastes, such as fluorescent bulbs, are also stored at the CAP.

There are also four Satellite Accumulation Points (SAPs) located throughout the installation. SAPs are located at or near the point of generation of a hazardous waste. Once their storage volume is exceeded, hazardous wastes are transported to the CAP prior to off-site disposal. SAPs are located at the FLARNG UTES facility, Civil Engineering (Building 69), Target Maintenance (Entomology Shop, Building 25), and Vehicle Maintenance (Building 28) (U.S. Air Force, 2003a). Table 4-23 lists regulated wastes generated at the installation during calendar year 2000 (CY2000).

Table 4-23. Regulated Wastes Generated at APAFR During CY2000

Turn-in Date	Waste Description	Quantity (lbs)	EPA Waste Code
March 2000	Waste Paint Related Material	300	D001
	Waste, Flammable Liquid (Petroleum Distillates)	41	
	Hazardous Waste, Solid (Cadmium, Lead)	100	D006
	Hazardous Waste, Liquid (Cadmium, Lead)	1170	
	Non Regulated Solids (Mercury Bulbs)	94	Non-RCRA
	Non-Regulated Solids (Rags, Spill Absorbent)	783	
	Non-Regulated Liquid (Washrack Residue)	2847	
	Non-Regulated Liquid (Poly-sol Cleaner)	86	
August 2000	Non-Regulated Petroleum Contaminated Soil	2000	
	Arsenic Contaminated Soil Non-Regulated	2500	
	Non-Regulated Material (Tar)	500	
October 2000	Hazardous Waste, Liquid (Cadmium)	3116	D006
	Waste Batteries (NICAD for recycle)	5423	D002, D006
	Non Regulated Solids (Mercury Bulbs)	108	D009
	Non-Regulated Solids (Soil, Rags)	181	Non-RCRA
	Non-Regulated Solids (Grease)	105	
	Non-Regulated Liquid (Wash Rack Residue)	2648	

Source: Grebing, 2003a

The variety of wastes includes contaminated soil, waste paint and paint thinner, wash rack residue, spill absorbent material and debris, and used batteries and fluorescent bulbs.

All generated wastes are disposed at permitted off-site facilities. Oily rags, lead-acid batteries, and waste paint material are disposed through the Defense Reutilization and Marketing Organization (DRMO). Fuel filters from UTES are recycled through the U.S. Property and Fiscal Office.

Used oil generated at APAFR is managed as recyclable material through A&S Oil Recovery, St. Petersburg, Florida. Characterization is conducted in accordance with 40 CFR 279.11 to ensure the used oil meets specifications for exclusion as hazardous waste. Used oil removed from vehicles and power equipment is containerized at the Vehicle Maintenance shop and transferred to an oil recovery storage tank. The stored waste oil is donated to A&S Oil Recovery in exchange for transport to a refinery (U.S. Air Force, 2003a).

Munitions Related Wastes

Munition fragments and residues are also generated on a recurring basis as a result of the range training missions. Under current practice, munition debris is recovered/removed from the ranges for the purpose of storage, reclamation, treatment, and disposal as solid waste. In accordance with AFI 13-212, the range is cleared of munition debris on a regular basis. Charlie and Bravo impact areas, the impact areas with the greatest concentration of debris, are cleared after 75 use days to 100 meters from the dive bomb and applied tactics targets, and approximately 700 meters from the nuclear targets. The tactical impact areas (Echo, Foxtrot) are cleared annually. All impact areas are cleared to their boundary every five years. All munition debris is inspected by trained EOD personnel.

Occasionally, the small spotting charge in the training munition fails to detonate or EOD blows vent holes in inert heavyweights bombs to expose the inert filler material. If necessary, EOD personnel will treat a hazardous munition, rendering it safe, and then supervise the collection and ultimate disposal of the debris (U.S. Air Force, 2000). Approximately 100,000 pounds of munition debris is recovered from the active ranges on annual basis (Hulbert, 2003). A private contractor demilitarizes, removes, and recycles the accumulated waste.

Pollution Prevention

The Environmental Flight is responsible for managing the pollution prevention activities at APAFR. APAFR has not developed a formal pollution prevention plan at this time. However, an opportunity assessment was conducted in February 1999 by FDEP personnel, and source reduction and recycling methods have been implemented since the assessment to reduce the volume and quantity of waste generated at APAFR facilities.

Specifically, APAFR waste disposal methods and technologies encompass recycling of used oils, scrap metal, tires, and lead-acid batteries and purchasing of environmentally preferred products.

Other applied pollution prevention activities include material substitution, process management, and preventive maintenance. Pollution prevention activities related to solid waste management include recycling, waste reduction, and waste segregation. The range recycling program currently recycles scrap metal, used oil, lead-acid batteries, tires, cardboard, and project-specific construction and demolition (C&D) materials (U.S. Air Force, 2004).

A formal pollution prevention plan is currently being developed by APAFR. The plan will address pollution prevention objectives and goals, program organization and goals, program elements and implementation strategy, scheduling recurring opportunity assessments, annual benefit assessment, and program reporting and tracking.

Restoration and Compliance Programs

The Environmental Restoration Program (ERP) is used by the Air Force to identify, characterize, and remediate past environmental contamination on Air Force installations. Although widely accepted at one time, the procedures followed for managing and disposing of wastes resulted in contamination of the environment. The ERP, which generally addresses contamination caused by releases of hazardous substances or petroleum products that occurred prior to January 1984, established a process to evaluate past disposal sites, control migration of contaminants, identify potential hazards to human health and the environment, and remediate the sites.

At APAFR, the ERP initially identified 11 sites for investigation during its initial phase in 1984. Thirteen sites were added to the program as the result of a 1990 RCRA Facility Assessment. During the period of 1985 to 2000, an additional 45 sites were added to the ERP, for a total of 69 sites. On 1 November 2000, the EPA, Region 4, modified the existing, Hazardous and Solid Waste Amendment (HSWA) Permit for APAFR by the removal of four Solid Waste Management Units (SWMUs), leaving the ERP with 65 sites. On 17 November 2000, the State of Florida received authorization from EPA, Region 4, for implementing the HSWA Corrective

Action Program. From October 2000 to the present, seven additional Area of Concerns (AOCs) were added to the ERP, for a total of 72 sites (U.S. Navy, 2004).

ERP sites can be classified as munitions burial sites (MBSs) (29), Point Source Areas such as waste pits (15), Non-Point Source Areas, such as a canal or group of unknown test plots (10), Landfills (10), Petroleum Sites (6), Former Target Area (1), and a Munitions Debris Pile (1). ERP sites are not only located within the cantonment area (Main Base), but also within the impact areas and other sections of the Range (Figure 4-25). Primary contaminants associated with these sites include fuels, arsenic, fluoride, copper, manganese, iron, aluminum, chlordane and other low levels of pesticides in the soil and groundwater (U.S. Navy, 2004).

Currently, the 72 existing ERP sites (including the 29 MBSs) are listed as SWMUs under the HSWA Corrective Action Program of the recently issued Postclosure Resource Conservation and Recovery Act (RCRA) Permit. This Postclosure Permit (#38564-003-HF) was issued to the APAFR by FDEP on 26 January 2004. The HSWA portion of the RCRA Permit requires Corrective Action to continue on two AOCs and on all the SWMUs located at the installation (U.S. Navy, 2004).

The HSWA portion of the RCRA Permit also requires the APAFR submit a semiannual Corrective Action Management Plan (CAMP) to FDEP, which includes the status and cleanup schedules for the two AOCs and SWMUs listed in the Permit. Delays in cleanup, as depicted in the CAMP, without the agreement of FDEP, could result in a potential enforcement action. The APAFR is not listed as a National Priorities List (NPL) Site under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (U.S. Navy, 2004).

The status of the ERP for APAFR is documented in a Management Action Plan (MAP) (U.S. Air Force, 2002a), which was last updated in December 2003. The MAP summarizes the status of the ERP and identifies specific program issues to promote effective investigation and cleanup strategies. The MAP is used as a tool to document the contaminants, regulations, plans, schedules, and funding requirements to implement response actions necessary to protect human health and the environment. Much of the data included in the MAP is generated from the Air Force Restoration Information Management System (AFRIMS) (U.S. Navy, 2004).

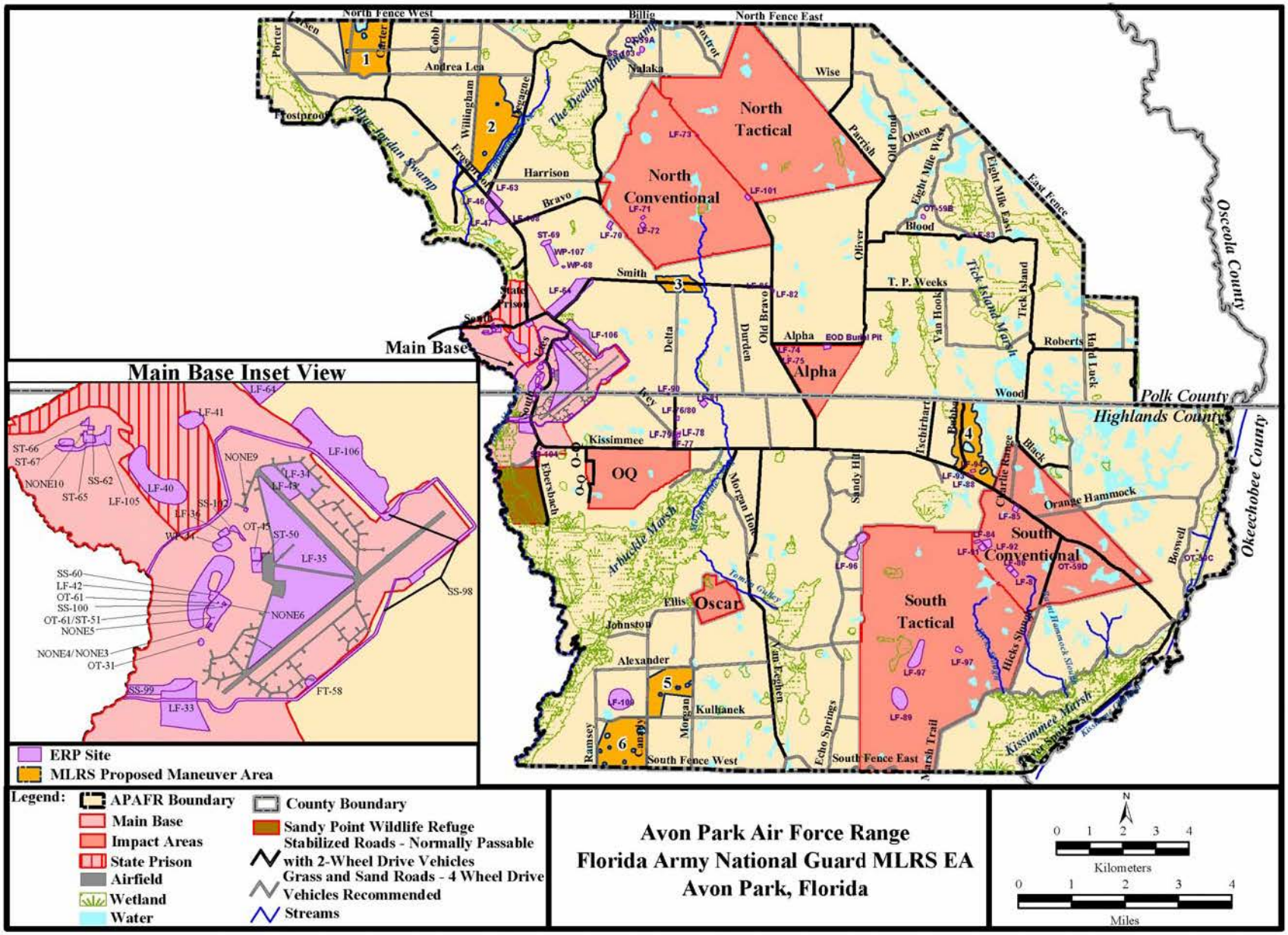

Figure 4-25. ERP Sites on APAFR

4.8 CULTURAL RESOURCES

4.8.1 Definition of the Resource

Cultural resources comprise prehistoric or historic sites, districts, buildings, structures, objects, and other evidence of human activity. These include: archaeological resources, historic architectural and engineering resources, and traditional cultural properties. Archaeological resources are locations where human activity has altered the earth or left deposits of physical remains such as stone tools, bottles, structure ruins. Historic architectural and engineering resources include standing buildings, dams, canals, bridges, and roads. Buildings generally must be 50 years or older, although military structures from the Cold War era (1946 to 1989) can be considered significant if they are of exceptional importance to the Cold War military mission. Traditional cultural properties are associated with the practices and beliefs of a living community. Significant cultural resources are those that are eligible or potentially eligible for inclusion in the National Register of Historic Places (NRHP), or that are important to traditional groups as outlined in the *American Indian Religious Freedom Act* (AIRFA), the *Native American Graves Protection and Repatriation Act* (NAGPRA), Executive Order 13007, *Indian Sacred Sites,* and Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*. Cultural resources that are unevaluated for NRHP-eligibility are treated as potentially eligible until evaluation is complete.

FLARNG is required to comply with Section 106 of the *National Historic Preservation Act* (NHPA), including SHPO and American Indian consultation, during the environmental analysis (EA) process. In 1999, the DoD promulgated its American Indian and Alaska Native Policy that emphasizes the importance of respecting and consulting with tribal governments on a government-to-government basis. The policy requires an assessment, through consultation, of the effect of proposed DoD actions that may have the potential to significantly affect protected tribal resources, tribal rights, and Indian lands before decisions are made by the armed services. The FLARNG consulted with Native American Tribes in April 2001, September 2001, and January 2003 (Healy, 2005). The proceedings of the consultation meetings are documented in transcripts kept on file at the FLARNG Headquarters in St. Augustine, Florida. The six tribes consulted on this project are traditionally the only federally-recognized tribes that have expressed an interest in Florida. Of these, only the Miccosukee Tribe of Indians of Florida expressed an interest in the proposed action (Healy, 2005). Correspondence and consultation between the FLARNG and those tribes with ties to APAFR is found in Appendix I. During consultation, the tribal representatives concurred with FLARNG that archaeological surveys would be conducted at proposed maneuver areas in accordance with State standards. It was agreed that if there were no potentially eligible sites identified during the surveys, that that Tribes would not desire further consultation.

4.8.2 Existing Conditions

Historical Setting

Human occupation of the region began at least 12,000 years ago. Over the millennia, complex forms of political and religious community organization developed, accompanied by burial mounds and elaborate earthworks. During the sixteenth century, the Kissimmee and Lake

Okeechobee regions are thought to have been under the control of the Calusa people (U.S. Air Force, 2003b). The Spanish arrived in the region in the early 1500s and, for the next two centuries, Spain used Florida as a military base to protect their interests to the south (U.S. Air Force, 2003b). By 1715, groups of Creek Indians began to move into Florida (U.S. Air Force, 2003b). There they were joined by other people, including free African Americans and escaped slaves, and eventually became known as Seminoles. Historical accounts place Seminoles in the Avon Park area in the mid to late nineteenth century (U.S. Air Force, 2003b). The Seminole and Miccosukee remain in Florida today (Seminole, 2003; Miccosukee, 2002) and may have ancestral ties to the Avon Park area.

In the 1700s, a sizeable British population split the territory into East and West Florida and established the head-rights land grant system and the plantation system of commercial agriculture. Britain returned Florida to Spain after the American Revolution. Florida became a U.S. territory in 1821 and was admitted to the Union as a slave state in 1845 (U.S. Air Force, 2003b). The area was homesteaded by Euroamericans beginning in the 1840s. After the Civil War, settlement and population increased. Agriculture continued as the dominant industry, with the addition of the phosphate, forest, and fisheries industries (U.S. Air Force, 2003b).

World War I brought military training camps and flying schools to Florida, and stimulated shipbuilding, agriculture, and turpentine operations. Increased defense spending for World War II expanded industry and agriculture further. Avon Park Army Air Field was built from 1942 to 1945 and served as a World War II Army Air Corps training facility (U.S. Air Force, 2003b). During the mid-1940s, the facility was assigned to the Third Air Force. At the end of World War II, the base was deactivated and assigned to MacDill AFB. The range was reactivated in mid-1946 for demolition practice bombing missions (U.S. Air Force, 2003b). In 1950, the base was again deactivated and 25,000 acres were leased for cattle grazing. During the early 1950s, the base was used primarily as a civilian fishing camp and an occasional bivouac site by various military units. In 1951, the U.S. Bureau of Prisons opened a minimum-security prison camp on base (U.S. Air Force, 2003b). In 1956, the site was renamed Avon Park Air Force Range.

By 1971, APAFR's mission had expanded to training in the use of F-4 and B-57 aircraft. FLARNG, ROTC, Army, Navy, and Marine Corps also used the range (HQ ACC, 1997). FLARNG became a full-time tenant in August 1984 (HQ ACC, 1997). By 1985, there were six active target complexes: Bravo, Charlie, and Oscar (conventional) and Delta, Echo, and Foxtrot (tactical). In the 1990s, Bravo, Charlie, Echo, and Foxtrot impact areas were all prepared for Hellfire missile firing by the FLARNG. FLARNG units fired 10-mm, 155-mm, and 8-inch guns. In 1996, control over APAFR was transferred to Moody AFB, Georgia, and APAFR became Operating Location Alpha, Detachment 1 of the 347th Wing at Moody AFB (HQ ACC, 1997). As of October 2003, responsibility for APAFR transferred to the 20th FW at Shaw AFB, South Carolina, and a tenant unit at Pope AFB, North Carolina. APAFR is now designated as 18th Air Support Operations Group Detachment 1 Operating Location Alpha.

Identified Cultural Resources

As of 2003, more than 139 cultural resources, consisting of prehistoric, historic, and multi-component sites, had been recorded on APAFR. Of these sites, 37 were determined to be

eligible or potentially eligible for the NRHP. In 2004, 12 new sites were identified (Thackston, 2004). Two of these are considered eligible for the NRHP. In 2005, survey was completed on the six MAs proposed for this project. Surveyors identified an additional three sites and nine isolates (U.S. Air Force, 2005a). FLARNG consulted with the SHPO and the Miccosukee Tribe of Florida regarding these resources. Currently, no resources on APAFR are listed in the NRHP (National Register Information System [NRIS], 2004), although 10 sites are in the process of being nominated (Thackston, 2004).

Within the six proposed Maneuver Areas (MAs), four archaeological sites and nine isolates have been identified. In MA 1 (Big Plantation) one previously identified historic cultural resource (site 8PO6098) had at first been considered potentially eligible for the NRHP. The site consists of the remains of a concrete footer that supported one of three Blue Jordan Bombing Target observation towers. In addition to the towers, the target included three concentric target circles, a central target, pyramidal control points and lighting. None of these features remain standing. Phase II investigations at this site determined the target's "integrity of materials, workmanship, design, and feeling have been irreparably damaged" and that therefore the site is not eligible for the NRHP (U.S. Air Force 2005c). In the remaining five MAs, Phase I archaeological survey identified an additional three prehistoric archaeological sites and nine isolates (an isolate consists of fewer than three artifacts within a 30 meter diameter area) (Table 4-24). One site with ceramics and an early Archaic projectile points was considered potentially eligible for the NRHP. This site, located in MA 2 (Willingham), received Phase II testing, which determined it is not NRHP eligible (U.S. Air Force, 2005c). Neither the other two sites and six isolates in the Willingham MA nor the three isolates in MA 4 (Bubba) are NRHP-eligible. Although the majority of acreage in the MAs (91 percent) is in areas that have been identified as having a low probability for cultural resources, the three sites and six isolates on the Willingham MA are along Willingham Creek, an area with a high probability for the presence of NRHP-eligible archaeological resources, and all but one isolate were found through subsurface testing (i.e., shovel probes). Table 4-24 lists the MAs, the number of archaeological sites found during Phase I survey, and their NRHP eligibility. The SHPO concurs that none of the recorded cultural resources in any of the MAs is eligible for the NRHP (Gaske, 2005).

Table 4-24. Cultural Resources by Maneuver Area

Maneuver Area	Archaeological Sites [1] (none are NRHP-eligible)
1. Big Plantation	1
2. Willingham	3
3. Delta	0
4. Bubba	0
5. Alexander	0
6. Ramsey	0
Total	***4***

Note: 1– A site is defined as three or more artifacts within a 30 meter diameter area

The FLARNG provided the results of the surveys to the SHPO and the Miccosukee Tribe on 7 and 15 September 2005, respectively (see Appendix I). There are no known traditional cultural properties on APAFR associated with American Indian traditions or beliefs (U.S. Air Force, 2003b).

One Euroamerican traditional cultural property, Fort Kissimmee Cemetery, is associated with the earliest Euroamerican settlers of the region. Members of the Fort Kissimmee Cemetery Association retain ownership of the parcel of land containing the cemetery, as well as a small piece of property that extends to the Kissimmee River near the southeast margin of APAFR. The Association maintains the cemetery and continues to inter their dead at that location (U.S. Air Force, 2003b).

4.9 SOCIOECONOMICS

4.9.1 Definition of the Resource

Avon Park Air Force Range (APAFR) straddles the boundary between Polk County (to the north) and Highlands County (to the south) in inland central Florida. Public access to APAFR is from the west where the closest community of Avon Park is located (in the extreme northwest corner of Highlands County). The region of influence comprises the two-county region of Highlands and Polk Counties. The primary socioeconomic resources of APAFR utilized by the public are associated with agriculture (grazing and seed harvesting), forestry (timber harvesting), and recreation.

4.9.2 Existing Conditions

Economic Activity

The primary focus of socioeconomics is on the sectors of the economy associated with agriculture, forestry, and recreation since these form the basis of the socioeconomic resources of APAFR. Descriptions are provided for these resources within a regional context and also for APAFR specifically.

Agriculture

Agriculture plays a far more important role in the economies of both Highlands and Polk Counties than in the state of Florida as a whole. Farm employment in 2000 comprised 1.1 percent of total full- and part-time employment in the state. The corresponding shares for Highlands and Polk Counties were 6.0 percent and 2.1 percent, respectively. When employment in farming is added to that in agricultural services and forestry, the share of total employment rises to just over 20 percent in Highlands County and 5.5 percent in Polk County. This compares to a statewide level of 3.0 percent (BEA, no date).

Regional Setting

In the case of Highlands County, much of the farmland (74 percent) is devoted to pasture, while the remaining 27 percent is cropland (76 percent of which is harvested). For Polk County, 69 percent of the farmland is devoted to pasture, and the remaining farmland is used for crops (69 percent of which is harvested). Orchards (almost wholly citrus groves) occupy 85,900 acres (13 percent) of the land area of Highlands County and 114,500 acres (10 percent) of the land area of Polk County (USDA, 1997).

The importance of citrus cultivation can be seen from an examination of the market value of agricultural products sold. In 1997, the value of total sales of agricultural products in Highlands County reached almost $203 million. In Polk County, the corresponding value was over $253 million. In both counties, the agricultural products category, which is almost entirely citrus production (fruits, nuts, and berries), contributed 69 percent of total market value of all agricultural products sold. For Florida as a whole, citrus production contributed 25 percent of total market value of all agricultural products sold. As of 2000-2001, Polk County ranked second in the state in citrus production (almost 34.5 million boxes), followed by Highlands County in third place with an output of just over 28 million boxes (USDA, 1997; Florida Agricultural Facts (NASS), 2002).

The sale of cattle and calves had a market value of $18.6 million in Highlands County in 1997 and $15.6 million in Polk County. These sales levels represented 9.2 percent and 6.2 percent, respectively, of the market value of all agricultural products sold in 1997 (USDA, 1997).

Over the period from 1993 through 2002, both Highlands and Polk Counties have contributed between 5 and 6 percent of the total state inventory of cattle and calves. The number of cattle and calves rose gently in both counties and the state between 1993 and 1995-1996 and then declined steadily. Inventory levels in 2002 represented a near 8 percent, 5 percent, and almost 13 percent decrease, respectively, from the 1993 levels for the state (1,780,000 versus 1,930,000), Highlands County (109,000 versus 115,000) and Polk County (94,000 versus 108,000) (Florida Agricultural Facts [NASS], 2002).

Avon Park Air Force Range Agricultural Programs

Grazing

As discussed in Section 3.5.2, over 90 percent of the area of the range is leased for cattle grazing. The cattle carrying capacity of APAFR varies from year to year but averages about 4,000 head annually. This number of cattle comprises about 1.9 percent of the combined total number (206,700 head) of cattle and calves in Highlands and Polk Counties.

There are currently nine leasehold areas varying in size from about 620 acres (lease number 5) to almost 21,000 acres (lease number 3). The grazing leases are for an initial period of five years with a single five-year renewal option. Each lease contains a 90-day cancellation clause to the benefit of the Air Force. The leases are re-bid every five years. The initial leases are awarded based on sealed bids received by the Air Force. The five-year option is valued by the U.S. Army Corps of Engineers (USACE) based on comparables on private leases. Most of the leases provide supplemental income to the lessees. The grazing leases obligate the lessee to perform critical maintenance that can impact mission operations such as removal of dead cattle within 12 hours of notification or discovery (APAFR, 2003a; Original Supplemental Agreement No. 1 to Lease No. DACA01-1-98-286).

Existing capital improvements associated with the grazing program include the following: fences (244.1 miles), cattle guards (74 units), cattle pens (10 units), tame pasture (1,436 acres), water systems (12 units), and stock ponds (24 units). Of the 244.1 miles of fencing, 86 miles function as boundaries for the installation, the runway, and the North and South impact areas.

Additionally, the grazing program provides and maintains a tractor that is used for fire disk line maintenance and provides personnel for fire fighting. In the absence of the grazing program, the 86 miles of fencing would be maintained. Personnel and fire fighting equipment would be supplied by other Air Force programs (Penfield, 2005).

The grazing program supports five Air Force civilian personnel responsible for monitoring infrastructure in the grazing areas and implementing required maintenance and repair activities (APAFR, 2003a). The grazing program also manages the federally mandated invasive species program by providing supervision and direction to an intern that conducts surveys throughout the property. The program provides a vehicle for the invasive species surveys and contributes $10,000 annually for the salary of the installation ecologist.

Lease payments made to the Air Force for use of the property for cattle grazing totaled $147,700 in 2000. Table 4-25 shows the financial performance of the grazing program for the last five fiscal years. Since FY1998, the program has generated $0.78 million in revenues (Penfield, 2005). On average over the five-year period, using an area under active management of 90,000 acres, the program has generated gross revenue of $1.73 per acre and after deducting expenses, has cost the APAFR about $0.04 per acre per year. Expenses including salaries, shown in Table 4-25, include expenses associated with all of the activities supported by the grazing program, as described above.

Table 4-25. APAFR Operating Statement for Grazing Program by Fiscal Year
(in $000, except where noted)

	1998	1999	2000	2001	2002
Revenues	**$ 160.4**	**$ 160.0**	**$ 147.7**	**$ 153.6**	**$ 158.3**
Average per acre*	$ 1.8	$ 1.8	$ 1.6	$ 1.7	$ 1.8
Expenses					
Salaries	$ 76.9	$ 49.7	$ 43.5	$ 51.8	$ 84.6
Contracts	$ 4.3	$ 44.0	$ 33.6	$ 33.2	$ 25.0
Supplies	$ 80.1	$ 64.8	$ 72.0	$ 70.8	$ 58.6
Miscellaneous	$ 0.6	$ 2.7	$ 0.7	NE	$ 0.4
Total Expenses	**$ 161.9**	**$ 161.2**	**$ 149.8**	**$ 155.8**	**$ 168.6**
Average per acre*	$ 1.8	$ 1.8	$ 1.7	$ 1.7	$ 1.9
Revenues Less Expenses	**$ (1.5)**	**$ (1.2)**	**$ (2.1)**	**$ (2.2)**	**$ (10.3)**
Average per acre*	$ (0.02)	$ (0.01)	$ (0.02)	$ (0.02)	$ (0.11)

Source: APAFR data reports on revenue generating programs, FY1998–FY2002; Penfield, 2005.
* Data expressed on a per acre basis is not in thousands and uses 90,000 acres under active management for all fiscal years.
NE = No expense reported

Seed Harvesting

APAFR also operates a native seed-harvesting program. The seeds are used mainly in the restoration of off-range sites following phosphate surface mining operations. The most important seed harvested is that of wiregrass, although other species are also harvested. The growing season is May and June with harvesting taking place from mid-November through mid-December. Revenues attributable to this program partially support a biologist and are placed in the grazing program account. Annual revenues from sales of native seed yield to APAFR between $10,000 and $20,000 (APAFR, 2003a).

Forestry

The timber industry of Florida is concentrated in the northeast and northwest sections of the state of Florida, which contribute 62 percent and 32 percent, respectively, of the total softwood products output of the entire state (over 467 million cubic feet in 1997). The central and southern section contributes the remaining share of 6 percent (just over 27 million cubic feet). Hardwood products play a much smaller role in the forest industry of Florida with output of just over 10 percent that of softwood output (Brown, 1995).

Regional Setting

Among the 30 counties that comprise the central and southern section of the state, Polk County ranks second for output of softwood products, contributing over 10 percent of regional output. The corresponding share of the regional softwood products output for Highlands County is under 2 percent. These contributions, however, do not reach 1 percent of statewide output (Brown, 1995).

As of 1995, an estimated 29 percent of the almost 79,000 acres of timberland in Highlands County was in public ownership. The corresponding figures were 14 percent and 243,000 acres for Polk County, and 19 percent and 14.6 million acres for the state of Florida. Of the publicly owned timberland in Highlands County, virtually all (98 percent) is owned by the federal government, while in Polk County, 43 percent is owned by the federal government, 51 percent by the state, and 6 percent by local government entities. In the state of Florida, the federal government owns 57 percent of timberland, 36 percent of which is National Forest land. Forty percent of Florida's timberland is owned by the state, and counties and municipalities own the remaining 3 percent (Brown, 1995).

Of the privately owned timberland in Highlands County, farmers own 26 percent, corporations own 58 percent, and individuals own 16 percent. The corresponding values for Polk County are 19 percent farmer-owned, 41 percent corporate-owned, and 40 percent individually owned. For the state of Florida, the values are 8 percent, 22 percent, and 30 percent, respectively (Brown, 1995).

Of the timberland in Highlands County, the largest share (42 percent) is classified as saw timber, followed by sapling-seedling (34 percent), non-stocked areas (14 percent), and pole timber (10 percent). For Polk County, the corresponding values are 40 percent saw timber, 35 percent sapling-seedling, 2 percent non-stocked area, and 23 percent pole timber.

Over the period from 1987 through 1995, an average of over 1 million cubic feet of growing stock has been removed annually from timberland in Highlands County. Of this amount, 47 percent comprised soft hardwood varieties, followed by 27 percent pine, and 26 percent hardwood. In Polk County, the composition of the growing stock removed (an annual average of 6.4 million cubic feet) is quite different with 85 percent composed of softwood (other than pine). Over the same time period, an average of 4.2 million board feet of saw timber was removed annually from timberland in Highlands County and almost 15 million board feet in Polk County. In Highlands County, the distribution across types of timber was 38 percent hardwood, 34 percent soft hardwood, and 28 percent pine. In Polk County, the distribution was 79 percent softwood (other than pine), 19 percent hardwood, and 2 percent soft hardwood (Brown, 1995).

Avon Park Air Force Range Forestry Program

A brief description of the forestry program is found in Section 3.5.2. Over the period from FY1997 through FY2001, the annual amount of timber sold has averaged almost 26,500 tons. Over the same time period, about 258 acres of land have been reforested annually. Between FY2001 and FY2004, an average of 416 acres of land have been reforested annually. Current annual timber production is about 25,000 tons with revenues of between $350,000 and $450,000. Of the timber harvested on APAFR, 75 percent is for saw timber or ply logs with 25 percent for pulp and mulch. Most of the timber harvested is slash pine with some longleaf pine. The timber for pulp/mulch is usually transported to mulch/chip mills within a 30-mile radius of APAFR, while timber for saw wood and ply-logs is transported greater distances to destinations that include Tarrytown (90 miles), Hawthorne (155 miles), Palatka (186 miles), Cross City (215 miles), and Gainesville (180 miles).

There are, on average, between five and six timber sales per year. Each sale is handled as a bid proposal whereby the timber area and type of timber to be harvested are designated and contained in the bid package along with a number of other specifications such as the timing and access conditions. The contract is awarded to the highest bidder. For a contract, activity usually comprises about three months of full-time work (but can extend because of weather). Civilian workers associated with each contract include a crew of four or five and 10 to 15 truck operators. Currently there are three contractors working APAFR, and contractors can and do have multiple contracts. Contractors operating consistently on the range operate within an approximately 200-mile radius covering Polk, Lake, and Hardee Counties. Truckers are usually independent owner-operators and reside in the region (Marion and Lake Counties to the north) (APAFR, 2003b).

The operational performance history of the timber program for the last five fiscal years is shown in Table 4-26. The above average increase in revenue for FY1999 reflects sale of salvaged timber from fire kill. Since FY1998, the program has generated $2.64 million in revenues. On average over the five-year period, using an area under active management of 15,000 acres, the program has generated gross revenues of $25.1 per acre, and after deducting program expenses, has returned about $9.93 per acre to the APAFR Forestry Reserve Account.

Funds received from timber sale contracts are sent through the range finance office to the Defense Finance and Accounting Service. Range annual budgets are sent to ACC for review and forwarded to the Air Force Center for Environmental Excellence for HQ approval. The forestry program is self-sustaining and supports three full-time foresters with necessary trucks, equipment, fuel, and materials (APAFR, 2003b). Expenses, including salaries, shown in Table 4-26 are directly related to the forestry program.

Table 4-26. APAFR Operating Statement for Forestry Program by Fiscal Year
(in $000, except where noted)

	1998	1999	2000	2001	2002	2003	2004
Revenues	**$ 243.3**	**$ 515.1**	**$ 355.6**	**$ 430.8**	**$ 295.1**	**$ 422.9**	**$ 375.4**
Average per acre	$ 16.2	$ 34.3	$ 23.7	$ 28.7	$ 19.7	$ 28.2	$ 25.1
Expenses							
Salaries	$ 94.1	$ 99.9	$ 104.9	$ 102.2	$ 61.3	$ 88.2	$ 129.3
Contracts	NE	$ 28.8	$ 47.5	$ 35.4	$ 84.8	$ 68.3	$ 70.6
Supplies	$ 72.1	$ 83.1	$ 75.0	$ 110.6	$ 58.8	$ 30.9	$ 28.8
Miscellaneous	$ 9.9	$ 11.3	$ 1.9	$ 3.8	$ 0.7	$ 63.8	$ 29.4
Total Expenses	**$ 176.1**	**$ 223.1**	**$ 229.3**	**$ 252.0**	**$ 205.6**	**$ 251.2**	**$ 258.1**
Average per acre	$ 11.7	$ 14.9	$15.3	$ 16.8	$ 13.7	$ 16.7	$ 17.2
Revenues Less Expenses	**$ 67.2**	**$ 292.0**	**$ 126.3**	**$ 178.8**	**$ 89.5**	**$ 171.7**	**$ 117.3**
Average per acre	$ 4.5	$ 19.5	$ 8.4	$ 11.9	$ 6.0	$ 11.4	$ 7.8

Source: APAFR data reports on revenue generating programs, FY1998–FY2004.
* Data expressed on a per acre basis is not in thousands and uses 15,000 acres under active management for all fiscal years.
NE = No expense reported.

Forty percent of the net receipts of the timber program goes to the counties of Polk and Highlands and are allocated equally to support road and school programs. Over the period from 1991 through 2002, a cumulative total of almost $572,000 has gone to the two counties (51 percent to Highlands County and 49 percent to Polk County). The amount averages $40,888 annually as shown in Table 4-27.

Table 4-27. Payments (in lieu of taxes) from Timber Program to Polk and Highlands Counties (40% of Net Receipts)

Year	Level	Payment per Acre
1991	$ 6,940	$ 0.46
1992	$ 24,680	$ 1.65
1993	$ 50,620	$ 3.37
1994	$ 51,420	$ 3.43
1995	$ 40,600	$ 2.71
1996	$ 16,410	$ 1.09
1997	$ 69,930	$ 4.66
1998	$ 5,500	$ 0.37
1999	$ 104,510	$ 6.97
2000	N/A	N/A
2001	$ 51,230	$ 3.42
2002	$ 35,800	$ 2.39
2003	**$ 68,680**	**$ 4.57**
2004	**$ 46,920**	**$ 3.13**
TOTAL	**$ 572,440**	
Average Annual	$ 40,888	$ 2.73

Source: APAFR data reports on revenue generating programs, FY1998–FY2004.
N/A – Data not available

Recreation

Regional Setting

Parks for outdoor activities include Lake Kissimmee State Park that consists of 5,000 acres bordered by Lakes Kissimmee, Tiger, and Rosalie. Activities include hiking trails, picnic facilities, boating, fishing, camping, and nature study. Tiger Creek Nature Preserve, owned by The Nature Conservancy, is a 4,400-acre resource that is home to plants and animals that have survived only in this location.

Avon Park Air Force Range Recreation Programs

A brief description of the recreation program is found in Section 4.3.2. As shown in Table 4-6 (in Section 4.3), hunting is the most popular recreational pursuit conducted on the APAFR. Most of the applications for hunting permits for the range are from persons residing south of Orlando. Fifty percent of permits given out in 2002 were to persons in with ZIP codes beginning with 338 (APAFR, 2003a).

Running just south of Orlando, ZIP code area 338-- encompasses Lake Wales, Poinciana, Haines City, Lake Placid, and Placid Lake. APAFR distributes about 3,000 applications annually (up to four persons can apply for permits on a single application) and issues about 2,000 permits annually (2,069 in 2003). Each permit allows all forms of recreation, including hunting. Permits are drawn by lottery and chosen permit-holders are allowed to bring guests most weekends.

Annual harvests during recent years (1999–2001) for primary game species included 481 white-tailed deer, 1,075 wild hogs, 875 bobwhite quail, and 350 wild turkeys. Hunting deer using dogs, a strong cultural attachment in the southern United States, occurs at APAFR with approximately 1,000 ”dog hunters” engaging in this activity. Approximately 20,000 hunter-days of use were recorded in 2001. Hunting permit sales currently generate $240,000 annually.

The APAFR financial reporting format documents the interdependence between recreation, fish and wildlife, and environmental flight functions. It is important to note that revenues used to fund the fish and wildlife management program and range maintenance contributing to attracting visitors, are derived from recreational permit sales for various activities.

Recreation-based revenues derived from the sale of recreational permits are used to fund natural resources activities. Such natural resource activities are related to resource conservation, research, and stewardship functions including but not limited to wildlife surveys, studies, monitoring, habitat upkeep, carrying capacity analysis, and nuisance species control (such as wild hog population control). Revenues generated from permit sales are also used to pay for the in-house salary of a wildlife biologist.

Table 4-28 shows the financial performance of the recreational program used to support not only recreational activities but also management programs related to fish and wildlife activities over the last five fiscal years. Expenses, including salaries, shown in Table 4-28 are associated with natural resources management activities at APAFR. The revenue amounts shown in the table are derived from the sale of recreational permits that allow for fishing, hunting, and other forms of

low-impact wildlife appreciation such as bird watching and hiking. Table 4-28, shows revenues and costs presented on a per acre basis using 80,777 acres as a scale factor to express the financial performance on a common basis.

Since FY1998, the recreation program has generated $1.8 million in revenues. On average over the seven-year period, using the acreage listed, the program has generated gross revenue of $3 per acre and after deducting program expenses, has cost APAFR about $0.32 per acre, on average. As a result of the program, APAFR is able to undertake proactive natural resource conservation, research and stewardship functions that otherwise would have to be funded from ACC or other Air Force sources or be eliminated.

Table 4-28. APAFR Operating Statement for Fish & Wildlife Program by Fiscal Year
(in $000)

	1998	1999	2000	2001	2002	2003	2004
Revenues	**$ 233.3**	**$ 235.7**	**$ 233.7**	**$ 259.2**	**$ 251.5**	**$ 310.9**	**$ 256.9**
Average per acre	$ 2.9	$ 2.9	$ 2.9	$ 3.2	$ 3.1	$ 3.8	$ 3.2
Expenses							
Salaries	$ 166.3	$ 176.5	$ 185.6	$ 183.5	$ 199.9	$ 236.2	$ 174.1
Contracts	$ 16.8	$ 13.3	$ 13.0	$ 12.6	$ 23.4	$ 53.7	$ 59.3
Supplies	$ 57.0	$ 56.0	$ 45.3	$ 50.9	$ 61.0	$ 24.6	$ 36.2
Equipment	$ 4.9	$ 22.6	$ 22.4	NE	NE	NE	NE
Miscellaneous	$ 1.6	$ 1.9	$ 1.6	$ 6.1	$ 3.6	$ 5.4	$ 2.1
Total	**$ 246.6**	**$ 270.3**	**$ 267.9**	**$ 253.1**	**$ 287.9**	**$ 319.9**	**$ 271.7**
Average per acre	$ 3.1	$ 3.3	$ 3.3	$ 3.1	$ 3.6	$ 4.0	$ 3.4
Revenues Less Expenses	**$ (13.3)**	**$ (34.6)**	**$ (34.2)**	**$ 6.1**	**$ (36.4)**	**$ (9.0)**	**$ (14.8)**
Average per acre	$ (0.2)	$ (0.4)	$ (0.4)	$ 0.1	$ (0.5)	$ (0.1)	$ (0.18)

Source: APAFR data reports on revenue generating programs, FY1998 – FY2004.
Data expressed on a per acre basis uses total management acreage of 80,777 inclusive of Management Area 4.
NE= No expense reported.

Wildlife observation and nature study is increasing at APAFR. A 30-foot observation tower at Lake Arbuckle is a popular site year-round for birdwatchers and organized groups. The 600-acre Sandy Point Wildlife Refuge, which is closed to hunting, is also a popular destination.

APAFR offers environmental education and interpretive programs and tours to non-profit groups and local schools, and participates in local fairs and special events in the community. In 2002, about three tours and presentations took place. APAFR also produces informative and interpretive brochures to educate the public about management practices they may see while visiting the range. The equivalent of 1.5 full-time employees are allocated for recreation enforcement.

APAFR and Regional Economic Interdependency

Expenditures associated with activities at APAFR have both a direct and indirect effect on the local and regional economy. Infusions of spending in the local and regional economies are associated with: (1) permanent APAFR mission operations; (2) temporary operations at APAFR;

and (3) revenue-generating programs, including recreation, cattle grazing, and timber sales conducted at the range.

Permanent APAFR Mission Operations

Expenditures associated with permanent APAFR mission operations recur on an annual basis and serve to stimulate the regional economy by supplying disposable incomes for households and making annual recurring purchases that stimulate other industries in the region. Table 4-29 shows the level of annual recurring expenditures by fiscal year.

Table 4-29. APAFR Operations and Maintenance Expenses Excluding Revenue Programs FY1998 through FY2002 in Thousands of Dollars

Expense Category	1998	1999	2000	2001	2002
Salaries	$ 3,460.5	$ 3,815.0	$ 3,968.5	$ 4,121.3	$ 4,276.2
Transportation	$ 245.4	$ 191.9	$ 260.1	$ 201.3	$ 384.8
Utilities	$ 107.8	$ 107.0	$ 130.5	$ 151.0	$ 90.2
Communications	$ 54.1	$ 48.5	$ 23.5	$ 36.6	$ 47.3
Infrastructure Maintenance and Repair	$ 70.8	$ 247.4	$ 35.8	$ 62.4	$ 102.2
Contracts	$ 766.4	$ 650.7	$ 1,412.5	$ 1,373.7	$ 1,283.5
Range Operating Contract	$ 282.4	$ 317.4	$ 396.4	NE	NE
Supplies	$ 756.7	$ 568.5	$ 715.5	$ 705.5	$ 631.5
Equipment	$ 83.3	$ 131.6	$ 112.3	$ 190.3	$ 328.8
Miscellaneous	NE	NE	NE	$ 2.8	$ 20.0
Total	**$ 5,827.4**	**$ 6,078.0**	**$ 7,055.1**	**$ 6,844.9**	**$ 7,164.5**

Source: APAFR data reports on revenue generating programs, FY1998 – FY2002
NE = No expense reported.

As shown in Table 4-29, salaries make up the largest expenditure for APAFR, followed by contracts and purchases of supplies and equipment. Contractual expenditures are for services such as refuse removal and janitorial services as well as architectural, engineering, and environmental services. Equipment purchases range from computers to other necessary supplies in support of range operations. Over the last five fiscal years, the annual recurring direct expenditures for APAFR averaged approximately $6.5 million.

Temporary Operations at APAFR

In addition to permanent salaries and expenditures from APAFR, other military service personnel, including Florida Army National Guardsmen, and civilian users of APAFR also impact the regional economy through direct spending that occurs locally. This form of spending from non-permanent personnel assigned to APAFR for temporary periods represents "imported dollars" into the region that are then recycled throughout the regional economy.

For those temporary users of APAFR, Figure 4-26 shows the breakdown of user days by type of service over the course of a year. User days represent the number of persons times the duration (in days) of their stay.

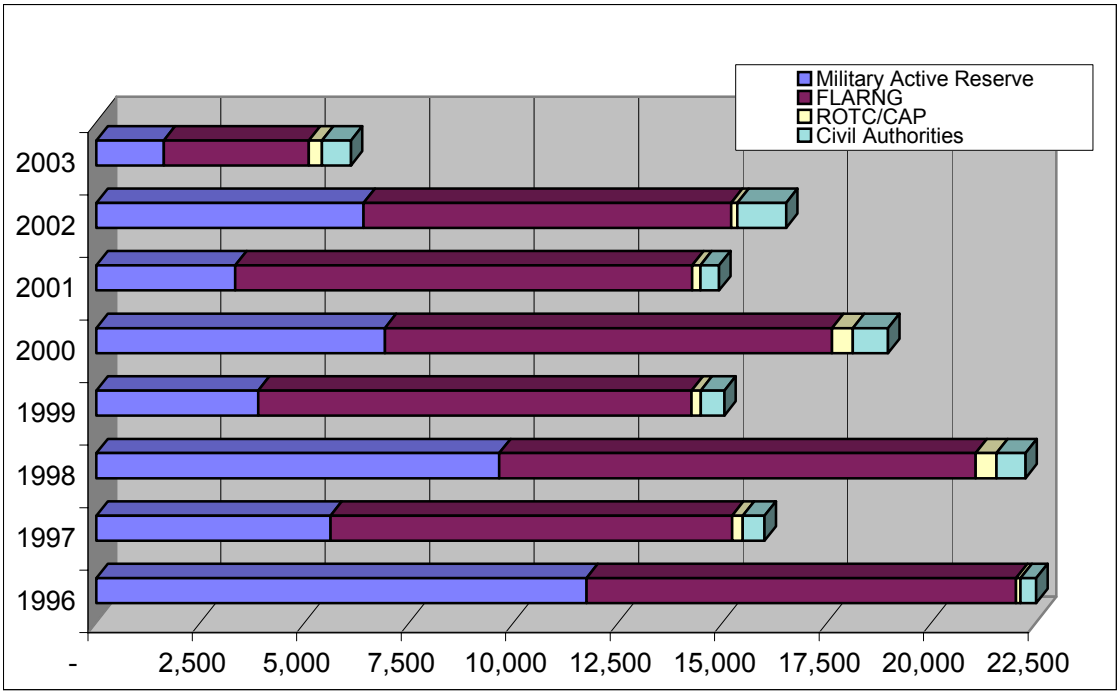

Figure 4-26. Trends in Person-Day Utilization by Type on APAFR

Using information contained in *Avon Park Air Force Range Year 2000 Economic Impact Analysis* (Highlands County EDC/IDA, 2001), the direct and indirect economic impacts contributed by activities at the range to the local and regional economies is estimated to be in excess of $12 million. This estimate takes into consideration the total indirect economic impacts generated from APAFR payroll and purchases, deployment per diems, explosive ordnance disposal, compliance teams, environmental programs, and aviation fuel sales.

Revenue-Generating Programs

The recreational spending associated with activities at APAFR influences the economies of Polk and Highlands Counties. Including family members and guests, it is estimated that up to 20,000-30,000 visitor days are generated by the activities available at APAFR, thus directly stimulating the economies of the counties.

According to the *Avon Park Air Force Range Year 2000 Economic Impact Analysis*, (Highlands County EDC/IDA, 2001), the direct spending associated with recreational visitors exceeded $1 million in 2000. These direct expenditures for hunting and fishing include equipment and other trip-related goods and services such as food and lodging. The estimated indirect earnings impact generated by these users was $1.33 million. Indirect economic impact reflects the effect on other companies and suppliers whose industries are stimulated by the direct spending.

Other revenue-generating programs at APAFR, including cattle grazing and timber sales, have direct and indirect economic impacts to the region, but are less sizeable than recreational expenditures.

Population

Between 1990 and 2000, the population of Polk County increased by just over 78,500 persons (by 19 percent or at an average annual rate of 1.8 percent), while that of Highlands County increased by about 18,900 persons (by 28 percent or at an average annual rate of 2.5 percent). This change compares with 24 percent (or 2.1 percent annually, on average) for the state of Florida. The populations of both Polk and Highlands Counties as well as the state of Florida increased at a substantially more rapid rate during the 1980s than in the 1990s (Table 4-30). Highlands County has a larger proportion (about 33 percent) of senior citizens (persons 65 years and over) compared to the state of Florida (about 17 percent) and Polk County (about 18 percent) (U.S. Bureau of the Census, 2000).

Table 4-30. Population and Population Change, 1980–2000

	Population (Number)			Average Annual Percent Change	
	1980	**1990**	**2000**	**1980-1990**	**1990-2000**
Polk County	321,652	405,382	483,924	2.3%	1.8%
Highlands County	47,526	68,432	87,366	3.7%	2.5%
State of Florida	9,746,961	12,938,071	15,982,378	2.9%	2.1%

Source: U.S. Census Bureau, 2000

Municipalities within Highlands County that are near APAFR include Avon Park and Sebring. Avon Park is the closest city to the APAFR and had 8,542 residents as reported in the 2000 Census. The population had increased slightly to 8,596 by 2003 as reported by the Florida Department of Revenue. Sebring, the county seat, had a resident population in 2000 of 9,667 that increased to 9,853 by 2003. There are a number of communities north of APAFR in Polk County. They include the municipalities of Frostproof (with a population of 2,982 in 2003), Hillcrest Heights (with a population of 264 in 2003), and Lake Wales (with a population of 11,626 in 2003).

4.10 ENVIRONMENTAL JUSTICE

This section addresses minority and low-income populations that have the potential to be affected by the project.

4.10.1 Definition of the Resource

Environmental Justice refers to the evaluation of the potential for disproportionate impacts on minority and low-income populations from a proposed federal action, in accordance with requirements of Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*. Accompanying Executive Order 12898 was a Presidential Transmittal Memorandum that referenced existing federal statutes and regulations, including the National Environmental Policy Act (NEPA), to be used in conjunction with the Executive Order. The Council on Environmental Quality (CEQ) issued *Environmental Justice Guidance Under NEPA* in December 1997. Air Force implementation of the Executive Order, contained in *The Interim Guide for Environmental Justice Analysis with the Environmental Impact Analysis Process*, dated November 1997 (U.S. Air Force, 1997b), was also used as guidance on this project.

The federal government maintains a government-to-government relationship with many Native American tribes. Therefore, in cases where Native American populations may be affected by a proposed federal action, tribes may also be addressed separately in an environmental justice analysis.

Minority populations include all persons identified by the Census of Population and Housing to be of Hispanic or Latino origin, regardless of race, and all persons not of Hispanic or Latino origin other than White (non-Hispanic persons who are Black or African American, American Indian, and Alaska Native, Asian, Native Hawaiian and Other Pacific Islander, another race, or of two or more races).

For the purposes of this analysis, low-income populations are defined as persons living below the poverty level ($16,895 for a family of four with two children in 1999, adjusted based on household size and number of children), as reported by the Census (U.S. Bureau of the Census, 2000). The Bureau of the Census uses a set of income thresholds that vary by family size and composition to detect who is considered low-income. The percentage of low-income persons is calculated as the percentage of all persons for whom the Bureau of the Census determines poverty status, which is generally a slightly lower number than the total population since it excludes institutionalized persons, persons in military group quarters and in college dormitories, and unrelated individuals under 15 years old.

In 1997, EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks (Protection of Children),* was issued to identify and address issues that affect the protection of children. Demographic data specific to the distribution of population by age are presented.

The ROI for collection of baseline data comprises Polk County and Highlands County, Florida.

4.10.2 Existing Conditions

For the purposes of this project, baseline data is presented for Polk County and Highlands County, Florida. The inclusion of these two counties was based on the potential for these areas (specifically, off-base areas adjacent to the main base) to be exposed to noise levels above recommended noise thresholds as a result of the project. Depending upon the actual results of noise modeling for the project, if high and adverse noise impacts are identified within either a more limited area or a larger area, the baseline data may be adjusted.

Minorities comprised 25.3 percent of the Polk County population in 2000 compared to 34.6 percent in the state of Florida. Black or African American persons comprised 13.5 percent of the Polk County population, compared to 14.6 percent in the state. American Indian and Alaska Native persons comprised 0.4 percent compared to 0.3 percent statewide and Asian persons 0.9 percent compared to 1.7 percent statewide. Persons reporting some other race represented 3.8 percent of the Polk County population, and persons reporting two or more races totaled 1.7 percent. Persons of Hispanic or Latino origin, who can be of any race, comprised 9.5 percent of the total population of Polk County, compared to 16.8 percent statewide. With regard to low-income populations, the percentage of persons below poverty in Polk County was 12.9 percent, compared to 12.5 percent statewide. Children under age 18 comprise 24.4 percent of the total population.

Minorities comprised 23.5 percent of the Highlands County population in 2000 compared to 34.6 percent in the state of Florida. Black or African American persons comprised 9.1 percent of the Highlands County population, compared to 14.6 percent in the state. American Indian and Alaska Native persons comprised 0.3 percent compared to 0.3 percent statewide, and Asian persons 1.0 percent compared to 1.7 percent statewide. Persons reporting some other race comprised 0.1 percent of the Highlands County population, and persons reporting two or more races 0.9 percent. Persons of Hispanic or Latino origin, who can be of any race, comprised 12.1 percent of the total population of Highlands County, compared to 16.8 percent statewide. With regard to low-income populations, the percentage of persons below poverty in Highlands County was 15.2 percent, compared to 12.5 percent statewide. Children under age 18 comprise 19.2 percent of the total population.

5. ENVIRONMENTAL CONSEQUENCES

5.1 NOISE

Noise, often defined as unwanted sound, is one of the most common environmental issues associated with human activities, especially around areas supporting military training. Concerns regarding noise relate to certain potential impacts such as hearing loss, non-auditory health effects, annoyance, speech interference, sleep interference, and effects on domestic animals, wildlife, structures, terrain, and historic and archaeological sites.

Noise associated with aircraft flight, ordnance delivery, and operational ground-based activities, such as ground maneuver and live fire exercises associated with the Alternatives, are considered and compared with current conditions to assess impacts. Data developed during this process also supports analyses in other resource areas. Noise from launching rockets has already been assessed in the Final Environmental Assessment for the Conversion of the 8-Inch Howitzer Weapon System to the Multiple Launch Rocket System in the Florida Army National Guard, 3rd Battalion, 116 Field Artillery (FLARNG, 1996, and is not addressed in this EA.

Based on numerous sociological surveys and recommendations of federal interagency councils, the most common benchmark is a Day-Night Average Sound Level of 65 dBA. This threshold is often used to determine residential land use compatibility around airports, highways, or other transportation corridors. Two other average noise levels are also useful.

- A Day-Night Average Noise Level of 55 dBA was identified by the U.S. Environmental Protection Agency (USEPA) as a level "…requisite to protect the public health and welfare with an adequate margin of safety" (USEPA, 1974). Noise may be heard, but no risk to public health or welfare is present.
- A Day-Night Average Noise Level of 75 dBA is a threshold above which effects other than annoyance may occur. It is 10 to 15 dBA below levels at which hearing damage is a known risk (OSHA, 1983). However, it is also a level above which some adverse health effects cannot be categorically discounted.

Public annoyance is the most common impact associated with exposure to elevated noise levels. When subjected to Day-Night Average Sound Levels of 65 dBA, approximately 12 percent of persons so exposed will be "highly annoyed" by the noise. At levels below 55 dBA, the percentage of annoyance is correspondingly lower (less than three percent). The percentage of people annoyed by noise never drops to zero, but at levels below 55 dBA, the noise is reduced enough to be essentially negligible (Finegold et al., 1994).

5.1.1 Preferred Alternative – Use of Any of Six Maneuver Areas

Scenarios were developed to assess potential noise associated with the use of the proposed maneuver areas by a Firing Battery. Since maneuver areas are geographically distinct and are of relatively large size, it was assumed that there would be little potential for significant cumulative noise occurring between maneuver areas. The assessment validated this assumption.

There are six MAs proposed for MLRS training use. They range in size from Delta, the smallest at 133 acres, to Willingham, the largest at approximately 670 acres. Primary sources of noise in the MAs during these training activities would be tracked- and wheeled-vehicle traffic and movement. The assessment considered estimated noise resulting from 27 vehicles (as well as 12 ammunition trailers) operating throughout the maneuver area. The vehicles included nine tracked, 14 heavy-wheeled, and four high mobility multipurpose wheeled vehicles (HMMWVs). The overall size of the MA affects how noise sources are distributed spatially in the area. Larger or smaller concentrations of noise sources affect noise levels emanating off the site. Therefore, to determine a range of potential noise impacts, the assessment considered the largest and smallest areas. Noise resulting from the use of other MAs would be between the two.

The first step in the analysis was estimating vehicle usage and calculating the total expected acoustic energy that would be generated within a single maneuver area. These data also provided information on an individual vehicle's relative contribution to the total amount of acoustic energy generated on the maneuver area. Next, individual equipment was spatially distributed throughout the maneuver area. Maneuver elements would not be expected to repetitively follow any specifically defined routes in the area. Therefore, it was assumed that overall movement through the area would be relatively uniformly distributed through the area over time, with slightly reduced activity close to the extreme borders of the area. This approach is similar to that used in Air Force aircraft noise models, which has been validated through extensive studies of aircraft maneuvering in large elements of airspace (Lucas and Calamia, 1996). This distribution yielded a vehicle-weighted contribution to total maneuver area acoustic energy at different points throughout the maneuver area. With this spatial distribution, a mean and standard deviation was calculated for the distribution along an axis running through the maneuver area.

These data were then used to normally distribute the total site energy throughout the maneuver area. Finally, the normally distributed energy from multiple source points throughout the maneuver area was aggregated at a range of points at varying distances from the maneuver area border. This aggregation allowed a determination at those points of the total acoustic energy that would emanate outside the maneuver area.

Calculations based on this conservative scenario provided equivalent noise levels (average acoustic energy) over an eight-hour period ($L_{eq(8)}$), which was then normalized to a full day $L_{eq(24)}$. Since little or no activity would be expected to occur at night, this would be equivalent to Day-Night Average Noise Levels (L_{dn}). It was assumed that the launchers moved 10 hours during a 24-hour-training period and that the other vehicles moved approximately 12 hours during the 24-hour-training period. The 8-hour and 24-hour equivalent noise levels emanating outside the maneuver area are shown in Tables 5-1 and 5-2. These levels occur on the day the exercise is conducted and do not indicate annual averages. This scenario is conservative because it considers only spherical spreading of sound (reduction with distance) and does not take into account noise reduction related to groundcover, refraction of the earth's surface, terrain, or atmospheric absorption. Due to the conservative nature of the scenario, actual levels resulting outside the maneuver area would be expected to be lower. As shown, except in very close proximity to the area boundary of the maneuver area (100 feet/30.5 meters), noise resulting from maneuver area activities is well below Noise Zone II (65 to 75 L_{dn}) or III (>75 L_{dn}) threshold levels.

Table 5-1. Largest Maneuver Area Noise (Willingham)

Distance from MA Edge (In Feet/Meters)	8 Hour Equivalent Noise Level (In dBA)	24-Hour Equivalent Noise Level (In dBA)
100/30.5	66.3	61.5
1,000/305	59.6	54.9
2,000/610	56.9	52.2
3,000/915	55.0	50.2
4,000/1,220	53.5	48.7
5,000/1,525	52.2	47.4

Table 5-2. Smallest Maneuver Area Noise (Delta)

Distance from MA Edge (in Feet/Meters)	8 Hour Equivalent Noise Level (In dBA)	24-Hour Equivalent Noise Level (In dBA)
100/30.5	73.0	68.3
1,000/305	63.7	58.9
2,000/610	59.9	55.2
3,000/915	57.4	52.6
4,000/1,220	55.5	50.7
5,000/1,525	53.9	49.2

Two MAs, Ramsey (509 acres) and Big Plantation (534 acres) abut the APAFR boundary. These two areas were also assessed to determine if their use would result in excessive noise exposure off the range. The results of this assessment are shown in Tables 5-3 and 5-4. As shown, for a 24-hour period when exercises are conducted, all areas off the installation remain in Noise Zone I.

Table 5-3. Noise Associated With Use of Ramsey

Distance from MA Edge (In Feet/Meters)	8 Hour Equivalent Noise Level (In dBA)	24-Hour Equivalent Noise Level (In dBA)
100/30.5	67.8	63.1
1,000/305	60.6	55.8
2,000/610	57.7	52.9
3,000/915	55.6	50.8
4,000/1,220	54.0	49.2
5,000/1,525	52.6	47.8

Table 5-4. Noise Associated With Use Of Big Plantation

Distance from MA Edge (in Feet/Meters)	8 Hour Equivalent Noise Level (In dBA)	24-Hour Equivalent Noise Level (In dBA)
100/30.5	67.8	63.0
1,000/305	60.4	55.7
2,000/610	57.5	52.8
3,000/915	55.5	50.7
4,000/1,220	53.9	49.1
5,000/1,525	52.5	47.8

As previously noted in Section 4.1, APAFR is an air-to-ground gunnery range. Elevated noise levels are fully compatible with this land use. Furthermore, noise created by the Army's use of the maneuver areas would only be present during six weekends per year and approximately 10 days during the 15-day annual training period. During the remainder of the year, noise from aircraft use of the range would dominate the acoustic environment of APAFR.

Overall, when the existing acoustic environment is considered, noise impacts associated with this Alternative are expected to be minimal because of the short duration and the relatively low levels remaining within the APAFR boundaries.

5.1.2 No Action Alternative

Under this Alternative, the FLARNG would continue to train on APAFR with no change from current conditions. Noise associated with this Alternative would remain as described in Chapter 4, Section 4.1.

5.2 AIR QUALITY

This section discusses the potential impacts to air quality as a result of the stated alternatives. For the analysis of the Proposed Action and alternatives, a threshold was established on an individual pollutant-by-pollutant basis (Chapter 4, Section 4.2). The individual pollutant emissions from the project will not exceed 10 percent of the total emissions for Highlands and Polk Counties combined for each corresponding pollutant as represented in the United States Environmental Protection Agency (USEPA) 1999 NEI (National Emissions Inventory) (USEPA NEI, 1999). Combustive emissions and fugitive dust as a result of vehicular activities associated with the FLARNG MLRS training are the main issues generated by the Proposed Action and alternative and will be the focus of the air analysis.

Based on evaluation using USEPA's compilation of pollutant emission factors and calculation methodology (USEPA, 1991 and 2003), the increase in emissions would not exceed the established 10 percent emissions criterion for Highlands and Polk Counties on an individual pollutant basis. Specific details regarding the assumptions and calculations associated with the emissions estimates are located in the Appendix D.

5.2.1 Fugitive Dust Emissions

Traffic on unpaved roads creates dust as a result of pulverizing surface material induced by the wheel force of the vehicle. Particles are lifted and dropped from the rolling wheels or tracks and the road surface is exposed to strong air currents in turbulent shear with the surface. The turbulent wake behind the vehicle continues to act on the road surface even after the vehicle has passed. The quantity of dust emissions from a given segment of unpaved road varies linearly with the volume of traffic (USEPA 2003). Specific details regarding the assumptions and calculations associated with the emissions estimates are located in Appendix D.

Preferred Alternative – Use of Any of Six Maneuver Areas

The individual calculations for the fugitive dust associated with the Preferred Alternative is based on the weight of the fleet of vehicles used as well as the amount of time the vehicles are in operation. Based on the battalion vehicle inventory, the fugitive dust emissions generated are approximately 13 percent of the total emissions portfolio for the proposed project. Table 5-5 provides a detailed listing of the emission by vehicle. The total annual hours are based on a conservative approach that during training activities the vehicular traffic would be occurring for 12 hours per day. Specifics regarding emissions factor and calculation development are located in Appendix D.

Table 5-5. Annual Fugitive Dust Emissions Estimate for a Battalion in Tons

Vehicle Type	Number of Vehicles	Weight (tons)	Total Annual Hours	lbs/VMT	PM Emissions (tons/yr)
M270	18	27.5	396	2.92	14.45
M577	12	15.9	396	2.28	11.30
M88	4	56	396	4.02	19.91
HEMTT	46	19.4	396	2.50	12.36
HMMWV	43	3.85	396	1.21	5.97
2.5 Ton Cargo Truck	18	8.8	396	1.75	8.66
5 Ton Cargo Truck	3	9.8	396	1.84	9.09
				Total Emissions	**81.73**

VMT – Vehicle Mile Traveled; HEMTT = Heavy Expanded-Mobility Tactical Truck

No Action Alternative

Under the No Action Alternative, annual emissions rates at APAFR would not increase. However, in order to meet the requirements of the mission, emissions would increase to meet the training levels necessary for the Florida Army National Guard to meet the Army doctrinal requirements for combat readiness. These activities would continue at Fort Stewart, Georgia.

5.2.2 Combustive Emissions

Carbon monoxide (CO) and nitrogen oxide (NO_x) emissions constitute the majority (85 percent) of combustive emissions from the overall exercise activities (Table 5-6). These emissions are generated as a result of vehicular exhaust and would occur in the alternative activity. Since the majority of vehicles used by the battalion would not be considered highway vehicles, emissions estimates were based on non-road vehicle emissions factors. Specifically, emissions factors

(USEPA, 1991) for heavy equipment were used as the basis for calculations. Detailed information regarding emissions factor and calculation development can be found in Appendix D.

Table 5-6. Annual Combustive Emissions Estimate in Tons

Vehicle Type	Number of Vehicles	Average HP	Total Annual Hours	NO_x	CO	VOC	SO_2	PM_{10}
M270	18	500	396	36.15	55.05	6.29	3.65	6.29
M577	12	275	396	13.25	20.18	2.31	1.34	2.31
M88	4	750	396	12.05	18.35	2.10	1.22	2.10
HEMTT	46	450	396	83.14	126.61	14.46	8.40	14.46
HMMWV	43	150	396	25.91	39.45	4.51	2.62	4.51
2.5 Ton Cargo Truck	18	225	396	16.27	24.77	2.83	1.64	2.83
5 Ton Cargo Truck	3	290	396	3.49	5.32	0.61	0.35	0.61
			Total	**190.27**	**289.74**	**33.09**	**19.23**	**33.09**

* Annual pollutant emissions estimates are provided in tons.

As indicated in Table 5-7, the individual pollutant emissions from the project would not exceed 10 percent of the total Highlands and Polk Counties emissions for each corresponding pollutant. The highest pollutant percentage is NO_x, which is approximately 0.57 percent of Highlands and Polk Counties total NO_x emissions based on the United States Environmental Protection Agency 1999 National Emissions Inventory. Certain conservative assumptions were made regarding the vehicle miles traveled during the exercises and those assumptions are detailed in Appendix D under the Combustive Emissions section.

Table 5-7. Comparison of FLARNG MLRS Exercise Activities to County-wide Annual Emissions in Tons*

	NO_x	CO	PM_{10}	VOC	SO_2
Total MLRS Exercise Emissions	190	290	115	33	19
Highlands County Emissions	3,605	33,629	9,972	5,107	581
Polk County Emissions	29,888	188,721	33,044	32,368	35,589
Total County Emissions	33,493	222,350	43,015	37,474	36,169
Percentage of Total County Emissions	0.57%	0.13%	0.27%	0.09%	0.05%

* Annual pollutant emissions estimates are provided in tons.

No Action Alternative

Under the No Action Alternative, annual emissions rates at APAFR would not increase. However, in order to meet the requirements of the mission, emissions would increase to meet the training levels necessary for the Florida Army National Guard to meet the Army doctrinal requirements for combat readiness. These activities would continue at Fort Stewart, Georgia.

5.3 LAND USE

Land use focuses on general land use patterns and land management plans and practices that were based on APAFR-specific planning documents. Impacts on land use were considered based on the degree to which individual land uses would be affected and whether these uses are

consistent with APAFR plans. Regional land uses outside APAFR were identified and evaluated to determine the degree to which these uses could be affected by noise.

The Proposed Action would not change aircraft operations, overflights, or use of associated airspace.

5.3.1 Preferred Alternative – Use of Any of Six Maneuver Areas

This Alternative would expand the use of APAFR for military training, using about 2.5 percent of the range area if all six MAs were used simultaneously. This Alternative would afford the most flexibility to the FLARNG in providing realistic training. The entire battalion could train together in a manner described by the Army training doctrine. On different weekends, the FLARNG may use different maneuver areas that would add diversity to the training regime.

High levels of noise are compatible with the current land use as a bombing range. The nearest noise sensitive area is the cantonment area, where personnel offices exist. There would be negligible impacts on regional land use from the noise associated with maneuver training in MAs 1 and 6, which are on the APAFR boundary.

Based on the noise analysis in Section 5.1, noise levels within 100 feet of the MA boundary would be less than 65 dBA, which is Noise Zone I (see Table 4-1). In general, within Noise Zone I, where very few people (less than 15 percent) will be bothered by noise levels, unrestricted land use is indicated. The current land use outside the boundaries of MAs 1 and 6 is agricultural, which is compatible with these noise levels.

APAFR has not, nor in the foreseeable future, reached its maximum use capacity, therefore range scheduling can easily de-conflict incompatible mission requirements. For example: MLRS training would not be scheduled at the same time as aircrews laser guided bomb training because of the lasing operations and large safety footprint. Most other aircraft training munitions footprints (such as BDU, Mk series bombs) would not affect MLRS training, so most likely no restrictions would be required (Walden, 2004).

The range would be closed to other ground training only if it would potentially affect the MLRS training. This would be handled through advanced scheduling. APAFR would be able to schedule other ground training if it were deconflicted and coordinated with the MLRS maneuvering training (Walden, 2004). Because the FLARNG schedules several months in advance of their requirement, there should be no impact to other missions.

Some portions or all of the range may be closed to the public and support programs, depending on how many maneuvering areas are being used and what type of training (section, platoon, annual, and so forth) is occurring. APAFR would work to safely deconflict public activities with the FLARNG mission, which may then allow some restricted access (Walden, 2004).

Table 5-8 shows the numbers of acres within the recreation management units that would be closed to the public during the MLRS maneuver training.

Table 5-8. Acres of Restricted Access During Maneuver Training

MANEUVER AREAS							
Management Unit	**1**	**2**	**3**	**4**	**5**	**6**	**Total**
1	534	<1					534
2		642					642
3			1				1
3A			57				57
4			75				75
8				104			104
10				324			324
12					324	473	797
Total	**534**	**642**	**133**	**428**	**324**	**473**	**2,533**

There are no hiking trails, campgrounds, boat ramps, or fishing locations located in any of the proposed MAs. Hunting would be restricted during MLRS training in the MAs. If all six MAs were being used simultaneously, then this would reduce the available acreage by about 3 percent.

APAFR may close the entire management unit to outdoor recreation during the MLRS training, depending on the type of training being conducted. This would result in closure of one to eight management units during a maximum of eight weekends per year. Closure of management units 1 and 2 would result in closure of two campgrounds and hiking trails in the northwestern corner of the range (Figure 4-6 in Chapter 4).

As there are a number of parks nearby, including Lake Kissimmee State Park that consists of 5,000 acres that are available for hiking, picnicking, boating, fishing, camping, and nature study, the impacts to non-hunting outdoor recreation would be minimal.

The hunting season lasts approximately five months, from November to March, and consists of about 20 weekends. If the FLARNG trained at APAFR one weekend per month during those months, and APAFR closed the entire management unit containing the MA to hunters, then hunting in the closed management units would be reduced by about 25 percent. However, there are a total of 19 available management units (Figure 4-6) leaving from 11 to 18 available to hunters. In addition, there are 10 other wildlife management areas in Polk and Highlands Counties where hunting is allowed (Fish and Wildlife Conservation Commission, 2004).

There are approximately 1,280 acres of intensively managed timberland in the six MAs, which is about 9 percent of intensively managed pine plantations (Table 4-5 in Chapter 4). According to the APAFR Forestry Program Manager, Mr. Kurt Olsen, he expects to be able to continue to manage these areas for timber (Olsen, 2004). Each of the MAs would have to be evaluated on a case-by-case basis that factors in the tree crop rotation schedule, the actual use by the MLRS unit of the area, and the age of the trees. It is likely that the forestry management practices in the proposed MAs would change to accommodate the FLARNG mission. Rather than clear cutting, trees would be selectively thinned to provide areas for hiding. Areas that had been recently clear cut, such as MA 1 and MA 6 would be replanted in such a way to support MLRS training. In these MAs, the APAFR forestry program may replant only portions of the area that would not interfere with the MLRS training. If it would not be possible to replant MAs 1 and 6 at all, then the forestry

management program would lose approximately 4 percent of its intensively managed pine plantation.

No cattle fences would need to be removed from the MAs, as there are none that interfere with the FLARNG's use of the areas. During the field exercises, cattle would remain in the MAs. Historically, the cattle leasees would be allowed into the MAs during field maneuvering exercises, and it is expected that this practice would continue. As the cattle grazing program has not interfered with the MLRS in the past, it is not expected that it would interfere with use of any of the six proposed MAs. Because the FLARNG would schedule the MAs for use during AT well in advance, APAFR would coordinate with each leasee on the use of that portion of their lease during AT. If the leasee chose to move his cattle during the AT period, it would be their choice, but not required by APAFR or the FLARNG.

5.3.2 No Action Alternative

There would be no changes in the current land use at APAFR. The FLARNG would not have sufficient maneuver areas to train the battalion according to Army doctrine. The current maneuver and firing points do not meet the MLRS training requirements. There would be no change to military use, commercial use (grazing and timber harvesting), or to outdoor recreation.

5.4 EARTH RESOURCES

This section evaluates the susceptibility of APAFR maneuver area soil resources to the effects of tracked vehicles.

5.4.1 Soil Trafficking

Soil trafficking is the exertion of pressure on the soil surface through the tracks and/or wheels of land vehicles. The ability of a soil to carry a certain load depends on a number of characteristics of the soil and the soil water content. Generally, under dry conditions, sandy soils have lower trafficability than clayey soils. All soils become less trafficable as soil moisture content increases (Arnup, 1998).

Heavy equipment, vehicles, and even foot traffic can leave a long-lasting legacy of compacted soils and ruts that can have dramatic impacts on the environment. The risk of soil compaction from trafficking depends on the intensity of traffic (number of passes), weight of the vehicle, tire pressure, soil type, ground cover, and soil properties, particularly soil moisture content and texture. Soil rutting primarily occurs as a result of the operation of heavy vehicles on wet soils.

The weight of the vehicle or equipment generally determines the degree of subsoil compaction. Heavier vehicles tend to cause deeper, longer lasting compaction. Most compaction occurs during the first few passes with subsequent trips having limited impact. Generally, compaction is greatest at points with the most passes (King and Haines, 1979). Compaction is most critical on clay and loamy soils that have been disturbed when wet, but compaction can also adversely impact the soil structure of sandy soils. General trends from a few relevant studies are found in Appendix F, Earth Resources.

5.4.2 Soil Disturbance

Soil disturbance may be categorized as displacement, exposure of mineral soil, compaction, rutting, erosion, mass wasting, nutrient depletion, microclimate changes, and hydrologic changes. Soils are most susceptible and least resistant to the effects of soil disturbance under wet conditions (Scheerer et al., 1994). Soil trafficking under wet conditions can result in considerable soil compaction and alter subsurface hydrology by increasing seasonally high water table levels (Sun et al., 2001). The types of soil disturbance evaluated in this analysis, including soil compaction and soil rutting, are defined and described below.

Soil Compaction

Soil compaction is the increase in soil bulk density that results from the rearrangement of soil particles in response to applied force. A limited amount of compaction of disturbed soils may be beneficial, but excessive compaction is detrimental to soil structure. Limited access to water and nutrients, restricted root development, reduced water infiltration and percolation, and reduced aeration are major constraints to plant growth associated with compact soil layers. Compaction of natural soils can significantly decrease plant production (Busscher et al., 1995; Unger and Kaspar, 1994; Brown et al., 1992; Logsdon et al., 1992; Douglas et al., 1992).

Sandy soils have proportionally high bulk densities (1.2 to 1.8 g/cm^3 or 75 to 110 lbs/ft^3) while silts and clays normally range from 1.0 to 1.6 g/cm^3 or 65 to 100 lbs/ft^3 (Unger and Kaspar, 1994). Under comparable conditions, silt and clay soils generally compact more severely than sandy soils. Soils with low levels of organic matter are generally more susceptible to soil compaction, whereas soils with higher levels of organic matter are more difficult to compact.

Soil Rutting

Depending on their pattern and orientation, ruts can alter surface drainage, particularly sheet flows, and may also increase soil erosion potentials. Under wet soil conditions, silts and clays are more prone to rutting than sandy soils. Organic soils are highly susceptible to rutting (Arnup, 1998). As soils become saturated compaction potentials generally decrease and rutting potentials increase (Coder, 2000; Arnup, 1998). Rutting is also influenced by slope, vegetation type, and ground cover.

Natural recovery of soils to pre-compaction and pre-rutting conditions is extremely slow, if it occurs at all. Recovery of sandy soils is very slow and compacted subsurface layers take much longer to recover. Based on trafficking studies from the timber harvest industry, soil recovery following timber harvest operations generally takes many years.

5.4.3 Analysis Methodology

For the analysis, MLRS mission activity impact scenarios were developed that would conservatively estimate the amount of proposed maneuver area (MA) that would be impacted by vehicle trafficking. Based on the scenarios, a trafficability screening index was developed to evaluate potential soil disturbance.

The Synoptic Method (USEPA, 1992) approach was selected as the template for developing a trafficability screening index. The Synoptic Method (SM) is a rapid, inexpensive, systematic process developed by the U.S. Environmental Protection Agency to evaluate the effects of resource loss and/or restoration on landscape function. The SM provides a broad overview of the environment and is intended to assist in developing a *relative rating* of potential impacts between analysis areas. It is not intended to provide a precise, quantitative assessment of impacts within an area or assess effects of specific impacts.

The four steps utilized in the process include: (1) identify appropriate indices, (2) select indicators for each index, (3) define rules of combination, (4) conduct the analysis, and (5) produce documentation and Geographic Information System (GIS) maps. The method primarily relies on the use of GIS maps to convey findings and interpretative data. Field validated data are not required for this level of analysis.

The indicators of the indices were selected based on the results of analysis of potential impacts of timber harvesting on soil and water resources. This reasoning is twofold. First, there is an extensive body of scientific research regarding the impacts of silvicultural trafficking disturbances on natural resources. Although the levels of trafficking intensity associated with timber harvesting are not anticipated to directly correspond to the proposed levels of MLRS trafficking on the terrain of the APAFR, there are relevant similarities in vehicle-soil interaction processes that provide valuable correlations for analyzing potential impacts to APAFR soil and water resources. Since the APAFR is generally dominated by wet, relatively flat terrain, emphasis is placed on relating to silviculture impacts in wet flats and flatwoods environments as possible.

Secondly, there are strong similarities in the types and configurations of timber harvesting and proposed MLRS military vehicles. In each case, wheeled and tracked vehicles are employed and the track/tire widths and vehicle weights can be substantial. Although their purpose and use may be different, the potential mechanical impacts on soil and water resources can be quite similar.

An index is an assessment variable used to develop theoretical models for extrapolating measurements of environmental impact. Indices identify critical features of the existing environment and processes that may impact APAFR soil and water resources. The indicator of an index is the actual data or metric that is used individually or in combination to estimate an index. Indicators are limited to parameters for which data are existing, accessible, and uniformly available for the entire analysis unit area. The screening indices and indictors for this analysis are presented in Table 5-9. Each step in the process is briefly described in the following discussion.

Table 5-9. Screening Indices and Indicators

Indices	Index Indicator
Mission Trafficking Index	Vehicle Footprint
	Vehicle Trafficking
Soil Compaction Index	Soil Texture
	Soil Moisture
	Restrictive Soil Layers
	Seasonal High Water Table
Soil Rutting Index	Soil Texture
	Soil Moisture
	Seasonal High Water Table

Mission Trafficking Index

The proposed mission trafficking index is based on an estimate of the footprints of wheeled and tracked vehicles/equipment that would be used during proposed MLRS off-road training activities. Proposed MLRS military vehicles and mobile equipment considered in this analysis includes the M270 launcher, M985 ammunition truck, M989 ammunition trailer, M577 command post carrier, M978 fuel tanker, M97 wrecker, M88 recovery vehicle, 2.5 ton truck, 5 ton truck, and HMMWV light vehicle.

To maximize combat realism, MLRS training stresses the use of existing roads and trails during maneuvers to minimize vehicle track signatures that could be detected by enemy aircraft. Typically, MLRS training maneuvers are conducted on existing roads and trails 75 to 90 percent of the time and 10 to 25 percent in the unrestricted maneuvering areas during "hide," "load," and "fire" exercises (Army National Guard, 2000).

Mission trafficking indicator rules of combination are based on the following assumptions.

- All MLRS military vehicles and mobile equipment under consideration in this analysis would be used on all proposed MAs during the proposed MLRS mission training cycles.
- Vehicles will use different paths for entering and exiting an MA.
- During mission operations, each vehicle will travel approximately 1.5 miles within the proposed MAs. Approximately 80 percent (1.2 miles) of maneuver traffic will occur on existing system and non-system roads (roads that are not identified as active components of the transportation network), such as logging roads, and tank trails, and 20 percent (0.3 miles) of maneuver traffic will occur off-road. Proposed MA perimeter roads are included as potential MLRS training impact areas.
- Firebreaks will be used during MLRS maneuver training. Firebreaks are constructed using tillage tools or specially designed plowing implements to remove combustible materials and create relatively bare areas that prevent the movement of ground fires. The soil conditions of these fire management features are not designed to accommodate vehicular travel; the corridor is generally defined by the width of the implement and no

load supporting subgrade, base coarse, or surface coarse features are constructed. To support traffic requirements, firebreaks designated for use during MLRS training will be upgraded to trafficking standards as defined by the RTLA component of the ITAM program management actions in Section 3.3.1.

- At least one MLRS training cycle would occur during periods of seasonal high water tables.
- Annual training cycles would be conducted at different locations from the previous year.
- Soil-vehicle ground pressure (Kpa) evaluation was not conducted as a part of this analysis.
- Estimates of free maneuver areas trafficking entry points and routes to be utilized during training events were not available.

Mission trafficking indicators, coefficients, rules of combination, and analysis products are presented in Table 5-10.

Table 5-10. Mission Trafficking Index Screening Process

Indicators		
Coefficient	**Description**	
Vehicle Footprints	The vehicle (motorized and non-motorized) footprint is relative to the configuration (single or dual wheels) and width of the contact tire/track ground feature.	
Vehicle Trafficking	Vehicle trafficking is the estimated square feet of soil surface contact that is likely to occur for a specified distance of travel.	
Rules of Combination		
Coefficient	**Criteria**	**Metric**
Vehicle Footprint	Track/wheel width for all vehicles potentially used during training	Feet
Vehicle Trafficking	Vehicle footprints created during mission performance	Acres
Synoptic Analysis Products		
1. Mission Trafficking Index Table Matrix		Acres
2. Trafficking Disturbance Potentials = Acres potentially impacted by vehicle trafficking		Acres

Soil Disturbance Screening Indices

In the absence of designated MA travel routes used during training, it is the purpose of this index is to identify, screen, and map MA susceptibility to MLRS trafficking-induced soil compaction and soil rutting. Sites susceptible to soil disturbance are defined as natural terrain locations within the proposed MAs characterized by soil structure and soil water conditions that tend to promote soil damage during trafficking.

Soil texture, soil moisture, and seasonal high water table are identified as the principal variables for conducting GIS level screening analysis. The selection of index indicators and coefficients is based on evaluation of soil and water resource data presented in Chapter 3, Section 3.6 and issues identified by the timber industry.

Soil Compaction Index

Soil compaction indicators, indicator coefficients, rules of combination, and analysis products are presented in Table 5-11. Soil compaction indicator coefficient rules of combination are based on the following assumptions.

- Soil texture, restrictive soil layers, soil moisture, and seasonal high water table are identified as the principal variables for conducting GIS level screening analysis.
- Soil moisture and water tables are highly variable and may exhibit significant localized fluctuations.
- Surface and subsurface hydrology have not been altered by constructed drainage features.
- Soil compaction susceptibility ranking variables are defined as follows.
  - *Severe* – Maximum levels of compaction are likely to occur.
  - *High* – Levels of compaction are likely to occur but at slightly reduced levels from severe because of potentials for reduced soil water content.
  - *Moderate* – Compaction is not likely to occur but may occur as a result of capillary rise within the soil profile or localized water table fluctuations.
  - *Low* – Compaction is not likely to occur.

Soil Rutting Index

Soil rutting indicators, indicator coefficients, rules of combination, and analysis products are presented in Table 5-12. Soil rutting indicator coefficient rules of combination are based on the following assumptions.

- Since rutting processes are generally limited to saturated or near-saturated soil conditions, ranking emphasis is placed on soil moisture and soil water variables.
- Soil moisture and water tables are highly variable and may exhibit significant localized fluctuations.
- At the time of trafficking, saturated surface soils will tend to rut rather than compact.
- Surface and subsurface hydrology have not been altered by constructed drainage features.
- Soil rutting susceptibility ranking variables are defined as follows.
  - Severe – Maximum levels of deep rutting soil deformation are likely to occur.
  - High – Significant levels of deep to moderately deep ruts are likely to occur; rutting potentials are slightly reduced because of potentials for reduced soil water content.
  - Moderate – Soil rutting may occur; however, rut penetration would likely be nominal.
  - Low – Soil rutting is not likely to occur.

Table 5-11. Soil Compaction Index Screening Process

Indicators			
Coefficient	**Description**		
Soil Structural Properties			
Soil Texture	Loamy and clayey soils tend to compact more readily than sandy soils. As soil organic matter levels decrease, so does a soils resistance to compaction.		
Restrictive Soil Layers	The presence of argillic and/or spodic subsurface horizons may restrict soil movement downward through the soil profile and increase soil moisture and water table levels.		
Soil Water			
Soil Moisture	Soils classified as hydric are more susceptible to compact than well-drained non-hydric soils.		
Seasonal High Water Table	The seasonal high water table (SHWT) represents an annual period when maximum water table levels are likely to occur. Soil SHWTs are highly variable and may annually fluctuate a few feet.		
Rules of Combination			
Coefficient	**Criteria**		**Analysis Metric**
Soil Structural Properties			
Soil Texture	Fine sands and loamy sands are more likely to compact than coarse sands.		Acres
Restrictive Soil Layers	Presence of restrictive subsurface argillic and/or spodic horizons; the presence of both horizons within a soil profile would likely increase potentials for restricted soil water movement compared to a soil profile with an argillic or spodic layer.		Acres
Soil Water			
Soil Moisture	Hydric soils are considered to be more susceptible to compaction than non-hydric soils.		Acres
Seasonal High Water Table	Soils with near-surface water tables are most likely to create non-saturated soil moisture regimes, which are most susceptible to soil compaction. Capillary rise can increase the extent of transition zones between soil water regimes. Duration of SHWTs generally range from six to nine months.		Acres
Analysis Products			
1. Soil Compaction Indicator Coefficient Table Matrix			Acres
2. Soil Compaction Susceptibility:			Acres
Severe	=	Soil texture is fine sand, loamy fine sand, or loamy sand AND the soil is hydric AND seasonal high water table from 0-12 inches.	Acres
High	=	Soil texture is fine sand, loamy fine sand, or loamy sand AND the soil is hydric AND seasonal high water table from 12-42 inches, OR, the soil texture is sand, the soil is hydric AND seasonal high water table from 6-12 inches AND the soil horizon is argillic and/or spodic.	Acres
Moderate	=	Soil texture is fine sand, loamy fine sand, or loamy sand or sand, AND the soil is non-hydric AND the seasonal high water table from 12-42 inches, or the soil is hydric AND the seasonal high water table from 6-12 inches AND the soil horizon is neither argillic nor spodic.	Acres
Low	=	Soil texture is fine sand, loamy fine sand, or loamy sand or sand, AND the seasonal high water table greater than 42 inches, AND the soil is non-hydric AND the soil horizon is neither argillic nor spodic, or the soil is hydric, AND the soil horizon is argillic and/or spodic.	Acres

Table 5-12. Soil Rutting Index Screening Process

Indicators			
Coefficient	**Description**		
Soil Texture	All textural classes of soils are susceptible to rutting; however, loamy and clayey soils tend to readily deform along smeared walls with sharper definition than sandy soils. All wetland soils are considered susceptible to rutting.		
Soil Water			
Soil Moisture	Hydric soils are more prone to rutting than non-hydric soils.		
Seasonal High Water Table	Soils with high water tables are most susceptible to rutting. Duration of seasonal high water tables generally range from more than six months to all year long except during very dry years.		
Rules of Combination			
Coefficient	**Criteria**		**Analysis Metric**
Soil Texture	Wetland soils including mucks, peats, loams, and sands.		Acres
Soil Water			
Soil Moisture	Hydric soils are considered susceptible to rutting, whereas non-hydric are not considered susceptible to rutting.		Acres
Seasonal High Water Table	Soils with SHWT levels above, at, or very near the surface are most likely to create saturated soil conditions most susceptible to soil rutting. Duration of SHWTs generally range from six to nine months.		Acres
Synoptic Analysis Products			
1. Soil Rutting Indicator Coefficient Table Matrix			Acres
2. Soil Rutting Susceptibility:			Acres
Severe	=	Soil texture is fine sand, loamy fine sand, or loamy sands or sand, or mucks, or peats AND the soil is hydric AND the seasonally high water table is 0 inches or above the surface or 0-6 inches below the surface.	Acres
High	=	Soil texture is fine sand, loamy fine sand, or loamy sands or sand, AND the soil is hydric AND the seasonally high water table is 6-12 inches.	Acres
Moderate	=	Soil texture is fine sand, loamy fine sand, or loamy sands or sand, AND the soil is non-hydric AND the seasonally high water table is greater than 12 inches.	Acres
Low	=	Soil texture is fine sand, loamy fine sand, or loamy sands or sand, AND the soil is non-hydric AND the seasonally high water table is greater than 24 inches.	Acres

Analysis of Impact Potentials

Soil Wetness and Climate Variables

The physical degradation of soils by mission trafficking is dependent on a number of site-specific conditions, but is typically most profound during wet periods. As presented in the previous sections, the emphasis of this data analysis is generally defined by soil properties and seasonal high water table variables that estimate periods when soils are typically most vulnerable to soil trafficking damage. However it is important to note that ***all*** soils are vulnerable to varying degrees of damage when wet.

Periods of soil wetness generally follow seasonal trends; however, the APAFR occurs in a part of Florida where heavy and prolonged rainfall events that extend wet periods beyond normal seasonal trends can be quite common. Tropical cyclone season thunderstorms between June and October and the effects of El Niño-Southern Oscillations (ENSO) can have dramatic effects on south-central Florida climate. Proposed MLRS off-road mission activities during or following rainfall associated with these climate variables could extend the duration of potential impacts and make all soils severely to highly susceptible to trafficking damage.

Frequent cyclone season convective thunderstorms may create localized soil wetness conditions susceptible to soil compaction and/or rutting damage. These thunderstorms are the product of interactions of late afternoon and early evening sea breezes and land surface diurnal heating effects. Winter precipitation increases during the ENSO El Niño phase and decreases during the La Niña phase influence the severity of the winter dry season. During El Niño years, periods of soil susceptibility to trafficking damage could be extended for longer periods and overlap into the normally dry winter season.

Existing Travel Corridors

For the proposed MLRS maneuver training, it is estimated that 80 percent of all vehicle traffic would occur within existing corridors, including paved and unpaved system roads, tank trails, firebreaks, and logging roads. Improved system roads and tank trails will be maintained to specifications that would support the proposed trafficking; however, there are potentials for unimproved roads to sustain short-term damage.

Of concern to this analysis is the potential for existing travel corridors and adjacent areas to be impacted by increases in traffic and changes in the types of vehicles used. Potential impacts include soil erosion, altered surface and subsurface hydrology, soil physical damage, and road-wetland crossing culvert (Table 4-10 in Chapter 4) damage. Typically roads are designed to support a range of vehicle types and usage. The traffic variables of proposed MLRS maneuver training could exceed surface stability tolerances of some travel corridor impact areas.

As an example, the surface and subgrade of some roads and trails could quickly deteriorate from proposed traffic levels; system road degradation would be exacerbated during wet periods. Generally, as the center crown of the road degrades, vehicle operators will begin to travel closer to the outside road edges to avoid potholes and other road deformities. Depending on the rate of road degradation, duration before road repairs, and presence of roadside obstacles such as wetlands or trees, proximity areas that were not designed to support vehicle tracking become unintended travelways. This scenario can result in increases in road width and physical damage to adjacent natural areas.

The proposed training may also include the use of unimproved system roads such as logging roads within silviculture management areas. It is anticipated that the use of these dirt roads as avenues for MLRS maneuver training could result in damage to surface and subsurface soils. In most instances, these roads are not constructed to the proper width or subgrade specifications to support the types of trafficking associated with the proposed MLRS training.

To minimize potential impacts to travel corridors, a number of management actions are included in the proposed action (see Section 3.3.1) and they are summarized here. The 3-116th will travel

to the MAs on any existing roads/trails designated by APAFR. Road selection will be based on current usage, road conditions, and suitability for tracked vehicles. The FLARNG will maintain roads and trails prepositioning shale, limestone, rock, or material suitable to APAFR near intersections. In the past, the FLARNG has hardened areas at road crossings to minimize damage. If needed, trails will be upgraded by the FLARNG to include hardened crossing. This action may require culverts and a permit for their installation.

To support increases in trafficking during MLRS training and reduce potential soil resource impacts, substandard roads will be upgraded to the maintenance standards as defined by the RTLA component of the ITAM program management actions in Section 3.3.1.

Pine Flatwoods Trafficking

As presented in Section 4.4 in Chapter 4, approximately 90 percent (2,381 acres) of the Preferred Alternative MA lands are within the NSLP flatwoods type. The pine tree cover that generally dominates the proposed MAs offers a preferred realistic setting for conducting MLRS training events. However, studies of silviculture management in the southeast United States have shown that trafficking of pine flats during wet periods can result in severe damage to soil resources.

A study by Sun et al. (2001) examined the impacts of timber management (harvest, site preparation, and drainage) on the soils and hydrology of wetland forests in the southeast United States. A review of the literature associated with timber harvests within wet pine flats in South Carolina and Florida showed that harvest trafficking under wet conditions can result in soil disturbances that degrade soil hydrologic properties such as hydraulic conductivity and available pore space and potentially increase water table levels by 2 to 5 inches. In all cases, wet weather harvests exhibited a higher degree of soil compaction impacts compared to dry weather harvests. Overall, the extent of soil compaction was greatest as soil moisture, clay content, and traffic increased.

It is estimated that MLRS flatwoods training events that may occur during wet soil conditions could alter seasonally high water table levels and result in increases in soil damage potentials for subsequent training events. Based on the type, frequency, and duration of off-road traffic, impacts could range from minor or transitory, allowing the landscape to reclaim productivity, to ecosystem altering soil damage.

Soil Damage Recovery

At APAFR when the soil is compacted, rutted, or eroded it does not readily recover to predisturbance conditions without intervention (that is implementation of actions to physically mitigate disturbed soil conditions). In the absence of intervention, soil recovery processes may take several decades. Intensive soil disturbance diminishes native plant species and encourages occupancy by non-native exotic species. Soil resource management practices as defined by the RTLA component of the ITAM program (Section 3.3.1) will be implemented by the FLARNG to prevent long-term damage and repair soils.

Estimating Proposed MLRS Soil Trafficking Impact Potentials

A logistical parameter that has direct bearing on actual trafficking soil disturbance impact potentials is the specific location of traffic footprints. This analysis is based on the potential for

undefined movements within established MA boundaries since exact travel routes to be used during MLRS training events were not available and would vary depending on the mission. Estimated MLRS vehicle and equipment footprints are presented in Table 5-13 and estimated free maneuver area vehicle trafficking for the proposed MLRS training cycles are summarized in Table 5-14.

The estimated 283 potential trafficking impact acres for the proposed MLRS yearly training is approximately 0.3 percent of the total APAFR land area (107,794 acres based on calculations from the GIS data provided by APAFR). A summary of the estimated susceptibility to soil compaction and rutting of the six proposed MLRS Preferred Alternative MAs are presented in Table 5-15.

Table 5-13. Estimated Soil Trafficking Vehicle and Equipment Impacts Associated With Proposed MLRS Preferred Alternative Maneuver Areas Training

Vehicle	Track/Tire Width (feet)[1]	Trafficking Impact Potentials (acres)[2]
M270 Launcher (T)	1.75	0.63
M577 Command Post Carrier (T)	1.75	0.63
M88 Recovery Vehicle (T)	2.33	0.84
M985 Ammunition Truck	1.17	0.43
M989 Ammunition Trailer	0.92	0.33
M978 Fuel Tanker	2.00	0.72
M97x Wrecker	2.33	0.85
2.5-Ton Truck	0.92	0.33
5-Ton Truck	1.25	0.45
M998 HMMWV Light Vehicle	1.00	0.36

[1] For wheeled vehicles, it is assumed that back wheels will follow in the same tracks as front wheels.
[2] Impact Acres = Track/Tire Width (feet) × 2 (track/tire footprints) × 7,920 feet (1.5 miles) ÷ 43,560 (square feet in one acre).
T = Tracked vehicle; other vehicles are wheeled.

Table 5-14. Summary of Proposed MLRS Preferred Alternative Yearly Training Cycle Soil Trafficking Impact Potentials

Proposed MLRS Training Cycles	Annual Frequency of Training Events	Training Event Potential Trafficking Impact Area (Acres)*			Total Yearly Training Potential Trafficking Impact Area (Acres)		
		Travel Corridors	Free Maneuver Areas	Total	Travel Corridors	Off-Road	Total
Section Certification	**2**	**2**	**1**	**3**	**4**	**1**	**5**
Platoon Certification	**2**	**65**	**16**	**81**	**130**	**32**	**162**
Annual Training	**1**	**65**	**16**	**81**	**65**	**16**	**81**
Battery Training	**2**	**14**	**4**	**18**	**28**	**7**	**35**
Total	**7**	**146**	**37**	**183**	**227**	**56**	**283**

* Estimated training event trafficking impact area based on the type and number of vehicles (Table 2.2-2) used during the training cycle; 80 percent of the total impacts occur within travel corridors, and 20 percent of total impacts occur in the free maneuvers areas.

In relation to the total acres of the APAFR lands sensitive to soil damage, the proposed MLRS maneuver areas comprise a relatively small percentage (Table 5-15). For the six MAs, 4 percent and 3 percent of the total acres of APAFR lands were ranked high for soil compaction and soil rutting respectively. Other comparative MA susceptibility ranking total values were less than

1 percent. The consequences of mission trafficking, soil compaction, and soil rutting impact potentials associated with the Preferred Alternative and No Action Alternative are discussed in the following subsections.

Table 5-15. Summary of Proposed MLRS Preferred Alternative Maneuver Areas Susceptibility to Soil Disturbance (Acres)

Susceptibility Ranking	MA-1	MA-2	MA-3	MA-4	MA-5	MA-6	Total for MAs	MA Percent of APAFR*	APAFR Range Wide Total
Soil Compaction Index									
Severe	82.98	3.70	0.77	6.56	0.19	6.64	**100.84**	**0.50**	**18,797**
High	442.29	637.81	109.11	421.07	324.28	465.75	**2,400.31**	**4.00**	**62,876**
Moderate	8.33	0.03	22.90	0.00	0.00	0.00	**31.26**	**0.30**	**11,689**
Low	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0.00**	**2,209**
(Blank)[a]	0.00	0.00	0.00	0.13	0.00	0.18	**0.31**	**0.00**	**12,223**
Total	**533.60**	**641.54**	**132.78**	**427.76**	**324.47**	**472.57**	**2,532.72**	**2.30**	**107,794[b]**
Soil Rutting Index									
Severe	0.00	0.16	0.00	0.13	0.00	0.00	**0.29**	**0.00**	**10,901**
High	525.27	641.39	109.87	427.64	324.47	472.39	**2,501.03**	**3.00**	**86,369**
Moderate	5.88	0.00	22.90	0.00	0.00	0.00	**28.78**	**0.40**	**831**
Low	2.45	0.00	0.00	0.00	0.00	0.00	**2.45**	**0.03**	**7,783**
(Blank)	0.00	0.00	0.00	0.00	0.00	0.18	**0.18**	**0.01**	**1,910**
Total	**533.60**	**641.55**	**132.77**	**427.77**	**324.47**	**472.57**	**2,532.73**	**3.44**	**107,794[1]**

MA = Proposed MLRS maneuver area
* The estimated MA percent of the total APAFR lands was derived by dividing the total acres of the six MAs for each susceptibility ranking by the comparable APAFR range wide total acres times 100.
[a] There are four blank polygons. Three of the blank polygons totaling 0.13 acres are muck soils where rutting is the primary impact, not compaction, and one of the blank polygons is water (0.18 acres).
[b]Acres are slightly higher than actual because of use of GIS data from APAFR.

Mission Trafficking

Based on the MLRS training requirements and estimates of military vehicle and equipment operation footprints, MA trafficking during training events could impact approximately 283 acres yearly (Tables 5-13 and 5-14). Platoon certification and annual training activities would each account for approximately 44 percent of the potential MA trafficking. Assuming an even distribution of yearly MLRS training activities among the six proposed MAs (46 acres per MA), the percent of MA lands potentially impacted by trafficking could range from approximately 36 percent for MA-3 (133 acres in size) to 7 percent for MA-2 (642 acres in size).

Of particular concern to this analysis is the potential for substantial increases in the frequency and duration of repetitive trafficking over the same area. Soil degradation caused by repetitive traffic could directly influence the value and realism of MLRS training events, affect other APAFR missions, and result in short-term damage to soil resources. Such conditions could diminish the capability of the proposed six MAs to sustain MLRS mission training requirements. However, long-term damage would not occur as the FLARNG will implement soil resource management practices as defined by the RTLA component of the ITAM program (Section 3.3.1) to prevent and repair soil damage.

APAFR has contract conditions that restrict excessive rutting caused by silviculture activities and contractors are not allowed to operate during wet conditions. Heavy trucks and equipment are also not allowed on roads when standing water is present. Because of MLRS training requirements and logistical needs, it is unlikely that comparable restrictions could be applied to MLRS training.

To minimize MLRS mission trafficking soil resource impact potentials, FLARNG will implement road management/maintenance practices as defined by the RTLA component of the ITAM program management actions in Section 3.3.1.

Soil Compaction

For the Preferred Alternative, approximately 95 percent (2,400 acres) of the proposed MA lands are estimated to have a *high* susceptibility to soil compaction, which was the dominant ranking for MAs 1 through 6. About 4 percent (101 acres) of the proposed MA lands have a *severe* soil compaction susceptibility ranking. Moderate susceptibility areas accounted for approximately 1 percent (31 acres) of MA lands; no MA lands were determined to have a low susceptibility to compaction (Table 5-15). Assuming an even distribution of MLRS training vehicle footprints among each of the six MAs, there is a high probability that areas estimated to be severely to highly susceptible to compaction (2,501 acres or 99 percent of total MA areas) would be impacted by MLRS training vehicle movements and sustain soil compaction damage.

Based on this analysis, it is concluded that the proposed MLRS military vehicle off-road trafficking associated with the Preferred Alternative could result in long-term soil compaction and adversely impact some soil resources within MAs 1 through 6. Intervention would be required to alleviate soil compaction damage. However, these areas occupy less than 3 percent of the total area of APAFR. Results of the soil compaction analysis are presented in Figures 5-1 through 5-3.

Intervention would entail the physical amendment of damaged soils to predisturbance conditions. Based on the depth and extent of compaction, implements such as disks, subsoilers, rippers, tillers, or hand tools may be required to restore natural soil conditions. To prevent potential damage, soil recovery operations are not allowed during wet periods. Depending on the extent of surface disturbance, planting of native grasses and forbs may also be required. Soil management recommendations are presented in Section 5.4.5.

Soil resource management practices as defined by the RTLA component of the ITAM program (Section 3.3.1) will be implemented by the FLARNG to prevent and repair soil compaction damage.

Soil Rutting

For the Preferred Alternative, approximately 99 percent (2,501 acres) of the MA lands are estimated to have a *high* susceptibility to soil rutting, which was the dominant ranking for MAs 1 through 6. Approximately 0.29 acres are estimated to have *severe* rutting susceptibility. Moderate to low rutting susceptibility accounts for about 1 percent (31 acres) of the MAs (Table 5-15). Assuming an even distribution of MLRS training vehicle footprints among each of the six MAs, there is a high probability that areas estimated to be severely to highly susceptible

to compaction (2,501 acres or 99 percent of total MA areas) would be impacted by MLRS training vehicle movements and sustain soil rutting damage.

Based on this analysis, it is concluded that the proposed MLRS military vehicle trafficking associated with the Preferred Alternative could result in short-term soil rutting and adversely impact soil resources within MAs 1 through 6. However, these areas occupy less than 4 percent of the total area of APAFR. Results of the soil rutting analysis are presented in Figures 5-4 through 5-6. Intervention would be required to alleviate soil rutting damage. As with soil compaction, intervention entails physically amending soils damaged by rutting to predisturbance conditions. The wet conditions frequently associated with rutting could limit treatment to dressing the surface with hand tools and replanting. In some cases, severely rutted areas may only be recoverable through natural attenuation. The soil resource management practices as defined by the RTLA component of the ITAM program (Section 3.3.1) will be implemented by the FLARNG to prevent and repair soil rutting damage.

5.4.4 No Action Alternative

The No Action Alternative would not result in the establishment of 3-116th MLRS Battalion training on the APAFR. The 3rd Battalion of the 16th Field Artillery Regiment, Florida Army National Guard, would continue current training using legacy monument firing points and survivability tactics training within existing 8-inch howitzer firing point areas. No impacts to soil resources are associated with this alternative since no action would be taken.

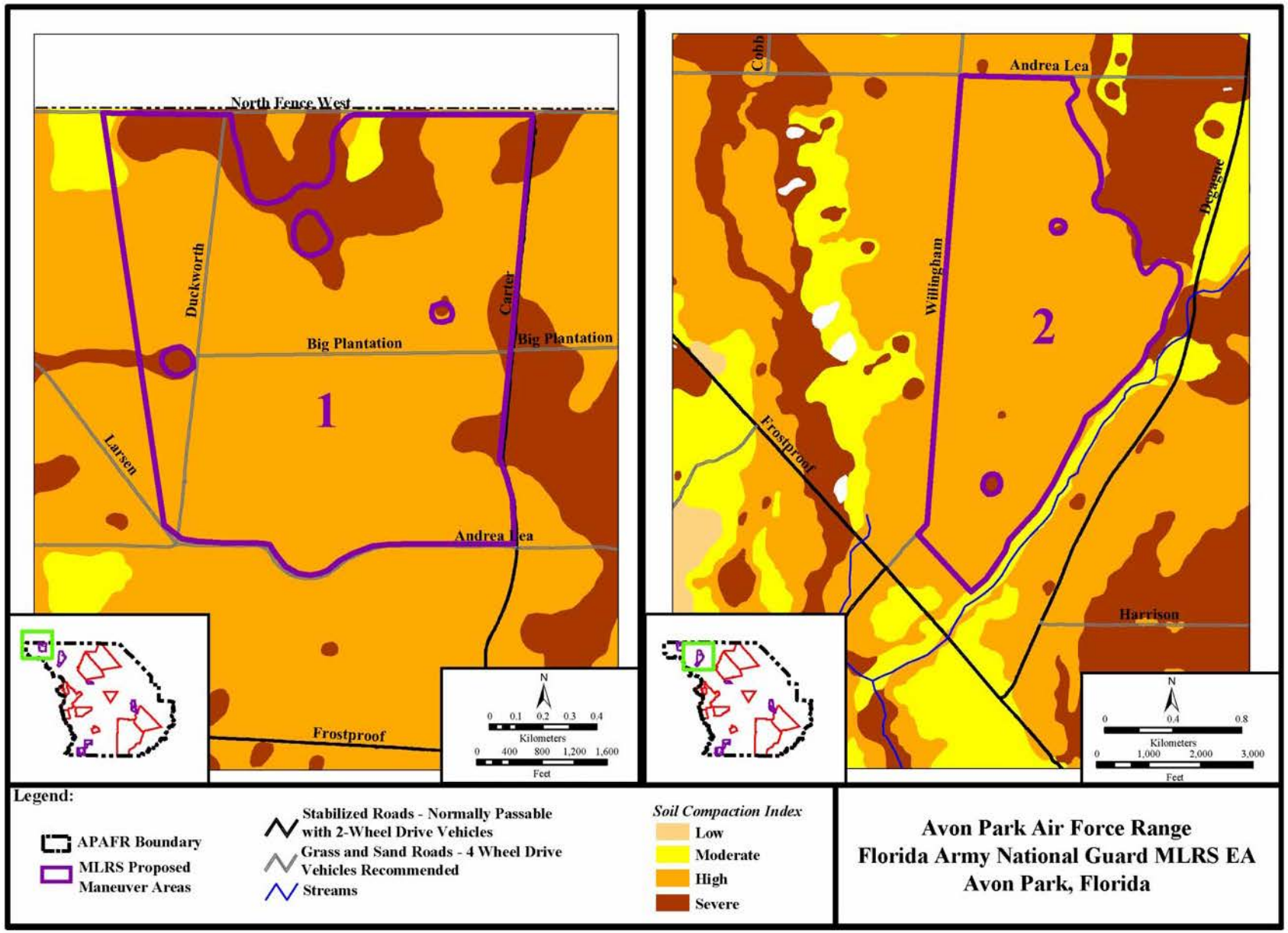

Figure 5-1. Estimated Soil Compaction Susceptibility for Proposed Maneuver Areas 1 and 2

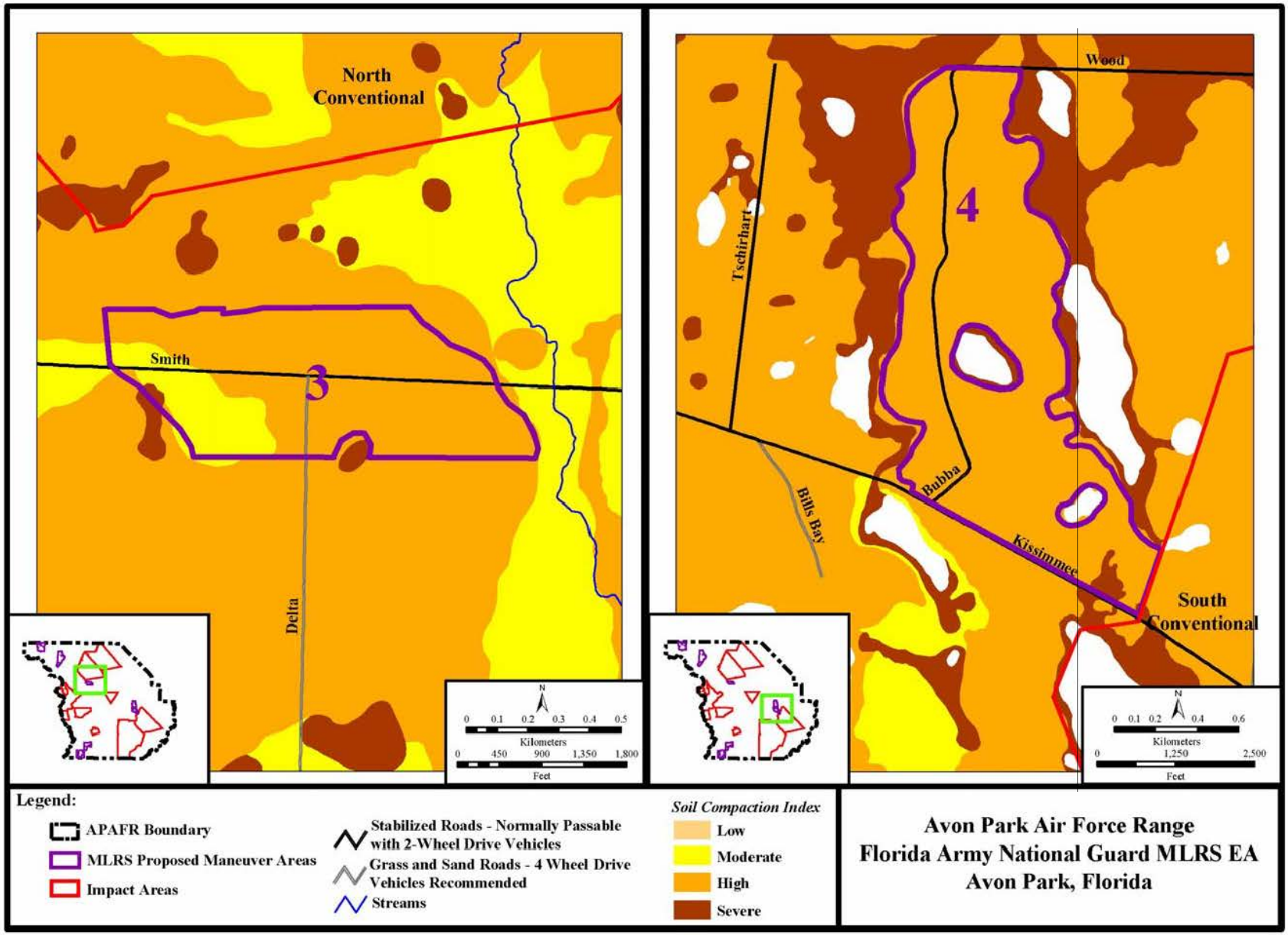

Figure 5-2. Estimated Soil Compaction Susceptibility for Proposed Maneuver Areas 3 and 4

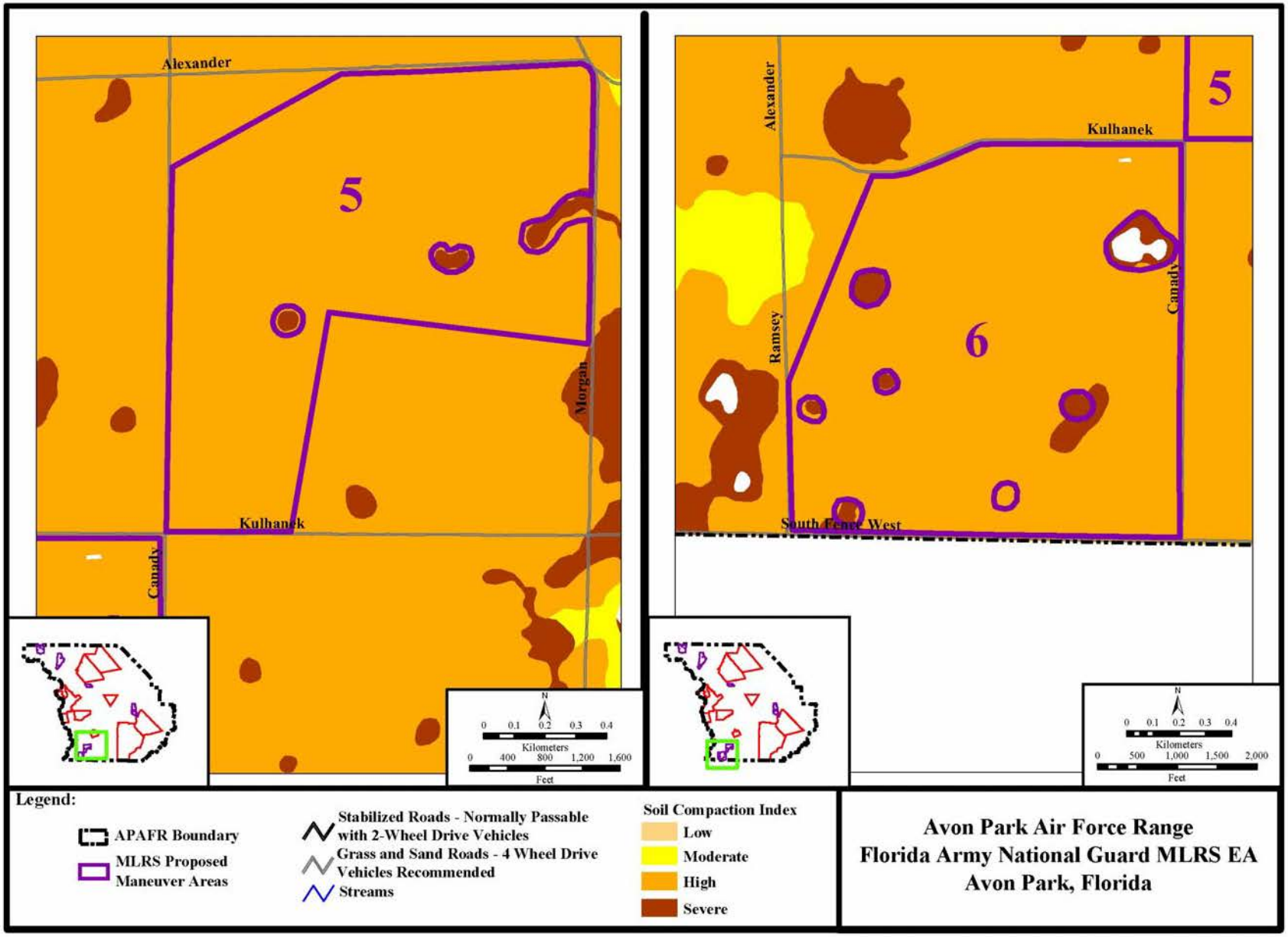

Figure 5-3. Estimated Soil Compaction Susceptibility for Proposed Maneuver Areas 5 and 6

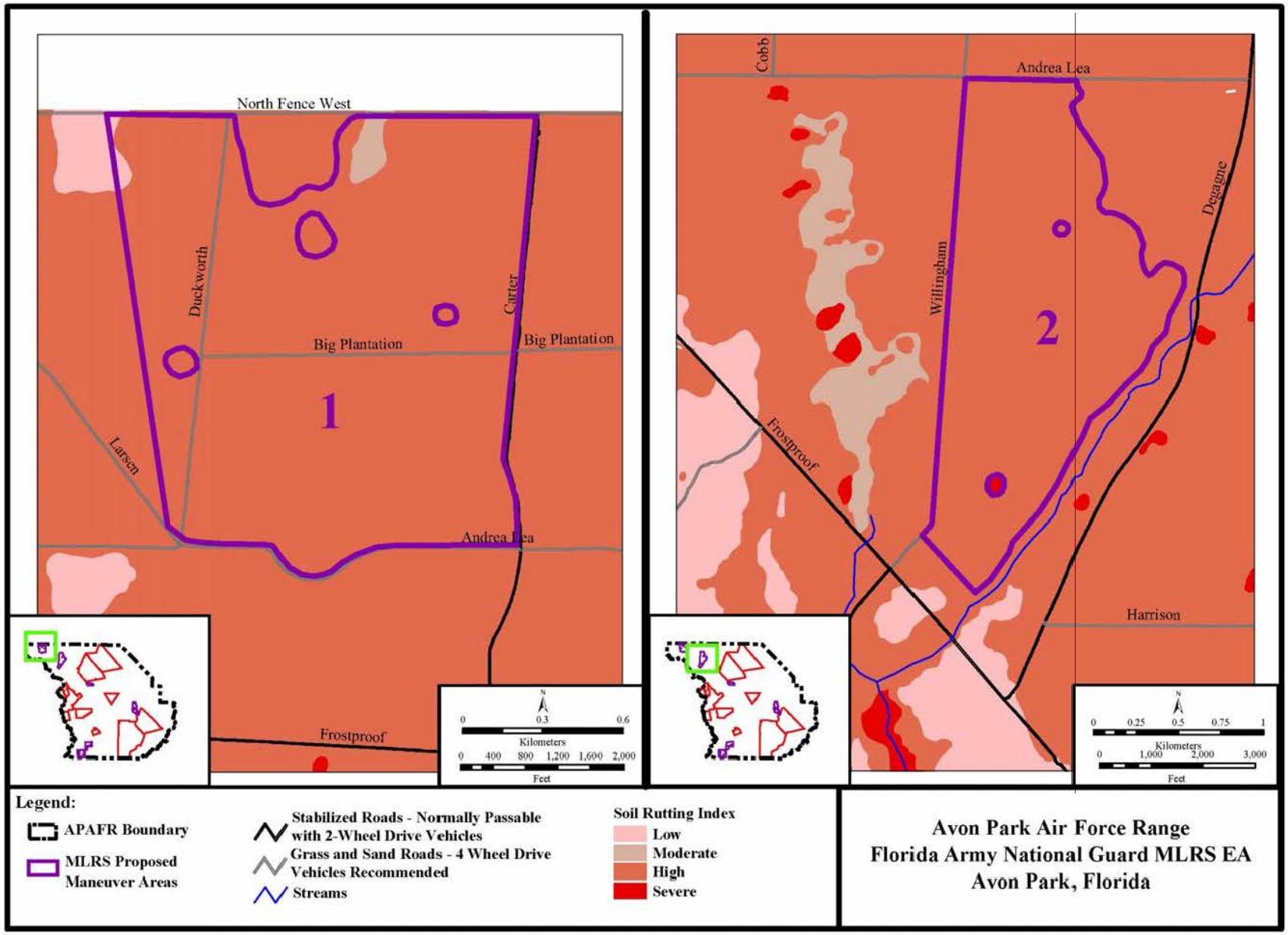

Figure 5-4. Estimated Soil Rutting Susceptibility for Proposed Maneuver Areas 1 and 2

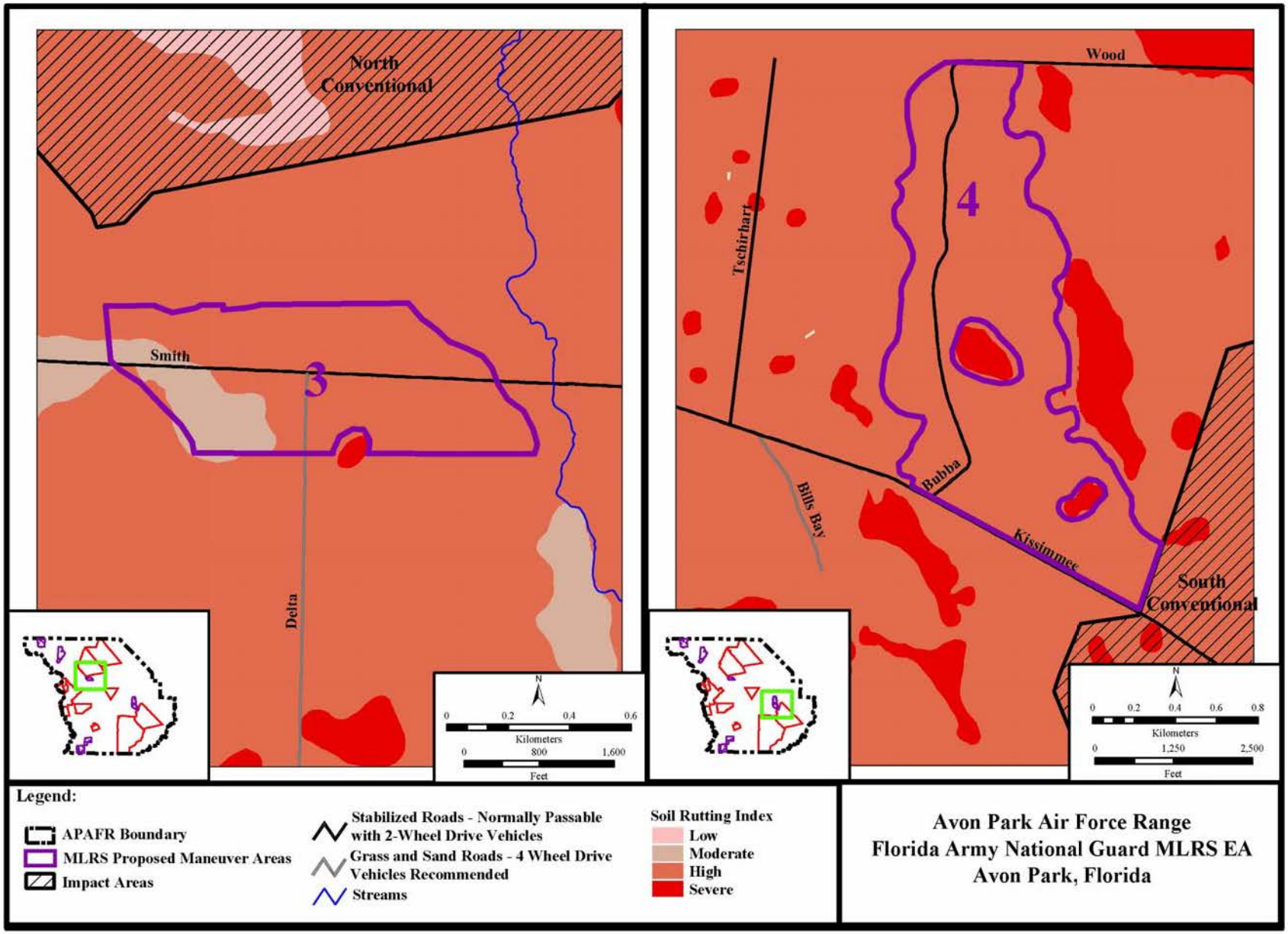

Figure 5-5. Estimated Soil Rutting Susceptibility for Proposed Maneuver Areas 3 and 4

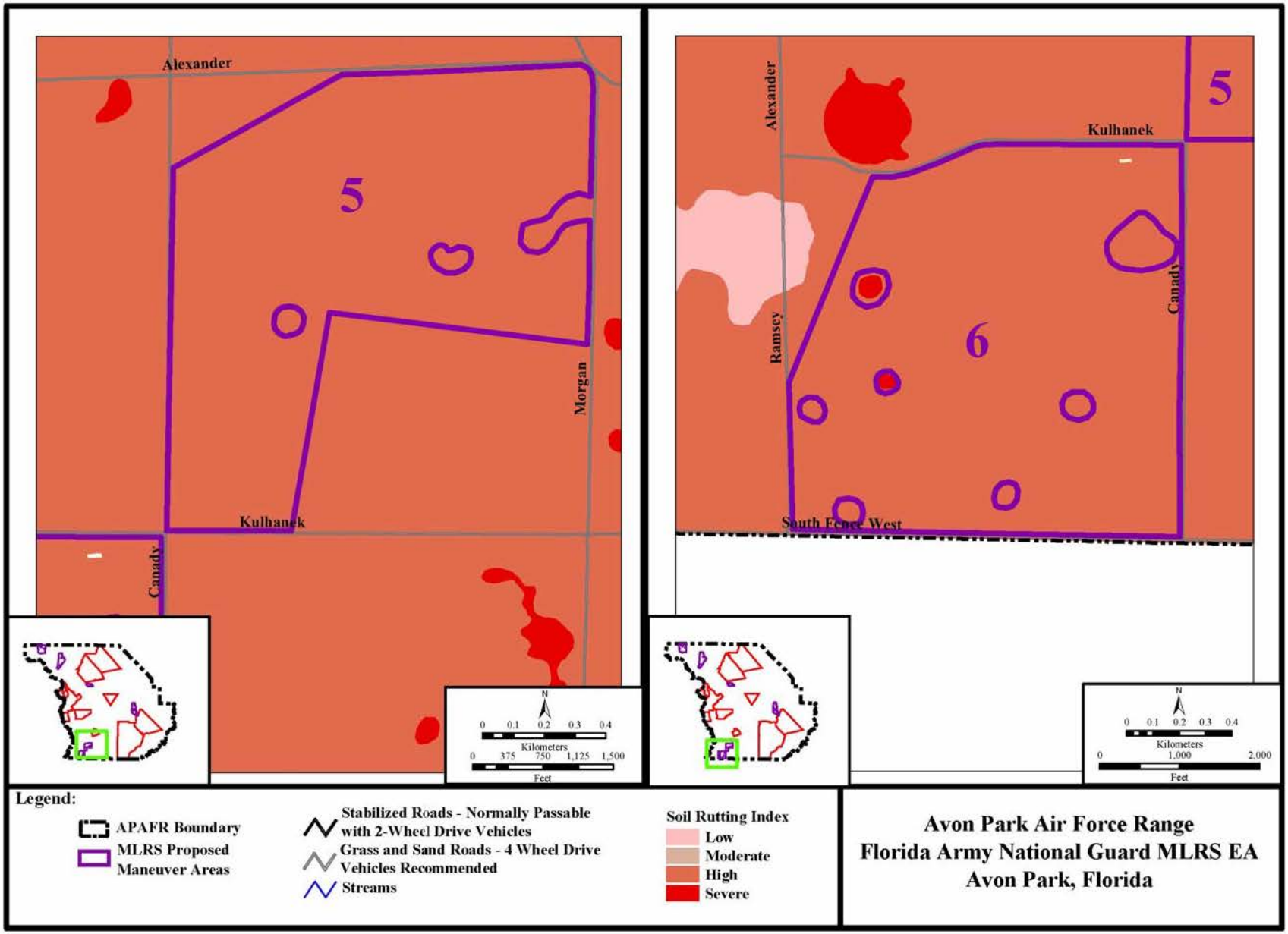

Figure 5-6. Estimated Soil Rutting Susceptibility for Proposed Maneuver Areas 5 and 6

5.5 WATER RESOURCES

This section analyzes potential impacts to wetlands in the proposed maneuver areas under the Preferred Alternative and the No Action Alternative. Because there were no floodplains or constructed features in any of the proposed MAs, there would be no impacts to these resources. The Proposed Action does not involve any subsurface activities that would jeopardize groundwater supplies, so there are no impacts to groundwater.

5.5.1 Preferred Alternative – Use of Any of Six Maneuver Areas

The majority of vehicular traffic would take place along constructed and established roads in designated upland, although some vehicles may accidentally go into wetlands. Because of the management actions that will be incorporated into the Proposed Action (see Section 3.3.1), no direct effects on wetlands are anticipated. During maneuver training, military troops and vehicles would avoid sensitive resources, including wetlands, seepage slope wetland areas, and surface waters. To avoid accidental contact with wetland resources, APAFR will provide the launch vehicles with GPS coordinates of these sensitive areas. In an effort to ensure long-term sustainability of the range, the FLARNG would implement the ITAM program as part of the Proposed Action (see Section 3.3.1). If there were accidental traverses into jurisdictional wetlands, then the FLARNG would get the U.S. Army Corps of Engineers to review the damages. If the wetlands were not jurisdictional, then the FLARNG would follow the policy and guidance in E.O. 11990, Protection of Wetlands and Air Force Instruction 32-7064, Integrated Natural Resources Management, and repair them as much as possible, by smoothing them out and monitoring their recovery. The FLARNG would ensure that there would be "no net loss" of wetlands.

There may be some indirect effects, which cannot be quantified, caused by the random nature of the maneuvering and the use of multiple MAs. Indirect effects may impact water quality and quantity supplied to the wetlands from runoff, which in turn could result in changes to wetland vegetation.

Water quality may be adversely impacted as sediments become suspended and are deposited into wetlands as a result of changes in soil characteristics or compaction (Russo, et al., 1993). Because the majority of soils in the MAs are Myakka sand, eroded soil material may be deposited in wetland ecosystems. As the soils are deposited, understory vegetation may become smothered, adversely affecting the overstory community. This would give rise to other species that may have a competitive advantage in the newly formed sandy substrate.

Soil rutting and compaction may alter hydrology, which can lead to secondary impacts to vegetative cover. This is observed when water flow is channeled away from plant communities and water and nutrient supplies are diverted elsewhere. Even one pass of a tank will create deep enough rutting to divert overland water flow capable of dehydrating surrounding areas (Trame and Harper, 1997). Because of the predominance of upland pine plantations and pine flatwoods in the MAs, it is anticipated that these areas would be more resistant to low intensity maneuvers based on certain studies in longleaf pine areas (DA, 1994).

Mechanized maneuvers and training exercises can damage plants and reduce the potential for native plants to reestablish (Outcalt and Lewis, 1990). These activities can also lead to the permanent removal of vegetation resulting in rutted soils with the potential to erode into nearby streams during the wet season. Mechanized traffic patterns can modify the underlying hardpan layer altering the porosity of the soil and leave the area unable to support hydrophytes (FNAI and TNC, 1995).

It is likely that the limited field training events associated with the MRLS training cycle would allow native vegetation and hydric soils to reestablish at the conclusion of military field exercises. With the option to conduct training in any of six maneuver areas rather than concentrating operations on a smaller area, impacts to water resources would be spread out spatially and temporally, lessening impacts on individual resources.

5.5.2 No Action Alternative

Under this Alternative, no new maneuver areas would be dedicated for MLRS training at APAFR. As a result, water resources would remain unaltered.

5.5.3 Regulatory Requirements

The Proposed Action does not involve dredging in wetlands or the discharge or fill material into wetlands. Indirect impacts to wetland resources will be avoided through the implementation of management actions identified in Section 3.3.1. Formal consultations between the U.S. Army Corps of Engineers (USACE), the Florida Department of Environmental Protection (FDEP), and the local Water Management Districts (WMD) will not be needed as impacts to regulated resources will be avoided. In the unlikely event that regulatory issues with the USACE, FDEP, WMD, and or other stakeholders should arise, such issues would be resolved before any Alternative is implemented.

5.6 BIOLOGICAL RESOURCES

This section discusses potential effects to biological resources on APAFR resulting from the Preferred Alternative and the No Action Alternative. MLRS battalions currently train at APAFR, but implementation of the Proposed Action would expand the percentage of the installation used for training and therefore the area of potential effects. As a result, analysis focuses on assessing the effects of expanded training requirements of the MLRS on the biological resources (plants, wildlife, and sensitive species, migratory birds, and habitat) identified in Chapter 4, Section 4.6.

In response to the analysis the FLARNG has consulted with the U.S. Fish and Wildlife Service regarding potential effects to federally listed plant and animal species. The U.S. Fish and Wildlife Service issued a biological opinion concurring with the findings in this environmental assessment. The Biological Opinion is attached as Appendix K.

Environmental Impact Analysis

Potential impact analysis was based on the analysis approach presented in the Final Programmatic Environmental Assessment for Multiple Launch Rocket System (MLRS) Fielding (Army National

Guard, 2000) and the Final Environmental Assessment for the Conversion of the 8-Inch Howitzer Weapon System to the Multiple Launch Rocket System in the Florida Army National Guard, 3rd Battalion, 116 Field Artillery (FLARNG, 1996) for activities other than live fire. Live fire activities have been previously addressed in the Final Programmatic Environmental Assessment for Multiple Launch Rocket System (MLRS) Fielding (Army National Guard, 2000). Generally, actions analyzed in the above documents were similar to those occurring under the Proposed Action. Consequently, the analysis approaches in these two documents were deemed relevant. The types of activities associated with the Proposed Action were then assessed for the potential to impact identified resources.

5.6.1 Preferred Alternative

The Proposed Action would result in increased frequency of training over what is being currently done.

The potential for adverse impacts varies by MA, with the highest potential occurring in those MAs that exhibit the highest percentage of protected species habitat acreage. MAs were derived by using exclusive mapping, an approach designed to avoid or minimize the inclusion of wetlands, protected species, and their habitats within their boundaries.

Because of the variability associated with how training exercises would be distributed among each MA, quantifying the potential impacts that may result from training activities is difficult. However, training activities would operate under resource conservation measures outlined in Section 3.3.1 to either offset or minimize potential impacts so that an entire MA would not be affected.

Vegetation and Wildlife (Including Threatened and Endangered Species)

Disturbance of vegetation and wildlife by training activities would occur at all MAs primarily from off-road vehicular traffic. Tracked-vehicle use would occur only about 30 days (six weekends plus one two-week event) out of the year, providing some interval of opportunity for regeneration of damaged vegetative areas. The ITAM program management actions in Section 3.3.1 address rest and recovery of the MAs by rotating their use, when feasible. The Proposed Action is not expected to change existing ecological processes within the maneuver areas. Vehicle traffic would result in a change to an early stage of succession, with less species diversity. However, over time, these areas would undergo succession to their current structure and function, if left alone.

Tables 4-17 and 4-18 in Chapter 4 of this document provide a listing and status of threatened and endangered plants and animal species potentially occurring on APAFR. According to FNAI element occurrence data, these species do not occur on any of the MAs. Figure 4-21 shows the HMUs of threatened and endangered bird species at APAFR. The management of threatened and endangered species at APAFR focuses on three species, the Florida scrub jay (FSJ), Florida grasshopper sparrow (FGS), and red-cockaded woodpecker (RCW), none of which nest within the proposed MAs. However, potential habitat for the RCW and the Florida scrub jay are present in some of the MAs.

The *Plan for Management of the Florida Grasshopper Sparrow, Florida Scrub jay and Red-cockaded Woodpecker at Avon Park Air Force Range, Florida* provides information on the management efforts related to these species (U.S. Air Force, 2000a).

Tracked Vehicle Use

Tracked-vehicle maneuver areas would potentially result in an increase in successional or introduced plant species, an increase in annual plants, and a decrease in long-lived perennials (FLARNG, 1996). A tracked vehicle does not always remove vegetation with each pass, but where this does occur because of locked-tracked turns or multiple passes, natural revegetation would occur if left undisturbed for a period of time (FLARNG, 1996). Disturbance from vehicular traffic may favor early successional plant species and wildlife that utilize these habitats.

Wet areas are a problem for the MLRS launchers and will be avoided as discussed in Section 3.3.1. Thus, wetland plant communities within the MA would not be affected.

Small mammals and herpetofauna (for example, snakes and frogs) may be disturbed by tracked vehicle traffic. Small animals tend to hide (and remain) while large animals tend to leave the area during training exercises (Army National Guard, 2000). Tracked vehicles may directly injure or kill small animals, or indirectly injure, kill or displace them as a result of collapsing burrows in which they live, or destroy their nests and eggs in the ground. The eastern indigo snake occurs throughout APAFR and is often associated with gopher tortoise burrows. This species may be affected by tracked-vehicle use. Some measures can be taken to minimize the potential for impact from tracked vehicles to the indigo snake. Periodic surveys of the MAs for gopher tortoise burrows, and subsequent relocation of the inhabitants, or alternately, marking the burrows as an area to be avoided during training will minimize tracked vehicle impacts. Given that tracked vehicle use at APAFR would occur about 30 days out of the year, which is about 8 percent of the total number of days in a year, over 90 percent of the time there would be no tracked-vehicle operations and therefore no potential impact to small mammals and reptiles. Additionally vehicle speeds would remain under 25 miles per hour, slow enough to sight and evade indigo snakes on roads and trails. The potential exists to affect this species within the MAs. Still, while tracked vehicles may affect individuals at certain times of the year, this activity would not result in long-term, adverse impacts to populations of indigo snakes. A consultation with the USFWS has been completed for the Proposed Action and a Biological Opinion is included as Appendix K. Education and instruction on how to identify and avoid indigo snakes is part of the current training and environmental awareness program at APAFR for FLARNG units.

Provided that management actions (as identified in Section 3.3.1) are implemented, impacts to vegetation, wildlife, or threatened and endangered species from vehicular traffic would be minor and temporary.

MA-1 Big Plantation

Wetlands and Plant Communities

Of the six MAs, Big Plantation (534 acres) contains the highest amounts of wetland area with 124 acres. Seventy-seven percent of this MA is non-wetland and is thus presumed suitable for heavy machinery and tracked vehicle use. Pine flatwoods and pine plantation are the primary plant communities in this MA. Approximately 8 percent of this MA is classified as marsh or swamp. Tracked vehicles would avoid these areas, as well as other wetland areas where the terrain would not support their use. There are no sensitive plant species within 0.5 mile of the Big Plantation MA boundary.

Potential Habitat for Threatened and Endangered Species

Within the Big Plantation MA, there is no FSJ HMU or RCW forage area. Potential habitat for the RCW does occur within this MA in the form of RCW HMU. Of the 533.6 acres that comprise this MA, 107.3 acres are RCW HMU, the least amount of the six MAs. Continued application of management guidelines specified in the APAFR Endangered Species Management Plan for habitat of this species should ensure the long-term survival of RCW populations at APAFR. Other protected species that have no designated habitat areas may potentially occur within this MA. Species that may forage or travel through, but not nest on, APAFR include the federally endangered wood stork and snail kite and the federally threatened Audubon's crested caracara. The federally threatened bald eagle nests on APAFR but not within any of the MAs. The federally threatened indigo snake may occur throughout APAFR. Many species of federally listed plants occur on APAFR, but none are known to occur within any of the MAs. The pigeon wing and hairy jointweed, two federally listed plants that occur on APAFR, would not be affected.

No direct effects to any of the federally listed bird species are likely from heavy machinery and tracked vehicle use. Wildlife would likely avoid the immediate vicinity of training activity or seek refuge if disturbed by noise and human presence. The slow travel speeds (less than 25 mph) of tracked and convoy vehicles would minimize the potential for direct impacts to indigo snakes on roadways. However, indigo snakes may be adversely affected by maneuvers of tracked vehicles within this MA.

Migratory Birds

There would be no impacts to migratory birds at this MA. Ground maneuvering would not interfere with migratory bird use of aquatic habitats. Habitats that attract migratory birds have been intentionally avoided during the determination of locations for proposed MAs.

Invasive Species

Cogon grass, old world fern, and Japanese climbing fern have been documented at the perimeter roads Carter, North Fence West, and Andrea Lea around this MA. Area coverage of these species could expand as a result of disturbance from tracked and wheeled vehicles from this alternative.

MA-2 Willingham

Wetlands and Plant Communities

The Willingham MA contains 17.3 acres of wetlands, leaving 97 percent of the 642-acre area as non-wetland. The majority of plant communities within this MA are pine plantation and pine flatwoods (97 percent) with the remaining comprised of pasture/developed, scrub, and marsh/swamp. Sensitive species or plant communities occurring within 0.5 mile of the Willingham MA boundary include an FNAI designated fragile natural community, nodding pinweed, and pigeon-wing. The pigeon wing does not occur within the boundaries of the MA. The pigeon wing and hairy jointweed, two federally listed plants that occur on APAFR, would not be affected.

Potential Habitat for Threatened and Endangered Species

Protected species habitat or potential habitat is present on this MA. HMU area for the RCW totals 642 acres. This entire MA falls within a RCW HMU.

Other listed species concerns for this MA are the same as for the Big Plantation MA, meaning occurrence of protected species is possible. With the exception of the indigo snake, no direct impacts to protected wildlife species from the Proposed Action are likely.

Migratory Birds

There would be no impacts to migratory birds at this MA. Ground maneuvering would not interfere with migratory bird use of aquatic habitats. Habitats that attract migratory birds have been intentionally avoided during the determination of locations for proposed MAs.

Invasive Species

There are currently no documented occurrences of invasive plant species within the Willingham MA. Introduction of invasive plants is possible from tracked and wheeled vehicles unintentionally transporting them from other MAs.

MA-3 Delta

Wetlands and Plant Communities

Wetland areas on this MA comprise just 1.5 percent of the total 131-acre area, the smallest of the MAs. Eighty percent of the area consists of pine plantation. Sensitive plant species occurring within 0.5 mile of the nearest Delta boundary include hartwrightia (*Hartwrightia floridana*). The pigeon wing and hairy jointweed, two federally listed plants, would not be affected.

Potential Habitat for Threatened and Endangered Species

All of the Delta MA is considered RCW HMU, with approximately 12 acres of RCW forage area. Delta MA is the only one of the six MAs with RCW forage area. The low wetland acreage

(2 acres) reduces the potential for occurrence for those listed species that feed in wetland and marsh areas such as the wood stork, Audubon's crested caracara and the bald eagle. As with all MAs, other species, in particular the indigo snake, may occur. Measures previously mentioned, such as driving at slow speeds of 25 mph (Section 3.3.1) should minimize the potential for impacts to this species.

Migratory Birds

There would be no impacts to migratory birds at this MA. Ground maneuvering would not interfere with migratory bird use of aquatic habitats. Habitats that attract migratory birds have been intentionally avoided during the determination of locations for proposed MAs.

Invasive Species

There are several locations of Cogon grass along Smith Road, which bisects the Delta MA. As units access the interior of the MA from either side of Smith Road and create areas of disturbance leading away from this road, the incidence of cogon grass expansion would likely increase. Because of the relatively high number of existing cogon grass areas, and the situation of the road, the potential for the spread of invasive species at this MA is potentially higher than at other MAs.

MA-4 Bubba

Wetlands and Plant Communities

The Bubba MA contains approximately 35.2 acres of wetlands, with approximately 390 non-wetland acres available for maneuvers. The Bubba MA has 22 acres of marsh/swamp, the highest of the six MAs. Plant community types are primarily pine flatwoods (55 percent) and pine plantation (36 percent). Sensitive plant species occurring within 0.5 mile of the Bubba MA boundary include cutthroat grass and hartwrightia. The pigeon wing and hairy jointweed, two federally listed plants, do not occur on or within 0.5 mile of this MA.

Potential Habitat for Threatened and Endangered Species

Sensitive species habitat is present on this MA. The entire area is part of a RCW HMU. No other sensitive species habitat occurs.

There is a potential for other listed species to occur or use the Bubba MA. This MA contains a central wetland/swamp area and is bordered on three sides by wetland areas, which may be attractive to other listed bird species. Indigo snakes may occur within this MA. Efforts should be made to avoid this species, which has been sighted on APAFR in a variety of habitats and on roadways.

Migratory Birds

There would be no impacts to migratory birds at this MA. Ground maneuvering would not interfere with migratory bird use of aquatic habitats. Habitats that attract migratory birds have been intentionally avoided during the determination of locations for proposed MAs.

Invasive Species

Tropical soda apple and cogon grass grow adjacent to perimeter roads (Kissimmee and Wood) around this MA. Additional disturbed area would be created on this MA as a result of tracked and wheeled vehicle maneuvers, potentially allowing for expansion of invasive species.

MA-5 Alexander

Wetlands and Plant Communities

The Alexander MA contains 37 acres of wetlands, which is about 11 percent of the total 324-acre area. Like all of the other MAs, the predominant plant community types are pine flatwoods (60 percent of the total area) and pine plantation (38 percent). Sensitive plant species occurring within 0.5 mile of the Alexander MA boundary include cutthroat grass and hartwrightia. The federally listed pigeon wing and hairy jointweed do not occur within the boundaries of this MA and would not be affected.

Potential Habitat for Threatened and Endangered Species

RCW HMU (324 acres) occurs on the Alexander MA. Other listed species may occur on or frequent this MA, though no nesting of any protected bird species is known to occur.

Migratory Birds

There would be no impacts to migratory birds at this MA. Ground maneuvering would not interfere with migratory bird use of aquatic habitats. Habitats that attract migratory birds have been intentionally avoided during the determination of locations for proposed MAs.

Invasive Species

One location of cogon grass occurs along Kulhanek Road, which forms the southernmost border of this MA.

MA-6 Ramsey

Wetlands and Plant Communities

Roughly 119 acres or 25 percent of the 473-acre total of the Ramsey MA is wetlands. Pine flatwoods and pine plantation are the predominant plant community types, with less than 5 acres of marsh/swamp and 6 acres of pasture/developed. Sensitive plant species occurring within 0.5 mile of the Ramsey MA boundary include Florida three-awned grass. The federally listed pigeon wing and hairy jointweed do not occur on within 0.5 mile of this MA and would not be affected.

Potential Habitat for Threatened and Endangered Species

All of the 473 acres of the Ramsey MA are RCW HMU. Other listed species may potentially occur, particularly those previously mentioned bird species closely associated with wetland

areas, such as the wood stork and crested caracara. Indigo snakes occur throughout APAFR and thus are potential inhabitants of this MA. When sighted, avoidance of this species is recommended to minimize impacts.

Migratory Birds

There would be no impacts to migratory birds at this MA. Ground maneuvering would not interfere with migratory bird use of aquatic habitats. Habitats that attract migratory birds have been intentionally avoided during the determination of locations for proposed MAs.

Invasive Species

There are no invasive species identified on this MA. However, units traveling from the adjoining Alexander MA could potentially introduce cogon grass into this MA.

Comparison of Maneuver Areas

Table 5-16 summarizes the amount of suitable training area in each MA, assuming wetland areas are unsuitable for training with tracked or heavy wheeled vehicles. Table 5-17 provides a comparison of plant community types at each MA, and Table 5-18 lists sensitive species habitat within each MA. Figure 5-7 illustrates the different amounts of sensitive species acreage on each MA.

Table 5-16. Available Training Area by MA

Maneuver Area	Maneuver Area Acres	Wetland Acres	Net Available Area for Maneuvers (acres)	Percent Available Area
1- Big Plantation	533.6	123.8	409.9	76.8
2- Willingham	641.5	17.3	624.2	97.3
3-Delta	132.8	2.0	130.8	98.5
4-Bubba	427.8	35.2	392.6	91.8
5-Alexander	324.5	36.9	287.5	88.6
6-Ramsey	472.6	119.3	353.2	74.7
Total All MAs	**2,532.8**	**334.5**	**2,198.2**	**86.8**

Table 5-17. Summary Acreages by Plant Community Within Proposed MLRS Maneuver Areas

Plant Community Type	Maneuver Areas						TOTAL
	1- Big Plantation	2-Willingham	3-Delta	4-Bubba	5-Alexander	6-Ramsey	
Pine Flatwoods	127.3	336.6	14.1	235.7	195.5	274.5	1183.6
Pine Plantation	392.1	287.7	106.5	152.0	124.3	188.1	1250.7
Hammock	0.0	0.0	0.0	1.3	0.0	0.0	1.3
Marshes and Swamps	7.8	3.1	0.1	21.9	1.7	4.5	38.9
Cutthroat Communities	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pastures and Developed	5.1	14.2	12.2	16.9	3.0	5.5	56.9
TOTAL	**532.3**	**641.6**	**132.9**	**427.8**	**324.5**	**472.6**	**2,531.4**

Table 5-18. Amount of Sensitive Species Habitat by Proposed MLRS MA

Sensitive Species Habitat	Maneuver Areas						TOTAL
	1- Big Plantation	2- Willingham	3-Delta	4- Bubba	5- Alexander	6- Ramsey	
RCW HMU (acres)	107.3	641.5	132.8	427.8	324.4	472.6	2,106.4
RCW Forage Area (acres)	0.0	0.0	12.1	0.0	0.0	0.0	12.1
RCW Cavity Trees	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HMU = Habitat Management Unit; RCW = Red-cockaded Woodpecker

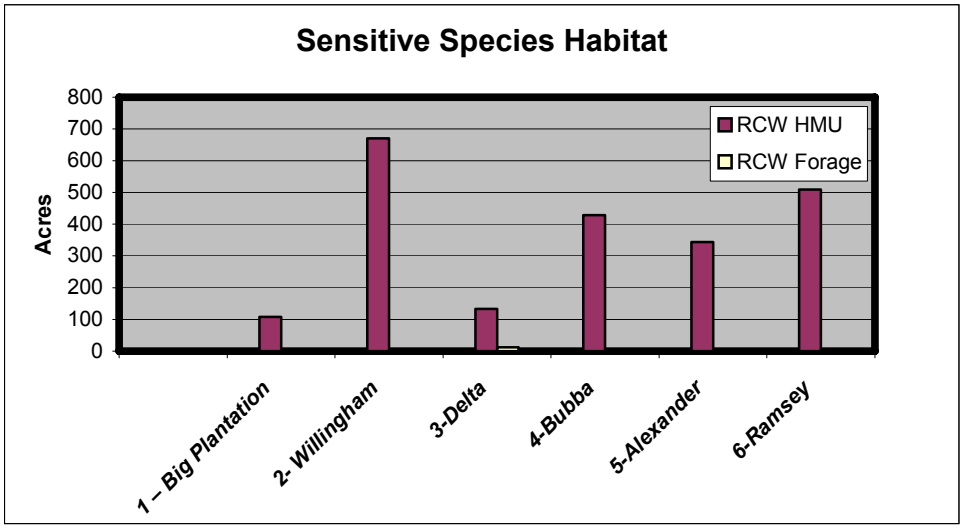

Figure 5-7. Sensitive Species Habitat on the Proposed MLRS Maneuver Areas

Big Plantation has the fewest sensitive species habitat concerns, but one of the largest area of wetlands. Delta has the lowest amount of wetland area but lowest overall maneuver area. All of Delta is RCW HMU, as is Willingham, Alexander, Bubba, and Ramsey. Willingham, Bubba, and Alexander all have about 10 percent or less area that is wetlands. Ramsey has the largest area of wetlands. The number and type of invasive species noted to occur at the MAs varies, with the Willingham and Ramsey areas having no documented occurrences. The potential for introduction or expansion of invasive species exists for all areas given the proposed usage for tracked and wheeled vehicle maneuvers and the type of disturbance that would arise. Additional cost and effort by APAFR personnel to control the spread and introduction of invasive species may be warranted to offset any potential adverse effects brought on by the Proposed Action.

Summary of Potential Effect Determinations for Protected Species

As a part of the Proposed Action, management practices would be observed that directly minimize the potential for impact to some protected species. The proposed maneuver areas were selected through a process of exclusionary mapping, specifically designed to lessen or avoid altogether environmental impacts from the Proposed Action, by identifying the locations of

sensitive species and habitats and then situating the MAs away from those features. To summarize potential impacts, the following conclusions of **no effect (NE), not likely to adversely affect (NLAA),** or **likely to adversely affect (LAA)** were applied to species likely to occur on or near APAFR and presented in Table 5-19. **No effect** means that no positive or negative effects are expected. **Not likely to adversely affect** means that all effects are beneficial, discountable, or insignificant effects. Beneficial effects are simply positive effects. Discountable effects are those that are extremely unlikely to occur and would not be expected to happen. Insignificant effects pertain to the small size of the impact and are virtually immeasurable or undetectable.

The Proposed Action would observe existing management practices to minimize potential impacts for other species. The proposed location of the MAs would avoid the Florida grasshopper sparrow and its habitat entirely. None of the MAs overlap any nest locations or HMU for the FGS. There are no FSJ nests on any of the MAs. RCW forage area is largely avoided, and management practices in the existing APAFR Endangered Species Management Plan are designed to minimize impacts to RCWs. These would be observed during MLRS training events at APAFR. Vehicle speeds of less than 25 mph and education/awareness training for incoming units would minimize potential impacts to the indigo snake while units travel on established trails and roads. However, maneuvers within the MAs are likely to adversely affect indigo snakes. The National Guard has a training video and pamphlet that instructs units on how to identify and avoid the indigo snake (U.S. Army, 2005).

Other species noted to occur in surrounding areas but not confirmed at APAFR would not be affected. These include the sand skink, the bluetail mole skink, the Highlands tiger beetle, and the snail kite. Species not known to nest at APAFR such as the wood stork would not be affected by MLRS tracked-vehicle use. Tracked-vehicle use would not occur in forage area for this species. The Florida panther is not expected to utilize APAFR and thus would not be affected by the Proposed Action.

Federally listed plant species are not found on any of the MAs. No effects would occur to the pigeon wing or hairy jointweed.

Given that the total amount of training would occur less than 10 percent of the time out of the year, the likelihood of encountering or affecting a protected species is low. Table 5-19 summarizes potential effect determinations for all federally listed animal and plant species potentially occurring on or near APAFR.

Table 5-19. Potential Effect Determinations for Protected Species at MLRS Maneuver Areas

Maneuver Area	Species												
	RCW	FGS	FSJ	Bald Eagle	Indigo Snake	Panther	Wood Stork	Caracara	Sand and Mole Skink	Tiger Beetle	Snail Kite	Pigeon wing	Hairy Jointweed
Big Plantation	NLAA		NE		LAA	NE							
Willingham													
Delta													
Bubba													
Alexander													
Ramsey													

NE = No Effect; NLAA = Not Likely to Adversely Affect; LAA = Likely to Adversely Affect; RCW= Red-cockaded Woodpecker; FGS = Florida Grasshopper Sparrow; FSJ = Florida Scrub Jay

5.6.2 No Action Alternative

Under this Alternative, MLRS training would continue to be conducted at existing approved training areas. Consequently, existing conservation measures would remain in place and the current level of impacts to all biological resources from vehicle maneuvers would not be expected to change under the No Action Alternative.

5.7 HAZARDOUS MATERIALS AND HAZARDOUS WASTE

The transport, storage, use, and disposal of hazardous materials and waste associated with the Alternatives may present a safety/health issue to human health and/or the environment. Potential impacts addressed in this section are related to hazardous material use and waste production during ground troop movements. Potential impacts to Environmental Restoration Program (ERP) sites caused by ground disturbance are also addressed.

Proper packaging, labeling, storage, and handling of hazardous material are addressed in the Hazardous Waste Management Plan (U.S. Air Force, 2003a). While the UTES maintains its own Hazardous Waste Management Plan for activities within the UTES compound, the APAFR Hazardous Waste Management Plan takes precedence. Recordkeeping, spill contingency and response requirements, and safe handling and transportation of materials requirements in the APAFR plan must be followed by the FLARNG during MLRS training.

5.7.1 Preferred Alternative – Use of Any of Six Maneuver Areas

Impacts from Ground Troop Movement

Impacts associated with hazardous materials and waste from ground troop movements are related to the production and disposal of graywater (shower and sink wash water) during field operations

and the use, disposal, and spill management of petroleum, oils, and lubricants (POLs) during vehicle fueling and maintenance.

Graywater

Graywater from ground troop movement may be produced during ground troop activities. Existing APAFR procedures for handling sewage and kitchen wastes, as identified under the *Hazardous Materials Management Plan*, would eliminate any potential effects on ground and surface waters. Wastewater from field kitchens would be contained and transported to on-base or off-base wastewater plants, but collection of field shower water is not required since no water quality issues are associated with this type of graywater. Portable latrines would be utilized where appropriate, and wastewater would be collected as needed. Coordination with the APAFR Environmental Flight Compliance Section (CEVC) would ensure that these requirements are met.

While APAFR's revised *Hazardous Materials Management Plan* is in the draft stage, APAFR's existing approved plan for recycling, hazardous materials management, and proper disposal of wastes would be followed during exercises until the revised Plan is completed and approved.

Vehicle Refueling and Maintenance

Potential impacts related to hazardous materials and waste from vehicle refueling and maintenance are associated with the potential for POL spills to occur and contaminate soils and surface/groundwater.

All handling of fuels before, during, and after training exercises would be in accordance with AFI 23-201, *Fuels Management*. Per APAFR's *Spill Prevention and Response Plan*, (U.S. Air Force, 1999a), should a POL spill occur during refueling or vehicle maintenance, the presence of spill kits would ensure quick response by on-site personnel. Any materials contaminated with fuel, such as rags or other items, would be characterized by CEVC and would be disposed of appropriately according to state and Air Force regulations (such as APAFR's *Hazardous Waste Management Plan*).

If a spill occurs, a spill discharge report must be filled out and the responsible party must hand carry or fax this spill report to CEVC within four duty hours of the spill occurrence. CEVC would then coordinate appropriately with federal, state, and local regulators per AFI 32-4002, *Hazardous Material Emergency Planning and Response Compliance*. Any spill that poses a threat to life, health, environment, or has the potential to cause a fire, would be reported by dialing 911. If the Fire Department declares an emergency condition, they can take control of the situation, including the tasking of the organization's cleanup detail. Spills over 25 gallons are required to be reported to the Florida Department of Environmental Protection (through CEVC).

With these management requirements in place, potential impacts related to vehicle refueling and maintenance and POL spills associated with the Proposed Action are not anticipated.

Impacts to ERP Sites

Impacts to ERP sites are associated with the potential for training-related ground-disturbing activities to affect the integrity of an ERP site (that is, disturb the soils). The only ERP sites with a potential to be impacted from the Proposed Action are located within the boundaries of the proposed "Bubba" maneuver area (MA-4), which is located to the north of the Charlie and Echo impact areas. These three sites are associated with past munitions burial activities at the installation. Table 5-20 presents information regarding these three sites. Ground troops would be informed of the location of these ERP sites, and ground movement of troops and vehicles would avoid these areas. Consequently, no impacts to ERP sites from training activities are anticipated.

Table 5-20. ERP Sites Located Within the Proposed "Bubba" Maneuver Area

Site	Name	Site Area	Buried Material	Relative Risk Ranking
LF-93	Munitions Burial Site No. 24	40 ft x 80 ft (3,200 ft^2) (0.07 acre)	Expended LUU-28 flares, MK-24 flares, BDU-33 and MK-106 practice bombs, M-117 bombs, and MK-82 and MK-81 practice bombs	Medium
LF-94	Munitions Burial Site No. 25	20 ft x 100 ft (2,000 ft^2) (0.05 acre)	Expended LUU-28 flares, MK-24 flares, BDU-33 and MK-106 practice bombs, M-117 bombs, and MK-82 and MK-81 practice bombs	Medium
LF-88	Munitions Burial Site No. 19	20 ft x100 ft (2,000 ft^2) (0.05 acres)	Expended flares, expended phosphorus igniters, practice bombs	Medium

Source: U.S. Air Force, 2002a

5.7.2 No Action Alternative

Under the No Action Alternative, training exercises would continue as they do currently. All applicable spill response, hazardous material and waste handling, and ERP site avoidance requirements would still apply. Thus, no adverse impacts associated with hazardous materials and waste would be anticipated under this Alternative.

5.8 CULTURAL RESOURCES

Under federal law, impacts to cultural resources may be considered adverse if the resources are eligible for, or listed in, the National Register of Historic Places (NRHP), or are important to traditional groups as outlined in the *American Indian Religious Freedom Act* (AIRFA), the *Native American Graves and Repatriation Act* (NAGPRA), and Executive Order 13007, *Indian Sacred Sites*. An action results in impacts to a historic property when it alters the resource's characteristics, including relevant features of its environment or use, in such a way that it no longer qualifies for listing in the National Register [36 CFR 800.9b]). In accordance with DoD American Indian and Alaska Native Policy (October 1999), FLARNG has determined that the Seminole Tribe of Florida and the Miccosukee Tribe of Indians may have ancestral ties to the Avon Park area. These tribes have been contacted to identify potential issues or concerns regarding the present project (see Appendix I, Agency Correspondence). The Seminole Tribe of Florida responded that they had no comments on the proposed action. The Miccosukee Tribe of Indians of Florida responded to the FLARNG contact letter, saying that they consider any Calusa

site to be important, would like to see all MA acreage surveyed, and would like to review survey results (Terry, 2005). Upon completion of this survey work (U.S. Air Force, 2005c), and in consultation with the FLARNG, the Miccosukee Tribe recommended that known sites within the maneuver areas should be avoided during FLARNG activities but should not be marked explicitly as cultural areas (Terry, 2005); the Florida SHPO concurred that none of the cultural resources recorded were eligible for the NRHP (Gaske, 2005). At this point, consultation between FLARNG/U.S. Air Force-APAFR and both the SHPO and the Miccosukee Tribe of Indians of Florida regarding the MLRS proposed action is complete. In the case of inadvertent finds, FLARNG should notify the Miccosukee Tribe and resume consultation with both the Tribe and the SHPO (Terry, 2005).

Analysis of potential impacts to cultural resources considers both direct and indirect impacts. Direct impacts may occur by physically altering, damaging, or destroying all or part of a resource; altering characteristics of the surrounding environment that contribute to the resource's significance; introducing visual or audible elements that are out of character with the property or alter its setting; or neglecting the resource to the extent that it deteriorates or is destroyed. Direct impacts are assessed by identifying the types and locations of proposed activity and determining the location of cultural resources that could be affected. Indirect impacts result primarily from project-induced increases in the use of an area that may lead to inadvertent or intentional impacts to a site.

5.8.1 Preferred Alternative – Use of Any of Six Maneuver Areas

Impacts to cultural resources are unlikely under the Proposed Action as a result of ground-disturbing actions associated with use of the MAs for MLRS training. Potential impacts are unlikely if ground-disturbing activities are restricted to areas with low probability for the presence of cultural resources, as described for each MA. For all MAs, compliance with Section 106 of the NHPA, including SHPO and American Indian consultation, has been completed. The SHPO concurred in a letter dated 26 October 2005 that "the training activities proposed within the six maneuver areas will have no effect on historic properties listed, or eligible for listing" in the NRHP (Gaske, 2005). In a letter dated 18 October 2005, the Miccosukee Tribe requested that the FLARNG avoid cultural sites within the MAs and initiate consultation with the Tribe should there be any inadvertent finds (Terry, 2005). The FLARNG has agreed to these conditions as discussed in section 3.3.1.

The six MAs have all been surveyed at regular intervals, with shovel probes at regularly spaced intervals (U.S. Air Force, 2005c), identifying a total of four archaeological sites and nine isolates, none of which are eligible for the NRHP. In the case of inadvertent discovery of cultural resources during the Proposed Action, FLARNG would initially follow the *Soldier's Field Card – A Guide to Protecting Natural and Cultural Resources, Avon Park Air Force Range, Florida* (FLARNG, no date). This requires the soldiers to report any artifacts uncovered during training activities to the Environmental Flight and to mark the location. To continue maneuver training in the discovery area, the FLARNG would comply with procedures identified in chapters 5 (Construction Monitoring Procedures) and 8 (Native American Concerns) of the APAFR Cultural Resources Management Plan (U.S. Air Force, 2003b). If, in consultation with the Florida SHPO, any inadvertently discovered cultural resources are determined to be NRHP-eligible, these would be marked, identified on maps, and avoided by the MLRS units

during training. No vehicles or bivouac sites would be permitted on or within NRHP-eligible sites or within 200 feet of marked cemeteries or human burials.

Potential cultural resources impacts and constraints are identified by Maneuver Area (MA) below.

MA 1 (Big Plantation). Impacts to cultural resources are unlikely. One historic site (8PO6098), determined to be not eligible for the NRHP because of extensive disturbance, has been identified in the MA. All acreage within this MA has received cultural resources inventory: transects were walked at regularly-spaced intervals and included shovel probes. The likelihood of encountering previously unidentified cultural resources is considered low, since all acreage falls within an area of low probability for cultural resources.

MA 2 (Willingham). All areas within MA 2 have been surveyed for cultural resources using pedestrian transects at regularly-spaced intervals and shovel probes. Three sites and six isolates were located along or near Willingham Creek, none of which are eligible for the NRHP. All but one isolate were found in subsurface shovel probes in the high probability area that borders Willingham Creek, where inadvertent discovery of additional cultural resources is possible but unlikely.

MA 3 (Delta). Impacts to cultural resources in MA 3 are unlikely. The MA has been inventoried for cultural resources, and no resources have been located. However, 28 acres lie within high or medium probability areas, where inadvertent discovery of cultural resources is possible.

MA 4 (Bubba). Impacts to cultural resources in MA 4 are unlikely. A complete survey of the MA (consisting of regularly-spaced pedestrian transects and shovel probes) recorded three archaeological isolates that are not eligible for the NRHP. This MA lies completely within an area with a low probability for archaeological sites, so that the likelihood of finding additional resources is low.

MA 5 (Alexander). Impacts to cultural resources in MA 5 are unlikely. All acreage in this MA has been surveyed for cultural resources using regularly-spaced pedestrian transect intervals and shovel probes; no resources have been identified. Furthermore, this MA is completely within an area that is considered to have a low probability for cultural resources.

MA 6 (Ramsey). Impacts to cultural resources in MA 6 are unlikely. During survey of all acreage in this MA, using regularly-spaced transects and shovel probes, no cultural resources were identified, and all acreage is in areas with low probability for archaeological resources.

5.8.2 No Action Alternative

Impacts to cultural resources are not expected under the No Action Alternative. Training would continue with tactics applicable to the 8-inch howitzer battery. Cultural resources would continue to be managed in compliance with Federal law and Air Force regulations.

5.9 SOCIOECONOMICS

Impacts to socioeconomic resources would be associated with changes: (1) in expenditures made in the local economy by military personnel during training activities and by civilians visiting for hunting and outdoor recreational purposes; and (2) resulting from project-related effects on other revenue-generating programs (cattle grazing, seed harvesting, and forestry). Increased levels of military training activity at APAFR could result in beneficial impacts to surrounding communities through increased expenditures in support of these actions. Fewer visits to APAFR for hunting and recreation could, however, have adverse effects on expenditures in the same communities. A reduction in acreage devoted to cattle grazing and timber harvesting could affect the fiscal condition of these Air Force programs.

5.9.1 Preferred Alternative – Use of Any of Six Maneuver Areas

Deployment Activities

Total deployments at APAFR under the preferred alternative are forecast to total about 7,700 soldier/days per year. Training activity at APAFR is associated with weekend activities and annual activities. Although the number of personnel involved in weekend training activities would increase, compared to current authorized levels, the number of training events would decline, resulting in a slight reduction in usage. Annual training activities, however, would add just over 5,800 soldier/days. The overall result would be an increase in annual usage of the range by about 5,700 soldier/days. It is assumed that expenditures in support of the training activities for food, supplies, and fuel in the local economy average $10 per soldier/day (Highlands County EDC/IDA, 2001). Total direct expenditures in the local economy attributable to the increased usage of the range would amount to $57,700 per year. Indirect earnings associated with these direct expenditures could total $30,700 for workers whose jobs result from the economic multiplier effect. This would translate into about two full-time jobs. The multipliers used to derive the indirect earnings and employment estimates are from the *Avon Park Air Force Range Year 2000 Economic Impact Analysis* (Highlands County EDC/IDA, 2001).

Revenue-Generating Programs

It is possible that increased deployments at APAFR could reduce both the acreage devoted to cattle grazing, seed harvesting, and timber harvesting, as well as limit public access for hunting and recreation.

Grazing

The grazing program contains approximately 90,000 acres under active management. Under the Preferred Alternative, a total of just over 2,600 acres (or less than 3 percent) of this land would be contained within the maneuvering areas. Past training activities conducted at the range have not hindered cattle grazing activities and conditions are not expected to change under the Preferred Alternative, though it is possible that a small portion of current grazing land could become unavailable for cattle. Thus, negligible impacts, including a possible total annual revenue loss to the grazing program of approximately $3,280, are anticipated.

Seed Harvesting

In FY 2002, a total of 3,840 acres of seed were harvested for sale (2,823 acres of wiregrass and 1,017 acres of lopsided Indian grass). This acreage increased to 4,091 acres (3,414 acres of wiregrass and 677 acres of lopsided Indian grass) in FY 2003.

Assuming, from a worst-case perspective, that seed harvesting would not take place in maneuver areas, anywhere between about 10 percent and 20 percent of the acreage harvested in prior years would be lost. The loss of harvested area could result in lost sales and revenue to the Air Force of between about $2,000 and $4,000 annually (10 and 20 percent, respectively) of total annual program revenues of $20,000. This impact is considered negligible.

Forestry

There are approximately 15,000 acres of pine plantation under active forest management and an additional 22,000 acres of pine flatwoods. It is estimated that a total of about 1,280 acres of pine plantation would be included in the maneuvering areas. Assuming a worst-case scenario, this entire acreage could be removed from the forestry program. The fiscal impact to the APAFR Forestry Reserve Account would be a reduction in net revenues of almost $13,000 annually. It is probable, however, that forest management procedures can be adapted to minimize loss of productive timberland. However, almost 600 acres of pine plantation that would be contained in two of the maneuver areas have been clear-cut (MA 1 and MA 6). It is unlikely, with implementation of the Preferred Alternative, that this acreage would be replanted. This acreage could, therefore, be permanently lost to the forest program, resulting in an annual loss of just over $6,000 in revenues for the program. This impact is considered negligible

Recreation

Almost 2,620 acres comprising the proposed maneuvering areas would overlay parts of the recreation management areas within the range. This comprises just over 3 percent of the area open for recreation activities. Hunting and scouting for hunting locations account for over 60 percent of all stated recreational use by visitors to the range. For purposes of analysis, it is assumed that the number of persons visiting the range for recreation and hunting is directly related to the size of the area open to the public. Thus, if the area contained in the maneuvering areas is determined to be off-limits for visitors to the range, then it is assumed that the number of visitors will decline proportionately, as will the revenues accruing to the Air Force. With a reduction in this open area, fewer visitors are expected. A reduction of about 220 hunters and 175 outdoor recreationists (non-hunters) annually is expected to occur.

It is estimated (Highlands County EDC/IDA, 2001) that persons engaged in hunting on the APAFR spend an average of $80 per person per year in the local economy purchasing supplies, lodging, and food. An annual total of about 6,850 hunters would have estimated direct expenditures of $547,400 annually. The indirect earnings effect (using a multiplier of 1.3131) is estimated to be $718,700 annually. Decreased access could reduce direct-effect spending by hunters in the local economy by approximately $17,700 annually. This reduction in direct expenditures would also decrease earning of persons in the surrounding communities by about $23,250 annually. This reduction in earnings is the equivalent of about one full-time job.

Persons engaged in outdoor recreation (other than hunting and scouting for hunting locations) on the APAFR number about 5,300. It is estimated that these visitors spend $100 per person per year in the local economy for a direct effect of $534,000 annually. The additional indirect earnings effect would total $701,200 annually (Highlands County EDC/IDA, 2001). Decreased access could reduce direct-effect spending by such persons in the local economy by approximately $17,300 annually. This reduction in direct expenditures would decrease earnings of persons in the surrounding communities by about $22,700 annually. This reduction in earnings is the equivalent of about one full-time job.

Community-based employment supported by the expenditures made in the local economy by hunters and persons engaged in other outdoor recreation activities would be reduced by about two full-time jobs. This impact is considered negligible.

5.9.2 No Action Alternative

Adoption of the No Action Alternative would not result in changes to environmental conditions as described in Chapter 4, Section 4.9.

5.10 ENVIRONMENTAL JUSTICE

CEQ's *Environmental Justice Guidance Under the National Environmental Policy Act* identifies factors that are to be considered to the extent practicable when determining whether environmental effects are disproportionately high and adverse. These factors include whether there is or will be an impact on the natural or physical environment that significantly (as employed by NEPA) and adversely affects a minority population, low-income population, or Indian tribe. Such effects may include ecological, cultural, human health, economic, or social impacts when those impacts are interrelated to impacts on the natural or physical environment. Other factors to be considered include whether health or environmental effects are significant (as employed by NEPA) and are or may be having an adverse impact on minority populations, low-income populations, or Indian tribes that appreciably exceeds or is likely to appreciably exceed those on the general population or other appropriate comparison group, and finally, whether these populations have been affected by cumulative or multiple exposures from environmental hazards.

The methodology for conducting the impact analysis for environmental justice included reviewing impact conclusions in Sections 5.1-5.9 for both the Preferred Alternative and the No Action Alternative. The following resources were included: airspace management; safety; noise; air quality; land use (including timber management, grazing and recreation); earth resources; water resources; biological resources; hazardous materials/waste; cultural resources; and socioeconomics. If the EA identified significant impacts or otherwise identified high and adverse impacts, an evaluation was conducted to determine if these impacts would disproportionately fall on minority populations or low-income populations.

Once impacts have been identified, the evaluation of disproportion for environmental justice includes a comparison between the percent of minority populations in the impacted area with the percent of minority populations in the general population. The same process is followed for low-income populations. If either or both percentages (minority and low-income) in the impact

area are appreciably greater than the general population, a disproportionate impact is identified and mitigations are considered. Mitigations identified in other sections of the EA are also reviewed to see the extent to which they would avoid or reduce the impacts. Those mitigations are also reviewed to determine whether additional mitigations are needed to specifically address impacts on minority populations and low-income populations.

In addition, to evaluate potential impacts to children, the alternatives are reviewed to determine if facilities or land uses specifically serving children (e.g., schools, daycare centers, and playgrounds) would be adversely affected or if there is any other reason to believe that effects to children would be adverse.

5.10.1 Preferred Alternative – Use of Any of Six Maneuver Areas

Impacts identified in sections 5.1-5.9 of the EA are briefly summarized below for each resource area, followed by an indication of whether further environmental justice analysis was required. If the EA did not identify an impact as significant and if the impact was not otherwise considered to be "high and adverse," no further environmental justice analysis was required. For any such impacts, the Preferred Alternative would not result in disproportionately high and adverse human health or environmental effects on minority populations and low-income populations.

One adverse impact created by the Preferred Alternative, reduction in public recreation access, was evaluated further to determine if disproportionate effects would result. Although no significant or high and adverse recreation impacts were identified, this analysis is provided because of public concern about recreation access on the range. The evaluation is described in the section called "Summary of Impacts for Which Further Environmental Justice Evaluation was Conducted."

Summary of Impacts Requiring No Further Environmental Justice Evaluation and for Which No Disproportionate Impacts on Minority Populations or Low-Income Populations Would Result

- Noise—Noise resulting from maneuvering is well below Noise Level II (65 to 75 L_{dn}), except within 100 feet of the MA boundary. No residences are located in this area.
- Air Quality—No regulatory thresholds would be exceeded.
- Earth Resources—Soils in MAs would be susceptible to compaction and rutting; impacts would be reduced through inspections and monitoring and repair of ruts on tank trails within reason.
- Water Resources—No impacts to groundwater or constructed features. The impacts to jurisdictional wetlands from cross-country travel would be avoided by providing the FLARNG with coordinates of sensitive resources and areas. Unnamed ponds in MAs 1, 4, and 6 may show a temporary increase in turbidity caused by sedimentation and erosion. Impacts would not affect the public in off-range areas.
- Biological Resources—Because of the presence of red-cockaded woodpecker habitat in two MAs (Bubba and Delta), consultation with U.S. Fish and Wildlife Service would likely be required prior to commencement of training. Impacts would not affect the public in off-range areas.

- Hazardous Materials/Waste—Graywater would be produced and disposed of during field operations. Use, disposal and spill management of POLs would occur. Three historic munitions burial sites exist underground in the south end of one MA (Bubba) that will require avoidance and demarcation. There would be no impacts to the public or off-range areas.
- Cultural Resources— No impacts to historic architectural or traditional resources. The six MAs would individually require archaeology surveys of 28-534 acres or more than 2,150 acres if required surveys were completed for all six MAs. There would be no impact to the public in off-range areas.
- Socioeconomics—Potential loss of employment associated with reduced public access would be small (up to 4 jobs), as would the increase in community-based employment associated with increased levels of expenditures (up to two jobs).
- Land Use/Off-Range Impacts and On-Range Timber Harvesting—Land use impacts to off-range areas would be minimal for several reasons. First, there is a low density of development in many areas adjacent to the range boundary. Also, noise impacts from the Preferred Alternative would be minimal, and no conflicts with local plans are anticipated. The six MAs individually contain 110-390 acres of timber for a total of more than 1,470 acres, a negligible impact if these areas were closed.

Summary of Impacts for Which Further Environmental Justice Evaluation Was Conducted

Land Use/Recreation—The project would result in periodic, temporary closures of a portion of the range to the public, as described in greater detail in Section 4.3. Depending on whether one or a combination of MAs are selected as locations for training, this would cause varying reductions in public use of the range for hunting and outdoor recreation. The six MAs individually contain 130-670 acres within recreation management units for a maximum of approximately 2,600 acres that could be designated as off-limits or temporarily closed to public recreation as a result of the Preferred Alternative, a reduction of about 3 percent from existing conditions, out of a total of approximately 82,000 acres. Other recreation sites are available in the region, such as Lake Kissimmee State Park and other parks, which would result in the recreation impact being minimal. Although no high and adverse recreation impacts were identified, because of public concern about recreation access, some analysis is provided of minority and low-income populations in the areas where the majority of recreation users are reported to reside. As stated above, hunting is the most popular recreation pursuit conducted on the range. In addition, no recreation facilities that specifically cater to children are anticipated to be adversely affected. For this reason, recreation impacts on children are expected to be minimal.

Hunting is the most popular recreation pursuit conducted on the range. Hunting comprised over 50 percent of recreational activity choices reported at APAFR from August 2002 through July 2003. Fifty percent of APAFR hunting permits issued in 2002 went to persons in the three-digit ZIP code area 338, an area encompassing Avon Park and the surrounding areas within Polk, Highlands, and Hardee Counties. Approximately 18 other wildlife management areas are available in the region for hunting, which would result in the hunting impact being minimal.

Although comparable ZIP code data are not reported for other types of recreation users at the range (such as for camping and fishing), it is anticipated that most other recreation users would

come from the six-county area closest to APAFR (DeSoto, Hardee, Highlands, Okeechobee, Osceola, and Polk Counties), as would most of the remaining hunting permits. Assuming that persons residing in ZIP code area 338 would, therefore, experience most of the recreation impacts of the project with the larger six-county area being affected to a lesser degree, population data for these two areas were compared to determine whether ZIP code area 338 appreciably exceeds the percentage of minorities and low-income populations in the six-county area.

In ZIP code area 338, approximately 25.8 percent of the population was minority and 13.8 percent reported an income below the poverty level. By comparison, the six-county area was 29.5 percent minority and 13.8 percent low-income. ZIP code area 338 does not contain an appreciably higher percentage of minority or low-income populations than the surrounding region. There would not be disproportionately high and adverse recreation impacts on minority populations and low-income populations from the Preferred Alternative.

5.10.2 No Action Alternative

Under the No Action Alternative, the 3-116th would continue to train with the MLRS at APAFR at the battery level using tactics similar to the 8-inch howitzer battery. Other proposed changes in training activities and areas would not be implemented to meet the current needs. Implementation of the No Action Alternative would not avoid any disproportionately high and adverse human health and environmental effects on minority populations and low-income populations or any adverse effects on children because none would occur as a result of the Preferred Alternative.

5.11 MITIGATION MEASURES

No mitigation measures will be necessary to reduce any adverse environmental impacts to below significant levels because of the management actions identified as part of the Proposed Action in Section 3.3.1.

6. CUMULATIVE EFFECTS AND IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The Council on Environmental Quality (CEQ) regulations (40 CFR 1508.7) define cumulative effects analysis as "the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions."

Cumulative effects may occur when there is a relationship between the Proposed Action and other actions expected to occur in a similar location or during a similar time period. Actions overlapping with or in proximity to the Proposed Action can reasonably be expected to have more potential for cumulative effects on "shared resources" than actions that may be geographically separated. Similarly, actions that coincide temporarily will tend to offer a higher potential for cumulative effects.

In this EA, an effort has been made to identify all actions that are being considered on APAFR and that are in the planning stage at this time. These actions are included in the cumulative analysis to the extent that details regarding such actions exist and the actions have a potential to interact with the Proposed Action in this EA. Although the level of detail available for future actions varies, this approach provides the decision maker with the most current information to evaluate the consequences of the Proposed Action.

6.1 PAST AND PRESENT ACTIONS RELEVANT TO THE PROPOSED ACTION AND ALTERNATIVES

Known past and present actions potentially resulting in cumulative effects include military and civilian activities at APAFR. Each of these is described below.

6.1.1 Federal Activities

Since it was established as a military installation in 1942, APAFR has undergone a number of changes, based on use and disuse. It was used heavily during WWII, again in the early 1960s during the Vietnam War, and during the 1980s for aircrew bombing and gunnery training. Its mission was greatly reduced between those periods.

More recently, in the early 1990s, the Base Realignment and Closure Commission (BRAC) recommended that MacDill AFB cease all flight operations by September 1993. In addition, four squadrons from Homestead AFB were deactivated because of the loss of Homestead AFB from Hurricane Andrew. These events resulted in a dramatic decline in aircrew training from a high of about 25,000 aircraft per year and 330 active duty military personnel to about 8,000 aircraft operations and less than 100 civilian personnel today. Utilization of the Bravo/Foxtrot and Charlie/Echo ordnance impact areas has dropped to about a 27 percent level (Beers, 2003).

Another change over time has been from the use of live ordnance to predominantly inert ordnance. During World War II (WWII), the types of bombs used ranged from small 15-pound

practice charges to 2,000-pound demolition bombs loaded with 0.5 ton of high explosive material (U.S. Air Force, 1997). During the 1960s, the majority of the munitions used were practice bombs filled with sand (USACE, 1999). Today, the predominant type of bomb used is the inert BDU-33.

Concurrent with the decline in air-to-ground operations was an increase in the use of ground training by the FLARNG, beginning in 1984. The FLARNG currently trains artillery, mortar, and the MLRS units at APAFR. During Annual Training, the MLRS fires Reduced Range Practice Rockets (RRPRs) from established firing points into the Artillery Impact Area located on the Bravo Impact Area over a 72-hour period. This activity was previously assessed and approved in the *Final Environmental Assessment For The Conversion Of The 8-Inch Howitzer Weapon System To The Multiple Launch Rocket System In The Florida Army National Guard 3rd Battalion, 116th Field Artillery* (FLARNG, 1996).

During 7–13 May 2005, APAFR hosted a Joint Integrated Fires Exercise (JIFE), which included advanced and mid-level training exercises for Tactical Air Controller Parties (TACPs) and Forward Observers (FOs) in the delivery of ordnance from aircraft, ground artillery, and mortars. The training occurred at existing firing and mortar points and from new mortar points. A detailed description of the activities performed is found in the Environmental Assessment for the Joint Integrated Fire Exercise at Avon Park Air Force Range, Florida (U.S. Air Force, 2005a). As part of the exercise, Reduced Range Practice Rockets were fired from Old Bravo on the western side of Alpha Range and from Oscar Range into the existing high explosive area in the North Conventional Range and an expanded HE area in the South Tactical Range. The RRPRs were launched from six-rubber-tired launchers called High-Mobility Artillery Rocket Systems, or HIMARS, which is are wheeled vehicles that launch the same type of rockets as the MLRS. Mortars (81-mm and 120-mm) were fired into both the North Conventional and South Tactical Ranges from existing and new FPs. Sixteen fixed-wing aircraft, including A-10s, AC-130s, F-15Es, F-16s, and B-2s, and 12 rotary aircraft (AH-1W and UN-1N) participated in the exercise, delivering ordnance to existing targets on both the North Conventional and South Tactical Ranges. There were approximately 35 TACP and FO personnel involved in the exercise and a number of support vehicles.

There were no significant impacts identified in the EA for the JIFE (U.S. Air Force, 2005). The EA evaluated cumulative impacts associated with the JIFE and this proposed action and did not identify any cumulative impacts. Environmental Observations of JIFE exercise prepared by the Air Force (U.S. Air Force, 2005b) identified short-term increases in noise, and in one case, a sonic boom resulted from the firing of the RRPR. Soil rutting from the HIMARS was slight in dry soils and increased with the wetness of the soils. There was some scorched vegetation near the HIMARs launch area, but the fire did not spread. There were some rocket craters, which were likely from the 2.75-inch inert rockets fired from aircraft (U.S. Air Force, 2005b) and some mild ground disturbance at the mortar set-up locations. There were small (104- and 63-acre) fires in both impact areas, which were believed to have been caused by the 2.75-inch inert rockets. Access to the range was closed during the exercise and grazing was not allowed in either of the range complexes during the exercise. These impacts were short-term, temporary, and minor.

The majority of employees at APAFR belong to the Environmental Flight, which is responsible for implementing the natural resources on the Range, in support of the military mission. They manage approximately 82,000 acres of vegetation, including pine flatwoods, swamps and marshes, hammocks, and scrub. Three endangered bird species nest in portions of APAFR, and the management of their habitat is guided by a plan agreed to by APAFR, the U.S. Fish and Wildlife Service, and the Florida Fish and Wildlife Conservation Commission. APAFR provides opportunities for public access and recreation, including hunting, fishing, camping, hiking, horseback riding, and nature watching. Approximately 90 percent of the area is leased for cattle grazing, and about 57 percent is used for forestry and timber production.

6.1.2 Non-Federal and Private Activities

The Avon Park Corrections Institute (AvPCI) and the Avon Park Youth Academy (APYA) are integrated elements in the cantonment area. The APYA is physically located on Highlands County property, and there is an independent common road network and utilities and general security for AvPCI, APYA, and APAFR. The Florida Department of Corrections provides security at the front gate to the joint cantonment area, and the APAFR airfield fire department is the first responder to emergencies at the correctional institution. Both share common logistical challenges to provide drinking water, sewage sanitation, and other utilities at this relatively remote location.

With a reduced military utilization in the last decade, APAFR decision makers have allowed other low impact activities. Of note is the South Florida Community College (SFCC) Criminal Justice Academy. The SFCC operates the only certified Criminal Justice Training Center in the region. It relies on the APAFR airfield to conduct offensive driving and uses APAFR ranges for land navigation and sniper training. Without APAFR facilities, conducting the basic and special police academy courses that are currently offered would become too costly.

The River Ranch Estates and Indian Lakes Estates are the only large-scale development on the APAFR boundaries. As currently planned, the low-density residential land use is compatible with the neighboring military mission.

6.2 REASONABLY FORESEEABLE ACTIONS THAT INTERACT WITH THE PROPOSED ACTION

This category includes foreseeable or Proposed Actions that have a potential to coincide, either partially in time or geographic extent, with the Proposed Action. The following foreseeable actions will be analyzed under subsequent NEPA documents.

- Increased Altitudes of Airspace Supporting Avon Park Air Force Range
- Construction and Operation of Remoted Target Systems at Avon Park Air Force Range, Florida
- FLARNG desire to add and expand artillery ranges
- 18th Air Support Operation Group, Avon Park Air-Ground Training Complex

- Navy proposal for intermediate and advanced training using live fire at APAFR
- Kissimmee River Restoration

6.2.1 Increased Altitudes of Airspace Supporting Avon Park Air Force Range

The proposed U.S. Air Force action would vertically increase the existing Restricted Area (RA) airspace that is over or adjacent to APAFR. The vertical increase is from 18,000 feet above mean sea level (MSL), or stated as flight level 180 (FL 180), to and including 40,000 feet above mean sea level (MSL) or stated as flight level 400 (FL 400). In airspace reconfiguration, the RA would absorb about one-third of the vertical extent of Military Operation Areas (MOAs) airspace and Class A Air Traffic Control Assigned Airspace (ATCAA) over or adjacent to APAFR.

6.2.2 Construction and Operation of Remoted Target Systems at APAFR

Under the Proposed Action, two types of remoted target systems (RETS) that support helicopter door gunnery training and ground-to-ground machine gun training on Oscar Range would be constructed. The first target is a vehicle silhouette mounted on a cart that traverses along a rail system, called an armored moving target carrier. The second target is a set of 10 stationary pop-up silhouettes or three-dimensional targets, called stationary infantry targets, which simulate attacking infantry. Construction entails bringing in road base material for the rail system and relocating sand from the strafe pad to form a berm for both RETS. Construction includes building retaining walls, a rail line, placing an electric cart on the line, building a blockhouse for storage, and building a small parking area.

6.2.3 Florida Army National Guard Desire to Add and Expand Artillery and Firearms Training at APAFR

The FLARNG is proposing to increase their firearms training facilities at APAFR. In December 2002, the FLARNG conducted a second site reconnaissance at APAFR to discuss this possibility. The FLARNG proposal includes three different initiatives.

1. The FLARNG proposes to create an automated record fire range for M16 and squad automatic weapon qualifications and training. The proposal would include the use of the existing 25-meter small arms range and the OQ impact area.
2. The FLARNG proposes to develop a multipurpose machinegun range and sniper field fire range. The machine gun and overlaid sniper range would include up to 7.62 mm with the fire point located on Oscar Impact and firing into OQ impact area. Up to .50-caliber ammunition would be used for the training with the firing location on OQ and firing into OQ impact area.
3. The FLARNG proposes to use the MK19 40-mm Grenade Machine Gun for training on Bravo Impact. Both inert and HE grenades would be used to engage hard targets. The location for the HE training would be overlaid on the M203 HE range. The M203 is a 40-mm Grenade Launcher that is attached to an M16A2 5.56-mm rifle.

6.2.4 U.S. Air Force 18th Air Support Operation Group, Avon Park Air-Ground Training Complex (AAGTC)

As a part of the 18th Air Support Operation Group, Pope AFB, North Carolina, APAFR is expected to become an air-ground training complex that enables realistic joint, interagency, and multinational war fighting that focuses on Combat Search and Rescue (CSAR) and Close Air Support (CAS) training.

Close air support mission requires a one-on-one relationship between the delivery platform aircraft and the CAS team, specifically the terminal air controller who operates on foot to employ weapons in close proximity to friendly forces. Producing this relationship in a timely and efficient manner requires a complex command and control network.

On ground CAS teams are generally a group of a few individuals hidden somewhere near the combat front with whichever unit they have been tasked to support. When the on-ground commander of the front unit makes a request for CAS, planners at the tactical operations center prioritize targets. Planners at the tactical operations center let the CAS team know what type of aircraft platform and ordnance is available. The team then requests the right combination of firepower to eliminate the ground target without causing casualties to nearby friendly ground forces.

Once an aircraft is assigned to the target, the team ensures the troops on the ground do not mistake the incoming aircraft as hostile and try to shoot it down. As described above, this type of exercise is expected to occur on the Echo impact area of APAFR.

CSAR involves military personnel practicing escape and evasion techniques that usually involve aerial pickup by helicopters under simulated combat conditions and could involve the use of other vehicles such as All Terrain Vehicles (ATVs). Like CAS training, it requires a thorough understanding of joint and service operating procedures and communication requirements.

6.2.5 Navy Proposal for Intermediate and Advanced Training Using Live-Fire at APAFR

The Navy is proposing to use APAFR for intermediate and advanced training of carrier battle groups off the Atlantic and Gulf of Mexico. The training and subsequent EOD clean-up would occur during a typical year for up to 60 days per year and up to 120 days per year at a maximum use. This training would occur during three (typical) to six (maximum) separate exercises. These phases of training include air-to-ground delivery of HE ordnance. Mission activities would include the following.

- Integrate Strike (includes use of HE)
- Close Air Support (includes use of HE)
- Combat Search-and-Rescue
- Unit-Level Bombing (includes use of HE)
- Helicopter Unit Terrain Following
- Helicopter Unit Air-to-Ground Training

Delivery of non-explosive ordnance would occur on any of the targets on Bravo, Foxtrot, Charlie, or Echo impact areas. Strafing events would occur at existing strafing area. Helicopters would fire .50-caliber, 7.62-mm, and 5.56-mm rounds at any targets in the two helicopter free-fire zones, one on Echo and one on Foxtrot impact areas. The Navy would use chaff, flares, and Electronic Warfare emitter sites as part of the training. The alternatives proposed for live bombs include combinations of the use of three existing impact areas: Foxtrot, Alpha, and Echo and the expansion of the Alpha impact area to the north.

6.2.6 Kissimmee River Restoration Project

This project is intended to restore the essential physical and hydrological characteristics of the Lower Kissimmee River Basin, including a more natural river channel and floodplain, with flows, depths, and hydroperiods like that of the historic condition. It is expected that restoration would provide the conditions necessary for natural reestablishment of an ecosystem similar to that which existed and functioned prior to channelization and flood control construction. Part of the overall restoration project lies adjacent to the eastern boundary of APAFR. Here, the project calls for the shallowing and partial backfilling of the canalization of the river that occurred during the 1960s. Flow through marsh areas both east and west of the river in the area of APAFR would be created.

6.3 ANALYSIS OF CUMULATIVE IMPACTS

6.3.1 Airspace

There is a proposal to increase the altitude of airspace supporting APAFR (see Section 6.2.1). However, since the Proposed Action does not impact airspace, there would be no cumulative impacts to airspace associated with this proposal.

6.3.2 Safety

Based on an operational risk management analysis, none of the identified alternatives for the Navy's proposed use of live ordnance would impact any of the FLARNG's proposed MAs, except during the actual delivery of the ordnance. During the Navy exercises, the entire APAFR would likely be closed to other users for safety reasons.

6.3.3 Noise

There are several reasonably foreseeable future actions that could have the potential to create cumulative noise impacts on APAFR.

There is a proposal to construct improved facilities on the range (see Section 6.2.2). Construction-generated noise could result from the use of heavy earth-moving equipment, and the equipment and activities involved in the construction process itself. However, construction-related noise is normally confined to the immediate construction area, is temporary and intermittent, occurs during the day, and ceases at the end of the construction period. No long-term impacts to noise would be expected from these operations.

The FLARNG is proposing to expand firearms training on the range, which would be limited to daytime exercises (see Section 6.2.3). Also, the U.S. Navy is proposing to use APAFR to support the expenditure of live high explosive air-to-ground ordnance, with most (88 percent) exercises occurring during the day (see Section 6.2.5). Noise resulting from these activities is impulsive noise, which has different characteristics than the noise assessed for the FLARNG maneuvering. Impulsive noise is measured on a C-weighted scale, as opposed to the assessment of the noise associated with MLRS maneuver training, which uses an A-weighted scale. Under both proposals, activities would be intermittent, and only occur infrequently throughout the year. There is insufficient information currently available to quantitatively evaluate the FLARNG's artillery proposal. Preliminary assessment of the Navy's proposal is underway, and operational constraints have been developed to ensure that significantly elevated noise levels are confined to APAFR during the conduct of the live-fire exercise, thus minimizing overall noise impacts. Another consideration in adding together the C-weighted noise is that there would be no other users allowed on APAFR during the Navy live-fire exercises. Therefore, the noise events associated with other users and the Navy live ordnance would not be additive. Cumulative noise associated with the MLRS maneuvering was estimated using A-weighted metrics. However, the closest proposed MA to the airfield where the firing point is located is about 1.5 miles. At these distances, there would be no additive effect. The combined noise levels would be well below Noise Zone II (65 to 75 L_{dn}).

In May 2005, APAFR supported a Joint Integrated Fires Exercise, or JIFE. This exercise lasted approximately one week, and included delivery of ordnance from fixed- and rotary-wing aircraft, ground artillery, and mortars, which are standard activities conducted on APAFR. It is reasonably foreseeable that this, or a similar exercise could be repeated in the future. The conduct of the JIFE was environmentally assessed, and no significant impacts were identified. The assessment of the JIFE identified short-term and isolated increases in noise. However, all identified noise increases were short-term, temporary, and minor. No sustained or notable cumulative effects would be expected to result from a reoccurrence of this exercise

Overall, there is likely to be an increase in noise if all the activities are conducted. There is likely to be annoyance to local residents and to inmates and employees of the State Prison. Nevertheless, APAFR is an air-to-ground gunnery range. Elevated noise levels are fully compatible with this land use. The Air Force would continue to monitor noise and manage the noise environment.

6.3.4 Air Quality

Three activities could potentially affect air quality; however, significant adverse impacts are not anticipated as a result of implementation of these actions.

Construction activities associated with the Remoted Target Systems Proposed Action (see Section 6.2.2) could increase emissions, but the increase would be minimal and short-term in nature.

The AAGTC exercises emphasizing both CAS and CSAR activities (see Section 6.2.4) would possibly increase mobile emissions, but it is anticipated that these increases would be negligible because of the limited number of exercises.

The Navy proposal for intermediate and advanced training using live-fire at APAFR would increase emissions. The combined annual emissions from the MLRS Maneuvering and the Navy alternatives (using the maximum usage) are shown in Table 6-1 (U.S. Navy, 2004). This table indicates that the MLRS contributions to combustive emissions are higher than those generated during the proposed Navy exercise, with the exception of PM_{10}. However, combined emissions are all less than 1 percent of the total for Polk and Highlands Counties.

Table 6-1. Annual Combustive Emissions Estimate in Tons

Activity	NO_x	CO	VOC	SO_2	PM_{10}
MLRS Maneuvering	190	290	33	19	33
Navy Alternatives (maximum use)	2.9	2	0.3	0.04	61
Total	**193**	**292**	**33**	**19**	**94**

6.3.5 Land Use

The noise generated from maneuvering by the MLRS battalion would not contribute significantly to the overall noise environment because other actions, such as air operations, are so much louder (greater than 10 dB). Noise levels would be less than 65 dBA from maneuvering and are compatible with adjacent land uses off APAFR. Therefore, there would be no cumulative impacts associated with noise and compatible land use.

During MLRS training, APAFR would only have to close or restrict the range to air-to-ground training if the aircraft weapons footprint would potentially affect the MLRS training. APAFR would also restrict or prohibit aircraft lasing operations. Most footprints of aircraft training munitions currently used and planned for use (such as BDU, MK series bombs) would not affect MLRS training, so most likely no restrictions would be required (Walden, 2004).

During MLRS training, the range would be closed to other ground training only if it would potentially affect the MLRS training. This would likely be handled through advanced scheduling. Because the FLARNG schedules several months in advance of their requirement, there should be no impact to other missions. It is anticipated that use of the proposed grenade machine gun by the FLARNG (see Section 6.2.3) would not occur during the firing of the RRPR by the MLRS, because both units would be firing into the Bravo impact area. These activities would be scheduled in advance to avoid any potential conflicts.

Some portions or all of the range may be closed to the public and support programs, depending on how many maneuver areas are being used and what type of training (section, platoon, annual, and so forth) is occurring.

The composite Weapon Safety Footprint (WSF) for the proposed RETS lies primarily northwest of the Oscar Range. It is expected that the helicopter gunnery training would occur two days per week. Ground-to-ground training would also occur at the RETS. The Army would be expected to use the facility one day per month for six to eight hours per day, with 75 percent of the use on the weekend. During RETS training, other military and civilian use of the area inside the WSF (the hazard area) would be precluded. During RETS training, management unit 13 would be temporarily closed to the public.

These access restrictions would be combined with the restrictions imposed by the FLARNG action and other current and foreseeable actions discussed in this section. The availability of public access and access to areas of the range for natural resources management activities would be impacted by the combined short-term closures to areas of the ranges. No long-term closures to areas of the range would be expected as a result of the RETS action.

Ground safety fans would have to be prepared for the Army's proposal for expanded artillery training at APAFR. This proposal is in the planning stages and has not been analyzed for potential environmental impacts. However, the proposal is limited to the use of the OQ Range, which is used for similar types of training. Based on the orientation of the proposed artillery range, it does not appear at this time that any of the proposed MAs would need to be closed. The MLRS unit of the FLARNG would have to verify that the safety fans would not include any of the proposed MAs. The ground area covered by the artillery safety fans would likely result in public and APAFR staff access restrictions during training exercises. These short-term restrictions would be combined with the restrictions imposed by the proposed FLARNG MLRS action and other current and foreseeable actions discussed in this section. The availability of public access and access to areas of the range would be impacted by the combined short-term closures to areas of the ranges. No long-term closures to areas of the range would be expected as a result of this FLARNG action.

This proposed AAGTC action has not yet been analyzed for potential environmental impacts. It would be expected to result in negligible impacts individually or cumulatively. These actions are similar to what is already occurring in the area. There are no MAs proposed for use near the Echo Range, so this action is not expected to cause cumulative effects.

The Navy evaluated the potential risks to military, civilian, and public activities on APAFR caused by the WSFs associated with the use of live bombs. During a Navy mission, no one would be allowed in the WSF (or hazard area) associated with the use of live bombs. Subsequent to the mission, portions of the WSF would remain off-limits to the public because of the potential for unexploded ordnance (UXO). None of the FLARNG's proposed MAs are within the off-limits areas proposed by the Navy and APAFR. Depending on the Navy alternative selected, the FLARNG would need to relocate up to nine existing artillery firing points, one MLRS firing point, four MLRS maneuver points, and one mortar point in the area surrounding the Alpha impact area (see Figure 1-2).

Long-term, the Navy proposal would reduce the areas available to the public as shown in Table 6-2.

Table 6-2. Acres Impacted by Closing Areas of the Range to Timber, Grazing, and Recreational Use (Excluding Impact Areas) Based on Navy Alternatives

Use	Navy Proposed Alternatives[1]						
	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	No Action
Timber	5,160	4,223	2,993	3,274	1,107	2,388	0
Grazing	17,268	13,369	9,017	12,969	4,717	7,641	0
Recreation	10,360	8,342	4,215	8,999	2,855	4,561	0

[1]Alt. 1 includes use of Foxtrot, Alpha, and Echo Impact Areas; Alt. 2 includes Foxtrot and Echo; Alt. 3 includes Foxtrot and Alpha; Alt 4 includes Echo and Alpha; Alt. 5 includes Alpha only; and Alt. 6 includes Alpha and the area north of Alpha.
From: U.S. Navy, 2004

A summary of potential cumulative closures is shown in Table 6-3.

Table 6-3. Potential Annual Closures of APAFR Associated With Training Proposals

Activity	Annual Days of Closure	Area closed to public[1]
Navy Training (Section 6.2.5)	60 typical; 120 maximum	Entire Range
RETS (Section 6.2.2)	12	Management Unit (MU) 13
FLARNG Artillery Proposal (Section 6.2.3)	24 maximum (1 weekend per month for 2 days)	MU 13
MLRS Maneuvering	14[2]	Entire Range
MLRS RRPR training	3	MUs 3, 3A, 4, and 16
Total Cumulative Closures	74	Entire Range
	96	MU 13
	3	MUs 3, 3A, 4, and 16

[1]See Figure 4-6
[2]Assumed that the entire range would be closed during platoon certification (4 days/year) and annual training (10 days/year in field).

There would be no cumulative effects to the grazing program as the FLARNG MLRS maneuvering proposal would not impact cattle grazing, though it is possible that a small portion of current grazing land would become unavailable for cattle, resulting in a potential annual loss of grazing lease revenue of approximately $3,280, which is negligible.

It is likely that the forestry management practices in the proposed MAs would change to accommodate the FLARNG mission. Rather than clear cutting, trees would be selectively thinned to provide areas for hiding. Areas that had been recently clear cut, such as MA 1 and MA 6 may not be replanted totally because of the potential damage that would be caused by the MLRS vehicles to immature trees. In these MAs, the APAFR forestry program may re-plant only portions of the area that would not interfere with the MLRS training. If it would not be possible to replant MAs 1 and 6 at all, then the APAFR forestry management program would lose approximately 631 acres or approximately 4 percent of its managed forests. This loss combined with the long-term loss of 3,533 acres caused by the Navy's proposal would result in a total of 4,164 acres or about 28 percent of the intensively managed pine plantation.

Any impacts from the Kissimmee River Project would largely be limited to the areas immediately adjacent to the River. As there are no MAs proposed near the lower portion of the Kissimmee River, no cumulative impacts are anticipated from this project.

6.3.6 Earth Resources

Of the military missions identified as potentially occurring in the near future (Section 6.2), ground training activities associated with the 18th Air Support Operation Group, the AAGTC could cumulatively affect soil resource physical conditions through ground troop movements.

Research has shown that soil compaction by foot traffic increases root exposure and soil erosion while decreasing soil infiltration rate, root penetration and growth, soil moisture content, thickness of the soil A horizon, depth of the litter layer, and vegetative cover. Typically foot traffic induced soil compaction requires repetitious trampling to produce adverse effects

(USACE, 1999). It is anticipated, that ground troop movements within the proposed MAs would not have an adverse cumulative effect on soil compaction even in areas where MLRS impacts have occurred.

Land use issues of concern to soil resources include cattle grazing and silviculture. By the nature of these land uses, some portions of the APAFR have already experienced a degree of soil disturbance from grazing and timber harvest. The overlap of soil disturbance compaction and rutting potentials associated with the proposed MLRS training could create localized areas with a greater susceptibility to soil damage than what would be expected from this analysis alone.

For grazing areas, soil compaction would likely be localized to feeding and watering locations within grazing paddocks and gate areas that concentrate cattle. The type and extent of soil damage created by grazing is highly variable and generally depends on local landscape conditions and management practices. The concentration of cattle around watering troughs has been reported to reduce soil infiltration rates (Sigua, 2003). A study by Broersma et al. (2000) evaluated the effects of grazing on improved pasture soil properties. Stocking rates of 0.69 AUM/ha (animal unit month per hectare) were not sufficient to produce significant changes in soil bulk density; however, pastures grazed for eight years had 6 percent higher soil bulk densities than ungrazed pastures. No effects to grazed pasture water infiltration rates were observed. Generally the effects of trampling appear to be less severe on grassland pastures than on bare soil (Sigua, 2003).

Soil deformation from cattle hoof rutting would also be localized to these areas of animal concentration. The cumulative effect from the proposed MLRS vehicle trafficking in proposed maneuver area locations that have experienced soil disturbance from grazing activities may have a higher degree of soil disturbance susceptibility than what has been estimated for just the proposed mission activities.

Of additional concern to soil disturbance cumulative effects is existing and future silviculture operations within the proposed maneuver areas. As has been previously discussed, soil compaction and rutting associated with the operation of heavy timber harvest and site preparation equipment can result in soil damage, particularly in areas with wet soil conditions as typifies much of the APAFR.

There is also the potential for reduced plant productivity that generally accompanies significant soil disturbances to affect sensitive species habitats, pine timber seedling regeneration and growth, and hunting. Cumulative effects on these resources would primarily occur as a result of extensive soil resource damage over relatively large areas. However, for issues where species viability may be directly linked to a relatively small habitat niche, as is the case for some sensitive plant and animal species, effects could have greater significance.

Areas that suffer extensive soil disturbance may also present opportunities for the establishment of highly competitive exotic species within native habitat areas. Vehicles, such as those that would be used during proposed MLRS training activities, have been identified as vectors that effectively transport and introduce exotic species (nonnative, invasive species) into natural areas. These invasive species may overwhelm, out-compete, and in some instances displace existing

vegetation and form potentially expansive monocultures of a single species. Dominance of single species generally degrades overall ecosystem biodiversity and habitat value.

6.3.7 Water Resources

Although cumulative actions at APAFR continue to encroach upon wetland areas, the management actions incorporated into the Proposed Action are designed to ensure no net loss of wetlands.

With the Kissimmee River Restoration Project (Section 6.2.6), there would be an increase in wetland areas along the southeastern boundary of APAFR caused by the restoration to historic physical and hydrological conditions. This would result in a net increase of an undetermined amount of wetlands over time.

6.3.8 Biological Resources

Concentrated vehicular traffic may locally damage vegetation, cause a shift in species composition (FLARNG, 1996), and cause soil compaction. Long-term repeated damage or removal of vegetation, which could result from frequent, intense use of the same MA during the year, may cause wildlife habitat degradation and allow the establishment of non-native weed species. Habitat degradation could potentially cause the reduction of wildlife species and displacement. Small mammals, reptiles and amphibians would be susceptible to direct impacts from vehicular traffic. Tracked vehicles may directly injure or kill small animals, or indirectly injure, kill or displace them as a result of collapsing burrows in which they live, or destroy their nests and eggs in the ground. The eastern indigo snake, federally listed as threatened, occurs throughout APAFR and is often associated with gopher tortoise burrows. This species may be affected by tracked vehicle use. Education and awareness practices performed by the FLARNG at APAFR would minimize potential impacts.

The construction of a remoted target system would disturb an area with several locations of an invasive species, cogon grass, potentially facilitating the spread of this species throughout the Oscar Range. Though no direct overlap of the Oscar Range with areas used in the proposed MAs occurs, the overall contribution to APAFR invasive species concerns from both actions represents a cumulative effect that would have to be dealt with through increased pesticide programs and other management approaches.

The creation of FLARNG ranges at the OQ Range for live small arms and grenade fire has no direct overlap with any of the MAs but could cumulatively add to invasive species concerns for APAFR in general. The 18th Air Support CSAR and CAS training would involve relatively little ground disturbance. No cumulative impacts with regards to protected species or invasive species are anticipated.

The Navy proposal for increased live bomb training may result in habitat degradation from live fire in the impact areas. HE use near protected species could cause shifts in preferred habitat, meaning a species may begin to utilize other areas. An example of a cumulative effect that could occur is that the shift in habitat use could cause them to move closer to an MLRS MA, increasing their risk of impact from the Proposed Action. Several locations and kinds of invasive species

occur on the ranges proposed for increased Navy training. The disturbances that result from Navy training could provide opportunities for invasive species to spread or become established in other areas, adding to overall APAFR invasive species concerns and management efforts.

The MLRS, JIFE and Navy Training actions were considered for their potential cumulative effect on threatened and endangered species. Biological assessments conducted for these training actions provided the determinations in Table 6-4 below. The Proposed Action would have potential adverse effects on one species, the indigo snake. Cumulative effects to this species may occur since other actions listed in the table were also determined to Likely Adversely Affect this species.

Observations of the JIFE (see Section 6.1.1) conducted in May 2005 included noise from sonic booms, ground disturbance from tracked vehicles and launchers, and wildfire. Tracked vehicles, which may affect the federally threatened indigo snake are an integral part of the Proposed Action as well as the JIFE. Tracked vehicles can directly affect the indigo snake or destroy habitat for this species. However, JIFE post-mission observations (see Section 6.1.1) did not report evidence of impacts to the indigo snake and the JIFE is not a recurring exercise. Thus, the potential for cumulative effects from the Proposed Action and the JIFE going forward is zero. There would be no cumulative impact to other protected species or their habitat from wildfire. Wildfire impacts, noted to occur from the JIFE, are not a concern for the Proposed Action. The Reduced Range Practice Rockets proposed for use typically expend their fuel before impact, minimizing the risk of fire.

Other than with indigo snakes, the Proposed Action has no other potential adverse effects in common with the JIFE and the increased live bomb Navy Training.

Table 6-4. Summary of T&E Species Effect Determinations for MLRS, JIFE, and Navy Training Actions at APAFR

<table>
<tr><th rowspan="2">ACTION</th><th colspan="13">Species</th></tr>
<tr><th>RCW</th><th>FGS</th><th>FSJ</th><th>Bald Eagle</th><th>Indigo Snake</th><th>Panther</th><th>Wood Stork</th><th>Caracara</th><th>Sand and Mole Skink</th><th>Tiger Beetle</th><th>Snail Kite</th><th>Pigeon wing</th><th>Hairy Jointweed</th></tr>
<tr><td>MLRS</td><td colspan="2">NLAA</td><td colspan="2">NE</td><td rowspan="3">LAA</td><td colspan="3">NE</td><td colspan="4" rowspan="3">NE</td><td colspan="2" rowspan="2">NE</td></tr>
<tr><td>JIFE</td><td colspan="3">LAA</td><td rowspan="2">NLAA</td><td colspan="3" rowspan="2">NLAA</td></tr>
<tr><td>Navy Training</td><td>NLAA</td><td>LAA</td><td colspan="2"></td><td colspan="2">LAA</td></tr>
</table>

NE = No Effect; NLAA = Not Likely to Adversely Affect; LAA = Likely to Adversely Affect; RCW = Red-cockaded Woodpecker; FGS = Florida Grasshopper Sparrow; FSJ = Florida Scrub Jay. **Bold** denotes affect requiring incidental take permit.

6.3.9 Hazardous Materials and Waste

Potential adverse impacts associated with hazardous materials and wastes are not anticipated as a result of implementation of any of the action Alternatives. Standard operation procedures with regard to vehicle fueling and maintenance and waste management in the field would minimize the potential for POL spills and gray water releases; target areas would be cleared of debris,

minimizing the potential for munition constituents to enter soils and groundwater; and ERP sites would be avoided. These management actions are typical for all present exercises at APAFR and would be implemented for other reasonably foreseeable future actions.

There are three ERP sites located within the boundaries of the proposed "Bubba" maneuver area (MA 4). Since ERP sites would not be selected as targets, there should be no recovery operations in or near active ERP sites; thus, no digging within ERP sites would occur. Should a RRPR stray into or near an ERP site, coordination with the APAFR Environmental Flight would be required prior to recovery. Additionally, the APAFR Environmental Flight should be notified of any unusual odors or soil discolorations during RRPR recovery.

No human health or environmental cumulative impacts from ordnance use associated with hazardous materials or waste are expected.

6.3.10 Cultural Resources

Cumulative impacts to cultural resources from military activities are not expected. The Proposed Action is expected to have limited adverse effects to cultural resources, which when combined with other military actions, is not likely to constitute a cumulative effect to cultural resources. Compliance with Section 106 of the NHPA, including SHPO and American Indian consultation, would be completed during the EA process. No NRHP-eligible cultural resources have been identified during survey of all six MAs, although consultation with the SHPO concerning these resources is ongoing. If, in the course of activities on these MAs, NRHP-eligible cultural resources were identified, these would be marked, identified on maps, and avoided by the MLRS units during training. No vehicles or bivouac sites would be permitted on or within NRHP-eligible sites, or within 200 feet of marked cemeteries or human burials. In the case of inadvertent discovery of cultural resources during the Proposed Action, FLARNG would initially follow the *Soldier's Field Card – A Guide to Protecting Natural and Cultural Resources, Avon Park Air Force Range, Florida* (FLARNG, no date). This requires the soldiers to report to the Environmental Flight any artifacts uncovered during training activities and to mark the location. To continue maneuver training in the discovery area, the FLARNG would comply with procedures identified in chapters 5 (Construction Monitoring Procedures) and 8 (Native American Concerns) of the APAFR Cultural Resources Management Plan (U.S. Air Force, 2003b). These avoidance procedures, compliance with Section 106 and the Cultural Resources Management Plan, and consultation with the Florida SHPO and American Indians will result in no cumulative effects to cultural resources.

6.3.11 Socioeconomics

To the extent that any of the projects would change the number of personnel assigned (temporarily or permanently) to the range, beneficial (increased personnel) or adverse (reduced personnel) impacts could be anticipated. None of the potential projects involve substantial changes in personnel assigned to the range and, thus, cumulative impacts to socioeconomic resources would be expected to be small and less than significant.

Should additional areas on the range be removed from active use or public access restricted because of the implementation of future projects, revenue-generating programs conducted at the

range could be adversely affected. The potential projects do not involve the imposition of significant additional restrictions on public access to the range. In the absence of such changes, cumulative impacts to socioeconomic resources would be less than significant.

6.3.12 Environmental Justice

The project would not create disproportionately high and adverse impacts on minority populations or low-income populations; therefore, there would be no environmental justice impacts. In cases where other training activities or military missions on the range reduce public recreation access (such as Navy Air-to-Ground Training), and especially hunting, there would be a cumulative reduction in public recreation use of the range. However, if this occurs, it would not be expected to result in disproportionately high and adverse impacts on minority and low-income populations given the existing demographics in the area.

For any potential cumulative reduction in recreation access, because it primarily relates to hunting as opposed to recreation facilities specifically used by children, cumulative recreation impacts to children are expected to be minimal.

6.4 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Irreversible and Irretrievable Commitment of Resources are related to the use of nonrenewable resources and the effects that the uses of these resources have on future generations. Irreversible effects result primarily from the use or destruction of a specific resource (such as energy or minerals) that cannot be replaced within a reasonable period of time. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (for example, extinction of a threatened or endangered species or the disturbance of a cultural site).

With the exception of cultural resources, resource commitments associated with the implementation of any of the Alternatives are neither irreversible nor irretrievable. The cultural resource impacts could involve potential disturbance to identified archaeological sites, resulting in the loss of integrity of these sites. For all MAs, compliance with Section 106 of the NHPA, including SHPO and American Indian consultation, would be completed during the EA process. As indicated in Section 6.3.10, all NRHP-eligible cultural resources would be marked, identified on maps, and avoided by the MLRS units during training. No vehicles or bivouac sites would be permitted on or within NRHP-eligible sites, or within 200 feet of marked cemeteries or human burials. In the case of inadvertent discovery of cultural resources during the Proposed Action, FLARNG would comply with procedures identified in the APAFR Cultural Resources Management Plan (U.S. Air Force, 2003b). In the event that a significant resource could not be avoided, mitigation measures involving recordation and data recovery would be developed, in consultation with the SHPO, to minimize the loss of these resources.

Most environmental consequences are short-term and temporary (such as air emissions from vehicles, noise during live fire, and so forth) or longer lasting but negligible (as in a change in land use). Training operations would involve consumption of nonrenewable resources, such as gasoline, used in vehicles. None of these activities would be expected to significantly decrease

the availability of the resources. Vehicle use would consume fuel, oil, and lubricants. The amount of these materials would increase slightly; however, this additional use is not expected to significantly decrease the availability of the resources.

7. CONCLUSIONS

The 3-116th Battalion needs up to four MAs where they can train all levels from Section up to Battalion according to Army doctrine in the MLRS for six weekends and one 15-day training event per year. Training doctrine requires that MLRS launch operators identify suitable firing points and hide points within a maneuver area. Currently, the 3-116th is limited to use of a single MA during a training event and must use only predetermined surveyed points and remain within a 100-foot radius of the maneuver point.

The Proposed Action to use up to six MAs at APAFR would have no significant adverse effects on any of the resources evaluated in this EA. There would be no impacts associated with hazardous waste/hazardous materials or cultural resources. Minor, temporary impacts on air quality, noise, land use, earth resources, and socioeconomics would result during the maneuvering exercises. Direct effects to wetlands would not occur due to management actions, which are part of the Proposed Action. Disturbance of vegetation and wildlife by training activities would occur at all MAs primarily from off-road vehicular traffic. Tracked vehicle use would occur only about 30 days (six weekends plus one two-week event) out of the year, providing some interval of opportunity for regeneration of damaged vegetative areas.

The eastern indigo snake may be adversely affected by tracked vehicle use within the MAs. However, measures would be taken by the FLARNG to avoid any long-term impacts to the population or their habitats. Periodic surveys of the MAs for gopher tortoise burrows, and subsequent relocation of the inhabitants, or alternately, marking the burrows as an area to be avoided during training, will minimize tracked-vehicle impacts. Vehicle speeds would remain under 25 miles per hour, slow enough to sight and evade indigo snakes on established roads and trails. Thus, while tracked vehicles may affect individuals at certain times of the year, this activity would not result in long-term, adverse impacts to populations of indigo snakes. Education and training awareness on how to identify and avoid indigo snakes is part of the current training at APAFR for FLARNG units. The Proposed Action is not likely to adversely affect the red-cockaded woodpecker or the Florida grasshopper sparrow and would have no effect on the Florida scrub jay. No federally listed plant species would be affected, including the pigeon wing and the hairy jointweed. There would be no effect to other federally or state-listed animal species.

Under the No Action Alternative, the FLARNG would continue to use the maneuver points at APAFR for battery training. They would not be able to identify fire points and hide locations as specified in the Army training doctrine for the MLRS. They would be required to travel to predetermined, surveyed fire points and to maneuver within 100 feet of these points. They would be restricted to a single MA during a training event. The 3-116th would not be able to achieve platoon or Battalion-level training at APAFR. There would be no significant adverse impacts on any of the resources evaluated in this EA.

Based on the findings of this EA, the Proposed Action of expanding the maneuver training to the proposed six MAs would not result in significant impacts to any natural, cultural, physical, or socioeconomic resource, and would be preferred over use of less than six of the MAs or the No Action Alternative.

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11. GLOSSARY

Adverse Effect – *(with respect to cultural resources)* Any action that may directly or indirectly alter the characteristics that make the property historic (and thus eligible for listing on the National Register).

Aquifer – A water-bearing rock formation.

Cantonment Area – The developed area or main base.

Cumulative Effects Analysis – The incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions.

Fugitive Dust – Dust generated during construction or by vehicles.

Hydrophytes (Hydrophytic Vegetation) – Vegetation that is specially adapted to flourish in soils that are predominantly saturated, or are partially, or completely submerged.

Hydric Soils – Soils characterized by a substrate that consists mainly of "a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (rooting zone)" (59 Federal Register 35680, 13 July 1994).

Impact Area – The area at military training sites into which munitions are fired.

Upland – Pertaining to higher parts of land that do not experience prolonged inundation.

Wetland – Pertaining to lower parts of land that experience prolonged inundation that create conditions for hydric soils and vegetation.

Wetland Hydrology – Evident by a substrate that is nonsoil and is saturated with water, or covered by shallow water at certain periods of the growing seasons of each year.

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APPENDIX A

MLRS ORGANIZATION AND EQUIPMENT

Table A-1. Battalion Table of Organization and Equipment

		HHSB	Firing Battery	Total
Number of Batteries		1	3	4
M270 Launcher (T)		0	6	18
M577 Command Vehicle (T)		3	3	12
M88 Recovery Vehicle (T)		1	1	4
HEMTT	Ammo (W)	0	12	36
	Wrecker (W)	0	1	3
	Tanker (W)	1	2	7
HEMAT (W)		1	12	37
HMMWV	Cargo (W)	21	7	42
	Ambulance (W)	1	0	1
2.5 Ton Cargo Truck (W)		9	3	18
5 Ton Cargo Truck (W)		0	1	3
Personnel	Officer	21	5	36
	Enlisted	95	86	353
Total Tracked	34		(T) = Tracked Vehicle	
Total Wheeled	147		(W) = Wheeled Vehicle	
Total Vehicles	181			
Total Officer	36			
Total Enlisted	353			
Total Personnel	389			

HHSB = Headquarters and Headquarters Service Battery; T = Tracked Vehicle; W = Wheeled Vehicle
HEMAT = Heavy Expanded-Mobility Ammunition Trailer

Table A-2. Headquarters and Headquarters Service Battery Table of Organization and Equipment

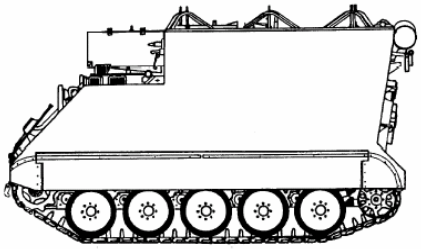
Units		M270	M88	M577	HEMTT			HEMAT	HMMWV		2.5 Ton	5 Ton	Personnel	
Type	Number				Ammo	Wrecker	Tanker		Cargo	Amb			Off	Enlist
Command Sec	1								3				10	2
Ammunition Mgt Sec	1								1				1	2
Operations Sec	1			1					1				2	6
Fire Direction Center	1			1					1				1	7
Intelligence Sec	1			1									1	3
Survey Sec	1								3				0	7
Liaison Sec	2								1				1	2
Battery HQ	1								1				1	2
Battery Supply Sec	1										1		0	2
S6 Sec	1								4				0	6
Automation Sec	1								1				0	3
Radio Sec	1								1				0	3
S-1 Sec	1										1		0	6
Unit Ministry Team	1								1				0	1
Treatment Team	1										1		1	3
Ambulance Team	1									1			0	2
Combat Medic Sec	1												0	6
BATTALION Supply Sec	1						1	1	1		1		1	8
Battery Maint Sec	1										1		0	6
BATTALION Maint Sec	1	1							1		3		1	17
Food Service Sec	1										1		0	5
Total		1	0	3	0		1	1	21	1	9	0	21	95
Total Tracked	4													
Total Wheeled	33													
Total Vehicles	37													
Total Officer	21													
Total Enlisted	95													
Total Personnel	116													

Table A-3. Firing Battery Table of Organization and Equipment

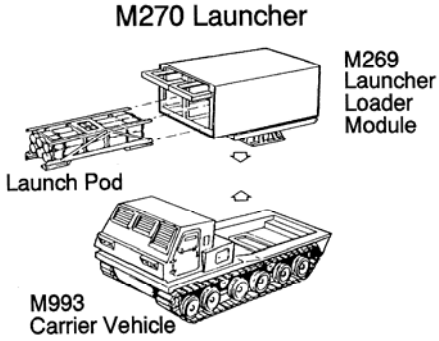
Units		M270	M577	HEMTT			HEMAT	HMMWV		M88	2.5 Ton	5 Ton	Personnel	
Type	Number			Ammo	Wrecker	Tanker		Cargo	Ambulance				Off	Enlist
Battery HQ	1							1					1	2
Battery Ops Center	1		1					1					1	9
Firing Plt HQ	2		1					2					1	6
Firing Sec	6	1											0	3
Support Plt Hq	1							1					1	2
Supply Section	1					2					1		0	6
Maint Sec	1				1					1	1	1	0	9
Ammunition Sec	2			6			6						0	12
Food Service Sec	1										1		0	4
Total		6	3	12	1	2	12	7	0	1	3	1	5	86
Total Tracked	10													
Total Wheeled	38													
Total Vehicles	48													
Total Officer	5													
Total Enlisted	86													
Total Personnel	91													

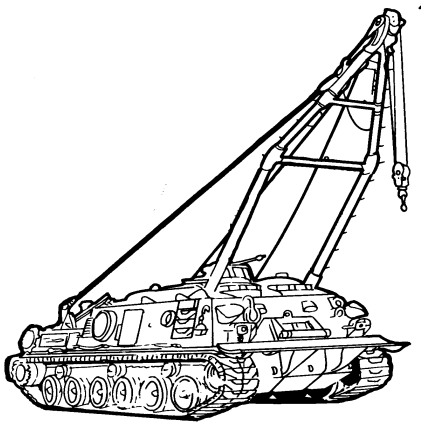
MAJOR EQUIPMENT USED BY THE MLRS BATTALION

The following vehicles support 3-116th training:



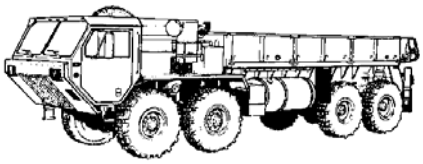
M577 Command Post Carrier



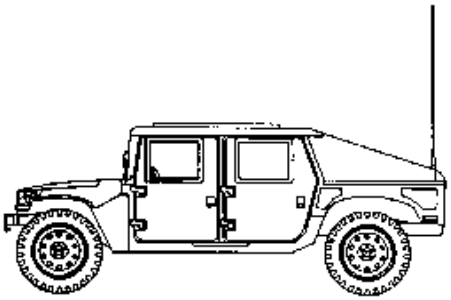


M88 Heavy Recovery Vehicle

Trailer, M989A1



M985 HEMTT



M998 HMMWV

APPENDIX B

DETAILED DESCRIPTION OF THE MLRS BATTALION'S TRAINING CYCLE

DETAILED DESCRIPTION OF THE MLRS BATTALION'S TRAINING CYCLE

This appendix describes the different levels of training involved in Battalion level certification as combat ready. This detailed training advances from section through platoon to Annual Training and includes retraining as necessary to achieve combat certification.

B.1 SECTION TRAINING

The purpose of section training is to rehearse, improve, and evaluate the skills essential to the successful accomplishment of the mission of the firing section. The MLRS battalion would conduct this training twice a year. On both occasions, the MLRS battalion would use a total of one maneuver area each time.

Concept of Operations

According to Field Manual No. 6-60 (FM 6-60) "Multiple Launch Rocket System (MLRS) Operations," each section must demonstrate proficiency in 11 graded tasks. All of the tasks for section certification would be accomplished on the main base airfield with the exception of the task "Occupy an OPAREA," which would be accomplished in one of the six available maneuver areas. The task requires the section be trained for and evaluated on: entering the operational area, moving to a firing area, selecting firing points and hide areas, and setting up equipment for firing. The section would be brought to a stationary launcher and given initial firing data and an area in which to operate. The section must communicate properly with higher headquarters and identify three firing locations and three hide locations. The section would conduct dry firing with practice rounds. Dry firing is the process of rehearsing the firing procedure with rockets that are completely inert and will not launch.

Each of the battalion's 18 firing sections would be rotated through this exercise using one M270 launchers in a single maneuver area. Twice a year, all 18 section crews would be shuttled in wheeled vehicles to one launcher in the maneuver area. During this weekend training, the launcher would be in the maneuver area for a 24-hour period beginning on Saturday at approximately 1200 hours (hrs).

Training Details

Each firing section chooses three hide areas and three firing areas. Training requires the section to drive the launcher to multiple locations within the maneuver area and select the correct location according to the criteria listed in Chapter 4 of FM 6-60. Units are discouraged from occupying positions within 1,640 feet of any other firing points (Army National Guard, 2000). The training section would be able to operate anywhere within the maneuver area under the operating restrictions. The battalion would use two HMMWVs to transport the crews from the main base airfield to the training site. Table B-1 provides the total assets in the field during section certification.

Table B-1. Total MLRS Battalion Assets in the Field for Section Certification

Location	Unit	Vehicle	Number	Action
Maneuver Area 1	Firing Section	M270 Launcher	2	18 iterations of section training
Maneuver Area 1	HHSB	Truck, Utility/ HMMWV	2	Transporting training crews between the airfield and the maneuver area

During operations when MLRS battalion personnel and equipment would be in the field over night, the battalion's standard operating procedure is for the launcher crews to sleep in the Hide Area with their vehicles and the rest of the firing battery to sleep in the Battery Headquarters areas. They dig small holes, approximately 12 inches in diameter by about 12 inches deep, for personal waste. These holes are covered up with dirt. No other types of holes are dug in the bivouac areas.

B.2 PLATOON CERTIFICATION

The purpose of the event is to rehearse and evaluate the actions of the firing platoons. The exercises are designed to build on the skills already trained at the section level and incorporate the platoon command, control, and logistic functions to train each of the six platoons as individual units.

Concept of Operations

To accomplish the training, the battalion would split into two halves: support platoons and training platoons. The support platoons would give up their section and platoon and battery commanders to be evaluators for the training platoons. The supporting half of the battalion would conduct as much individual and collective training as possible. The training platoons would rehearse and be evaluated on the platoon level tasks listed in the FM 6-30-20. The event would occur twice a year, each time with a different half of the battalion acting in support of the other. For each event, the battalion would use four maneuver areas: one for each of the firing batteries and one for HHSB. The batteries would remain in one maneuver area for the duration of the certification. The training in the maneuver areas would typically begin on Saturday at 1000 and conclude Sunday at 1200.

Firing Sections. Each of the firing sections would occupy a 3-kilometer operational area and conduct the same operations as described in section certification. The firing sections would rehearse occupying a section area, conducting fire missions, and conducting resupply of ammunition, food, fuel, and repair parts as a part of the platoon. The firing sections of the training platoons would be evaluated and assisted by personnel of the support platoons. The support platoons would conduct concurrent training.

Platoon Headquarters. The platoon headquarters consists of an M577 Command Vehicle and two HMMWVs and is manned by the platoon leadership to include platoon leader and platoon sergeant. Each platoon headquarters provides command and control for three firing sections.

Figure B-1 shows a schematic of a possible battery set-up in an MA. Upon occupation of the platoon area of operations (AO), the platoon headquarters would establish the command post (CP) inside the platoon area of operations. The CP is a cluster of tents and camouflage nets

covering the vehicles and equipment of the headquarters personnel. These personnel would remain at the CP with the exception of incidental HMMWV traffic throughout the exercise.

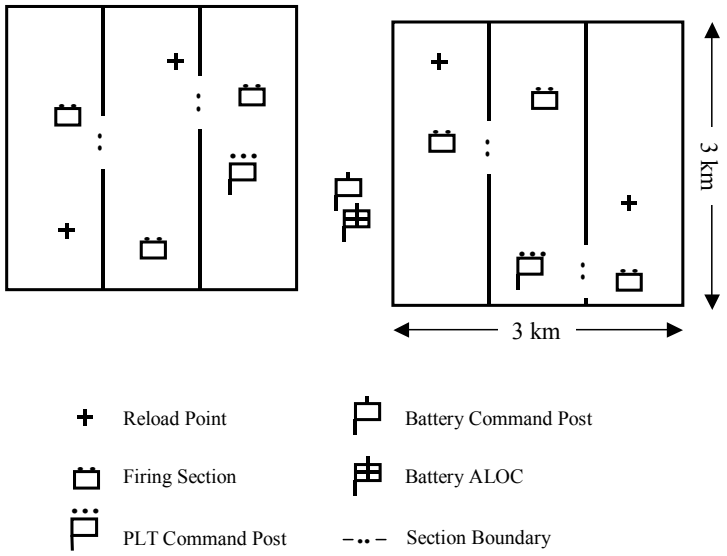


Figure B-1. Schematic of a Typical Battery Set-up in an MA

To begin the training, the battery commander would assign both of his platoon leaders a 9 square kilometer area within which to operate his platoon. The platoon leader would use his M577 command post vehicle to reconnoiter the area and identify the section areas, the release point, and two reload points. Release points are the locations where the platoon would split apart from a moving formation to occupy different firing section areas. Reload points are the locations where a firing section would drive their launcher to meet the ammunition resupply vehicles after the execution of a mission. The ammunition resupply vehicles would continuously occupy the reload points once the platoon had occupied the platoon area of operations. Each platoon leader would then lead his platoon back to the release point and release the sections to begin their own operations. The platoon leader would then establish a command post within the platoon area of operation (AO) and remain relatively stationary for the duration of the exercise. The sections would receive fire missions from the battery and conduct dry fire training. After conducting the dry fire training, the sections would rehearse reloading at the reload points. This rehearsal consists of meeting the ammunition resupply vehicle from the battery at the reload points and unloading the training rounds from the launcher, reloading the same training rounds back into the launcher and moving to a new hide site to wait for another mission. Each of the sections would conduct a dry fire and resupply operation a minimum of three times and a maximum of five times per 24-hour period.

Battery Headquarters. Battery headquarters consists of a Headquarters Section and the Battery Operations Center (BOC) and have a total of two HMMWVs and one M577. These units and vehicles would collocate in the maneuver area at a location also named the BOC. They might be inside one of the platoon areas of operations but would remain within the maneuver area

assigned to the battery. They combine to provide command and control for the two firing platoons.

During the platoon certification, the battery headquarters would deploy to the battery maneuver area at the beginning of the exercise, establish a BOC, and remain there for the duration of the exercise. The BOC is similar to the platoon CPs in that the personnel would cover their vehicles and equipment with tents and camouflage nets. All of the BOC personnel may leave and return to the BOC throughout the exercise using the HMMWVs.

Support Platoon. The Support Platoon is made up of a Support Platoon Headquarters section (one HMMWV), a Supply section (two HEMTT tanker trucks and a 2.5-ton cargo truck), a Maintenance section (one M88 recovery vehicle, one HEMTT wrecker truck, one 2.5-ton cargo truck, and one 5-ton cargo truck), two Ammunition sections (six ammunition HEMTT trucks and six HEMAT trailers each), and a Food Service section (one 2.5-ton truck). The Support Platoon would deploy to the field for platoon certification and establish the battery Administration and Logistics Operations Center (ALOC) between 150 and 300 meters from the BOC.

All of the vehicles of the Support Platoon would be stationed at the battery ALOC with the exception of the Ammunition Sections' HEMTTs and HEMATs. The ammunition resupply vehicle is an M985 Heavy Expanded-Mobility Tactical Truck (HEMTT) with an M989 Heavy Expanded-Mobility Ammunition Trailer (HEMAT). These vehicles would be stationed in threesomes at the platoon reload points. Once they have resupplied a firing section, the HEMTT and the HEMAT would return to the battalion Ammunition Supply Point (ASP) at the battery ALOC. The HEMTT and HEMAT combined have a 100-foot turning radius making the platoon reload points fairly large open areas. The HEMTT tank trucks would refuel the vehicles in the firing platoons once a day. The tank truck can either go to all the vehicles in the battery or meet them all in one place. The method of refueling would be at the discretion of the controlling commander, but the battalion standard operating procedure is for the refueling truck to move to a central location, preferably beside a road. Refueling is done as the platoon moves from one location to another. Launchers would not be refueled at fire or hide areas. The tanker has a "portable berm" set up in the central location, in case of spills. In the event of a spill, the FLARNG would notify APAFR Range Control.

The Maintenance section would remain in the battery ALOC to retrieve, repair, and maintain the batteries' vehicles. The Supply section coordinates the resupply of the battery and the Food Service section prepares the batteries' meals from the battery ALOC. The remainder of the vehicles would move from the battery ALOC as required during the training event.

Training Details

Platoon certification would require four maneuver areas: one for each firing battery and one for the battalion TOC. All vehicles would adhere to the operating restrictions when driving within the maneuver areas. Outside the maneuver areas, all vehicles would remain on the roads. All of the tracked vehicles would deploy to the assigned maneuver areas on Saturday at approximately 1000 and would remain until 1200 Sunday. There would be incidental traffic of HMMWVs on the roads throughout the exercise. The resources that would be required for platoon certification and for a battery MA are shown in Tables B-2 and B-3, respectively.

Table B-2. Total Battalion Resources for Platoon Certification

Location	#	Size	Vehicles per Location											Total Vehicles per Location	Total Vehicles	Personnel Per Location		Total Personnel for all Locations
			M270	M577	HEMTT			HEMAT	HMMWV		M88	2.5 Ton	5 Ton			Off	Enlist	
					Ammo	Wrecker	Tanker			Amb								
Section Areas	18	3 km^2	1											1	18	0	3	54
PLT Command Post	6	50 m^2		1					2					3	18	1	6	42
Battery Operations Center	3	50 m^2		1			2		2					5	15	2	11	39
Reload Points	12	50 m^2			3			3						6	72	0	6	72
Battery Administrative and Logistics Operations Center	3	50 m^2				1			1		1	3	1	7	21	1	21	66
Tactical Operations Center	1	50 m^2		3					11					14	14	17	31	48
Airfield/Main Base	1						1	1	10	1	1	9		23	23	4	64	68

Table B-3. Resources for Battery Maneuver Area

Man Area	Location		Unit per Location		Vehicles per Unit		Action per 24 hour period
	Type	Number	Type	Number	Type	Number	
1,2,3	Section Areas	6	Firing Section	1	M270 Launcher	1	Three fire missions, 2 reloads (MINIMUM)
	Platoon Command Posts	2	Firing PLT HQ Sec	1	M577	1	Command and control
					HMMWV	2	Command and control
	Reload Point	4	Battery Ammunition Section	.5	M985/M989	3	Reload launchers and go to battalion ASP once
	BOC	1	BOC	1	M577	1	Command and control
					HMMWV	1	Command and control
			Battery HQ Sec	1	HMMWV	1	Command and control
	Battery ALOC	1	Support Plt HQ Section	1	HMMWV	1	Command and control
			Battery Supply Sec	1	M978 HEMTT Tanker	2	Refuel Firing sections once
					2.5 Ton Cargo Truck	1	Transporting supplies
			Maintenance Sec	1	M97X HEMTT wrecker	1	Recovery of broken/stuck vehicles
					M88 Recovery Vehicle	1	Recovery of broken/stuck vehicles
					2.5 Ton Cargo Truck	1	Transporting supplies
				1 cont'd	5 Ton Cargo Truck	1	Transporting supplies
			Food Service Sec	1	2.5 Ton Cargo Truck	1	Transporting supplies

Table B-3. Resources for Battery Maneuver Area Cont'd

Man Area	Location		Unit per Location		Vehicles per Unit		Action per 24 hour period
	Type	Number	Type	Number	Type	Number	
4	Battalion TOC	1	Command Sec	1	HMMWV	3	Command and control
			Fire Direction Center	1	M577	1	Command and control
			Intelligence Sec	1	M577	1	Command and control
			Survey Sec	1	HMMWV	3	Command and control
			Liaison Sec	2	HMMWV	1	Command and control
			Ammunition Mgt Sec	1	HMMWV	1	Command and control
			Operations Section	1	M577	1	Command and control
					HMMWV	1	Command and control

B.3 ANNUAL TRAINING

Annual training is a concentrated two-week exercise designed to train every system in the battalion and replicate actual combat as closely as possible.

Concept of Operations

Annual training would be 15 days in duration beginning on a Friday night. The battalion would muster at APAFR and prepare their equipment typically until Monday afternoon when they go to the maneuver areas. On Sunday, they would conduct a section certification as described in the previous section. They would remain in the maneuver areas for approximately 10 days, after which they would return to the main base for post operations maintenance and administrative duties. They would spend a maximum of 10 days in the maneuver areas. The remainder of the days would be used at the main base facilities for the maintenance and administrative duties subsequent to a long field training exercise.

While on the range, annual training would consist of four main events: "lane training," section live fire, unit training under battalion control, and "72-hour war." The firing batteries would rotate between the first three events for six days and participate together in the last event for 72 hours. The first three events would be conducted in the same maneuver area, and the batteries would move through the events in rotation so that each battery would visit each training event in the training event's maneuver area. These events would be supervised and evaluated by a Training Support Battalion (TSB). The TSB is an active unit that supports National Guard training. The TSBs have their own HMMWVs and follow the launchers and ammunition crews.

Each of the firing batteries would rotate through lane training. The firing batteries would be presented with a notional combat situation at the maneuver area. There would be a composite battalion scenario with the battalion TOC participating as higher headquarters but each battery would participate in the training by itself. This lane would consist of predetermined tactical stimuli that force the training unit to act or react with the appropriate action. For example, a firing battery may be informed of a mass of enemy troops and equipment and ordered to fire upon them. The battery must then assign the firing data to the firing sections, the sections must go through the firing sequence, and the battery must be resupplied. However, the procedures are the same as those previously trained for section, and platoon certification and lane training would only use dry fire techniques like the previously described events.

While one of the batteries is conducting lane training, the other two batteries would be training in separate maneuver areas. The training would be run by the battalion TOC and would replicate the actions rehearsed in platoon certification.

Simultaneous with the conduct of the lane training, a separate battery would conduct a highly controlled "live fire" with Reduced Range Practice Rockets (RRPR). Live fire would occur over an approximately three-day period. Each section would rotate to Firing Point A-6 (Figure 1-2) on the main airfield at different times. This Firing Point (A-6) has been approved for MLRS live fire by APAFR and has an associated safety fan (FLARNG, 1997). Each section would fire three rounds for a total of 54 rounds from the launcher into an impact area. The rounds are non-energetic once they have expended their propellant with the exception of a smoke marking

charge. The section would return to the hide area once the rocket firing was completed. This rotation would continue until all sections completed their live fire training.

During the last event, the 72-hour war, all of the firing batteries, the battalion headquarters, and the HHSB would engage in the same tactical scenario under the command of a brigade headquarters. Essentially, the actions on the ground would be no different than before except that all of the battalions would be participating in the same scenario.

Each of the batteries would be serviced in the same manner as they would in a combat environment throughout the entire two weeks. In support of the firing batteries, the battalion's resupply, maintenance, personnel, and administrative units would operate in a field environment. Consequently, the Administrative and Logistics Operations Center (ALOC), the Unit Maintenance Control Point (UMCP), and the Tactical Operations Center (TOC) would operate within a maneuver area.

Firing Sections. The firing sections would operate in the same manner and use the same tactics and procedures for which they trained in section training. The exception would be the live fire. For the live fire, each one of the sections would drive from their maneuver area to Firing Point A-6 on the airfield. Once at the live fire location, the section would position the launcher in a manner prescribed by the safety personnel, fire the rockets, and return to their battery maneuver area.

Platoon Headquarters. The platoons would operate in the same manner in which they were certified during platoon certification.

Battery Headquarters and Support Platoon. The only difference in battery actions from platoon certification is that the batteries would now be supported from the field. Rather than sending the support vehicles to the main base, the battery would now send the support vehicles to another maneuver area where the battalion support units are located. Each battery, complete with its support platoon and headquarters, would rotate between four maneuver areas to be presented with different tactical scenarios.

Tactical Operations Center. The Tactical Operations Center is the nerve center of the battalion. It consists of 48 personnel and 14 vehicles. The TOC would deploy to the field, possibly to its own maneuver area. As during other exercises, the TOC would use camouflage nets and tents to cover its vehicles and equipment. The commander is free to locate the TOC in any area of the scheduled training space but would most likely place the TOC in the same maneuver area as the battalion ALOC. However, he would move the TOC on average every three days to a new location within the maneuver area. The TOC would control and track all of the battalion throughout the exercise. There would be heavy vehicle traffic to and from the TOC throughout the exercise.

Battalion Administrative and Logistics Operations Center. The battalion would locate all of its administrative functions in one maneuver area. The administrative functions consist of the ALOC, the Unit Maintenance Control Point, and the Ammunition Holding Area. This conglomeration would contain 64 personnel and 23 vehicles. The ALOC would remain in a

single 200 square meter area throughout the exercise, but would be heavily trafficked. The role of the ALOC is to supply, arm, maintain, and repair all of the personnel and equipment in the battalion. There would be a total of approximately 50 vehicles entering or exiting the ALOC per day.

Training Details

Each of the batteries would occupy one maneuver area. Additionally, an extra maneuver area would be used to change the tactical scenarios. The battalion administrative functions would occupy another maneuver area. In total, the battalion would use five maneuver areas: four for the firing batteries and one for the administrative functions. However, the battalion would only occupy four maneuver areas at one time. The batteries would be in the maneuver areas for a maximum of 10 days. The battalion assets required for annual training are provided in Table B-4. Table B-5 lists the vehicle types and numbers required by a firing battery in an MA for annual training. Table B-6 provides the vehicles required by the Headquarters and Headquarters Service Battery during annual training.

The live fire would consist of 18 vehicles located at Firing Point A-6 at the airfield, each firing three rounds into the Artillery Impact Area located on the Foxtrot Impact Area. The rounds are RRPR, which travel up to 15 kilometers. The RRPR does not explode on impact, but buries itself into the ground leaving a shallow 2 to 3-foot diameter depression (Army National Guard, 2000). The RRPR has a warhead with the same fuse and burster as the tactical warhead. The warhead contains no explosive material and is therefore inert. The practice warhead, however, contains three smoke canisters, three ballast rods, and 129 ballast weights, which give the practice rocket the same weight, balance, and trajectory as the tactical rocket (U.S. Department of the Army, 1987).

Table B-4. Total Battalion Assets in the Field for Annual Training

Location	#	Vehicles per Location											Total Vehicles per Location	Total Vehicles	Personnel Per Location		Total Personnel per Locations	Total Personnel for all Locations
		M270	M577	HEMTT			HEMAT	HMMWV		M88	2.5 Ton	5 Ton			Off	Enlist		
				Ammo	Wrecker	Tanker			Amb									
Section AO	18	1											1	18	0	3	3	54
PLT Command Post	6		1					2					3	18	1	6	7	42
Battery Operations Center	3		1			2		2					5	15	2	11	13	39
Reload Points	12			3			3						6	72	0	6	6	72
Battery Administrative and Logistics Operations Center	3				1			1		1	3	1	7	21	1	21	22	66
Tactical Operations Center	1		3					11					14	14	17	31	48	48
Administrative and Logistics Operations Center	1					1	1	10	1	1	9		23	23	4	64	68	68

Table B-5. Total Firing Battery Vehicles per Maneuver Area for Annual Training

Man Area	Location		Unit per Location		Vehicles per Unit		Action per 24 hour period
	Type	Number	Type	Number	Type	Number	
1,2,3,4	Section AO	6	Firing Section	1	M270 Launcher	1	Three fire missions, 2 reloads (MINIMUM)
	Platoon CP	2	Firing PLT HQ Sec	1	M577	1	Command and control
					HMMWV	2	Command and control
	Reload Point	4	Battery Ammunition Sec	.5	M985/M989	3	Reload launchers and go to battalion ASP once
	BOC	1	BOC	1	M577	1	Command and control
					HMMWV	1	Command and control
			Battery HQ Sec	1	HMMWV	1	Command and control
	Battery ALOC	1	Support Plt HQ Sec	1	HMMWV	1	Command and control
			Battery Supply Sec	1	M978 HEMTT Tanker	2	Refuel Firing sections once
					2.5 Ton Cargo Truck	1	Transporting supplies
			Maintenance Sec	1	M97X HEMTT Wrecker	1	Recovery of broken/stuck vehicles
					M88 Recovery Vehicle	1	Recovery of broken/stuck vehicles
					2.5 Ton Cargo Truck	1	Transporting supplies
					5 Ton Cargo Truck	1	Transporting supplies
			Food Service Sec	1	2.5 Ton Cargo Truck	1	Transporting supplies

Table B-6. Total HHS Battery Vehicles per Maneuver Area for Annual Training

Man Area	Location		Unit per Location		Vehicles per Unit		Action per 24-Hour Period
	Type	Num	Type	Num	Type	Num	
5	Battalion TOC	1	Command Sec	1	HMMWV	3	Command and control
			Operations Sec	1	M577	1	Command and control
					HMMWV	1	Command and control
			Fire Direction Center	1	M577	1	Command and control
				1	HMMWV	3	Command and control
			Intelligence Sec	1	M577	1	Command and control
			Survey Sec	1	HMMWV	3	Command and control
			Liaison Sec	2	HMMWV	1	Command and control
			Ammunition Mgt Sec	1	HMMWV	1	Command and control
	Battalion ALOC	1	S6 Sec	1	HMMWV	4	
			Automation Sec	1	HMMWV	1	
			Radio Sec	1	HMMWV	1	
			S-1 Sec	1	HMMWV	1	
			Unit Ministry Team	1	HMMWV	1	
			Treatment Team	1	2.5 Ton Cargo Truck	1	Transporting supplies
			Ambulance Team	1	HMMWV	1	Ambulance
			BATTALION Supply Sec	1	M978 HEMTT Tanker	1	Refuel Firing sections once
					HEMAT	1	
					HMMWV	1	
					2.5 Ton Cargo Truck	1	Transporting supplies
			Battery Maint Sec	1	HMMWV	1	
					M88 Recovery Vehicle	1	Recovery of broken/stuck vehicles
					2.5 Ton Cargo Truck	1	Transporting supplies
			Food Service Sec	1	2.5 Ton Cargo Truck	1	Transporting supplies

Upon ignition of the fuse and burster, the smoke canisters, which contain titanium tetrachloride ($TiCl_4$), are ruptured and the $TiCl_4$ reacts with moisture in the air to form a smoke-like cloud, giving a visual marker over the target (U.S. Department of the Army, 1987). The rocket motor contains 216 pounds of solid propellant Arcadene 360B fuel (Army National Guard, 2000). The rocket burns for approximately two seconds and covers a distance of about 0.5 mile (Army National Guard, 2000). When firing the RRPRs, the target area and 800-meter diameter safety zone around the firing point are cleared of all personnel (Army National Guard, 2000).

B.4 BATTERY TRAINING

The purpose of battery training is to retrain any of the areas deemed insufficient after the Annual Training. Each battery commander would review his battery's performance and then return to the field to retrain any of the tasks whose accomplishment he judges as substandard. Each battery commander and the battalion commander would determine if the battery needed to retrain. The battalion has two weekends in which to retrain and there is a possibility of every battery returning to the field for both weekends. However, usually the battalion completes its entire training successfully, and one battery may need to return to the field for one weekend.

Concept of Operations

One firing battery would conduct identical operations to platoon certification. The number and type of vehicles and personnel would be the same for one battery during platoon certification. The battalion TOC and ALOC would not deploy to the field, but would support the battery from the main base.

Training Details

The training details would be identical to the platoon certification. Table B-7 provides a summary of the assets in the field for the most likely battery training scenario.

Table B-7. Total Assets in the Field: Most Likely Scenario for Battery Training

Location	#	Size	Vehicles per Location											Total Vehicles per Location	Total Vehicles	Personnel Per Location		Total Personnel per Location	Total Personnel for all Locations
			M270	M577	HEMTT			HEMAT	HMMWV		M88	2.5 Ton	5 Ton			Off	Enlist		
					Ammo	Wrecker	Tanker			Amb									
Section AO	6	3 km^2	1											1	6	0	3	18	18
PLT Command Post	2	50 m^2		1					2					3	6	1	6	7	14
Battery Operations Center	1	50 m^2		1			2		2					5	5	2	11	13	13
Reload Points	4	50 m^2			3			3						6	24	0	6	6	24
Totals			3	3	12	0	2	12	6	0	0	0	0	38	38	4	56		69

References:

Army National Guard, National Guard Bureau, 2000. Final Programmatic Environmental Assessment for Multiple Launch Rocket System (MLRS) Fielding.

Florida Army National Guard, 3rd Battalion, 116 Field Artillery, 1997. Finding of No Significant Impact. Florida Army National Guard Training with the Multiple Launch Rocket System at Avon Park Air Force Range.

U.S. Department of the Army, U.S. Army Missile Command, 1987. Life Cycle Environmental Assessment for the Multiple Launch Rocket System. Redstone Arsenal, AL.

APPENDIX C

SELECTION CRITERIA USED IN THE ENVIRONMENTAL ASSESSMENT FOR THE CONVERSION OF THE 8-INCH HOWITZER WEAPON SYSTEM TO THE MULTIPLE LAUNCH ROCKET SYSTEM

SELECTION CRITERIA USED IN THE ENVIRONMENTAL ASSESSMENT FOR THE CONVERSION OF THE 8-INCH HOWITZER WEAPON SYSTEM TO THE MULTIPLE LAUNCH ROCKET SYSTEM

The following selection criteria used in the determination of alternatives were listed in Section 3.1 "Selection Criteria" of the Final Environmental Assessment for the Conversion of the 8-Inch Howitzer Weapon System to the Multiple Launch Rocket System (FLARNG, 1996 and 1997):

1. Onsite unit level maintenance facilities, infrastructure, and adequate existing or modified tank trail system.
2. Adequate bivouac and support areas contiguous to maneuver areas.
3. Controlled airspace and access.
4. Within 80 miles of MLRS units based in south Florida to reduce associated cost factors related to time element, travel, and transport of troops and equipment.
5. Based on regulation (Army Regulation 350-I series), travel time less than 25 percent of regular training time (two days training time, travel time limited to one-half day).
6. Suitable impact area, with a minimum of 3,000 acres to accommodate short-range training rounds.
7. Maneuver areas adequate to locate a minimum of nine maneuvering points per area, approximately 500 meters (1,640 feet) apart.
8. Ability to train three weekends per month (one battery per weekend) for seven months per year for the first two years. Frequency reduced to two weekends per month for seven months all subsequent years.
9. One potential annual 15-day training period during which live firing would be conducted.
10. A distance between 8,000 meters (4.9 miles) and 15,000 meters (9.3 miles) from firing point to impact areas.
11. Minimum adjacent inhabitants to enable management of noise resulting from training.

References:

Florida Army National Guard (FLARNG), 1996. Final Environmental Assessment for the Conversion of the 8-Inch Howitzer Weapon System to the Multiple Launch Rocket System in the Florida Army National Guard, 3rd Battalion, 116th Field Artillery.

Florida Army National Guard, 3rd Battalion, 116 Field Artillery, 1997. Finding of No Significant Impact. Florida Army National Guard Training with the Multiple Launch Rocket System at Avon Park Air Force Range.

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APPENDIX D

TECHNICAL SUPPORTING MATERIAL FOR AIR QUALITY

TECHNICAL SUPPORTING MATERIAL FOR AIR QUALITY

This appendix presents an overview of the Clean Air Act (CAA) and the State of Florida air quality program. The appendix also discusses emission factor development and calculations including assumptions employed in the air quality analyses presented in the Air Quality sections of Chapters 3 and 4.

AIR QUALITY PROGRAM OVERVIEW

In order to protect public health and welfare, the USEPA has developed numerical concentration-based standards or NAAQS for six "criteria" pollutants (based on health related criteria) under the provisions of the Clean Air Act Amendments of 1970. There are two kinds of NAAQS: Primary and Secondary standards. Primary standards prescribe the maximum permissible concentration in the ambient air to protect public health including the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards prescribe the maximum concentration or level of air quality required to protect public welfare including protection against decreased visibility, damage to animals, crops, vegetation, and buildings *(40 CFR 50)*.

The CAA gives states the authority to establish air quality rules and regulations. These rules and regulations must be equivalent to, or more stringent than, the Federal program. The Division of Air Resource Management within the Florida Department of Environmental Protection (FDEP) administers the state's air pollution control program under authority of the Florida Air and Water Pollution Control Act and the Environmental Protection Act.

Florida has adopted the NAAQS except for sulfur dioxide (SO_2). USEPA has set the annual and 24-hour standards for SO_2 at 0.03 parts per million (ppm) (80 micrograms per cubic meter [$\mu g/m^3$]) and 0.14 ppm (365 $\mu g/m^3$) respectively. Florida has adopted the more stringent annual and 24-hour standards of 0.02 ppm (60 $\mu g/m^3$) and 0.1 ppm (260 $\mu g/m^3$) respectively. In addition, Florida has adopted the national secondary standard of 0.50 ppm (1300 $\mu g/m^3$). Federal and State of Florida ambient air quality standards are presented in Table D-1 *(FAC)*.

Based on measured ambient air pollutant concentrations, the USEPA designates areas of the United States as having air quality better than (attainment), worse than (nonattainment) the NAAQS, and unclassifiable. Those that cannot be classified on the basis of available information as meeting or not meeting the NAAQS for a particular pollutant are "unclassifiable" and are treated as attainment until proven otherwise. Attainment areas can be further classified as "maintenance" areas. Maintenance areas are those areas previously classified as nonattainment and have successfully reduced air pollutant concentrations below the standard. Maintenance areas are under special maintenance plans and must operate under some of the nonattainment area plans to ensure compliance with the NAAQS. All areas of the state are in compliance with the NAAQS.

Each state is required to develop a state implementation plan (SIP) that sets forth how CAA provisions will be imposed within the state. The SIP is the primary means for the

implementation, maintenance, and enforcement of the measures needed to attain and maintain the NAAQS within each state and includes control measures, emissions limitations, and other provisions required to attain and maintain the ambient air quality standards. The purpose of the SIP is twofold. First, it must provide a control strategy that will result in the attainment and maintenance of the NAAQS. Second, it must demonstrate that progress is being made in attaining the standards in each nonattainment area.

Table D-1. National and State Ambient Air Quality Standards

Criteria Pollutant	Averaging Time	Federal Primary NAAQS[1,2,3]	Federal Secondary NAAQS[1,2,4]	*Florida Standards*
Carbon Monoxide (CO)	8-hour 1-hour	9 ppm[5] (10 mg/m^3)[6] 35 ppm (40 mg/m^3)	No standard No standard	9 ppm (10 μg/m^3)[7] 35 ppm (40 μg/m^3)
Lead (Pb)	Quarterly	1.5 μg/m3	1.5 μg/m^3	1.5 μg/m^3
Nitrogen Dioxide (NO_2)	Annual	0.053 ppm (100 μg/m^3)	0.053 ppm (100 μg/m^3)	0.053 ppm (100 μg/m^3)
Ozone (O_3)	1-hour[8] 8-hour[9]	0.12 ppm (235 μg/m^3) 0.08 ppm (157 μg/m^3)	0.12 ppm (235 μg/m^3) 0.08 ppm (157 μg/m^3)	0.12 ppm (235 μg/m^3) 0.08 ppm (157 μg/m^3)
Particulate Matter ≤10 Micrometers (PM_{10})	Annual 24-hour[10]	50 μg/m^3 150 μg/m^3	50 μg/m^3 150 μg/m^3	50 μg/m^3 150 μg/m^3
Particulate Matter ≤2.5 Micrometers ($PM_{2.5}$)	Annual 24-hour[11]	15 μg/m^3 65 μg/m^3	15 μg/m^3 65 μg/m^3	15 μg/m^3 65 μg/m^3
Sulfur Dioxide (SO_2)	Annual 24-hour 3-hour	0.03 ppm (80 μg/m^3) 0.14 ppm (365 μg/m^3) No standard	No standard No standard 0.50 ppm (1300 μg/m^3)	0.02 ppm (60 μg/m^3) 0.10 ppm (260 μg/m^3) 0.50 ppm (1300 μg/m^3)

Source: Florida Department of Environmental Protection, 2000.

1. National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year.
2. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 mm of mercury; ppm refers to parts per million by volume.
3. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.
4. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
5. ppm = parts per million
6. mg/m3 = milligrams per cubic meter
7. μg/m3 = micrograms per cubic meter
8. The ozone one-hour standard still applies to areas that were designated nonattainment when the ozone eight-hour standard was adopted in July 1997. The 1-hour ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than 1 averaged over a three-year period.
9. The 8-hour ozone standard is attained when the 3-year average of the annual fourth-highest daily maximum 8-hour average is not greater than 0.08 ppm.
10. The PM_{10} 24-hour standard is attained when 99 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.
11. The $PM_{2.5}$ 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.

In attainment areas, major new or modified stationary sources of air emissions on and in the area are subject to Prevention of Significant Deterioration (PSD) review to ensure that these sources are constructed without causing significant adverse deterioration of the clean air in the area. A major new source is defined as one that has the potential to emit any pollutant regulated under the CAA in amounts equal to or exceeding specific major source thresholds: 100 or 250 tons/year based on the source's industrial category. A major modification is a physical change or change in the method of operation at an existing major source that causes a significant "net emissions increase" at that source of any regulated pollutant. Table D-2 provides a tabular listing of the PSD significant emissions rate (SER) thresholds for selected criteria pollutants *(USEPA Draft New Source Review Workshop Manual: Prevention of Significant Deterioration and Nonattainment Permitting)*. (It should be noted that PSD SER and increment thresholds have been established for PM_{10}, but not for $PM_{2.5}$.)

The goal of the PSD program is to: 1) ensure economic growth while preserving existing air quality, 2) protect public health and welfare from adverse effects which might occur even at pollutant levels better than the NAAQS, and 3) preserve, protect, and enhance the air quality in areas of special natural recreational, scenic, or historic value, such as national parks and wilderness areas. Sources subject to PSD review are required by the CAA to obtain a permit before commencing construction. The permit process requires an extensive review of all other major sources within a 50-mile radius and all Class I areas within a 62-mile radius of the facility. Emissions from any new or modified source must be controlled using Best Available Control Technology. The air quality, in combination with other PSD sources in the area, must not exceed the maximum allowable incremental increase identified in Table D-3. National parks and wilderness areas are designated as Class I areas, where any appreciable deterioration in air quality is considered significant. Class II areas are those where moderate, well-controlled industrial growth could be permitted. Class III areas allow for greater industrial development.

Table D-2. Criteria Pollutant Significant Emissions Rate Increases Under PSD Regulations

Pollutant	Significant Emissions Rate (tons/year)
PM_{10}	15
Total Suspended Particulate (TSP)	25
SO2	40
NOx	40
Ozone (VOC)	40
CO	100

Source: Title 40 CFR Part 51

Table D-3. Federal Allowable Pollutant Concentration Increases Under PSD Regulations

Pollutant	Averaging Time	Maximum Allowable Concentration ($\mu g/m^3$)		
		Class I	Class II	Class III
PM_{10}	Annual	4	17	34
	24-hour	8	30	60
SO_2	Annual	2	20	40
	24-hour	5	91	182
	3-hour	25	512	700
NO_2	Annual	2.5	25	50

Source: Title 40 CFR Part 51
$\mu g/m^3$ = Micrograms per cubic meter

Florida has a statewide air quality-monitoring network that is operated by both state and local environmental programs *(FDEP State Air Monitoring Reports).* The air quality is monitored for carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter and sulfur dioxide. The monitors tend to be concentrated in areas with the largest population densities and not all pollutants are monitored in those areas. The air quality monitoring network is used to identify areas where the ambient air quality standards are being violated and plans are needed to reduce pollutant concentration levels to be in attainment with the standards, also included are areas where the ambient standards are being met but plans are necessary to ensure maintenance of acceptable levels of air quality in the face of anticipated population or industrial growth.

The end-result of this attainment/maintenance analysis is the development of local and statewide strategies for controlling emissions of criteria air pollutants from stationary and mobile sources. The first step in this process is the annual compilation of the ambient air monitoring results, and the second step is the analysis of the monitoring data for general air quality, exceedances of air quality standards, and pollutant trends.

The FDEP Southwest District operates monitors in both Highlands and Polk counties. Over the years of record there have been exceedances (pollutant concentration greater than the numerical standard) of a NAAQS. However, there has not been a violation (occurrence of more exceedances of the standard than is allowed within a specified time period) of an ambient standard *(FDEP State Air Monitoring Reports).*

Regional Meteorology

The climate on APAFR is subtropical and exhibits a duality of seasons. This location is characterized by long wet, warm, and humid summers and mild, dry winters, with humidity averaging approximately 75 percent. The Gulf of Mexico lies to the west and the Atlantic Ocean lies to the east of the peninsula. The average annual temperature at APAFR from 1971 to 2000 was 72 degrees Fahrenheit (^{o}F). The highest average daily maximum temperature is 81°F in July, and the lowest average daily minimum temperature is 60 ^{o}F in January. During the winter-spring season, average monthly temperatures range from 63 ^{o}F in December to 74 ^{o}F in April. Average monthly summer-fall temperatures from May through November range from 80 ^{o}F to 83 ^{o}F. Highest mean maximum temperatures were recorded in June, July and August at 92-95 ^{o}F and lowest temperatures were recorded in December, January, and February at 64-67 ^{o}F.

Average annual precipitation is approximately 49 inches. During the rainy season, which runs from June through September, precipitation average amounts range from 5.98 to 8.25 inches. Summer thunderstorms can be intense, with 2 to 3 inches of rain falling within one to two hours. Winter is the driest season, with an average of only 1.87 to 2.48 inches of rain per month. Rainfall is less intense but can last up to 24 hours in duration. In the U.S., Central Florida has the most frequent occurrence of thunderstorms, with storms occurring about 90 days per year. This happens because sea breezes from both the east and west converge in Central Florida. Tropical storms may occur from June through November, but have been most common in August and September. These tropical storms can produce high winds and very heavy rainfall, resulting in considerable damage and flooding to low-lying areas. The hurricane season is 1 June to 30 November with hurricanes crossing the peninsula every few years.

The average annual prevailing wind direction is from the north November through February, and the northeast March through October. However, winds from the southeast often prevail during July and August. The annual average wind speed is 5.8 miles per hour (mph), with monthly averages ranging from 3.7 mph to 6.3 mph *(USAF 2004).*

PROJECT CALCULATIONS:

Fugitive Dust Emissions:

Traffic on unpaved roads creates dust as a result of pulverizing surface material induced by the wheel force of the vehicle. Particles are lifted and dropped from the rolling wheels or tracks and the road surface is exposed to strong air currents in turbulent shear with the surface. The turbulent wake behind the vehicle continues to act on the road surface even after the vehicle has passed. The quantity of dust emissions from a given segment of unpaved road varies linearly with the volume of traffic. In addition to vehicle traffic, dust emissions from unpaved roads have been found to vary directly with the silt fraction in the road surface.

The following empirical expressions were used to estimate the quantity in pounds of size-specific particulate emissions from an unpaved road, per vehicle mile traveled at an industrial site.

$$E = k\,(s/12)^{a} * (W/3)^{b}$$

Where:

E = size specific emission factor (lb/Vehicle Mile Traveled)
s = surface material silt content (%)
W = mean vehicle weight (tons)
a = .9 (empirical value)
b = .45 (empirical value)

Surface material silt content was assumed to be 8.3%. This percentage was the median value for all industry means provided in AP-42 Table 13.2.2-1 entitled Typical Silt content Values of Surface Material on Industrial Unpaved Roads (USEPA 2003). Specification sheets determined vehicle weights.

The speed limit for the MLRS battalion exercises is limited to 25 MPH. Using a conservative assumption that each day of the exercise, all vehicles would operate twelve (12) hours per day, the FLARNG would conduct activities for three days every month for six months and conduct annual training for 15 days. Based on the aforementioned accumulation of time, vehicle operation would be approximately 396 hours annually. As stated earlier this is an extremely conservative estimate of vehicle operations.

Combustive Emissions:

Combustive emissions are generated as a result of the combustion activities, which occur during engine operations. Unlike highway vehicles, there is no national registration database for

non-road vehicles. Therefore, emissions factors are based on correlations and surveys developed over a number of years by USEPA (Table D-4). Non-road vehicles require a variety of data including the number of vehicles in a fleet, the average engine power (in horsepower) for each type of vehicle and the operation time of the vehicle.

Table D-4. Emission Factors for Non-road Vehicles

Vehicle Class	Emission Factors (g/hr)*				
	CO	NO_X	VOC	SO_X	PM***
Diesel-Powered Vehicles					
Crane	4.20	10.30	1.30	0.93	1.44
Excavator	5.20	10.75	0.70	0.93	1.44
Grader	3.80	9.60	1.60	0.87	1.00
Off-Highway Truck	2.90	9.60	0.86	0.89	0.80
Other Construction Equipment	9.20	11.01	1.40	0.93	1.44
Other General Industrial Equipment	6.06	14.00	1.60	0.93	1.60
Scraper	5.00	8.70	0.70	0.90	1.26
Tractor/Loader/Backhoe	6.80	10.10	1.40	0.85	1.05
Trencher	9.14	10.02	1.60	0.93	1.44
Paving Equipment**	4.60	11.01	1.00	0.93	0.90
Roller**	3.10	9.30	0.80	1.00	0.78
Gas-Powered Vehicles					
Other Gen. Ind. Equipment**	158.7	5.2	38.8	0.21	0.1
Roller**	383.8	2.1	22.9	0.22	0.2
Tractor/Loader/Backhoe**	257.4	4.8	105.4	0.16	0.1

* Source: USEPA 1991 ** Emission factors in g/hp-hr *** Indicates total particulate matter, not only PM_{10}.

Combustive emissions from the battalion vehicles were calculated using non-road vehicle emissions factors, specifically heavy-duty equipment. The following equation was used to calculate emissions from the battalion activities:

$$\text{Emissions} = \text{POP} * \text{A} * \text{EF} * \text{CF}$$

Where:

Emissions = Non-road Vehicle Emissions (lbs)
POP = Engine population (number of vehicles)
A = Activity (hrs/year)
EF = Emission Factor (g/hr)
CF = .002205 conversion Factor (g to lbs)

Vehicle inventory was obtained from the data in Chapter 2. Engine size data was ascertained by an Internet search for specification criteria for each vehicle type used during the FLARNG MLRS battalion's exercises.

Two conservative assumptions were made for the analysis. First the fugitive dust calculations assumed that during each day of the exercises, all vehicles would operate twelve (12) hours per day. The FLARNG would conduct activities for three days every month for six months and

conduct annual training for 15 days. Based on the aforementioned accumulation of time, vehicle operation would be approximately 396 hours annually. Secondly, the EF chosen for use in emissions calculations were either from "Other Construction Equipment" or "Other General Industrial Equipment" vehicle classes. The highest factor of these two vehicle classes was used in the analysis to add to the conservative analysis approach.

National Emissions Inventory

The National Emissions Inventory (NEI) is operated under EPA's Emission Factor and Inventory Group, which prepare the national database of air emissions information with input from numerous State and local air agencies, from tribes, as well as from industry. The database contains information on stationary and mobile sources that emit criteria air pollutants and hazardous air pollutants (HAPs). The database includes estimates of annual emissions, by source, of air pollutants in each area of the country, on an annual basis. The NEI includes emission estimates for all 50 States, the District of Columbia, Puerto Rico, and the Virgin Islands. Emission estimates for individual point or major sources (facilities), as well as county level estimates for area, mobile and other sources, are available currently for years 1996 and1999 for criteria pollutants, and HAPs.

Criteria air pollutants are those for which EPA has set health-based standards. Four of the six criteria pollutants are included in the NEI database:

- Carbon Monoxide (CO)
- Nitrogen Oxides (NOx)
- Sulfur Dioxide (SO2)
- Particulate Matter (PM10 and PM2.5)

The NEI also includes emissions of Volatile Organic Compounds (VOCs), which are ozone precursors, emitted from motor vehicle fuel distribution and chemical manufacturing, as well as other solvent uses. VOCs react with nitrogen oxides in the atmosphere to form ozone. The NEI database defines three classes of criteria air pollutant sources:

- Point sources - stationary sources of emissions, such as an electric power plant, that can be identified by name and location. A "major" source emits a threshold amount (or more) of at least one criteria pollutant, and must be inventoried and reported. Many states also inventory and report stationary sources that emit amounts below the thresholds for each pollutant.
- Area sources - small point sources such as a home or office building, or a diffuse stationary source, such as wildfires or agricultural tilling. These sources do not individually produce sufficient emissions to qualify as point sources. Dry cleaners are one example: a single dry cleaner within an inventory area typically will not qualify as a point source, but collectively the emissions from all of the dry cleaning facilities in the inventory area may be significant and therefore must be included in the inventory.

- Mobile sources - any kind of vehicle or equipment with a gasoline or diesel engine; airplane; or ship.

The main sources of criteria pollutant emissions data for the NEI are:

- For electric generating units - EPA's Emission Tracking System / Continuous Emissions Monitoring Data (ETS/CEM) and Department of Energy fuel use data.
- For other large stationary sources - state data and older inventories where state data was not submitted.
- For on-road mobile sources - the Federal Highway Administration's (FHWA's) estimate of vehicle miles traveled and emission factors from EPA's MOBILE Model.
- For non-road mobile sources - EPA's NONROAD Model.
- For stationary area sources - state data, EPA-developed estimates for some sources, and older inventories where state or EPA data was not submitted.

State and local environmental agencies supply most of the point source data. EPA's Clean Air Market program supplies emissions data for electric power plants.

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APPENDIX E

TECHNICAL SUPPORTING MATERIAL FOR LAND USE

TECHNICAL SUPPORTING MATERIAL FOR LAND USE

INTERGOVERNMENTAL COORDINATION

Listed below are intergovernmental agreements between APAFR and federal or state entities.

a. Grazing Leases: Large herds of cattle graze on 96,000 acres of APAFR under a mutually advantageous economic arrangement for the government and the cattlemen. Presently, APAFR has nine five-year grazing leases that allow private cattlemen to graze their cattle on designated areas of the range. The Mobile District of U.S. Army Corps of Engineers (USACE) secures the leases with private individuals, with the local USACE office managing the leasing and coordinating the program with the Natural Resources Section at Avon Park.

b. Wildlife Management Area: Avon Park has a cooperative agreement with the Florida Fish and Wildlife Conservation Commission (FWC) and the U.S. Fish and Wildlife Service (USFWS) to manage a portion of the range as a State of Florida Wildlife Management Area. All forms of legal game may be taken during established seasons, and fishermen are permitted access to the installation whenever the mission permits. In accordance with this tripartite agreement, the Air Force is responsible for hunter education and permit issuance. The Natural Resources Section of Civil Engineering publishes an "Outdoor Recreation Plan" which has the approval of all parties to the cooperative agreement and also includes campgrounds and recreational areas that are located on the reservation. This plan dictates that all visible signs of wildlife management activities be made as aesthetically pleasing as possible and, where disruptive activities are necessary, that they be conducted in areas having little scenic or recreational value, during periods when visitor use is light. For camper protection, hunting is not permitted near campgrounds.

c. Forest Management: As described in the Avon Park Forest Management Plan, the forest management program is to support the military mission and to practice ecosystem management on natural forested stands. In addition, forest management exists for the production and sale of timber products in existing pine plantations where compatible with the military mission. The Natural Resources Section administers commercial contracts with private timber businesses for the sale and removal of timber stands.

d. Outdoor Recreation Agreement: As previously mentioned, outdoor recreation is covered by a plan developed by the Natural Resources Section. This plan is also one of a series of range plans developed by the Natural Resources Section that are interdependent but require mutual coordination. The Florida Department of Environmental Protection (FDEP) and the U.S. Park Service are parties to this agreement because of Florida Trail segments on the eastern boundary of the range and the Arbuckle National Recreational Trail in the northwestern portion of the range.

e. Mutual Aid (Forest Fire) Agreement: This is a mutual aid agreement for fire-fighting support between the Air Force and the Florida Division of forestry that permits either agency to request firefighting equipment when required. Additionally, an agreement with the state of Florida, Avon Park Correctional Institution, provides firefighting personnel primarily to be

used for structural fire protection, but they can also serve by providing augmenters for range wildfire suppression. The Natural Resources Section is additionally responsible for performing firebreak maintenance and training Base Fire Department and Range Maintenance personnel as firefighting augmenters.

f. Conservation District: APAFR has an agreement with the Natural Resource Conservation Service (NRCS) local offices to protect the soils of the range under the establishment of a conservation district. The NRCS is now in the process of completing a range soils survey-mapping project.

g. Kissimmee River Committee/Agreement: APAFR is a participant on a joint committee to study the possibility of designating the Kissimmee River as a "Critical Area" under Chapter 380 of the Florida Statutes. This committee (Kissimmee River Resources Planning and Management Committee) did not recommend a "critical area" designation at this time, but the committee did formulate recommended management policies and has implemented a cooperative support agreement between South Florida Water Management District, FDEP, and the Air Force on the management of range lands as they affect the Kissimmee River floodplain.

h. Avon Park Correctional Institute (APCI) Agreement: Incineration of solid waste and treatment of sewage is accomplished by Avon Park Correctional Institution facilities. The present agreement with the state allows APAFR to purchase water waste disposal from the APCI facilities at the "fair market rate."

   The APCI also provides electricity to the range under contract. The Air Force at Avon Park is under contract with APCI for all of its utilities. APCI purchases electricity from the Peace River Electrical Cooperative and resells a portion of it to Avon Park at the same purchase price rate. Consequently, all utilities (water, waste, electric power) are purchased by Avon Park at the fair market rate.

   The Avon Park Correctional Institute is also under contract to the Air Force to provide entry gate security personnel to man the only entry gate to APAFR. The entry gate is a part of the APCI complex and as such would only be manned during the day. The Air Force has a contract with APCI to man the security gate 24-hours per day. This contract pays one-half of the security personnel's total salary in order to keep the gate open around the clock.

APPENDIX F

TECHNICAL SUPPORTING MATERIAL FOR EARTH RESOURCES

TECHNICAL SUPPORTING MATERIAL FOR EARTH RESOURCES

This appendix provides additional detailed information on APAFR soil resources and a summary of relevant studies on soil compaction and rutting.

SOILS

Soils are classified according to the U.S. Department of Agriculture's National Cooperative Soil Survey hierarchical taxonomic classification that includes soil order, suborder, great group, subgroup, family, and series. Soil orders are the most general classification, whereas soil series provide detailed data on a large spatial scale including series descriptions, taxonomic class, typical soil horizons, range of characteristics, geographic setting, drainage, soil water, vegetation, and other features. Typical soil profiles for each of the soil orders are shown in Figures F-1 through F-5.

Alfisol Soil Order – Holopaw Soil Series

Alfisol Soil Order – Winder Soil Series

Figure F-1. Alfisol Soil Order Profiles
(University of Florida Extension, 2002)

Entisol Soil Order – Astatula Soil Series

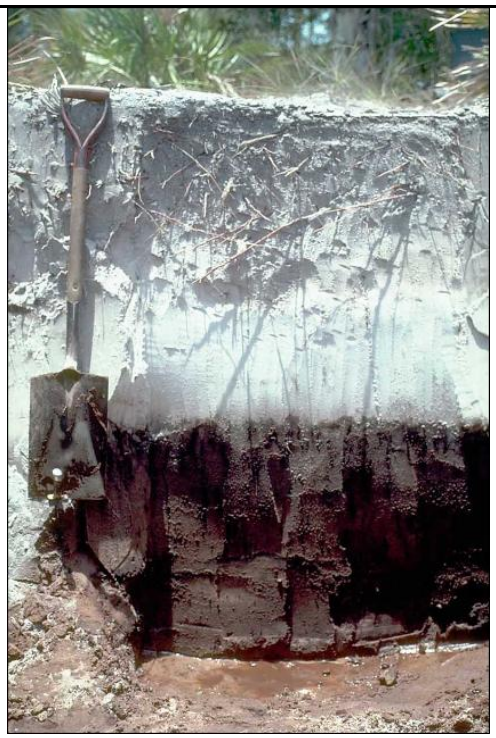
Entisol Soil Order – Basinger Soil Series

Figure F-2. Entisol Soil Order Profiles
(University of Florida Extension, 2002)

Histosol Soil Order

Inceptisol Soil Order

Figure F-3. Histisol and Inceptisol Soil Order Profiles
(NRCS, 2004)



Spodisol Soil Order – Immokalee Soil Series

Spodisol Soil Order – Myakka Soil Series

Spodisol Soil Order – Oldsmar Soil Series

Spodisol Soil Order – Wabasso Soil Series

Figure F-4. Spodisol Soil Order Profiles
(University of Florida Extension, 2002)

Figure F-5. Mollisol Soil Order Profile
(NRCS, 2004)

A SUMMARY OF RELEVANT STUDIES ON SOIL COMPACTION AND RUTTING

Soil Compaction

A study by King and Haines (1979) evaluated the effects of timber harvesting equipment on soil compaction in a slash pine (*Pinus elliottii*) plantation located in southern Alabama. The flatwoods soils included loamy sand topsoils over sandy clay loam subsoils. A three-wheeled harvester weighing approximately 21,000 pounds loaded was used during thinning operations. Assuming an even load distribution, each tire supported approximately 7,000 pounds. Following the thinning operation no physical damage to the soil was detected. The nominal level of soil disturbance was partly attributed to the mat of tree branches and tops that was distributed ahead of the harvester during tree delimbing and low soil moisture (13 percent) at the time of thinning. The mat of debris reduced the level of contact between the harvester tires and the mineral soil surface. No detectable impacts to surface soil or subsoil bulk density were identified.

A study by Gassman et al. (1989) found that the depth of compaction for a layered soil was affected very little by the difference in simulated pressures of four tractor treatments. It was also determined that the strain from an applied load is distributed more evenly and extends to a greater depth for a uniform soil profile than for a layered soil.

A study of timber harvest impacts on Atlantic coastal soils by Hatchell et al. (1969) identified sharp increases in the surface bulk density of clay loam soils after one or two passes; bulk density increases were more gradual in subsequent passes. Increases in bulk density were greater

in sandy loam or loamy sands compared to clay loam or clays. Traffic on wet soils resulted in decreased soil aeration porosity and infiltration rates.

A study by Sun et al. (2001) examined the impacts of timber management (harvest, site preparation, and drainage) on the soils and hydrology of wetland forests in the southeast United States. A review of the literature associated with timber harvests within wet pine flats in South Carolina and Florida showed that harvest trafficking under wet conditions can result in the soil disturbances that degradation of soil hydrologic properties such as hydraulic conductivity and available pore space and potentially increase water table levels by 2 to 5 inches. The hydrology of poorly and very poorly drained flat soils was less altered by skidding than moderately well or somewhat poorly drained soils; lateral subsurface water flow may be instrument in determining the impacts of soil disturbance particularly for fine texture soils. In all cases, wet weather harvests exhibited a higher degree of soil compaction impact compared to dry weather harvests. Overall, the extent of soil compaction was greatest as soil moisture, clay content, and traffic increased.

Conclusions drawn from these studies include:

- Low soil moisture content is likely instrumental in reducing soil compaction potentials.
- Soils with uniform textural profiles and limited horizon development, as is the case with most entisols, may increase the potential depth of compaction compared to a soil with developed horizons.
- Under comparable conditions sandy loam and loamy sand soils may be more prone to compaction than clayey soils.
- Trafficking in pine flats particularly under wet conditions can result in significant soil compaction and alter subsurface hydrology by increasing seasonally high water table levels.

Soil Rutting

In wet pine flats in South Carolina, soil rutting raised water tables by reducing drainage. This in turn reduces rooting zone oxygen supplies, which may result in the drowning of some vegetation root systems. Seedlings growing on non-trafficked sites exhibited 43 percent greater height growth, 90 percent greater volume, and 9 percent better survival than those on rutted sites. Bedding and phosphorous fertilization were the most effective treatments for the partial amelioration of soil rutting impacts on pine seedlings (Scheerer et al., 1994).

A study by Burger, et al. (1994) of the potential effect of timber harvesting on South Carolina wet pine flats soils identified direct correlations between volumetric soil moisture and soil damage potentials from rutting. The study area had flat topography, poorly drained loams and sandy loams overlying clayey subsoils, and seasonally high water table depths of 1.5 feet or less for 6 to 9 months per year. Analysis and data collection were limited to the A horizon (topsoil). The hazard model was developed during the study utilizes soil moisture and soil strength field data and harvesting equipment ground pressure parameters to estimate potentials for soil damage during harvesting operations. In an applied example, the wet pine flat soils had a measured

average volumetric moisture content in the topsoil of 21 percent and would be trafficked by a 23,000 pound skidder with 24 inch wide tires applying approximately 223 kPa of ground pressure. Results of the model determined that at 21 percent moisture content soil disturbance would be limited. At 19 percent or less moisture content little soil disturbance could be expected and at 28 percent or greater extensive soil disturbance would likely occur.

In a study by Vidrine et al., (1999) the operation of timber harvest equipment on sandy loam soils with a soil moisture content of 42 percent resulted in severe rutting to machine ground clearance limits of 22 inches. Mean rut depth and width were 13 and 37 inches respectively. Trafficking on soils with moisture contents of 22 to 29 percent also resulted in rutting; however, the depths of ruts were not as deep as those created by severe rutting at higher moisture contents. Soil bulk density was as high as 1.53 g/cc in the deep ruts formed in sandy loam soils with moisture contents of 22 to 24 percent. In comparison, undisturbed soil bulk densities for soils in proximity to rutted areas ranged from 1.23 to 1.35 g/cc.

Conclusions drawn from these studies include:

- Based on pattern and orientation soil rutting can alter surface and subsurface hydrology and increase water table levels.
- Rutting creates soil conditions that can adversely affect the establishment and growth of vegetation.
- Trafficking on loam and sandy loam soils with moisture contents within upper strata greater than 20 percent increases the potential for soil rutting and compaction to occur.

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APPENDIX G

TECHNICAL SUPPORTING MATERIAL FOR WATER RESOURCES

WATER RESOURCES

GROUNDWATER

Groundwater beneath the APAFR property is found within three different aquifers: the Surficial Aquifer, the Intermediate Aquifer, and the Floridan Aquifer (USGS, 2004). Each of these aquifers is described as follows.

Surficial Aquifer

The Surficial aquifer system, which consists generally of sand, clayey sand, and shell is under unconfined conditions and is approximately 125 to 200 feet thick. Although the Surficial aquifer is not used for water supply at the range, residential areas beyond the Avon Park AFR boundary have installed small diameter wells in the Surficial aquifer to supply water for shallow irrigation systems. Hydraulic conductivity has been found to range from 5 to 30 feet per day. Recharge to the Surficial aquifer is principally by precipitation. Discharge from the aquifer is into the surface water bodies, through seepage into ditches and wetlands and through direct evapotranspiration.

Intermediate Aquifer System

The Intermediate aquifer system includes all water bearing units and confining units between the overlying Surficial aquifer and the underlying Floridan Aquifer. These units have variable texture and permeability depending on clay content. The Intermediate aquifer contains water under confined conditions and consists primarily of limestones and dolostones of the Hawthorne Group (Arcadia and Peace River Formations). The upper confining unit of the Intermediate aquifer system consists of clayey sediments of the Peace River. The lower confining layer consists of a sand and clay member of the Arcadia Formation. The intermediate aquifer in the range area is approximately 200 feet thick.

The Floridan Aquifer

The Floridan Aquifer underlies the Intermediate aquifer system and is the principal source of water in the basin. The top of the Floridan Aquifer is considered to be the top of the first persistent carbonate sequence below the silts and clays of the lower confining unit of the Intermediate aquifer system. The Floridan aquifer is composed of the Ocala group and Avon Park Limestone. These carbonate units contain highly permeable zones that are capable of producing sufficient water supplies.

Table G-1 describes the water quality criteria used by the Florida Department of Environmental Protection to classify waterbodies.

Table G-1. Water Quality Criteria for Class III Waters

Parameter	Units	Class III	
		Fresh	Marine
Turbidity	NTU	≤29 above background	≤29 above background
Dissolved Solids	mg/L	None	None
pH	pH units	No more than one unit change above or below background	No more than one unit change for coastal waters or .2 unit change for open waters
Chlorides	mg/L	None	No increase >10 percent above background
Fluorides	mg/L	≤10.0	≤5.0
Conductivity	Micromho	No increase above 50 percent of background or 1,275	None
Dissolved Oxygen	mg/L	Not less than 5.0	Not average less than 5.0 and never be less than 4.0
BOD	mg/L	No increase such that DO drops below limit for any class	
Nutrients: Total Phosphorus, Total Nitrogen		No alteration in nutrients such that an imbalance in natural populations of aquatic flora or fauna results	
Total Coliform	#/100 ml	≤2,400 in any one sample	≤2,400 in any one sample
Fecal Coliform	#/100 ml	≤800 in any one sample	≤800 in any one sample
Copper	µg/L	≤(.8545[in hardness] – 1.465)	≤2.9
Iron	mg/L	≤1.0	≤0.3
Lead	µg/L	(1.273[in hardness] – 4. 705)	≤5.6
Zinc	µg/L	(0.8473[in hardness] + 0.7614)	≤86
Mercury	µg/L	≤0.012	≤0.025

Source: FDEP, 2000

WETLANDS

The classification of wetlands is based on the hierarchical system developed by the U.S. Fish and Wildlife Service (Cowardin et al., 1979). This system classifies wetlands based upon vegetative cover, chemical characteristics, salinity, hydrogen-ion concentration (pH), water regimes, and other factors. Riverine, Palustrine, and Lacustrine Systems have been identified at Avon Park.

Riverine Systems

Water is usually, but not always, flowing in the Riverine System. This system is bounded on the landward extend by uplands, by the channel bank, or by wetland dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens. These wetlands traditionally consist of all wetlands and deepwater habitats contained within a channel except those wetlands (1) dominated

by trees, shrubs, persistent emergents, emergent mosses, or lichens, and (2) which have habitats with ocean-derived salinities in excess of 0.5 parts per thousand (ppt) (Figure G-1).

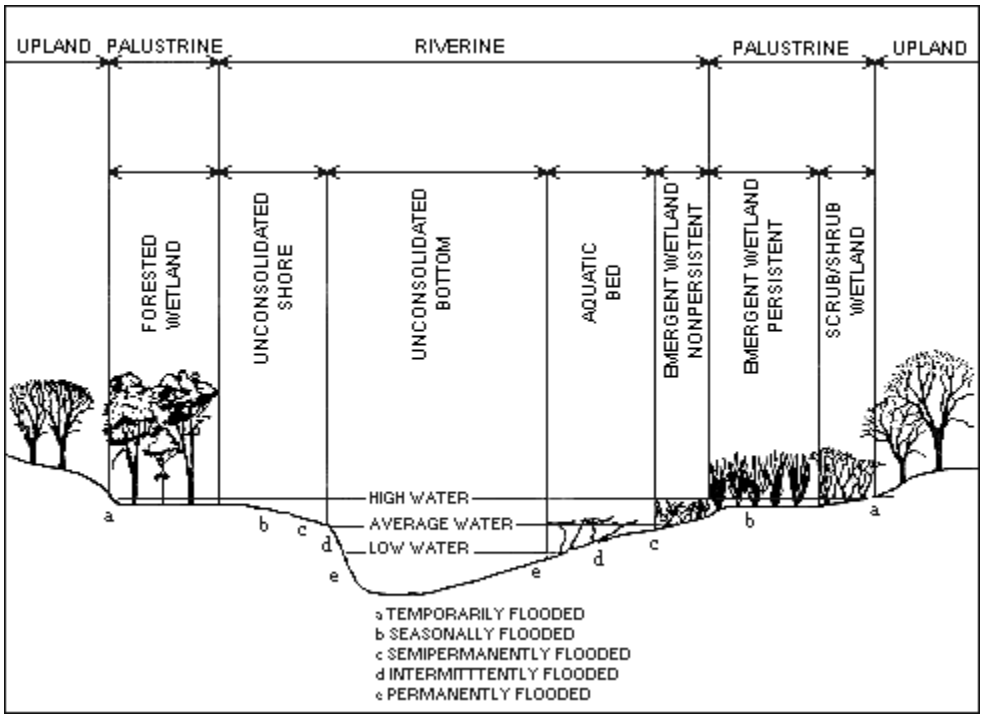

Figure G-1. Characteristics of Habitats in the Riverine System

Palustrine Systems

The Palustrine System was developed to categorize vegetated wetlands commonly referred to as swamps, marshes, ponds, and bogs. These wetlands traditionally consist of wetlands and deepwater habitats (1) situated in a topographic depression or dammed river channel; (2) lacking trees, shrubs, persistent emergents, emergent mosses, or lichens with greater than 30 percent areal coverage; and (3) whose total area exceeds 8 hectares (20 acres); or area less than 8 hectares if the boundary is active wave-formed or bedrock or if water depth in the deepest part of the basin exceeds 2 meters (6.6 feet) at low water (Figure G-2). Ocean-derived salinities are always less than 0.5 parts per thousand.

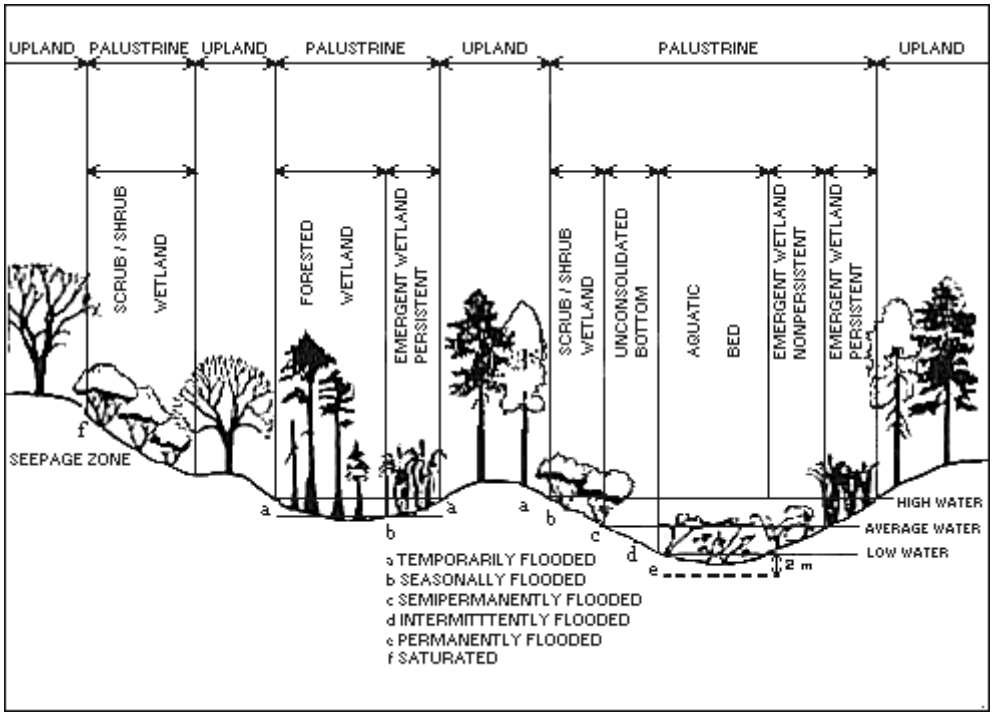

Figure G-2. Characteristics of Habitats in the Palustrine System

Lacustrine Systems

The Lacustrine System includes permanently flooded lakes, intermittent lakes, tidal lakes, and other areas of deep water, which commonly exhibit considerable wave action. These wetlands traditionally consist of all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens, and all such tidal wetlands where ocean-derived salinities are below 0.5 ppt (Figure G-3). This category also includes wetlands lacking such vegetation but with all of the following characteristics: (1) area less than 8 hectacres; (2) lacking an active wave-formed or bedrock boundary; (3) water depth in the deepest part of the basin less than 2 meters (6.6 feet) at low water; and (4) ocean-derived salinities less than 0.5 parts per thousand.

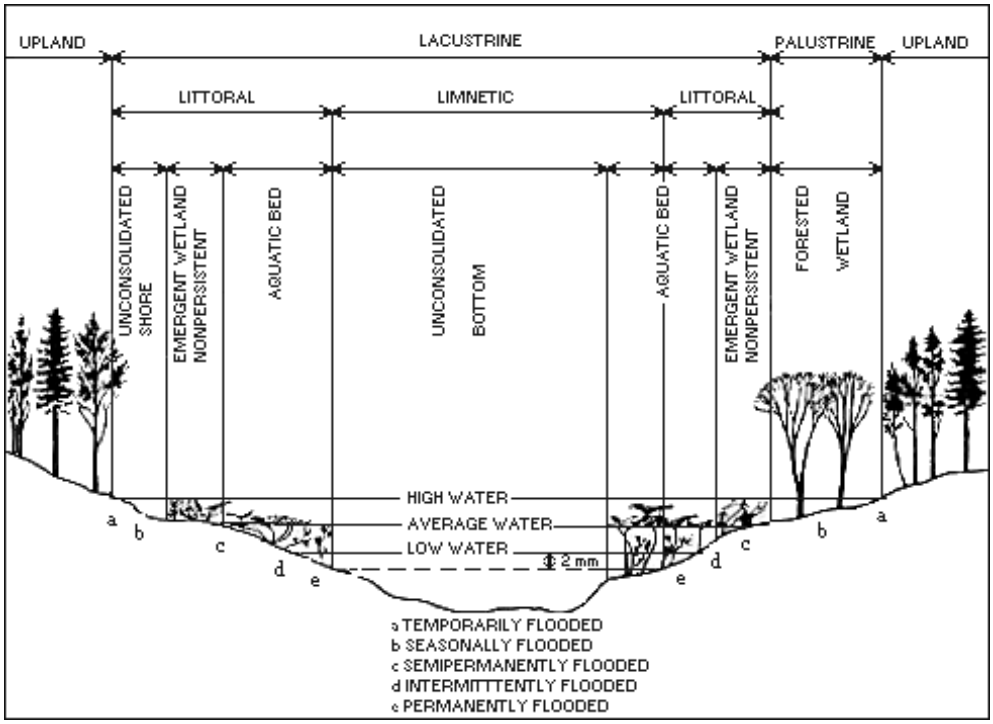

Figure G-3. Characteristics of Habitats in the Lacustrine System

References:

Cowardin, L. M., V. Carter, F. C. Golet, and E. T. LaRoe, 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Department of the Interior, Fish and Wildlife Service, Biological Services Program. FWS/OBS-79/31. December 1979.

Florida Department of Environmental Protection (FDEP), 2000. 2000 Florida Water Quality Assessment 305(b) Main Report and Technical Appendix, Bureau of Surface Water Management.

U.S. Geological Survey (USGS), 2004. Karst Features and Hydrogeology in West-central Florida. <http://water.usgs.gov/ogw/karst/kigconference/abt_karstfeatures.htm>. Website accessed on 18 March 2004.

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APPENDIX H

TECHNICAL SUPPORTING MATERIAL FOR BIOLOGICAL RESOURCES

COMMON AND SCIENTIFIC NAMES OF PLANT AND ANIMAL SPECIES FOUND WITHIN CHAPTER 3 BIOLOGICAL RESOURCES

Table H-1. Plant Species

SCIENTIFIC NAME	COMMON NAME
Andropogon spp.	Bluestems
Ardisia escallonioides	Marlberry
Aristida beyrichiana	Wiregrass
Asclepias curtissii	Curtiss' milkweed
Befaria racemosa	Tarflower
Callicarpa americana	American beautyberry
Carya floridana	Scrub hickory
Carya glabra	Pignut hickory
Cephatlanthus occidentalis	Buttonbush
Ceratiola ericoides	Rosemary
Chapmannia floridana	Florida alicia
Cladoina spp.	Ground lichens
Cladium jamaciense	Sawgrass
Clitoria fragrans	Pigeon-wing
Coelorachis tuberculosa	Piedmont jointgrass
Cyperus spp.	Nutsedge
Fimbristylis spp	Fimbry (Many-spiked sedge)
Gaylussacia dumosa	Dwarf huckleberry
Gordonia lasianthus	Loblolly bay
Hartwrightia floridana	Hartwrightia
Hypericum edisonianum	Edison's ascyrum
Ilex cassine	Dahoon holly
Lechea cernua	Nodding pinweed
Lilium catesbaei	Southern red lily
Lupinus diffusus	Sandhill lupines
Lyonia ferruginea	Rusty lyonia
Lyonia ligustrina	Maleberry
Lyonia mariana	Staggerbush
Lyonia spp.	Fetterbushes
Matelea floridana	Florida spiny-pod
Magnolia virginiana	Sweet bay magnolia
Morella carolliniensis	Southern bayberry
Myrica cerifera	Wax myrtle
Nyssa sylvatica var. biflora	Swamp tupelo
Ophioglossum palmatum	Hand fern
Osmunda cinnamomea	Cinnamon fern
Panicum abscissum	Cutthroat grass
Panicum hemitomon	Maidencane
Persea palustris	Swamp bay
Pinus clausa	Sand Pine
Pinus elliottii var.densa	Slash Pine

Table H-1. Plant Species Cont'd

SCIENTIFIC NAME	COMMON NAME
Pinus palustris	Longleaf pine
Platanthera integra	Yellow fringeless orchid
Polygonella basiramia	Hairy jointweed
Pontederia cordata	Pickerelweed
Psychotria sulzneri	Shortleaf wild coffee
Pteroglossaspis ecristata	Wild coco
Quercus chapmanii	Chapman oak
Quercus geminata	Sand live oak
Quercus hemisphaerica	Laurel oak
Quercus laevis	Turkey oak
Quercus margaretta	Scrub oak
Quercus minima	Dwarf live oak
Quercus myrtifolia	Myrtle oak
Quercus virginiana	Live oak
Rhynchospora spp.	Beakrush
Sabal palmetto	Cabbage palms
Serenoa repens	Saw palmetto
Taxodium ascendens	Pond cypress
Woodwardia virginica	Chain fern
Xyris iridifolia	Yellow-eyed grass

Table H-2. Animal Species

SCIENTIFIC NAME	COMMON NAME
Birds	
Aimophilia aestivalis	Bachman's sparrow
Ajaia ajaja	Roseate spoonbill
Ammodramus savannarum	Florida grasshopper sparrow
Aphelocoma coerulescens	Florida scrub jay
Athene cunicularia floridana	Florida burrowing owl
Buteo lineatus	Red-shouldered hawk
Cathartes aura	Turkey vulture
Caracara cheriway	Crested caracara
Colinus virginianus	Northern bobwhite
Columbina passerine	Ground dove
Dendroica pinus	Pine warbler
Dendroica coronata	Yellow-rumped warbler
Falco sparverius paulus	Southeastern American Kestrel
Grus canadensis pratensis	Florida sandhill crane
Haliaeetus leucocephalus	Bald eagle
Lanius ludovicianus	Loggerhead shrike
Mycteria americana	Wood stork
Pandion haliaetus	Osprey
Picoides borealis	Red-cockaded woodpecker
Piplo erythrophthalumus	Eastern towhee
Polyborus plancus	Crested caracara
Rostrhamus sociabilis	Snail kite
Sitta canadensis	Red-breasted nuthacth
Sterna antillarum	Least tern
Sternella magna	Eastern meadowlark
Mammals	
Cryptotis parva	Least shrew
Didelphis virginiana	Oppossum
Felis concolor coryi	Florida panther
Felis rufus	Bobcat
Mephitis mephitis	Striped skunk
Odocoileus virginianus	White-tailed deer
Peromyscus gossypinus	Cotton mouse
Podomys floridanus	Florida mouse
Procyon lotor	Raccoon
Reithrodontomys humulis	Eastern harvest mouse
Sciurus niger sherman	Shermans fox squirrel
Sigmodon hispidus	Cotton rat
Spilogale putorius	Spotted skunk
Sus scrofa	Feral pig
Sylvilagus floridanus	Eastern cottontail
Ursus americanus floridans	Florida black bear
Urocyon cinereoargenteus	Gray fox

Table H-2. Animal Species Cont'd

SCIENTIFIC NAME	COMMON NAME
Reptiles and Amphibians	
Acris gryllus dorsalis	Florida cricket frog
Alligator mississippiensis	American alligator
Bufo quercicus	Oak toad
Coluber constrictor priapus	Southern black racer
Cnemidophorus sexlineatus	Six-lined racerunner
Drymarchon corais couperi	Eastern indigo snake
Elaphe obsolete spp.	Rat snake
Eumeces egregious lividus	Blue-tailed mole skink
Gastrophryne carolinensis	Narrow-mouthed toad
Gopherus polyphemus	Gopher tortoise
Limnaoedus ocularis	Little grass frog
Masticophis flagellum	Coachwhip
Neoseps reynoldsi	Sand skink
Pituophis melanoleucus mugitus	Florida pine snake
Pseudacris nigrita nigrita	Southern chorus frog
Rana areolata	Gopher Frog
Sceloporus woodi	Florida scrub lizard
Insects	
Cicindela highlandensis	Highlands Tiger beetle
Latrodectus bishopi	Red widow spider

APPENDIX I

AGENCY CORRESPONDENCE

20041216002

An Employee-Owned Company

December 20, 2004

TO: Distribution

SUBJECT: Review of Preliminary Draft Environmental Assessment (EA) for the M270 Multiple Launch Rocket System (MLRS) Expanded Training Use Areas at Avon Park Air Force Range, Florida

This correspondence is a request on behalf of the Florida Army National Guard (FLARNG) for comments from your office on the subject document. The FLARNG prepared this EA to conform to the requirements of the National Environmental Policy Act (NEPA).

We respectfully request your comments be sent to Mrs. Amy Wiley, NEPA Coordinator, Florida Army National Guard, Camp Blanding Joint Training Center, Route 1 Box 465, Starke, Florida 32091, within 45 days, which is **3 February 2005**. The FLARNG would greatly appreciate it if you would consolidate your agency's comments. If you have any questions, please call Mrs. Wiley at 904-682-3450.

Sincerely,

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

Karen Daniels

Karen Daniels
Project Manager

cc: SAIC Central Records

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Mr. Brian Hendrick, Avon Park Correctional Institution (1 printed copy)

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FLORIDA DEPARTMENT OF STATE
Glenda E. Hood
Secretary of State
DIVISION OF HISTORICAL RESOURCES

RECEIVED
JAN 13 2005
OIP/OLGA

Ms. Lauren Milligan
Director, Florida State Clearinghouse
Florida Department of Environmental Protection
3900 Commonwealth Boulevard, Mail Station 47
Tallahassee, Florida 32399-3000

January 10, 2005

RE: DHR Project File Number: 2004-12437
Received by DHR December 22, 2004
SAI #: 200412210317C
Florida Army National Guard –Preliminary Draft Environmental Assessment for the M270 Multiple Launch Rocket system (MLRS) Expanded Training Use Areas at Avon Park Air Force Range, Highlands and Polk Counties

Dear Ms. Milligan:

Our office received and reviewed the above referenced project in accordance with Section 106 of the *National Historic Preservation Act of 1966* (Public Law 89-665), as amended in 1992, and *36 C.F.R., Part 800: Protection of Historic Properties*, Chapter 267, *Florida Statutes*, Florida's Coastal Management Program, and implementing state regulations, for possible impact to historic properties listed, or eligible for listing, in the *National Register of Historic Places*, or otherwise of historical, architectural or archaeological value. The State Historic Preservation Officer (SHPO) is to advise and assist state and federal agencies when identifying historic properties, assessing effects upon them, and considering alternatives to avoid or minimize adverse effects.

We look forward to future coordination between the Florida Army National Guard and this office with regards to this action.

If you have any questions concerning our comments, please contact Scott Edwards, Historic Preservationist, by electronic mail *sedwards@dos.state.fl.us*, or at 850-245-6333 or 800-847-7278.

Sincerely,

Lorna R. Kammerer, Deputy SHPO

for Frederick Gaske, Director, and
State Historic Preservation Officer

500 S. Bronough Street • Tallahassee, FL 32399-0250 • http://www.flheritage.com

☐ Director's Office (850) 245-6300 • FAX: 245-6436
☐ Archaeological Research (850) 245-6444 • FAX: 245-6436
☑ Historic Preservation (850) 245-6333 • FAX: 245-6437
☐ Historical Museums (850) 245-6400 • FAX: 245-6433
☐ Southeast Regional Office (954) 467-4990 • FAX: 467-4991
☐ Northeast Regional Office (904) 825-5045 • FAX: 825-5044
☐ Central Florida Regional Office (813) 272-3843 • FAX: 272-2340

STATE OF FLORIDA
Department of Military Affairs
Office of the Adjutant General

St. Francis Barracks, P.O. Box 1008
St. Augustine, Florida 32085-1008

January 13, 2005

Construction & Facility Management Office-It

Seminole Tribe of Florida
The Honorable Mitchell Cypress
6300 Stirling Road
Hollywood, Florida 33024

Dear Sir:

The Florida Army National Guard (FLARNG) requests your review of Tribal interests concerning the preliminary draft Environmental Assessment (EA) that is currently undergoing National Environmental Policy Act (NEPA) analysis. This EA is entitled: *Preliminary Draft Environmental Assessment for the M-270 Multiple Launch Rocket System (MLRS) Expanded Training Use Areas at Avon Park Air Force Range, Florida.*

The FLARNG is the proponent and lead agency for this proposed action, while the United States Air Force (USAF) is the landowner of Avon Park Air Force Range (APAFR). Avon Park Air Force Range is a USAF multiple use bombing and gunnery range located on approximately 106,073 acres, within Polk and Highlands Counties, in Central Florida. The proposed action, outlined in the preliminary draft EA, is for the FLARNG to conduct weekend and annual training for the MLRS activities. This action would involve the use of both wheeled and tracked MLRS vehicles on approximately 2,534 acres of dedicated training areas of this range. While this activity involves new technology the proposed training areas have been used for various activities over the past five decades. These activities include forestry, timber harvesting and cattle grazing in recent years, and the sites were used for military training activities during World War II. A majority of the proposed acreage would be considered low probability environments for cultural deposits.

This document is only a preliminary draft of the NEPA process and is still under development. If you would like to participate in the developmental process both the USAF and the FLARNG would welcome your input.

Please respond to this letter within 30 days indicating whether you wish to provide input on this action. If you do not respond or request an extension of time to review the proposed action and the effects it may have on tribal cultural issues, the USAF and FLARNG will move forward with the next phase of the project. Thank you for your consideration of this proposed action and for taking part in the NEPA process.

Sincerely,

Richard J. Gallant
Colonel, Florida Army National Guard
Construction & Facility Management Officer

Enclosure

STATE OF FLORIDA
Department of Military Affairs
Office of the Adjutant General

St. Francis Barracks, P.O. Box 1008
St. Augustine, Florida 32085-1008

January 13, 2005

Construction & Facility Management Office-lt

Seminole Nation of Oklahoma
The Honorable Jerry Haney
P.O. Box 1498
Seminole, Oklahoma 74884

Dear Sir:

The Florida Army National Guard (FLARNG) requests your review of Tribal interests concerning the preliminary draft Environmental Assessment (EA) that is currently undergoing National Environmental Policy Act (NEPA) analysis. This EA is entitled: *Preliminary Draft Environmental Assessment for the M-270 Multiple Launch Rocket System (MLRS) Expanded Training Use Areas at Avon Park Air Force Range, Florida.*

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Sincerely,

Richard J. Gallant
Colonel, Florida Army National Guard
Construction & Facility Management Officer

Enclosure

STATE OF FLORIDA
Department of Military Affairs
Office of the Adjutant General

St. Francis Barracks, P.O. Box 1008
St. Augustine, Florida 32085-1008

January 13, 2005

Construction & Facility Management Office-It

Muscogee (Creek) Nation of Oklahoma
The Honorable R. Perry Beaver (Chief)
P.O. Box 580, Highway 75 and Loop 56
Okmulgee, Oklahoma 74447

Dear Sir:

The Florida Army National Guard (FLARNG) requests your review of Tribal interests concerning the preliminary draft Environmental Assessment (EA) that is currently undergoing National Environmental Policy Act (NEPA) analysis. This EA is entitled: *Preliminary Draft Environmental Assessment for the M-270 Multiple Launch Rocket System (MLRS) Expanded Training Use Areas at Avon Park Air Force Range, Florida.*

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Sincerely,

Richard J. Gallant
Colonel, Florida Army National Guard
Construction & Facility Management Officer

Enclosure

STATE OF FLORIDA
Department of Military Affairs
Office of the Adjutant General

St. Francis Barracks, P.O. Box 1008
St. Augustine, Florida 32085-1008

January 13, 2005

Construction & Facility Management Office-lt

Mississippi Band of Choctaw Indians
The Honorable Phillip Martin
P.O. Box 6257
Philadelphia, Mississippi 39350

Dear Sir:

The Florida Army National Guard (FLARNG) requests your review of Tribal interests concerning the preliminary draft Environmental Assessment (EA) that is currently undergoing National Environmental Policy Act (NEPA) analysis. This EA is entitled: *Preliminary Draft Environmental Assessment for the M-270 Multiple Launch Rocket System (MLRS) Expanded Training Use Areas at Avon Park Air Force Range, Florida.*

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Sincerely,

Richard J. Gallant
Colonel, Florida Army National Guard
Construction & Facility Management Officer

Enclosure

STATE OF FLORIDA
Department of Military Affairs
Office of the Adjutant General

St. Francis Barracks, P.O. Box 1008
St. Augustine, Florida 32085-1008

January 13, 2005

Construction & Facility Management Office-lt

Miccosukee Tribe of Indians of Florida
The Honorable Billy Cypress
P.O. Box 440021
Tamiami Station, MM70

Dear Sir:

The Florida Army National Guard (FLARNG) requests your review of Tribal interests concerning the preliminary draft Environmental Assessment (EA) that is currently undergoing National Environmental Policy Act (NEPA) analysis. This EA is entitled: *Preliminary Draft Environmental Assessment for the M-270 Multiple Launch Rocket System (MLRS) Expanded Training Use Areas at Avon Park Air Force Range, Florida.*

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Sincerely,

Richard J. Gallant
Colonel, Florida Army National Guard
Construction & Facility Management Officer

Enclosure

STATE OF FLORIDA
Department of Military Affairs
Office of the Adjutant General

St. Francis Barracks, P.O. Box 1008
St. Augustine, Florida 32085-1008

January 13, 2005

Construction & Facility Management Office-lt

Choctaw Nation of Oklahoma
The Honorable Gregory E. Pyle (Chief)
P.O. Drawer 1210, 16th & Locust
Durant, Oklahoma 74702

Dear Sir:

The Florida Army National Guard (FLARNG) requests your review of Tribal interests concerning the preliminary draft Environmental Assessment (EA) that is currently undergoing National Environmental Policy Act (NEPA) analysis. This EA is entitled: *Preliminary Draft Environmental Assessment for the M-270 Multiple Launch Rocket System (MLRS) Expanded Training Use Areas at Avon Park Air Force Range, Florida.*

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Sincerely,

Richard J. Gallant
Colonel, Florida Army National Guard
Construction & Facility Management Officer

Enclosure

STATE OF FLORIDA
Department of Military Affairs
Office of the Adjutant General

St. Francis Barracks, P.O. Box 1008
St. Augustine, Florida 32085-1008

January 13, 2005

Construction & Facility Management Office-lt

Dr. Janet Matthews
State Historical Preservation Officer, Florida Division of State
R.A. Gray Building, 500 S. Bronough Street
Tallahassee, Florida 32399

Dear Ma'am:

The Florida Army National Guard (FLARNG) requests your review of Tribal interests concerning the preliminary draft Environmental Assessment (EA) that is currently undergoing National Environmental Policy Act (NEPA) analysis. This EA is entitled: *Preliminary Draft Environmental Assessment for the M-270 Multiple Launch Rocket System (MLRS) Expanded Training Use Areas at Avon Park Air Force Range, Florida.*

The FLARNG is the proponent and lead agency for this proposed action, while the United States Air Force (USAF) is the landowner of Avon Park Air Force Range (APAFR). Avon Park Air Force Range is a USAF multiple use bombing and gunnery range located on approximately 106,073 acres, within Polk and Highlands Counties, in Central Florida. The proposed action, outlined in the preliminary draft EA, is for the FLARNG to conduct weekend and annual training for the MLRS activities. This action would involve the use of both wheeled and tracked MLRS vehicles on approximately 2,534 acres of dedicated training areas of this range. While this activity involves new technology the proposed training areas have been used for various activities over the past five decades. These activities include forestry, timber harvesting and cattle grazing in recent years, and the sites were used for military training activities during World War II. A majority of the proposed acreage would be considered low probability environments for cultural deposits.

This document is only a preliminary draft of the NEPA process and is still under development. If you would like to participate in the developmental process both the USAF and the FLARNG would welcome your input.

Please respond to this letter within 30 days indicating whether you wish to provide input on this action. If you do not respond or request an extension of time to review the proposed action and the effects it may have on tribal cultural issues, the USAF and FLARNG will move forward with the next phase of the project. Thank you for your consideration of this proposed action and for taking part in the NEPA process.

Sincerely,

Richard J. Gallant
Colonel, Florida Army National Guard
Construction & Facility Management Officer

Enclosure

STATE OF FLORIDA
Department of Military Affairs
Office of the Adjutant General

St. Francis Barracks, P.O. Box 1008
St. Augustine, Florida 32085-1008

January 13, 2005

Construction & Facility Management Office-lt

Chickasaw Nation
The Honorable Bill Anouatubby
P.O. Box 1548
Ada, Oklahama 74820

Dear Sir:

The Florida Army National Guard (FLARNG) requests your review of Tribal interests concerning the preliminary draft Environmental Assessment (EA) that is currently undergoing National Environmental Policy Act (NEPA) analysis. This EA is entitled: *Preliminary Draft Environmental Assessment for the M-270 Multiple Launch Rocket System (MLRS) Expanded Training Use Areas at Avon Park Air Force Range, Florida.*

The FLARNG is the proponent and lead agency for this proposed action, while the United States Air Force (USAF) is the landowner of Avon Park Air Force Range (APAFR). Avon Park Air Force Range is a USAF multiple use bombing and gunnery range located on approximately 106,073 acres, within Polk and Highlands Counties, in Central Florida. The proposed action, outlined in the preliminary draft EA, is for the FLARNG to conduct weekend and annual training for the MLRS activities. This action would involve the use of both wheeled and tracked MLRS vehicles on approximately 2,534 acres of dedicated training areas of this range. While this activity involves new technology the proposed training areas have been used for various activities over the past five decades. These activities include forestry, timber harvesting and cattle grazing in recent years, and the sites were used for military training activities during World War II. A majority of the proposed acreage would be considered low probability environments for cultural deposits.

This document is only a preliminary draft of the NEPA process and is still under development. If you would like to participate in the developmental process both the USAF and the FLARNG would welcome your input.

Please respond to this letter within 30 days indicating whether you wish to provide input on this action. If you do not respond or request an extension of time to review the proposed action and the effects it may have on tribal cultural issues, the USAF and FLARNG will move forward with the next phase of the project. Thank you for your consideration of this proposed action and for taking part in the NEPA process.

Sincerely,

Richard J. Gallant
Colonel, Florida Army National Guard
Construction & Facility Management Officer

Enclosure

02/09/2005 15:36 8502452190 FL ST CLEARINGHSE PAGE 05/10

FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

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KENNETH D. HADDAD, Executive Director
VICTOR J. HELLER, Assistant Executive Director

MARY ANN POOLE, DIRECTOR
OFFICE OF POLICY AND STAKEHOLDER COORDINATION
(850)488-6661 TDD (850)488-9542
FAX (850)922-5679

January 26, 2005

RECEIVED
JAN 28 2005
OIP / OLGA

Ms. Lauren Milligan
Environmental Consultant
Florida State Clearinghouse
Department of Environmental Protection
3900 Commonwealth Boulevard, MS-47
Tallahassee, Florida 32399-3000

Re: SAI #FL200412210317C, Florida Army National Guard – Preliminary Draft Environmental Assessment for the M270 Multiple Launch Rocket System (MLRS) Expanded Training Use Areas at Avon Park Air Force Range, Highlands and Polk Counties

Dear Ms. Milligan:

The Office of Policy and Stakeholder Coordination of the Fish and Wildlife Conservation Commission (FWC) has coordinated an agency review of the preliminary draft Environmental Assessment (EA) for the Florida Army National Guard's (FLARNG) proposal to expand artillery training at Avon Park Air Force Range (APAFR). This letter is provided to the Florida State Clearinghouse as part of its determination of consistency under the Coastal Zone Management Act and review under the National Environmental Policy Act.

The FLARNG proposes to expand existing training activities of the FLARNG at APAFR so that the FLARNG can simulate the wider variety of battle conditions required for certification as combat capable and ready to deploy to combat under the U.S. Army's training doctrine. This expansion includes increased, heavy vehicular traffic off of the existing roads and associated shoulders and the creation of six new Maneuver Areas (MAs). The preliminary draft EA describes most of the areas proposed for use as being comprised of poorly drained soils that are highly susceptible to compaction from vehicular traffic. The proposed FLARNG maneuvers would be conducted on between one and four MAs on up to six weekends per year, with one 15-day Annual Training Session.

Through careful management, APAFR has continued to provide significant wildlife value, including significant habitat benefits for species listed by both the State and Federal governments

620 South Meridian Street • Tallahassee • FL • 32399-1600
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as endangered (E) or threatened (T), and by the State as species of special concern (SSC). Table 1 provides a list of these species as reported in various forms in the preliminary draft EA; it also includes several State-listed avian species that, given their ranges in Florida and available habitat in APAFR, may forage on site, but which are not included in the preliminary draft EA. Additionally, analyses (Cox and Kautz 2000) based on LandSat data by the FWC indicate the potential for rich species diversity on APAFR.

The FWC has been a land management cooperator with the Environmental Flight at APAFR for many years, and cooperated on the operation of a public wildlife management area where several forms of public recreation are allowed. The FWC, along with the U.S. Fish and Wildlife Service (USFWS), has also assisted with preparation of land and resource management plans for these lands. Both FWC and USFWS are signatories to both the APAFR's Endangered Species Plan and the Integrated Natural Resource Management Plan. The former includes delineated Habitat Management Units (HMUs) specifically of the Florida grasshopper sparrow, Florida scrub jay, and red-cockaded woodpecker. Section 3 of the preliminary draft EA indicates that 83% (2,190 acres) of the 2,618 acres comprising the MAs are within HMUs for the red-cockaded woodpecker and 2% of the total (51.5 acres) is within HMUs for the Florida scrub jay. Table 5-16 (p. 5-35) indicates that no nests of either species were found within the proposed MAs, but does not describe the level of impact that is anticipated to other habitat features that make these areas important in the management and conservation of these species. The preliminary draft EA indicates that there would be no impacts to HMUs established for the Florida grasshopper sparrow.

Staff responsible for cooperating in the management of APAFR as a public wildlife management area does not anticipate that the proposed activities would pose significant problems with that program. On the other hand, at this point in its development, the EA does not provide sufficient information for the FWC to provide a complete review of other environmental considerations, either under the Coastal Zone Management Act or under the National Environmental Policy Act. The areas of information that would be most significant in this regard include:

Consistency with State statutes and regulations: The State statute that would apply is Chapter 372, Florida Statutes, and the regulation is Rule 68A-27, Florida Administrative Code. In this context, we note that generally the State of Florida protects the animal, its active nest, and, (if applicable) its eggs, but does not regulate habitat.

Consistency with HMU management plans: This information would include the type and locations of impacts to the established HMUs; and the extent to which impacts can be avoided, minimized, or repaired.

Extent of environmental impact: The preliminary draft EA describes the potential for extensive soil compaction and resulting effects on vegetation. Because vegetation is a critical component of fish and wildlife habitat, an analysis of the effects on vegetation would be central to

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Ms. Lauren Milligan
Page 3
January 26, 2005

supporting either a Finding of No Significant Impact or a Finding of Significant Impact under the National Environmental Policy Act.

The FWC recognizes the important national military objectives of the proposed training, and understands that APAFR is designated military land, with military training objectives within the primary mission for these lands. We therefore offer our technical assistance in refining the scope of information that we would need to complete our review and in providing relevant data. If you have any questions about our review at this point, please do not hesitate to contact me at 850-488-6661.

Sincerely,

Mary Ann Poole

Mary Ann Poole, Director
Office of Policy and Stakeholder Coord.

map/hb
ENV 1-3-2
U:\traci.wallace\sai 0317c.doc
Enclosure

Literature Cited

Cox, J. A., and R. S. Kautz. 2000. Habitat conservation needs of rare and imperiled wildlife in Florida. Office of Environmental Services, Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida. 156 pp.

Table 1. State-Listed Wildlife Species Documented or Potentially Occurring on APAFR

SCIENTIFIC NAME	COMMON NAME	STATE STATUS
Amphibians		
[a]*Rana areolata*	Gopher frog	SSC
Reptiles		
[a]*Alligator mississippiensis*	American alligator	SSC
[b]*Drymarchon corais couperi*	Eastern indigo snake	T
[c]*Eumeces egregius lividus*	Blue-tailed mole skink	T
[a]*Gopherus polyphemus*	Gopher tortoise	SSC
[c]*Neoseps reynoldsi*	Sand skink	T
[a]*Pituophis melanoleucus mugitus*	Florida pine snake	SSC
Birds		
[b]*Ammodramus savannarum*	Florida grasshopper sparrow	E
[b]*Aphelocoma coerulescens*	Florida scrub-jay	T
[d]*Aramus guarauna*	limpkin	SSC
[a]*Athene cunicularia floridana*	Florida burrowing owl	SSC
[b]*Caracara cheriway*	Crested caracara	T
[d]*Egretta thula*	snowy egret	SSC
[d]*E. caerulea*	little blue heron	SSC
[a]*E. tricolor*	tricolored heron	SSC
[d]*Eudocimus alba*	white ibis	SSC
[b]*Falco sparverius paulus*	Southeastern American kestrel	T
[b]*Grus canadensis pratensis*	Florida sandhill crane	T
[b]*Haliaeetus leucocephalus*	Bald eagle	T
[b]*Mycteria americana*	Wood stork	E
[b]*Picoides borealis*	Red-cockaded woodpecker	SSC
[a]*Platalea ajaja*	Roseate spoonbill	SSC
[c]*Rostrhamus sociabilis*	Snail kite	E
[b]*Sterna antillarum*	Least tern	T
Mammals		
[b]*Puma concolor coryi*	Florida panther	E
[a]*Podomys floridanus*	Florida mouse	SSC
[a]*Sciurus niger sherman*	Sherman's fox squirrel	SSC
[b]*Ursus americanus floridans*	Florida black bear	T

[a]Listed in Appendix H only
[b]Listed in Appendix and Section 4
[c]Listed in Appendix and Section 4, but noted in Section 4 as occurring off-site
[d]Other state-listed species that would be expected, given range and type of habitat

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Department of Environmental Protection

Jeb Bush
Governor

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Colleen M. Castille
Secretary

February 2, 2005

Mrs. Amy Wiley, NEPA Coordinator
Florida Army National Guard
Camp Blanding Joint Training Center
Route 1, Box 465
Starke, Florida 32091

RE: Florida Army National Guard – Preliminary Draft Environmental Assessment for the M270 Multiple Launch Rocket System (MLRS) Expanded Training Use Areas at Avon Park Air Force Range – Highlands and Polk Counties, Florida.
SAI # FL200412210317C

Dear Mrs. Wiley:

The Florida State Clearinghouse, pursuant to Presidential Executive Order 12372, Gubernatorial Executive Order 95-359, the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended, and the National Environmental Policy Act, 42 U.S.C. §§ 4321, 4331-4335, 4341-4347, as amended, has coordinated a review of the referenced preliminary draft environmental assessment (EA).

The Florida Fish and Wildlife Conservation Commission (FWC) notes that Section 3 of the preliminary draft EA indicates that 83% of the 2,618 acres comprising the Maneuver Areas are within the Habitat Management Units (HMUs) for the red-cockaded woodpecker and 2% of the total is within HMUs for the Florida scrub jay. Though staff does not anticipate that the proposed activities would pose significant problems with management of the base as a public wildlife management area, the EA does not provide sufficient information for the FWC to provide a complete review of the proposal. The EA should include additional information on the type and locations of impacts to the established HMUs, and the extent to which impacts can be avoided, minimized, or repaired. In addition, an analysis of the effects on vegetation would be central to supporting either a Finding of No Significant Impact or a Finding of Significant Impact under NEPA. Please refer to the enclosed FWC letter for additional details and comments.

Based on the information contained in the preliminary draft EA and comments provided by our reviewing agencies, the state has determined that, at this stage, the subject project is consistent with the Florida Coastal Management Program (FCMP). The applicant must, however, address the concerns identified by the FWC prior to project implementation. All subsequent environmental documents prepared for this project must be reviewed to determine the

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Mrs. Amy Wiley
February 2, 2005
Page 2 of 2

project's continued consistency with the FCMP. The state's continued concurrence with the project will be based, in part, on the adequate resolution of any issues identified during this and subsequent reviews.

Thank you for the opportunity to review the subject document. If you have any questions regarding this letter, please contact Ms. Lauren P. Milligan at (850) 245-2163.

Sincerely,

Sally B. Mann

Sally B. Mann, Director
Office of Intergovernmental Programs

SBM/lm
Enclosures

cc: Mary Ann Poole, FWC

Florida Clearinghouse Page 1 of 1

Florida
Department of Environmental Protection
"More Protection, Less Process"

Categories

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Project Information	
Project:	FL200412210317C
Comments Due:	January 19, 2005
Letter Due:	February 03, 2005
Description:	FLORIDA ARMY NATIONAL GUARD - PRELIMINARY DRAFT ENVIRONMENTAL ASSESSMENT FOR THE M270 MULTIPLE LAUNCH ROCKET SYSTEM (MLRS) EXPANDED TRAINING USE AREAS AT AVON PARK AIR FORCE RANGE - HIGHLANDS AND POLK COUNTIES, FLORIDA.
Keywords:	FLARNG - M270 MLRS EXPANDED TRAINING AREAS AT AVON PARK AFR - HIGHLANDS/POLK CO.
CFDA #:	12.401

Agency Comments:
COMMUNITY AFFAIRS - FLORIDA DEPARTMENT OF COMMUNITY AFFAIRS
ENVIRONMENTAL PROTECTION - FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
No Comment
FISH and WILDLIFE COMMISSION - FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
4-PAGE LETTER PLUS ENCLOSURE BY MARY ANN POOLE ON 1/26/05.
STATE - FLORIDA DEPARTMENT OF STATE
Staff looks forward to future coordination between the Florida Army National Guard and the DOS Division of Historical Resources with regards to this action.
TRANSPORTATION - FLORIDA DEPARTMENT OF TRANSPORTATION
Consistent; No Comments. Larry Slayback, District ICAR Coordinator (239) 461-4300.
SOUTH FLORIDA WMD - SOUTH FLORIDA WATER MANAGEMENT DISTRICT
Released Without Comment
ENVIRONMENTAL POLICY UNIT - OFFICE OF POLICY AND BUDGET, ENVIRONMENTAL POLICY UNIT
No Comment
CENTRAL FL RPC - CENTRAL FLORIDA REGIONAL PLANNING COUNCIL
No Comments
HIGHLANDS -
POLK -

For more information please contact the Clearinghouse Office at:

3900 COMMONWEALTH BOULEVARD MS-47
TALLAHASSEE, FLORIDA 32399-3000
TELEPHONE: (850) 245-2161
FAX: (850) 245-2190

Visit the Clearinghouse Home Page to query other projects.

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http://tlhora6.dep.state.fl.us/clearinghouse/applicant/project.asp?chips_project_id=31463 3/18/2005

Healey, Martin J Mr FL-ARNG

From: Healey, Martin J Mr FL-ARNG
Sent: Monday, February 21, 2005 4:45 PM
To: 'Steve Terry'
Cc: Robinson, Russell K Mr FL-ARNG
Subject: RE: Extension request

Dear Steve,

I have received and acknowledge your request for a 30 day extension on the review of the documents listed in your email. Thank you for your time and it was a pleasure to meet you. Again I look forward to working with you. I hope this is a new era for the FLARNG and Miccosukee Tribe cooperation and relations.

Marty

-----Original Message-----
From: Steve Terry [mailto:SteveT@miccosukeetribe.com]
Sent: Friday, February 18, 2005 9:04 AM
To: martin.j.healey@fl.ngb.army.mil
Subject: Extension request

Marty,
Please consider this as a request for a 30 day extension of time to reply to the Preliminary Draft EA entitled Addition of Multiple Launch Rocket System Training to the Training Program of Camp Blanding Joint Training Center, Florida, the Draft EA entitled Draft Environmental Assessment Construction of a Multi-Unit Armory at the Snake Creek Weekend Training Site (WETS) Miaramar, Florida and the Preliminary Draft EA entitled Preliminary Draft Environmental Assessment for the M270 Multiple Launch Roacket System (MLRS) Expanded Training Use Areas at Avon Park Air Force Range, Florida. Thank you for meeting with me today. I look forward towards working with you on Cultural Resources issues concerning the Florida Army National Guard. Steve Terry

1

Miccosukee Tribe of Indians
of Florida

Business Council Members
Billy Cypress, Chairman

Jasper Nelson, Ass't. Chairman
Max Billie, Treasurer

Andrew Bert Sr., Secretary
Jerry Cypress, Lawmaker

February 24, 2005

COL. Richard J. Gallant
Construction & Facility Management Office
Dept. Of Military Affairs
Florida Army National Guard
St. Francis Barracks, P.O. Box 1009
St.Augustine, FL 32085-1008

Dear COL. Gallant:

The Miccosukee Tribe received your letters concerning several proposed construction projects in the State of Florida. Also, I met with Martin Healey last week on these same projects. Our meeting was very productive, and the Tribe looks forward to fostering a good relationship with the Florida Army National Guard. Our comments on these projects are as follows:

After consultation with Mr. Dayhoff and careful review of the documentation provided, the Tribe determined that there is no cultural, historical, or religious site of the Tribe at the Snake Creek Weekend Training Site at Miramar. We also determined the same applies to the MLRS Training Program proposed for Camp Blanding. This determination was based on the documentation provided by the Florida Army National Guard.

The MLRS Training Program for Avon AFB is slightly different. At no time has there ever been any consultation with the Miccosukee Tribe on this military installation. Yet, through personal knowledge, I know that there is at least one dugout canoe and numerous other artifacts stored at this base from previous cultural resources surveys. The cultural resources survey section of this EA is lacking in that there are 220 acres of High/Medium probability acreage that has not been surveyed. This, at a minimum, needs to be surveyed before the Miccosukee Tribe can comment on this. We would prefer that at least a pedestrian survey be conducted of the 2,314 acres that are considered low probability acreage. The Air Force states that there are no known traditional cultural properties on the installation yet there has been no consultation with the Miccosukee Tribe. The Tribe can prove through a preponderance of evidence to be affiliated with the remnants of the Calusa Indians. Therefore, any Calusa site on this installation will be important to the Miccosukee Tribe. The Tribe will require the following before a determination can be made of this EA:

RECEIVED
MAR 1 2005
CONSTRUCTION & FACILITY MANAGEMENT OFFICE

P.O. Box 440021, Tamiami Station, Miami, Florida 33144, (305) 223-8380, fax (305) 223-1011
Constitution Approved by the Secretary of the Interior, January 11, 1962

COL. Gallant Letter
February 24, 2005
Page 2

1. We receive a copy of all archaeological surveys, reports, etc. conducted on this installation.
2. The Medium/High priority acreage be surveyed with the results of the survey sent to the Tribe.
3. A pedestrian survey be conducted of the Low Priority acreage.

Thank you for consulting with us. Please call me at (305) 223-8380, Ext. 2244, if you require further information.

Sincerely,

Steve Terry
NAGPRA & Section 106 Representative

-----Original Message-----
From: Healey, Martin J Mr FL-ARNG
Sent: Friday, February 25, 2005 7:34 AM
To: wsteele@semtrib.com
Cc: Healey, Martin J Mr FL-ARNG; Robinson, Russell K Mr FL-ARNG
Subject: EA documentation for Snake Creek WETS, Camp Blanding Joint Training Center MLRS, Avon Park MLRS

Dear Mr. Steele,

Hello sir. I have been trying to reach you by phone this week concerning Tribal response to three documents sent to your Chairman's Office. They were all issued over forty (40) days ago. The Florida Army National Guard was seeking input from the tribes with regard to the following documentations.

1. *Draft Environmental Assessment Construction of a Multi-Unit Armory at the Snake Creek Weekend Training Site (WETS) Miramar, Florida.*
2. *Preliminary Draft Environmental Assessment for the M-270 Multiple Launch Rocket System (MLRS) Expanded Training Use Areas at Avon Park Air Force Range, Florida.*
3. *Addition of Multiple Launch Rocket System Training to the Training Program of Camp Blanding Joint Training Center, Florida.*

I will be out of the office from Friday 25, FEB to 8, FEB but please email or call my phone at 904/823-0246 and leave a voice mail. You may also email, or call Mr. Russell Robinson – Office Phone 904/823-0275 Cell Phone 904/814-6174. Mr. Robinson and I will be in New Orleans next week at a GIS training course.

These are high priority projects for the Guard so if you could please respond as quickly as possible it would be appreciated.

Thank you for your time and efforts in this matter.

Sincerely,

Martin J. Healey
FLARNG
Cultural Resources

Phone Contact Record

Date: 25 February 2005

Project: EA for M270 Multiple Use Rocket System (MLRS) Expanded Training Use Areas at Avon Park Air Force Range (APAFR), Florida

Contact: Mr. Jeff Howe, U.S. Fish and Wildlife Service (USFWS), Vero Beach Office, 772-562-3909, ext. 283 with Karen Daniels, Project Manager, Science Applications International Corporation (SAIC)

Description of Contact:

Jeff Howe noted that their agency received the Preliminary Draft Environmental Assessment on December 20, but that he personally has only had it for three weeks and that he has three other APAFR projects to review with a higher priority.

We discussed the project some and Ms. Daniels noted that the project would have no effect on the Florida Grasshopper Sparrow or the Red-cockaded woodpecker. She noted that the FLARNG was interested in any avoidance measures that the USFWS prescribed for the indigo snake. Mr. Howe said that avoidance measures would include education and awareness training. Ms. Daniels told him the FLARNG did both of these, but that it may not have been explicit in the document. Ms. Daniels mentioned the training video and the pamphlet that were provided to the FLARNG soldiers before training at APAFR. The Draft EA will explicitly include this information. Ms. Daniels told Mr. Howe that our Draft EA for public comment was going out on 25 March. Mr. Howe subsequently talked with his supervisor and said he would try to minimally get the FLARNG a letter before the public document went out telling the FLARNG if their agency concurs or if they feel the FLARNG needs a formal consultation.

CFMO-ENV-ESC 18 March 2005

MEMORANDUM FOR RECORD

SUBJECT: Native American Consultation – *Preliminary Draft Environmental Assessment for the M-270 Multiple Launch Rocket System (MLRS) Expanded Training Use Areas at Avon Park Air Force Range.*

1. On 10 January 2005 seven letters were drafted by the Construction and Facility Management Office of the Florida Army National Guard (FLARNG). These letters were sent by certified letter to the Federally Recognized Indian Tribes that the FLARNG has historically been in contact with. These seven Indian Tribes are the only Federally Tribes that have expressed an interest in the State of Florida for their ancestral ties. The letters were sent out in accordance with the applicable Federal and State laws including but not limited to the following:

1. National Environmental Policy Act (NEPA) of 1969.
2. National Historic Preservation Act (NHPA) of 1966.
3. Executive Order (EO) 11593.
4. Antiquities Act of 1906 / Archaeological Resources Protection Act of 1979 (ARPA) / Archaeological and Historical Preservation act of 1974 (AHPA).
5. Native American Graves Protection and Repatriation Act (NAGPRA).
6. American Indian Religious Freedom Act (AIRFA) of 1978 and EO 13007 – Indian Sacred Sites, dated October 1996.
7. Presidential Memorandum date 29 April 1994 – Government to Government Relations with Native American Tribal Governments / Department of Defense American Indian and Alaska Native Policy, 27 October 1999.
8. EO 13175. Consultation and Coordination with Indian Tribal Governments.
9. Curation of Federally- Owned and Administered Archaeological Collections (36 CFR Part 79).
10. Army Regulations 200-4, Cultural Resource Management.

2. All Certified mail return receipts were received by the FLARNG on 18 January 2005. On this date the 30 day comment period began. FLARNG personnel then started a correspondence log for this project. The following list is an annotated version of the FLARNG communications log. The annotated version contains the name of the Federally Recognized Indian Tribe, the name of the Point of Contact (POC) for the Tribe (in most cases the Tribal Historic Preservation Officer) and the POC comments on the project. The FLARNG correspondence log and all correspondence letters both electronic and paper are attached to this MFR for you reference.

a) Chickasaw Nation – Ms. Nial, THPO – Phone conversation on 24 February 2005 - Stated the Chickasaw Nation was not interested in this area of Florida.
b) Choctaw Nation of Oklahoma – Mr. Cole, THPO – Phone conversation on 24 February 2005 - Stated the site is out of the Tribes interest in Florida.
c) Miccosukee Tribe of Indians of Florida – Mr. Terry, THPO – Stated in a letter received by the FLARNG 01 March 2005 "The cultural resources survey section of this EA is lacking in that there are 220 acres of High/Medium probability acreage that has not been surveyed. This, at a minimum, needs to be surveyed before the

Miccosukee Tribe can comment on this. The tribe will require the following before a determination can be made of this EA:

1. We receive a copy of all archaeological surveys, reports, etc. conducted on this instillation.
2. The Medium/High priority acreage be surveyed with the results of the survey sent to the Tribe.
3. A pedestrian survey be conducted of the Low Priority acreage."

d) Mississippi Band of Choctaw Indians – Mr. Carleton, THPO –Phone conversation on 22 February 2005 – Stated that the Tribe had no interest in this area of the State of Florida.

e) Muscogee (Creek) Nation of Oklahoma – Ms. Bear, THPO – Phone conversation on 22 February 2005 – Stated that the Tribe had no interests in this part of the State of Florida.

f) Seminole Nation of Oklahoma – Mr. Spain, THPO – Phone conversation on 2 February 2005 – Stated that he would let the Seminole Tribe of Florida handle this one.

g) Seminole Tribe of Florida - Mr. Steele, THPO, Mr. Trnka (Asst. THPO) – Mr. Healey attempted to contact the Tribal representatives on a number of occasions (see communication log.) On 18 March Mr. Healey had a phone conversation with Mr. Trnka Assistant THPO. Mr. Steele was attending to tribal business out of the State. Mr. Trnka stated the THPO office had not received the documentation from the Chairman's office. Mr. Healey then explained the projects to Mr. Trnka. Mr. Healey also explained the only comments received back from the Tribes were from the Miccosukee Tribe of Florida and told Mr. Trnka what those comments were. Mr. Healey explained that the FLARNG would be moving forward on these projects and the Seminole Tribe could comment at a later date if they deemed necessary. Mr. Healey suggested that Mr. Trnka contact Mr. Terry at the Miccosukee Tribe and consult with him.

This record has been created to show the FLARNG and the USAF have shown due diligence and good faith with regard to the laws and regulations listed above involving this federal action taking place at the Avon Park Air Force Range. It is the recommendation of the conservation personnel of the FLARNG that the FLARNG and the USAF move forward with this project with continued consultations with the Miccosukee and Seminole Indian Tribes.

Encl

MARTIN J. HEALEY
CIV, FLNG
Environmental Specialist I

Avon Park MLRS Preliminary EA

TRIBE	CHAIRMAN/CHIEF/MEKKO	TRIBAL CONTACT	CERTIFIED LETTER		RESPONSE LETTER	FLARNG PHONE LOG	FLARNG EMAIL LOG
			SENT	RECEIVED			
Chickasaw Nation	The Honorable Bill Anouatubby (Chief) P.O. Box 1548 Ada, OK 74820 TEL: 580/436-2603 FAX: 580/436-4287	Mr. Ed Postoak P.O. Box 1548 Ada, OK 74820 TEL: 580/332-8685 EMAIL: Ms. Gingy Nial - THPO	1/13/2005	1/20/2005	No letter received from the Tribe as of 02/21/05	Martin Healey FLARNG phoned Mr. Ed Postoak on 23,Feb 2005 @ 13:50 hrs.. Mr. Postoak said the Tribe was not interested in these areas of Florida but would have his Historic Preservation Officer call FLARNG back.	
Chickasaw Nation						23, FEB 2005 Ms. Gingy Nial the historic preservation officer for the Chickasaw Nation phoned at 14:21 hrs. 580/332-8685	
Chickasaw Nation						24, FEB 2005 Mr. Healey FLARNG spoke to Ms. Nial of the Chickasaw Nation with regards to the Snake Creek WETS EA. Ms. Nial stated the tribe was not interested in this area of Florida. Mr. Healey requested an email stating that the tribe was not interested be sent to him at the FLARNG.	
Choctaw Nation of Oklahoma	The Honorable Gregory E. Pyle (Chief) P.O. Drawer 1210 Durant, OK 74702 TEL: 580/924-8280 FAX: 580/924-1150	Mr. Terry Cole Director: Cultural Resources P.O. Drawer 1210 Durant, OK 74702 TEL: 580/924-8280 EMAIL: tcole@choctawnation.com	1/13/2005	1/20/2005	No letter received from the Tribe as of 02/21/05	23, FEB 2005 Mr. Healey FLARNG called Mr. Cole@16:32 hrs was told Mr. Cole left for the day.	
Choctaw Nation of Oklahoma						24, FEB 2005 Mr. Healey FLARNG called Mr. Cole @14:00 hrs. Mr. Cole requested we document over the phone that the Choctaw Nation of Oklahoma had no comment the site is out of the Tribes area of interest in Florida.	
Miccosukee Tribe of Indians of Florida	The Honorable Billy Cypress (Chairman) P.O. Box 440021 Miami, FL 33144 TEL:305/223-8380 FAX: 305/223-1011	Mr. Steve Terry - THPO P.O. Box44021 Miami, FL 33144 TEL: 305/223-8380 FAX: 305/553-3644 EMAIL: stevet@miccosukeetribe.com	1/13/2005	1/20/2005	No letter received from the Tribe as of 02/21/05		Email received 21, FEB 2005 Requesting 30 day extension. Mr. Healey FLARNG replied in email acknowledging extension request 22, FEB 2005
Miccosukee Tribe of Indians of Florida			9/15/2005	9/18/2005	Concurrence letter received 10/25/05.		
Muscogee (Creek) Nation of Oklahoma	The Honorable R. Perry Beaver (Chief) P.O. Box 850 Highway 75 and Loop 56 Okmulgee, OK 74447 TEL:918/756-8700 FAX: 918/796-2911	Ms. Joyce A. Bear - THPO P.O. Box 850 Highway 75 and Loop 56 Okmulgee, OK 74447 TEL:918/457-8700 ext 603 FAX: 918/758-1499 Alternate contact: Mr. Tim Thompson - Cultural Preservation Advisor P.O. Box 850 Highway 75 and Loop 56 Okmulgee, OK 74447 TEL:918/759-0151 FAX: 918/758-0649 Email: MekkoTim@hotmail.com	1/13/2005	1/20/2005	No letter received from the Tribe as of 02/21/05	22, FEB 2005 Mr. Healey FLARNG spoke with Ms. Bear of the Muscogee (Creek) Nation of Oklahoma @16:40 hrs. Ms. Bear Stated the Tribe had no interests in this part of the State of Florida.	
Seminole Nation of Oklahoma	The Honorable Jerry Haney (Chief) P.O. Box 1498 Seminole, OK 74884 TEL:405/257-6287 FAX: 405/257-6205	Mr. Eman Spain - THPO P.O. Box 1498 Wewoka, OK 74884 TEL:405/257-2036 FAX: 405/257-2036 Cell: 405/584-2035	1/13/2005	1/20/2005	No letter received from the Tribe as of 02/21/05	22, FEB 2005 Mr. Healey FLARNG called Mr. Spain and was told he was not in.	
Seminole Tribe of Florida	The Honorable Mitchell Cypress (Chairman) 6300 Stirling Rd Hollywood, FL 33024 TEL:4954/966-6300 ext. 1414 FAX: 954/9673486	Mr. Willard Steele - THPO Ah-Tah-Thi-Ki Museum HC-61, Box 21-A Clewiston, FL 33440 TEL:863/902-1113 Ext 104 Email: wsteele@semtribe.com	1/13/2005	1/20/2005	No letter received from the Tribe as of 02/21/05	22, FEB 2005 Mr. Healey FLARNG left voice mail.	email sent out by Martin Healey FLARNG to Mr. Willard Steele on 25, FEB 2005 cc. Russell Robinson.
Seminole Tribe of Florida						23, FEB 2005 Mr. Healey FLARNG left voice mail @13:55 hrs..	
Seminole Tribe of Florida						24, FEB 2005 Mr. Healey FLARNG spoke to operator and told operator he would send an email.	

Healey, Martin J Mr FL-ARNG

From: Willard Steele [wsteele@semtribe.com]
Sent: Monday, March 21, 2005 8:50 PM
To: Healey, Martin J Mr FL-ARNG
Subject: RE: EAs sent on 1/10/05 and 1/13/05

We have no comment. -ws

-----Original Message-----
From: Healey, Martin J Mr FL-ARNG [mailto:martin.j.healey@fl.ngb.army.mil]
Sent: Friday, March 11, 2005 8:28 AM
To: Willard Steele
Cc: Robinson, Russell K Mr FL-ARNG; Wiley, Amy A Mrs FL-ARNG
Subject: EAs sent on 1/10/05 and 1/13/05

Dear Mr. Steele,

On Jan 10, 2005 and Jan 13, 2005 the Florida Army National Guard sent you three documents. These documents were an executive summary on an EA and Phase I CRS on Snake Creek WETS site located in Miramar, FL. An EA titled *Addition of Multiple Launch Rocket System Training to Training Program of Camp Blanding Joint Training Center, Florida*. And An EA titled *Preliminary Draft Environmental Assessment for the M-270 Multiple Launch Rocket System (MLRS) Expanded Training Use Areas at Avon Park Air Force Range, Florida.*

We received no comments back from the Seminole Tribe of Florida at the end of the thirty day review period. I have attempted to contact you at your office on a number of occasions. If you could please take the time to let me know if the tribe wises to comment on these issues I would appreciate it. The Florida National Guard will be proceeding forward with these projects at this time. Again if you could send me an email or a phone call would do to let me know if your tribe wises to comment or not it would be greatly appreciated.

Thank you for your time and efforts in these maters.

Sincerely,

Martin J. Healey
CFMO-ENV
FLARNG

3/22/2005

NOTICE OF AVAILABILITY OF DRAFT ENVIRONMENTAL ASSESSMENT

Agency: Florida Army National Guard (FLARNG) – Department of Military Affairs

Action: FLARNG has prepared a Draft Environmental Assessment to expand the 3-116th training and maneuver areas at Avon Park Air Force Range (APAFR) so that the 3-116th can conduct Battalion level MLRS training, fulfilling their training requirements to become certified as combat ready. Battalion level MLRS training includes section, platoon, and battery certification for a minimum of six weekends per year and one 15-day annual training exercise. The Draft EA evaluates the Proposed Action and the No-Action Alternative against numerous environmental and socioeconomic resources.

The Draft EA is now available for public review and comment. The EA is available for review at the Robert F. Ensslin Armory, 2305 SR-207, St. Augustine, Florida 32086. Telephone requests should be directed to Major Mark Widener at (904) 823-0277 during business hours (7:30 a.m. – 5 p.m.). The EA is also available for review at the following public libraries:

- Avon Park Public Library, located at 100 N. Museum Ave., Avon Park, FL. Library hours are Mon, Wed, Thurs 9:30am-5:30pm; Tues 9:30am-7:30pm; Fri 9:30am-3:30pm; and Sat 9:30am – 12pm.
- Sebring Public Library, located at 319 W. Center Ave, Sebring, FL. Library hours are Mon, Tues 9:30am-7pm; Wed, Thurs, Fri 9:30am-5:30pm; and Sat 9:30am-12pm.

The Draft EA is also available on-line at the FLARNG website: http://www.floridaguard.net/. Go to the Site Directory link, then to Documents, which lists the documents that are available for viewing.

Comments for consideration by FLARNG on the Draft EA should be provided in writing to: Headquarters, Florida Army National Guard, Attention: Public Affairs Officer, 82 Marine Street, St. Augustine, Florida, 32085. The document will have a 30-day comment period. The end of the comment period will be April 28, 2005. Written substantive comments received at the above address within the review period will be addressed.

SB#7623 3/27/05 144542

shot.

NOTICE OF AVAILABILITY OF DRAFT ENVIRONMENTAL ASSESSMENT

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- Sebring Pubic Library, located at 319 W. Center Ave., Sebring, FL. Library hours are Mon., Tue. 9:30 am – 7:00 pm; Wed., Thu., Fri., 9:30 am – 5:30 pm; Sat., 9:30 am – 12:00 pm.

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THE NEWS-SUN
2227 U.S. 27 SOUTH
Published three (3) times weekly
SEBRING, HIGHLANDS COUNTY, FLORIDA

STATE OF FLORIDA,
COUNTY OF HIGHLANDS:

Before the undersigned authority personally appeared Kim Young, who on oath says that she is Business Manager of the News-Sun, a tri-weekly newspaper published at Sebring, in Highlands County, Florida; that the attached copy of advertisement, being a Proof of Publication in the matter of:

NOTICE OF AVAILAILITY OF DRAFT ENVIRONMENTAL ASSESSMENT; AVON PARK AIR FORCE RANGE

Was published in said newspaper in the issue(s) of

MARCH 27, 2005

Affiant further says the News-Sun is a newspaper published at Sebring, in Highlands County, Florida, and that the said newspaper has heretofore been continuously published in said County, Florida, Wednesday, Friday and/or Sunday and has been entered as a second class mail matter at the post office Sebring, in said county, Florida, for a period of one year next preceding the first publication of the attached copy of advertisement; and affiant further says that she has neither paid nor promised any person, firm or corporation any discount, rebate, commission or refund of the purchase of securing this advertisement of publication in the said newspaper.

Kim Young, Business Manager

Sworn to and subscribed before me on 4TH day of April A.D. 2005

Notary Public, State of Florida

MARIE SESMAN
Notary Public, State of Florida
My comm. expires May 20, 2008
Comm. No. DD 304302

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OFFICE OF POLICY AND STAKEHOLDER COORDINATION
(850)488-6661 TDD (850)488-9542
FAX (850)922-5679

May 11, 2005

RECEIVED
MAY 12 2005
OIP / OLGA

Ms. Lauren Milligan
Florida State Clearinghouse
Department of Environmental Protection
3900 Commonwealth Boulevard, MS-47
Tallahassee, Florida 32399-3000

Re: SAI #FL200503290656C, FLARNG – M270 MLRS Expanded Training Areas at Avon Park AFR – Highlands/Polk Co.

Dear Ms. Milligan:

The Fish and Wildlife Conservation Commission (FWC) has coordinated a second agency review of the draft Environmental Assessment (EA) for the Florida Army National Guard's (FLARNG) proposal for expanded artillery training at Avon Park Air Force Range (APAFR), Highlands/Polk County (SAI #FL200503290656C). This is the second opportunity for review of this draft EA, since the FLARNG had previously sent a preliminary draft EA.

The FWC appreciates the inclusion in this draft of Figure 4-20, Locations of Threatened and Endangered Wildlife Species. This figure allows the examination of habitat management units (HMUs) and other information for listed species known to occur on APAFR, and for which there are endangered species management plans (ESMPs). The six Proposed Maneuver Areas (MAs) have substantially avoided HMUs for Florida scrub jays (threatened) and Florida grasshopper sparrows (endangered), but all six lie at least partially within HMUs for the red-cockaded woodpecker (RCW; species of special concern).

The APAFR RCW Endangered Species Management Plan, the development of which has been a cooperative effort among the staffs of APAFR, FWC, and U.S. Fish and Wildlife Service, sets a goal of 68 active clusters. Population goals in this plan were calculated based on the availability of all currently available RCW habitat in the RCW HMUs. In addition, the state of Florida's RCW Recovery Plan specifies a population goal for the APAFR metapopulation of 50 active groups by 2020. Since the number of RCW groups on private lands in this same metapopulation is declining, continued growth of the APAFR population is an important factor in our ability to meet statewide species management goals.

620 South Meridian Street • Tallahassee • FL • 32399-1600
Visit MyFWC.com

Ms. Lauren Milligan
Page 2
May 11, 2005

Figure 4-20 of the draft EA shows the locations of the six proposed MAs in relation to the HMUs for red-cockaded woodpeckers. The figure also shows that no cavity trees lie within the proposed MAs; however, Table 3-4 indicates that a total of 2,190 acres of habitat currently being managed as RCW habitat lies within the proposed MAs. The EA further indicates that forestry practices may need to be altered to accommodate the MLRS. Pages 5-8 and 5-9 state: "Areas that had been recently clear cut, such as MA 1 and MA 6, may not be replanted totally because of the potential damage that would be caused by the MLRS vehicles to immature trees. In these MAs, the APAFR forestry program may replant only portions of the area that would not interfere with the MLRS training." FWC staff estimate that as much as 631 acres of pine RCW foraging habitat could be removed as a result of changes to the forestry program. FWC concern could be allayed if that habitat could be replaced at another location, but we could not find in the EA any indication that such mitigative measures are contemplated.

The draft EA also indicates that 98% of the MAs are comprised of soils with a high susceptibility to soil rutting and compaction, which can alter the habitat structure when vegetation regrows. The extent to which this might affect plan objectives for the HMUs is unclear.

Staff of the APAFR Environmental Flight, U.S. Fish and Wildlife Service, and FWC have cooperated not only on development of endangered species plans, but also on the development of the Integrated Natural Resource Management Plan (INRMP) addressing all natural and cultural resources on APAFR. None of these plans contemplated the level of military activity being proposed by the FLARNG and other military entities recently submitting documents through the State Clearinghouse.

With regard to the FLARNG training project, the FWC's biological staff will be available between now and the beginning of the training to meet with representatives of the FLARNG, the consulting firm SAIC, the APAFR Environmental Flight, and the U.S. Fish and Wildlife Service to work out details regarding management and protection of the RCW and other wildlife species. We want to assure the opportunity for the FLARNG to pursue necessary training. For the longer term, we recommend that the FLARNG training be part of a comprehensive planning approach with APAFR staff and other appropriate resource agencies through the INRMP and endangered species plans that have been developed for APAFR.

Sincerely,

Mary Ann Poole

Mary Ann Poole, Director
Office of Policy and Stakeholder Coord.

map/hb
ENV 1-3-2
u:\traci.wallace\sai 0656c hugh

cc: Mr. Paul Ebersbach, Avon Park Air Force Range
Mr. Allen Webb, USFWS, Vero Beach
Ms. Mary Peterson, USFWS, Vero Beach

Department of Environmental Protection

Jeb Bush
Governor

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Colleen M. Castille
Secretary

May 12, 2005

Mrs. Amy Wiley, NEPA Coordinator
Florida Army National Guard
Camp Blanding Joint Training Center
Route 1, Box 465
Starke, Florida 32091

RE: Florida Army National Guard – Draft Environmental Assessment for the M270 Multiple Launch Rocket System (MLRS) Expanded Training Use Areas at Avon Park Air Force Range – Highlands and Polk Counties, Florida.
SAI # FL200503290656C (Reference SAI # FL200412210317C)

Dear Mrs. Wiley:

The Florida State Clearinghouse, pursuant to Presidential Executive Order 12372, Gubernatorial Executive Order 95-359, the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended, and the National Environmental Policy Act, 42 U.S.C. §§ 4321, 4331-4335, 4341-4347, as amended, has coordinated a review of the referenced draft environmental assessment (EA).

The Florida Fish and Wildlife Conservation Commission (FWC) notes that though the six proposed Maneuver Areas (MAs) have substantially avoided the Habitat Management Units (HMUs) for Florida scrub jays and Florida grasshopper sparrows, all lie at least partially within HMUs for the red-cockaded woodpecker. FWC staff estimates that as much as 631 acres of pine red-cockaded woodpecker foraging habitat could be removed as a result of altered forestry practices within the MAs. Since the Avon Park Air Force Range population of these birds is important to statewide species management goals, FWC requests that this habitat be replaced at another location as mitigation for the proposed activities. Staff also recommends that the Florida Army National Guard training be part of a comprehensive planning approach with Air Force Range staff and other appropriate resource agencies through the Integrated Natural Resource Management Plan and endangered species plans developed for Avon Park Air Force Range. Please see the enclosed FWC letter for additional information.

Based on the information contained in the draft EA and comments provided by our reviewing agencies, the state has determined that, at this stage, the subject project is consistent with the Florida Coastal Management Program (FCMP). The applicant must, however, address the concerns identified by the FWC prior to project implementation. The state's continued

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Mrs. Amy Wiley
May 12, 2005
Page 2 of 2

concurrence with the project will be based, in part, on the adequate resolution of issues identified during this and any subsequent reviews.

Thank you for the opportunity to review the draft EA. If you have any questions regarding this letter, please contact Ms. Lauren P. Milligan at (850) 245-2163.

Sincerely,

Sally B. Mann, Director
Office of Intergovernmental Programs

SBM/lm
Enclosure

cc: Mary Ann Poole, FWC
Karen Daniels, SAIC

Florida State Clearinghouse

From: Wiley, Amy A Mrs FL-ARNG [amy.wiley@fl.ngb.army.mil]
Sent: Tuesday, May 24, 2005 1:24 PM
To: Karen L. Daniels (E-mail)
Cc: Robinson, Russell K Mr FL-ARNG
Subject: EPA comments on APAFR EA

Karen,

Gerald Miller from the Atlanta EPA office called me about the MLRS EA. He said that they had reviewed a lot of documents regarding "these tracked vehicles". He said that the main thing is to assure we have adequate funding for rut and erosion control. I told him that FLARNG is planning to fund these through our ITAM program. He recommended using our engineers to help draw up plans for rehabilitation, if necessary. He said that those were his only comments and that he is not planning to send anything in writing. This email should suffice as a phone record of our conversation.

Amy Wiley
National Environmental Policy Act Coordinator Florida Army National Guard Camp Blanding Joint Training Center Route 1, Box 465 Starke, Florida 32091

<mailto:amy.wiley@fl.ngb.army.mil>
phone: (904) 682-3450 FAX: (904) 682-3157

DEPARTMENT OF THE AIR FORCE
18th AIR SUPPORT OPERATIONS GROUP, DETACHMENT 1
AVON PARK AIR GROUND TRAINING COMPLEX (ACC)
MACDILL AIR FORCE BASE and AVON PARK AIR FORCE RANGE, FLORIDA

7 September 2005

MEMORANDUM FOR Ms. Laura Kammerer
Supervisor, Compliance and Review
Bureau of Historic Preservation
Division of Historical Resources
R.A. Gray Building, 4th Floor
500 South Bronough Street
Tallahassee, FL 32399-0250

FROM: 18 ASOG, DET 1, OL A/CEV
29 South Boulevard
Avon Park Air Force Range, FL 33825-9381

SUBJECT: Avon Park Survey Reviews

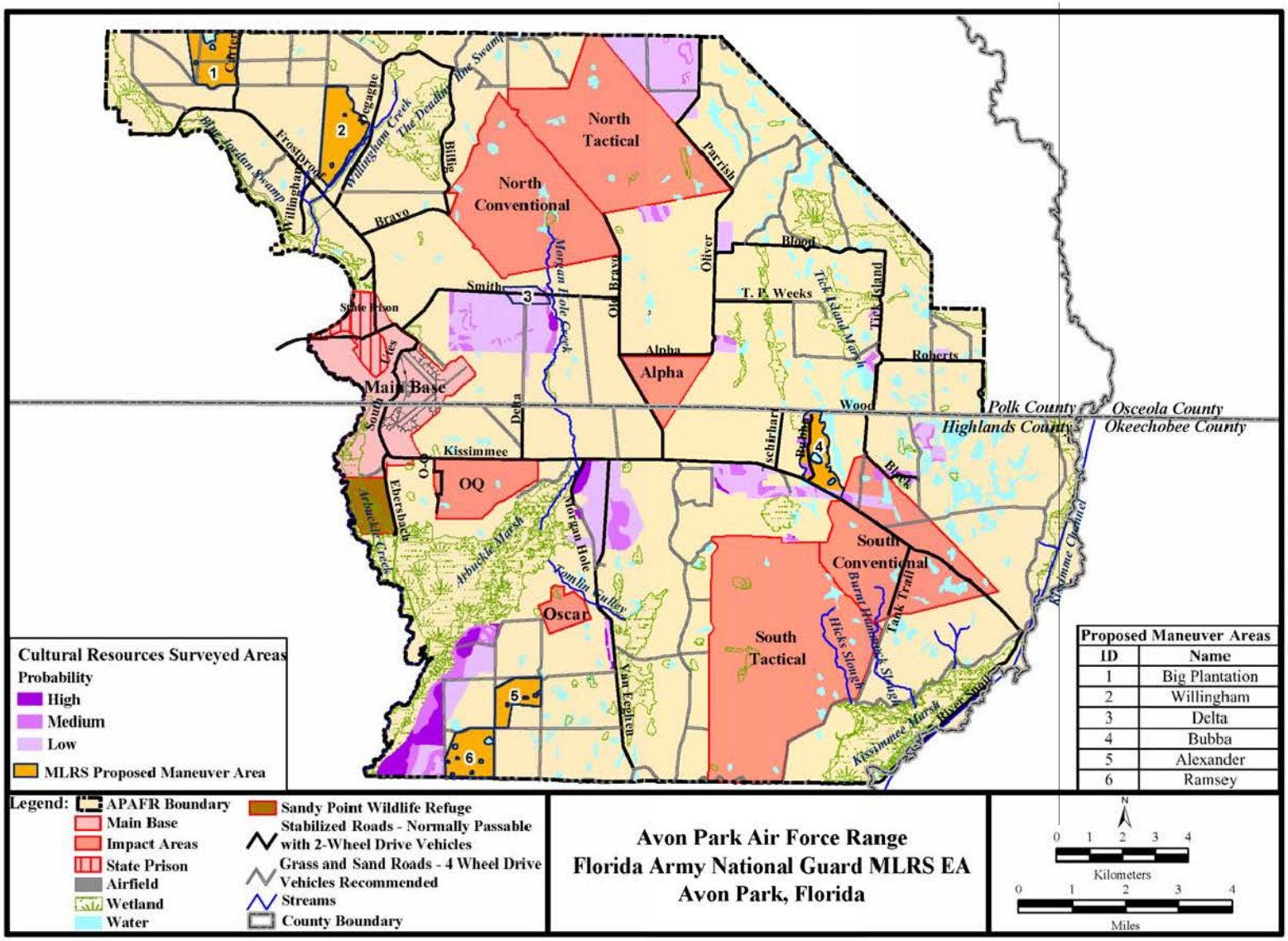
1. In accordance with Section 106 of the *National Historic Preservation Act of 1966*, as amended, and *36 CFR Part 800: Protection of Historic Properties*, this letter is to provide the office of the State Historic Preservation Officer (SHPO) the findings of a Phase I Cultural Resources Assessment Survey and Phase II Site Evaluations for your comments. The draft survey report entitled: *Phase I and Phase II Archaeological Investigations, Avon Park Air Force Range, Highlands and Polk Counties* is included for your review. This preliminary draft is being submitted to your office so that the Air Force can incorporate your comments into the final report prior to its submittal for review.

2. If you have any questions, please contact Ronald Grayson at (863) 452-4119, ext 306, or by electronic mail at ronald.grayson@avonpark.macdill.af.mil.

for

FRANKLIN S. WALDEN, Lt Col, USAF
Commander

Attachments:
1. Phase I and Phase II Archaeological Investigations, Avon Park Air Force Range, Highlands and Polk Counties.


Avon Park Air Force Range
Florida Army National Guard MLRS EA
Avon Park, Florida
Cultural Resources Surveyed Areas
Probability
High
Medium
Low
MLRS Proposed Maneuver Area
Legend:
APAFR Boundary
Main Base
Impact Areas
State Prison
Airfield
Wetland
Water
Sandy Point Wildlife Refuge
Stabilized Roads - Normally Passable with 2-Wheel Drive Vehicles
Grass and Sand Roads - 4 Wheel Drive Vehicles Recommended
Streams
County Boundary
Proposed Maneuver Areas
ID Name
1 Big Plantation
2 Willingham
3 Delta
4 Bubba
5 Alexander
6 Ramsey
North Tactical
North Conventional
South Conventional
South Tactical
Alpha
Oscar
OQ
Main Base
State Prison
Polk County
Osceola County
Highlands County
Okeechobee County
Kissimmee River
Kissimmee Marsh
Arbuckle Marsh
Tick Island Marsh
Kilometers
Miles

STATE OF FLORIDA
Department of Military Affairs
Office of the Adjutant General
St. Francis Barracks, P.O. Box 1008
St. Augustine, Florida 32085-1008

September 15, 2005

Construction & Facility Management Office-1t

Miccosukee Tribe of Indians of Florida
The Honorable Billy Cypress
P.O. Box 440021
Tamiami Station, MM 70
Miami, FL 33144

Dear Sir,

The Florida Army National Guard (FLARNG) and the United States Air Force (USAF) request your review of Tribal interests concerning the *Draft Phase I & Phase II Archaeological Investigations, Avon Park Air Force Range, Polk and Highlands Counties, Florida.* This document is being forwarded for your review pursuant to the consultation process regarding the Environmental Assessment for the M-270 Multiple Launch Rocket System (MLRS) Expanded Training Use Areas at Avon Park Air Force Range, Florida.

While this document covers more area of the range than the MLRS maneuver areas (MA), the MA are included in the area covered by this cultural resource survey. This document is being supplied by the Avon Park Air Force Range Cultural Resource Office under Section 106 requirements as well as, requested by the tribe per correspondence received during initial consultation contact dated February 24, 2005.

Please respond to this letter within 30 days indicting whether you wish to provide additional input on this action. FLARNG cultural resource staff will be continue to consult with your Tribal Historic Preservation Officer regarding this project. The FLARNG would like to thank the tribe for their continued consultation on this matter during the closing stages of the NEPA process.

Sincerely,

Richard J. Gallant
Colonel, Florida Army National Guard
Construction & Facility Management Officer

USPS - Track & Confirm Page 1 of 1

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City, State, ZIP+4 Miami, FL 33144

PS Form 3800, January 2001 See Reverse for Instructions

http://trkcnfrm1.smi.usps.com/PTSInternetWeb/InterLabelInquiry.do 9/29/2005

FLORIDA DEPARTMENT OF STATE
Glenda E. Hood
Secretary of State
DIVISION OF HISTORICAL RESOURCES

Franklin S. Walden, Lt. Col, USAF
18 ASOG, DET 1, OL A/CEV
29 South Boulevard
Avon Park Air Force Range, Florida 33825-9381

September 23, 2005

Re: DHR Project File No. 2005-9700 / Received by DHR: September 9, 2005
Phase I and Phase II Archaeological Investigations, Avon Park Air Force Range, Polk and Highlands Counties, Florida

Dear Colonel Walden:

Our office received and reviewed the above referenced survey report in accordance with Section 106 of the *National Historic Preservation Act of 1966* (Public Law 89-665), as amended in 1992; *36 C.F.R., Part 800: Protection of Historic Properties*; and Chapter 267, *Florida Statutes*, for assessment of possible adverse impact to cultural resources (any prehistoric or historic district, site, building, structure, or object) listed, or eligible for listing, in the *National Register of Historic Places (NRHP)*, or otherwise of historical, architectural or archaeological value.

In January through March 2005, GeoMarine Inc. (GMI) conducted Phase I and II investigations of 11 noncontiguous tracts within the Avon Park Air Force Range (APAFR) under contract with the US Army Corps of Engineers, Fort Worth District, and the US Air Force acting on behalf of the Air Combat Command and APAFR. The Phase I cultural resource assessment survey located three unrecorded archaeological sites. Phase II archaeological testing was conducted at two previously recorded archaeological sites and also at one site identified during the Phase I investigation.

Sites 8PO6831 and 8PO6833 were identified during the Phase I survey. Due to low research potential and the lack of intact features or cultural strata, it is the opinion of GMI that 8PO6831 and 8PO6833 do not appear eligible for listing in the *NRHP*. This office concurs with these determinations.

Site 8PO6832 was also identified during the Phase I survey. Based on the results of Phase I shove-testing at this site, it was the opinion of GMI that 8PO6832 appeared to be potentially eligible for listing in the *NRHP*. GMI subsequently conducted Phase II testing and this site and found it to yield a limited, though temporally diagnostic, artifact assemblage from the Early Archaic period. Due to the site's disturbed condition, it is the opinion of GMI that 8PO6832 does not appear to be eligible for listing in the *NRHP*. This office concurs with this determination.

Phase II testing was also conducted at 8HG688 in order to determine *NRHP*-eligibility. GMI found this site to be a well-preserved single-component Belle Glade Period III occupation site. Due to further research potential and the likelihood of intact features or cultural strata, it is the opinion of GMI that 8HG688 appears to be potentially eligible for listing in the *NRHP*. This office concurs with this determination.

500 S. Bronough Street • Tallahassee, FL 32399-0250 • http://www.flheritage.com

☐ Director's Office (850) 245-6300 • FAX: 245-6436
☐ Archaeological Research (850) 245-6444 • FAX: 245-6436
☑ Historic Preservation (850) 245-6333 • FAX: 245-6437
☐ Historical Museums (850) 245-6400 • FAX: 245-6433
☐ Southeast Regional Office (954) 467-4990 • FAX: 467-4991
☐ Northeast Regional Office (904) 825-5045 • FAX: 825-5044
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Colonel Walden
September 23, 2005
Page 2

Previously recorded site 8HG882 had been determined to be eligible for listing in the *NRHP* in 2000. The site appeared to be significantly disturbed by hurricane activity in 2004. GMI conducted Phase II investigation of 8HG882 in order to determine whether this damage was sufficient to alter the *NRHP*-eligibility of the site. As a result of this investigation, it is the opinion of GMI that 8HG882 remains eligible for listing in the *NRHP*. This office concurs with this determination.

This office notes that the Page 79 of the report cites the definition of an archaeological site as three artifacts recovered within a 30-m diameter area. The following page contains a table describing isolated finds (IF) recorded during the Phase I survey. IF # 11 is described as three fragments of vitrified bone, which appears to conflict with the previously stated site definition. This office recommends that either this discrepancy be explained in the text or IF # 11 be recorded as an archaeological site.

This office requests that new or updated Florida Master Site File Site Forms and maps for sites 8PO6831, 8PO6832, 8PO6833, 8HG688, and 8HG882 be submitted to this office. In addition, this office requests that the historic tram line observed within the Oscar tract be recorded and a Site Form and map for this resource be submitted.

If you have any questions concerning our comments, please contact Beth Chambless, Historic Sites Specialist, by phone at (850) 245-6333, or by electronic mail at ejchambless@dos.state.fl.us. Your continued interest in protecting Florida's historic properties is appreciated.

Sincerely,

Frederick Gaske, Director, and
State Historic Preservation Officer

STATE OF FLORIDA
Department of Military Affairs
Office of the Adjutant General

St. Francis Barracks, P.O. Box 1008
St. Augustine, Florida 32085-1008

October 5, 2005

Frederick Gaske
Director, Division of Historic Resources
State Historic Preservation Officer
Attn: Laura Kammerer
Compliance Review Section
R.A. Gray Building
500 South Bronough Street
Tallahassee, Fl 32399-0250

RE: Environmental Assessment for the M270
Multiple Launch Rocket System (MLRS)
Expanded Training Use Areas
Avon Park Air Force Range, Florida

Dear Ms. Kammerer,

In accordance with Section 106 of the National *Historic Preservation Act of 1966*(Public law 89-665), as amended in 1992; *36 CFR Part 800: Protection of Historic Properties:* and Chapter 267, *Florida Statutes* the Florida Army National Guard (FLARNG) and the United States Air Force (USAF) request your concurrence regarding six (6) Maneuver Areas (MA) proposed by the USAF for use by the FLARNG at Avon Park Air Force Range (APAFR). Five of the six MAs were addressed in the APAFR cultural resource survey (DHR Project File No 2005-9700). Attached is a map of the areas surveyed for cultural material by the APAFR contractor and submitted to your office for comment in October 2005. Also maps locating the MAs for the MLRS project. You will notice that one MA (MA #3) is not covered on this survey. According to APAFR Cultural Resource Manager this area (MA #3) may be found in a cultural resource survey submitted to your office April 1997 (DHR2005-2876).

In order to proceed with our Environmental Assessment to meet legal sufficiency, we request your concurrence that these training activities will have no effect on any known cultural resource located within the MAs.

We would appreciate your review of this documentation at your earliest convenience. Should you have any questions, please feel free to contact Mr. Martin Healey in our conservation section, commercial phone number: 904/823-0249 SUNCOM: 865-0249. martin.j.healey@fl.ngb.army.mil.

Sincerely,

E. Rodney Ryan
Lieutenant Colonel, Florida Army National Guard
Special Projects Officer

Richard J. Gallant
Colonel, Florida Army National Guard
Construction & Facility Management Officer

Enclosures

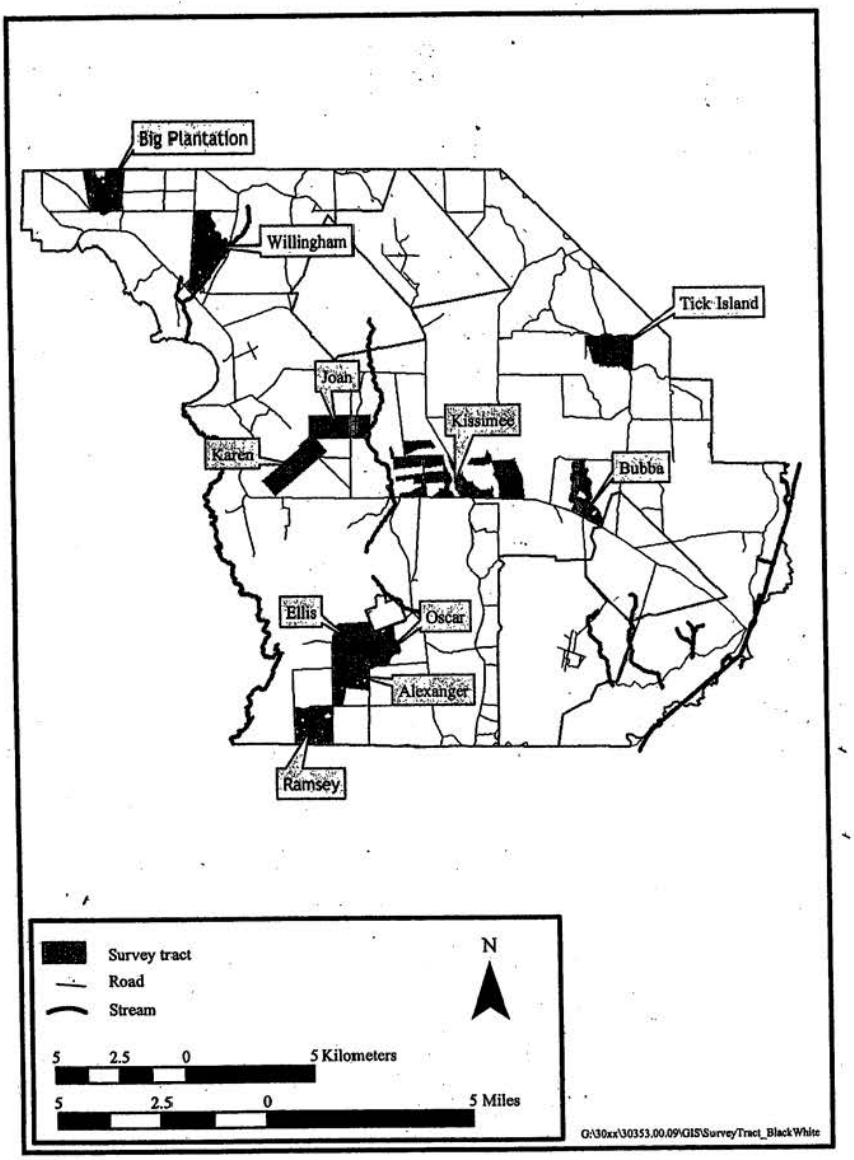

Figure 2. Eleven survey tracts on APAFR.

4

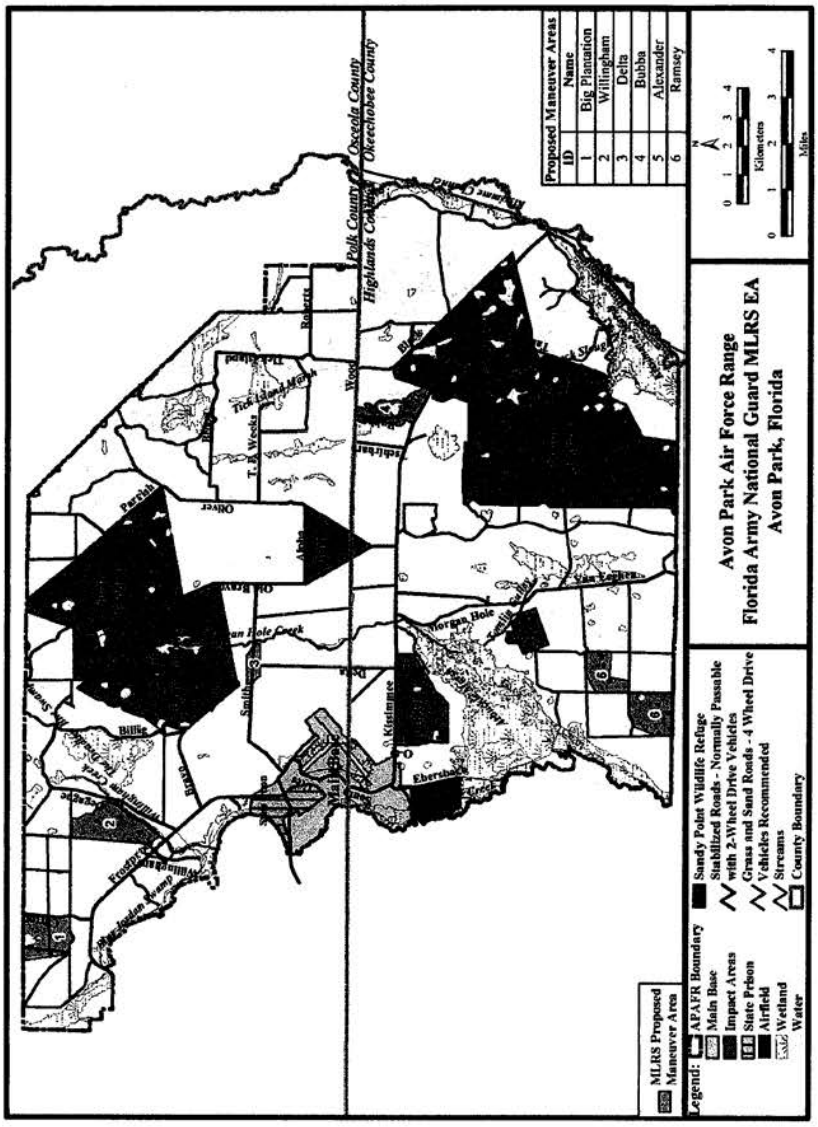

Figure 3-5. Proposed Maneuver Areas 1–6

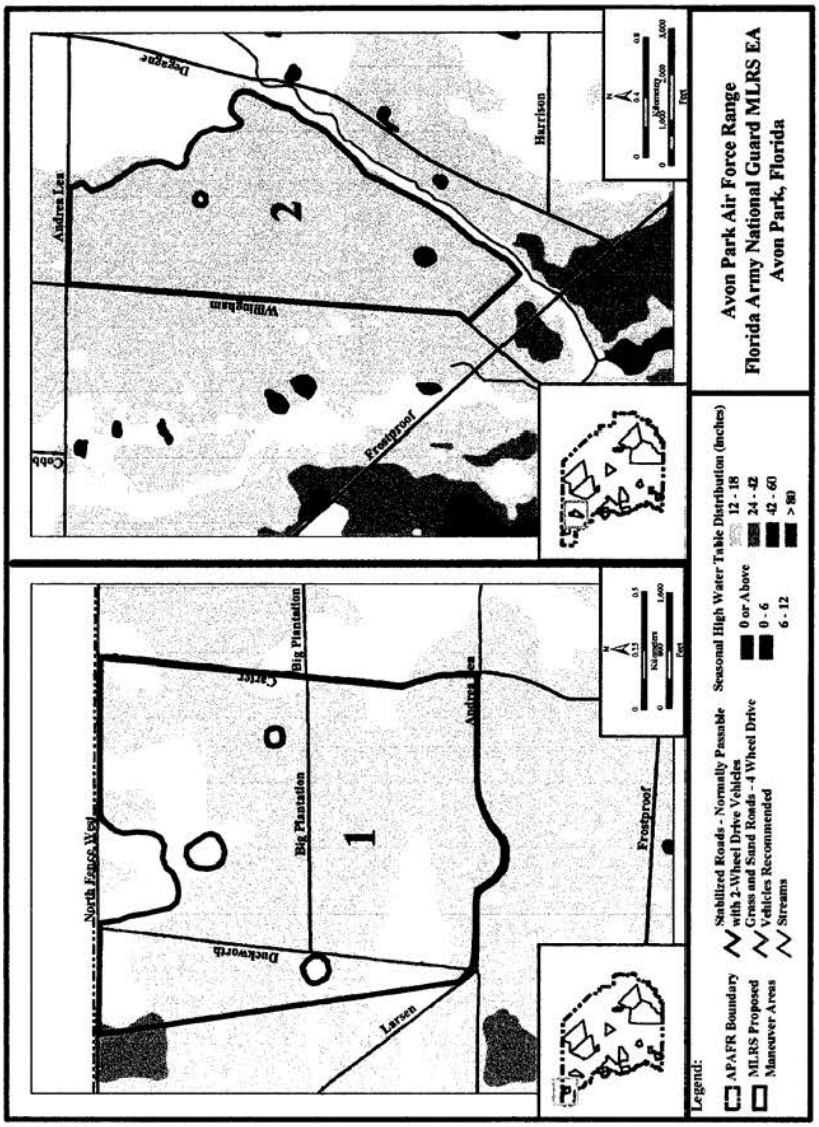

Figure 4-10. Proposed MLRS Maneuver Areas 1 and 2 Seasonal High Water Table Levels

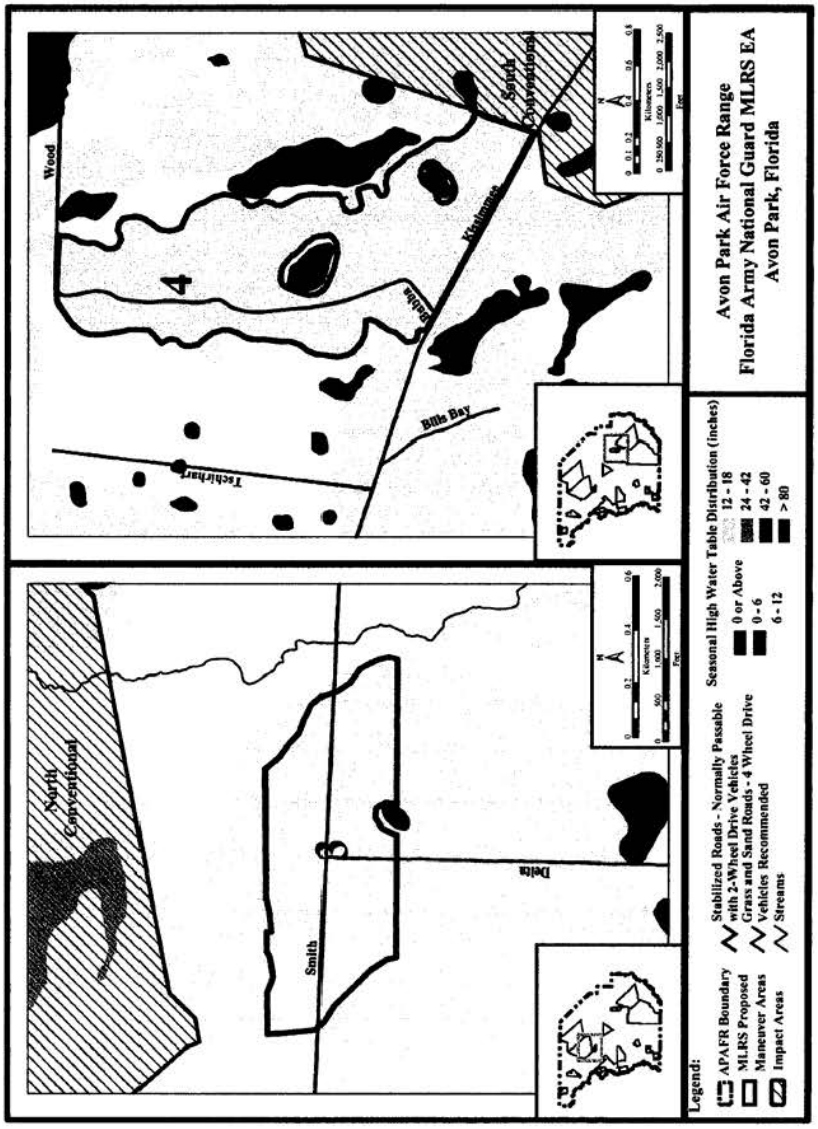

Figure 4-11. Proposed MLRS Maneuver Areas 3 and 4 Seasonal High Water Table Levels

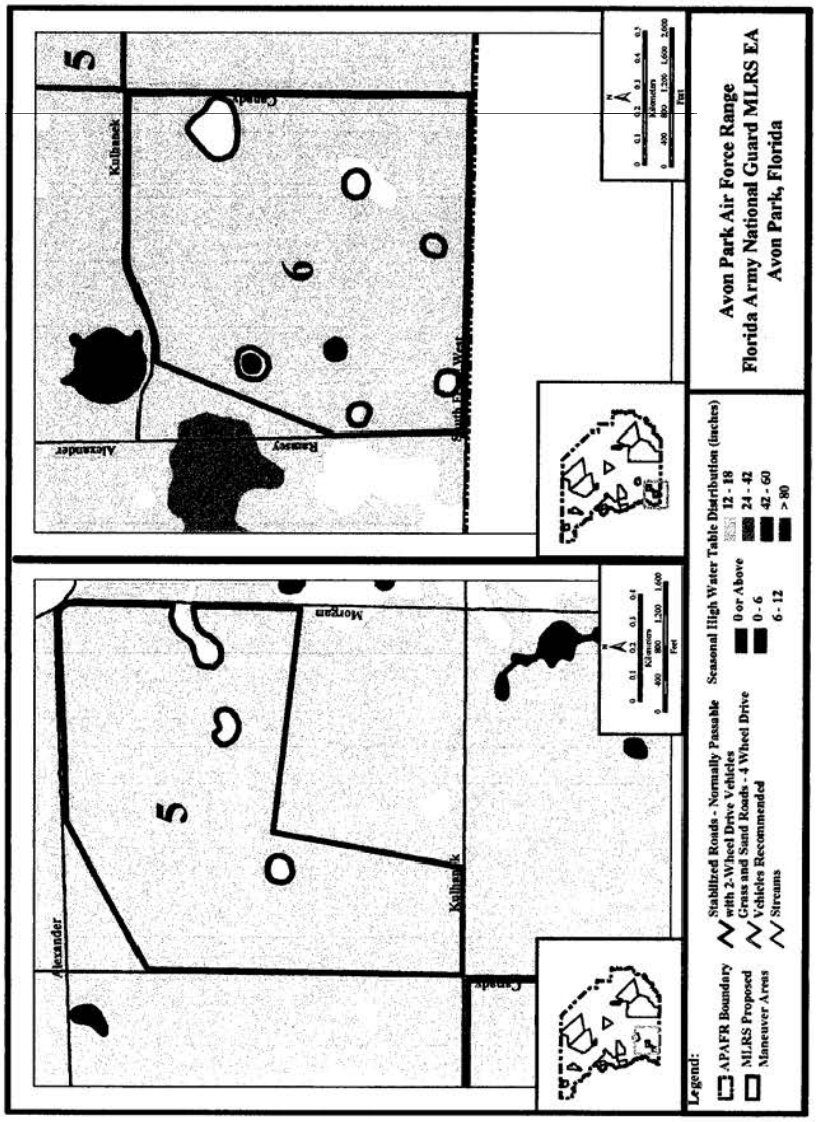

Figure 4-12. Proposed MLRS Maneuver Areas 5 and 6 Seasonal High Water Table Levels

Miccosukee Tribe of Indians
of Florida

Business Council Members
Billy Cypress, Chairman

Jasper Nelson, Ass't. Chairman
Max Billie, Treasurer

Andrew Bert Sr., Secretary
Jerry Cypress, Lawmaker

October 18, 2005

COL. Richard J. Gallant
Construction & Facility Management Office
Dept. Of Military Affairs
Florida Army National Guard
St. Francis Barracks, P.O. Box 1009
St.Augustine, FL 32085-1008

Dear COL. Gallant:

The Miccosukee Tribe received your letters and supporting documents on the Maneuver Areas for the Florida National Guard at the Avon Park Air Force Range. Also, I discussed these with Martin Healey last week on these same projects. The Tribe looks forward to fostering a good relationship with the Florida Army National Guard. Our comments on these projects are as follows:

After consultation with Mr. Dayhoff and careful review of the documentation provided, the Tribe recommends the following. All known cultural sites within the Maneuver Areas should be have their coordinates entered into on the GPS units utilized by the Florida National Guard as areas to avoid and should be avoided. They should not be marked as cultural resource areas. Further, if there are any inadvertent finds due to the activities of the Florida National Guard, the Tribe should be contacted as soon as possible so we can start consultation on the find.

Thank you for consulting with us. Please call me at (305) 223-8380, Ext. 2244, if you require further information.

Sincerely,

Steve Terry
NAGPRA & Section 106 Representative

P.O. Box 440021, Tamiami Station, Miami, Florida 33144, (305) 223-8380, fax (305) 223-1011
Constitution Approved by the Secretary of the Interior, January 11, 1962

FLORIDA DEPARTMENT OF STATE
Glenda E. Hood
Secretary of State
DIVISION OF HISTORICAL RESOURCES

Richard J. Gallant
Colonel, Florida Army National Guard
Construction & Facility Management Officer
St. Francis Barracks
P. O. Box 1008
St. Augustine, Florida 32085-1008

October 26, 2005

Re: Avon Park Air Force Range
Use of Six Maneuver Areas by the Florida Army National Guard
Polk & Highlands Counties
DHR Project File No. 2005-10934

Dear Colonel Gallant:

Our office received and reviewed the above referenced project in accordance with this agency's responsibilities under Section 267.061, *Florida Statutes,* Section 106 of the *National Historic Preservation Act of 1966*, as amended and *36 CFR Part 800: Protection of Historic Properties*. The State Historic Preservation Officer is to advise State and Federal agencies as they identify historic properties (listed or eligible for listing, in the *National Register of Historic Places*), assess effects upon them, and consider alternatives to avoid or minimize adverse effects.

Based on information previously reviewed by the Division of Historical Resources, it is the opinion of this agency that the training activities proposed within the six maneuver areas will have no effect on historic properties listed, or eligible for listing in the *National Register of Historic Places,* or otherwise of historical or archaeological value.

If you have any questions concerning our comments, please do not hesitate to contact Susan Harp at (850) 245-6333. Thank you for your interest in protecting Florida's historic resources.

Sincerely,

Frederick P. Gaske, Director, and
State Historic Preservation Officer

Xc: Mr. Martin Healy, FLARNG

500 S. Bronough Street • Tallahassee, FL 32399-0250 • http://www.flheritage.com

☐ Director's Office (850) 245-6300 • FAX: 245-6436
☐ Archaeological Research (850) 245-6444 • FAX: 245-6436
✓ Historic Preservation (850) 245-6333 • FAX: 245-6437
☐ Historical Museums (850) 245-6400 • FAX: 245-6433
☐ Southeast Regional Office (954) 467-4990 • FAX: 467-4991
☐ Northeast Regional Office (904) 825-5045 • FAX: 825-5044
☐ Central Florida Regional Office (813) 272-3843 • FAX: 272-2340

APPENDIX J

SUSTAINABLE RANGE PROGRAM/
INTEGRATED TRAINING AREA MANAGEMENT PROGRAM

INTEGRATED TRAINING AREA MANAGEMENT PROGRAM

The Integrated Training Area Management Program (ITAM) is the Army's formal strategy for focusing on sustained use of training and testing lands. The Army's ITAM program consists of several components that work in concert to ensure effective management of Army lands. This approach requires information regarding initial resource conditions and knowledge of impacts from various types of military training (DA, 2005). There are four components of ITAM that work in unison to accomplish the mission. The components are as follows:

- Land Condition – Trend Analysis (RTLA): Provides a management procedure that inventories and monitors land conditions. RTLA collects physical and biological resource data from training lands to relate land conditions to training and testing activities.

- Training Requirements Integration (TRI): Provides a decision support procedure that integrates training requirements with land management, training management, and natural and cultural resources management processes. Its goal is to achieve the "training-environmental" balance and interface that requires continuous interaction and coordination between the operations/training staff and the natural resources management/environmental staff. This ensures sound land-use planning and management decisions that meet regulatory compliance and training and testing activity requirements.

- Land Rehabilitation and Maintenance (LRAM): Provides a preventative and corrective land rehabilitation and maintenance procedures to reduce the long-term impacts of training and testing on an installation. It includes training area redesign and/or reconfiguration to meet training requirements.

- Sustainable Range Awareness (SRA): Provides a means of educating land users on their stewardship responsibilities. It provides for the development and distribution of educational materials to land users. These materials relate the principles of land stewardship and the practices for reducing training and/or testing impacts.

Understanding and minimizing the ecological impacts of tracked vehicle training activity is essential to the program. The National Environmental Policy Act of 1969 (NEPA) and U.S. Army Regulation 200-2 (Department of the Army 1980) requires that the Army minimize or avoid both short and long-term impacts caused by military training activities. Army training demands have intensified while land available was remained constant. For these reasons, it is in the Army's interest to sustain soils and vegetation resources on current training lands to meet mission requirements for realistic training and testing.

Sustainable Range Program

In July of 2003, the ITAM Program was reconfigured under the Army's Sustainable Range Program (SRP). As part of the Army's commitment to environmental stewardship, the Sustainable Range Program (SRP) promotes environmental stewardship through the development & transfer of management tools and solutions for sustainable, ready, compliant and realistic training ranges (USAEC, 2005).

The SRP is aimed at understanding how the Army can effectively manage its testing and training ranges while preserving air, land, and water quality. In 2004, the Sustainable Range Program contract was expanded to include:

- Integrated Training Area Management (ITAM)
- Sustainable Range Awareness (SRA)
- Training Requirements Integration (TRI)
- Range and Training Land Assessment (RTLA)
- Land Rehabilitation and Maintenance (LRAM)
- Maneuver Area Maintenance
- Geographic Information System (GIS)
- Encroachment Mitigation
- Army Training and Testing Area Carrying Capacity (ATTACC)
- Land Acquisition Planning
- Range Safety
- Range Operations & Maintenance
- Range Sustainability
- Munitions Management
- Targetry Operations & Maintenance
- Cost Analysis
- Management Analysis
- UXO Ordnance Location, Clean-up & Disposal
- Automated Tools Creation/Support & Information Technology Support

Range and Training Land Analysis (RTLA) Program

The Range and Training Land Analysis (RTLA) details numerous biological field collection methodologies and analyses at ITAM installations to monitor changes and capture trends occurring on Army training lands. The RTLA component of ITAM has four main objectives:

1. From baseline data, monitor natural and cultural resources, and analyze data for trends and impacts.
2. Identify and recommend land rehabilitation and maintenance priorities.
3. Provide Geographic Information System (GIS) capabilities.
4. Provide information that may affect force structure and stationing decisions.

The RTLA Program's general management goals revolve around sustaining healthy and diverse ecosystems while maintaining realistic and sustainable training environments for desired training loads. The Program strives to revegetate selected disturbed areas to pre-disturbance conditions and minimizing the establishment and spread of undesirable non-native plants (DA, 2005).

REFERENCES

Department of the Army (DA), 2005. Army Integrated Training Area Management (ITAM) program website accessed 11 MAR 2005. http://srp.army.mil/public/Home.aspx.

U.S. Army Environmental Center (USAEC), 2005. The U.S. Army Environmental Center's program website accessed 11 MAR 2005. http://aec.army.mil/usaec/technology/rangexxi00.html.

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APPENDIX K

FLARNG COORDINATION WITH U.S. FISH AND WILDLIFE SERVICE

HEADQUARTERS
CAMP BLANDING JOINT TRAINING CENTER
FLORIDA ARMY NATIONAL GUARD
5629 SR 16 West, Building 2300, Camp Blanding
Starke, Florida 32091-9703

FLARNG-USFWS Section 7 meeting 22 July 2005
Amy Wiley, NEPA Coordinator

MEMORANDUM

SUBJECT: Section 7 Meeting on the Environmental Assessment for the M270 Multiple Launch Rocket System (MLRS) Expanded Training Use Areas at Avon Park Air Force Range (APAFR), Florida

1. Meeting held on 21 July 2005 at 1000 at the USFWS Vero Beach office. Individuals present were MAJ Mark Widener, Mr. Russell Robinson and Mrs. Amy Wiley from the Florida Army National Guard (FLARNG) and Mr. Alan Webb and Ms. Mary Peterson from US Fish & Wildlife Service (USFWS).

2. MAJ Widener introduced himself and his staff and said that the purpose of the meeting is to address the expansion of the MLRS maneuver area (MA) and the potential request for formal consultation. From a professional standpoint, he and his staff question why a formal consultation will be required in this process. We want to help USFWS understand what we are proposing and the issues that are involved. We feel confident that we have covered all the bases and can move forward with this action without any impacts to the jurisdictional areas of USFWS, as well as those of other agencies.

3. Alan Webb stated that USFWS is there to do what they have to do to work through it.

3. Russell Robinson stated that the first point FLARNG wants to raise is that we feel there is no effect or an unlikely effect on any of the listed species. He said that the current USFWS requests seem to be inconsistent with some of their past actions.

a. The JIFE BO excluded the reevaluation of the firing points that FLARNG had already assessed in the Conversion EA.

b. USFWS issued a "no effect/unlikely to effect" letter for the Camp Blanding MLRS EA earlier this year.

c. USFWS issued a "no effect/unlikely to effect" letter in 1996.

3. Alan Webb asked for an explanation of what the "Conversion EA" is. MAJ Widener explained that the purpose of that EA was the conversion of the Howitzer to the MLRS and described the restrictions that were placed on the MLRS unit at the time that EA was completed. We could only train with one battery at a time, which is a fourth of the unit, making it impossible to train to combat readiness.

4. Alan Webb stated that he understood that the firing in this Conversion EA is the same as the firing that is going to be done as a result of the new EA. "Now it looks like you are going to be expanding the entire operation but using the same firing points?"

5. MAJ Widener stated that in the 1996 Conversion EA, three areas were identified -- Willingham, Bravo and Delta -- but the MLRS could draw only one area at a time for one battery. There are 100m circles with a concrete marker in the middle. To get to these areas, MLRS drives on established roads. The drivers can maneuver in the 100m circles, but they don't have freedom of movement outside the circles.

Because MLRS is a shoot and hide type weapon system, we need to allow for movement within a MA. With just the 100m circles the MLRS unit cannot develop the skill of firing and finding new hide spots on their own.

The Air Force screened out the six MAs to be outside their Habitat Management Units (HMUs), and outside of wetlands as best they could. But in this EA we are not giving up the 100m circles. It will be status quo in these areas, and the MAs will give them a free reign to drive the track around. This will allow us to draw one, two, three batteries and a headquarters so that we can have the whole battalion out. This is an expanded MA. We did not assess the firing in this new document because the firing is still the same. The safety fan, the impact area we shoot to, the number of rockets: that has not changed in this new document. The documents are written to a worst-case scenario. Because we train only on weekends and one AT, and because these rockets are expensive, training will be under controlled circumstances. It will usually be done during an AT. When I say live missile it is actually a practice missile.

6. Mr. Robinson stated that the MAs only represent about 3.4 percent of total area of APAFR. About 3,600 acres is the total acreage of the MAs.

7. Mr. Webb stated that he can agree with the discussion of the firing points because they are using the same firing as they did before, but we still need to discuss the issues with the MA as to the type of habitat there and the type of species associated with it.

8. Mrs. Wiley stated that she has provided new species distribution maps that just came from APAFR. Of the species shown on the maps there are no Florida Grasshopper Sparrow (FGS) HMUs and no cavity trees for red cockaded woodpeckers (RCWs), but the southernmost MA contains a small amount of Florida Scrub Jay (FSJ) habitat in MA 6.

9. Mr. Webb: If you have FSJ habitat in the MA the tank activity is probably going to take it out. For your protection you will need to have an incidental take permit for that habitat. If there is habitat in there and FSJs are occupying it we will need to account for that. It's not an issue it is just something that needs to be done to have the S7 protection that you will be comfortable with. We just want to give you the ESA coverage in case something does happen. If we can show that the scrub habitat is not occupied, then we could do a concurrence letter, but without a survey we will need to do an incidental take. If there is occupied habitat, it's going to be formal. It's not an insurmountable issue, but I would feel more comfortable if you had the coverage. Or, if you want to, do surveys and show that it is not occupied. APAFR does these surveys routinely.

10. Mr. Robinson read an excerpt from the USFWS Consultation Manual. He said that we view these activities as pulse or short-term effects. A short-term effect is less likely to jeopardize the existence of a species.

11. Mr. Webb said this is only about jeopardy.

12. Mr. Robinson said that perhaps we could exclude those areas with the scrub habitat.

13. MAJ Widener said that if it would help with the consultation to carve the areas out as exclusion areas so that there is no loss of habitat then we could do that. Cutting them out is insignificant when it comes to our MA and will not hurt our Proposed Action.

14. Mr. Webb asked that, "You don't have RCW in there, is that right?"

15. Mrs. Wiley stated that we have some RCW foraging areas, but we don't have 200-foot buffer trees or cluster centers. The RCW HMUs are all over Avon Park, and they did their best to avoid them, but it is not possible to totally avoid them. They did avoid cavity trees and clusters.

16. MAJ Widener mentioned a study done that shows that military training has a minimal impact on RCW. Our operations go through these foraging areas. He said he believes that we have sufficient historical data as well as some documented data that shows minimal impact to the RCW. We manage the RCW in a recovery mode at Camp Blanding for over 10 years. For the last almost four years we have been involved with translocation, as well as at Avon Park. Our ground operations at Camp Blanding are more intensive than at Avon Park. We're very attuned to the RCW and we just don't have any indication that driving the track is going to have a significant impact to the RCW and their ability to forage.

17. Ms. Peterson said that's what she is asking for; any type of documentation. That resolves the issue.

18. Mr. Webb. If you're not taking down trees, your operation is going to keep the understory lower, which could be good for the RCWs.

19. MAJ Widener stated that we are very sensitive to RCWs. In our first document we had a mitigation plan with items we had to do to satisfy the Air Force that any impacts would be monitored. As a result we have had an individual on the ground – Bill Frankenberger -- since 1996, who, after every exercise goes out and looks around to see if there are any impacts. He is now a state employee. We also have an awareness program, including a training video that addresses all the environmental issues that result from operation of the MLRS. One of those is the RCW. We discuss that they cannot go close the to the cavity trees and cannot run over trees that are greater than a few inches diameter. They cannot go breaking through established planted areas. We have checks and balances to operate this lethal war weapon in a way that is environmentally sensitive as possible in a training scenario.

20. Mr. Webb: On the RCW, if we can get some back up that your activities can provide a positive effect on the habitat, we can go ahead and concur with a "no effect/not likely to affect" determination. When you say a no effect you don't need a concurrence letter from us. The problem is, if something happens you have no coverage at all.

21. Mrs. Wiley: The number of days that they're going to be out there a year is only 25, which supports this even further.

22. Mr. Robinson: They are really only going to be out there only one day out of each weekend drill.

23. MAJ Widener: The document identifies 25 days a year. That is a worst-case scenario. In reality, they will operate from around noon Saturday to around midnight or two in the morning, maybe a little on Sunday. In the 15-day AT period you may have only 8 or 9 days in the field. So, of the 25 days maybe half they will be on the ground.

24. Mr. Webb: What's the next species.

25. Mrs. Wiley: There is new data on plants also. There is pigeonwing in MA 2. The last map shows it blown up larger. Perhaps we could also carve that out.

26. MAJ Widener said that if we need to mitigate that, he has the authority to say that if we need to carve that out we can.

27. Mrs. Wiley: Earlier GIS data shows that there are no listed plants, but the data just given to us shows it in there.

28. Mr. Webb: If they can avoid that, then that is good.

29. Ms. Peterson: If there are surveys, that is what I wanted to know.

30. MAJ Widener: We are a tenant. What the Air Force does comes to us second hand. It is a challenge sometimes.

31. Ms. Peterson: There are some MAs where the plants are shown nearby. I wanted to know if you had looked in that MA for the plants.

32. MAJ Widener: We got to a point in the process of assessing this that we asked the Air Force to tell us where they will allow us to operate. They ran a search through their GIS and came up with these areas. These have the least impact to anything. If we need to further cut out little areas we can. We can provide you with the criteria that they used to evaluate these MAs.

33. Ms. Peterson said that all she wants to know is: if the areas contain suitable habitat, have they been surveyed.

34. Mr. Webb stated that USFWS can't do incidental take for plants. If you need to be in there, we can include it in the BO. We can do the same as we are going to do with the scrub jay as in "not likely to affect".

35. MAJ Widener stated that the MAs are fluid. We understand that we may have to go back and further isolate areas if there are new findings.

36. Mrs. Wiley said that FLARNG has those management actions written into the EA. For instance if an RCW cavity tree develops in the future, we will provide a 200 ft. buffer.

37. Mr. Webb: The last one, indigo, is the interesting one. Indigos occur anywhere except standing water. I think you are safer to have an incidental take statement that says that if you take an indigo by your maneuver, you are okay. It's better. We did it with the JIFE and with the Navy. It's a protection measure. It's better than hitting one and saying, "Well, now what do we do?".

38. Mr. Robinson: We have a good 10-year history and we have Bill Frankenberger there. Out of the 10 years we've operated we have not had an indigo snake taking.

39. MAJ Widener: Our awareness identifies that gopher tortoise burrows are to be avoided; not only the opening but also the area around them, and we indicate that there are other species that use them including the indigo snake. He verified to Ms. Peterson that, instead of operating in a 100m circle the MLRS will move around in a MA.

39. Mr. Webb: I get a sense that you are a little sensitive to a Biological Opinion (BO). I don't see a difference between a BO and a concurrence letter. They both have the same level of detail. The difference is that with a BO, if there is harm to a species we are going to give you coverage for it. My concern is that I feel that I'm pretty comfortable with all the other species, but I don't feel that we can go that way for the snake because of their elusive nature. You will be a lot less open to criticism if you have the take.

40. MAJ Widener: We're not totally against doing a BO.

41. Mr. Webb: AT this point the indigo is the only one we're really dealing with. I'm thinking one indigo per MA, and you're good to go. We want to make sure that we can meet your timeframe.

42. MAJ Widener: I understand that with the JIFE, Avon Park worked closely with you guys and you were able to meet their timeframe. Contractually, I am three years into getting this NEPA document done and the requirement for a consultation and a BO at the 11th hour is a concern of mine.

43. Mr. Webb: I am looking at it from the point of view that a BO on the snake is not a big issue. Really if you needed it in two weeks we could probably go that route but I'm not going to say that because I know what Mary's schedule is. But we will meet whatever schedule you ask us to.

44. MAJ Widener: That is helpful because I was concerned that we were looking at six months if we ever get there.

45. Mr. Webb: we will say that we met to hear what your concerns were. We will need clarification on the fact that you are planning to avoid those areas, that there is a recent survey on the plants. There may be back and forth discussion. We will put together a draft BO and let you guys look at it to make sure that it is okay.

46. MAJ Widener: We're looking at a BO for each of the MAs to cover for takes.

47. Mr. Webb: Just give us a timeframe on the BO so that you will have time to look at. There won't be any surprises, just an indigo snake for each of the maneuver as with a total of six.

48. Mr. Robinson: For clarification what do we need? Surveys on the pigeonwing and wireweed. Support on the RCW from Ralph Costa.

49. Mr. Webb: Yes, I can agree that maneuvers may keep the foraging habitat down, which is good for the habitat.

50. Mr. Robinson: Also, you will need the timeframe that we need the BO, and one snake per MA, not to exceed six.

51. Mr. Webb: And a statement that you don't believe any fires would be possible.

52. Mrs. Wiley: We have a statement here that we could include.

53. MAJ Widener: Based on the '96 document, firing is only from the designated firing point. In the MAs, they will do a dry fire. They simulate a firing; they don't actually fire. The RRPRs are made so that they drop short. They are a marker round. They produce a puff of white smoke that he forward observer can see.

This document is referring to the amendment to training with the RCW. We can leave you a copy. By this letter, the Service amends the BO on the RCW, which was for management guidelines on military lands. It says that for transient, off-road military traffic within buffer zones, but not within 50 yards of the trees, the potential for impact on forage or cavity trees are likely to be minimal.

54. Ms. Peterson left to make copy of letter and returned.

55. MAJ Widener: We appreciate you working with us on this because we would like to bring this to a close.

DISTRIBUTION:
MAJ Mark Widener
Russell Robinson
Nancy Davis
Harriet Fleming

5

July 28, 2005

Construction & Facility Management Office-lt

U.S. Department of the Interior
Fish & Wildlife Service
South Florida Ecological Services
Ms. Mary Peterson
1339 20th Street
Vero Beach, FL 32960

Ms. Peterson:

I want to express my appreciation to you and Alan Webb for meeting with my staff on July 21, 2005, to discuss the USFWS requirements for our draft Environmental Assessment (EA) regarding the M270 Multiple Launch Rocket System (MLRS) Expanded Training Use Areas at Avon Park Air Force Range (APAFR).

As you are aware, the Florida Army National Guard (FLARNG) is proposing to add six maneuver areas (MAs) to its established MLRS training program at APAFR. No new firing of the MLRS is proposed in our current EA; therefore FLARNG and USFWS agreed to assess only the potential impacts from our proposed action of adding the additional maneuver locations.

However, we would like to emphasize that the risk of ordnance-related fires from the inert Reduced Range Practice Rockets (RRPRs) fired by the MLRS is negligible. As discussed, these are inert rockets; they resemble a telephone pole with a smoke marking charge. The noise from firing is also minimal, and it was determined in the 1996 EA for the conversion of the 8-inch Howitzer to the MLRS at APAFR, that there would be no significant impacts to wildlife due to noise. Firing is into the Bravo High Explosive Impact Area, which has been traditionally used for live fire exercises.

Biological Information

The primary species of concern is the federally-listed indigo snake. Other species that were considered include: red cockaded woodpecker, Florida scrub jay, Florida grasshopper sparrow, pigeonwing and hairy jointweed. Following is a brief discussion of our determinations of the proposed action's effect on each of those species.

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Indigo snake (*Drymarchon corais couperi*):
Established populations of eastern indigo snakes are known to exist throughout APAFR in association with xeric upland habitats. Individual sightings have been recorded in many locations on the installation, as depicted on a map that was provided to USFWS at the meeting. Therefore, avoiding locations where this species might occur is not feasible. As a result, FLARNG and USFWS agreed that there is a possibility of an accidental taking of this species. Since FLARNG's proposed action **May Adversely Affect** the indigo snake, we request that USFWS issue FLARNG six incidental take permits for the indigo snake.

Red cockaded woodpecker (*Picoides borealis*):
FLARNG has provided survey maps to the Service that show that there are no red cockaded woodpecker (RCW) trees with a 200-foot buffer or RCW cluster centers within any of our six proposed MAs. However, RCW Habitat Management Units (HMUs) do exist within our proposed MAs, as RCW HMUs make up much of Avon Park. However, information provided in the U.S. Army RCW Biological Opinion, issued by USFWS, which FLARNG provided during the meeting, provides sufficient evidence, and a conclusion by the Service, that military maneuvering has only a minimal impact on the RCW. Military maneuvers actually help to prevent overgrowth of the understory, which can have a beneficial effect on the RCW. The meeting records show that, as a result, FLARNG and USFWS agree that the proposed action will have **No Effect or is Not Likely to Adversely Affect** the red cockaded woodpecker.

Florida scrub jay (*Aphelocoma coerulescens*):
Three of the originally proposed MAs – MA-2, MA-5 and MA-6 – included a relatively small portion of Florida scrub jay (FSJ) HMUs. As a result of your meeting and subsequent conversations with you, we have refined the boundaries of these three MAs so that the current proposed MAs do not contain FSJ HMUs or nesting areas (see attachment). As a result, there is no designated FSJ habitat in any of the six proposed MAs. Our records show that, as a result, FLARNG and USFWS agree that the proposed action will have **No Effect or is Not Likely to Adversely Affect** the Florida scrub jay.

Florida grasshopper sparrow (*Ammodramus savannarum s. Floridanus*):
Survey maps FLARNG provided to you on 21 July, 2005, illustrate that there are no Florida grasshopper sparrow HMUs within, or in the vicinity of, the six proposed MAs. The meeting records show that FLARNG and USFWS agree that the proposed action will have **No Effect or is Not Likely to Adversely Affect** the Florida grasshopper sparrow.

Pigeon-wing (*Clitoria fragrans*):
APAFR Environmental Flight conducted inventory work on this and other plant species from 2001 through 2004. During this time, all six proposed maneuver areas were surveyed for pigeon-wing. As a result of one of the surveys, a 0.072-acre area of pigeon-wing was found in MA2. Consequently, FLARNG has realigned the boundaries of MA-2 so that the MA no longer includes this patch of pigeon-wing. As a result, there are no known pigeon-wing plants within any of our proposed MAs (see attachment). The meeting records show that, as a result of

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omitting this patch from the MA, FLARNG and USFWS agree that the proposed action will have **No Effect or is Not Likely to Adversely Affect** pigeon-wing.

Wireweed (Hairy jointweed) (*Polygonella basiramia*):
The MAs were also surveyed for wireweed during the 2001 through 2004 inventory. The survey maps illustrate that no wireweed patches occur within, or in the vicinity of, the six proposed MAs. Therefore, the proposed action should have **No Effect** on wireweed.

In summary, after consulting with you and Mr. Webb, FLARNG has determined that our proposed action would have either have no effect or is not likely to affect the following species: Red cockaded woodpecker, Florida scrub jay, Florida grasshopper sparrow, pigeon-wing and wireweed. Additionally, we believe our proposed action may adversely affect the indigo snake. Therefore, we request that USFWS issue us six incidental take permits for the indigo snake – one take for each MA.

The USFWS will be notified immediately if any of the actions considered in this proposed action are modified or if additional information on listed species becomes available. If impact to listed species occurs beyond what has been considered in this assessment, all operations will cease and the Service will be notified. Any modifications or conditions resulting from consultation with the Service will be implemented prior to commencement of activities.

FLARNG requests that the Service send us a Biological Opinion for the indigo snake by 12 August, 2005. We appreciate your expeditious response. If you require further information, please contact Russell Robinson at 904-823-0275, or Amy Wiley at 904-682-3450.

Sincerely,

E. Rodney Ryan
Lieutenant Colonel, Florida Army National Guard
Special Projects Officer

Richard J. Gallant
Colonel, Florida Army National Guard
Construction & Facility Management Officer

Enclosures

Colonel Richard J. Gallant

Tucker, J. and R. Bowman. 2004. Population monitoring and habitat management of the Florida grasshopper sparrow (*Ammodramus savannarum floridanus*) at Avon Park Air Force Range. Annual Report 2003. Archbold Biological Station. Lake Placid, Florida. 36 pages.

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U.S. Navy (Navy). 2005. Draft Environmental Impact Statement for Navy air-to-ground training at Avon Park Air Force Range. Avon Park, Florida.

Webb, J.K., B.W. Brook, and R. Shine. 2002. What makes a species vulnerable to extinction? Comparative life-history traits of two sympatric snakes. Ecological Research 17:59-67.

August 19, 2005

Colonel Richard J. Gallant
Florida Army National Guard
Saint Francis Barracks, P.O. Box 1008
Saint Augustine, Florida 32085-1008

Service Log No.:	4-1-05-PL-10734
Date Received:	December 20, 2004
Formal Consultation Initiation Date:	August 4, 2005
Project:	Multiple Launch Rocket System Expanded Training Use Areas at Avon Park Air Force Range
Counties:	Highlands and Polk

Dear Colonel Gallant:

This document transmits the Fish and Wildlife Service's (Service) biological opinion based on our review of the Florida Army National Guard (FLARNG) proposed artillery training at Avon Park Air Force Range (APAFR), Highlands and Polk Counties, and its adverse effects on the threatened eastern indigo snake (*Drymarchon corais couperi*) in accordance with section 7 of the Endangered Species Act of 1973, as amended (ESA) (87 Stat. 884; 16 U.S.C. 1531 *et seq.*).

The FLARNG also provided determinations of "may affect, but is not likely to adversely affect" for the red-cockaded woodpecker (*Picoides borealis*) (RCW), the Florida scrub-jay (FSJ) (*Aphelocoma coerulescens*), the Florida grasshopper sparrow (FGS) (*Ammodramus savannarum floridanus*), pigeon wings (*Clitoria fragrans*) and wireweed (*Polygonella basiramia*), and "no affect" for the Everglade snail kite (*Rostrhamus sociabilis plumbeus*), the sand skink (*Neoseps reynoldsi*), the bluetail mole skink (*Eumeces egregious lividus*), the Highlands tiger beetle (*Cicindela highlandensis*), the wood stork (*Mycteria americana*), the Audubon's crested caracara (*Caracara cheriway*), the bald eagle (*Haliaeetus leucocephalus*), and the Florida panther (*Puma concolor coryi*).

Acronyms and abbreviations used throughout this letter are outlined in Table 1.

This biological opinion is based on information provided in the March 18, 2005, Ecological Assessment (EA), telephone conversations, emails, meetings, and other sources of information. A complete administrative record of this consultation is on file in the South Florida Ecological Services Office, Vero Beach, Florida.

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Table 1. Acronyms and abbreviations

Acronym/Abbreviation	Definition
ALOC	Administration and Logistics Operations Center
APAFR	Avon Park Air Force Range
Army	U.S. Department of the Army
EA	Environmental Assessment
ESA	Endangered Species Act of 1973, as amended
ESMP	Endangered Species Management Plan
FGS	Florida Grasshopper Sparrow
FLARNG	Florida Army National Guard
FSJ	Florida Scrub-Jay
FWC	Florida Fish and Wildlife Conservation Commission
HE	High Explosive
HHSB	Headquarters and Headquarters Service Battery
HMU	Habitat Management Unit
INRMP	Integrated Natural Resources Management Plan
KPPSP	Kissimmee Prairie Preserve Sate Park
MA	Maneuver Area
MLRS	Multiple Launch Rocket System
Navy	U.S. Navy
NEPA	National Environmental Policy Act
OPAREA	Operational Area
RCW	Red-Cockaded Woodpecker
RRPR	Reduced Range Practice Rockets
Service	Fish and Wildlife Service
TLWMA	Three Lakes Wildlife Management Area
TOC	Tactical Operations Center
USAF	U.S. Air Force

Consultation History

On December 20, 2004, the FLARNG released a preliminary draft EA as required by the National Environmental Policy Act (NEPA) for the M270 Multiple Launch Rocket System (MLRS) Expanded Training Use Areas proposed action at Avon Park.

On March 24, 2005, the FLARNG submitted a draft EA to the Service on the proposed action. The

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EA identified 12 federally-protected species that could be affected by the action. The FLARNG determined that the proposed action would have "no affect" on the RCW, FGS, FSJ, bald eagle, Florida panther, wood stork, Audubon's crested caracara, sand skink, bluetail mole skink, Highlands tiger beetle, and Everglade snail kite. The FLARNG determined the proposed action "may affect, but is not likely to adversely" affect the eastern indigo snake.

On April 28, 2005, the Service commented on the draft EA via email. The Service acknowledged that the FLARNG had proposed many steps to protect listed species, but was concerned that the action had the potential to adversely impact the RCW, FSJ, and eastern indigo snake. The Service stated that the proposed action may also affect two federally-protected plant species: the pigeon wing and wireweed. The Service noted that additional information would be necessary to determine whether initiation of formal consultation was appropriate.

On May 5, 2005, the Service participated in a teleconference with representatives from the FLARNG and the U.S. Air Force (USAF) to discuss the proposed action and potential impacts to listed species. The Service recommended including the ordnance delivery and high explosive (HE) impact areas in the proposed action for the purposes of consultation in accordance with section 7 of the ESA. The FLARNG noted that the action of firing rockets and the effects to HE impact areas was addressed in a previous EA (FLARNG 1996). The Service was concerned, though, that new information could reveal the effects of the action may affect listed species in a manner or to an extent not previously considered. The FLARNG agreed to consider including the firing action in the proposed action.

On June 30, 2005, the Service attended an interagency coordination meeting at APAFR with representatives from the Florida Fish and Wildlife Conservation Commission (FWC), APAFR Environmental Flight, and the FLARNG. The FLARNG's proposed action was among the topics discussed at the meeting. The participants also visited several of the proposed maneuver areas (MAs) to be used for the MLRS training exercises.

July 21, 2005, the Service met with representatives from the FLARNG at the Service's Vero Beach Ecological Services office to discuss ways to further minimize potential impacts to listed species. The FLARNG agreed to modify the footprint of three of the six MAs to completely avoid designated FSJ habitat. The FLARNG also modified the footprint of one MA to avoid a 0.072-acre area of the federally-protected pigeon wing. The FLARNG noted that no wireweed was found during surveys of the six proposed MAs in 2001 and 2004. The Service also expressed concerns that a significant amount of RCW Habitat Management Units (HMUs) overlapped with the proposed MAs.

The FLARNG's draft EA addressed potential impacts due to training activities that involved moving to and from and within the MAs; but, it did not include the action of firing rockets or the effects to HE impact areas, as this was addressed in the FLARNG's 1996 EA. The Service expressed concerns that new information could reveal that the effects of the action may affect listed species in a manner or to an

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extent not previously considered. Specifically, the Service was concerned that ordnance-ignited wildfires could potentially impact the FGS and the FSJ by destroying nests, killing nestlings, displacing birds from occupied habitat, or destroying vegetation and trees within occupied habitat. At the meeting the FLARNG presented information to the Service that training units would use Reduced Range Practice Rockets (RRPR), which are "cold" when they hit the HE area, so that the risk of fire was negligible.
The FLARNG also indicated that the firing action had not changed since the 1996 EA; thus, they believed that it was not necessary to reinitiate consultation on the ordnance delivery action.

On August 4, 2005, the Service received a letter and related information from the FLARNG summarizing the information presented at the July 21, 2005 meeting. The FLARNG modified their determination for the RCW, FSJ, FGS, and pigeon wing from "no affect" to "no affect, or is not likely to adversely affect." They also changed their determination for the eastern indigo snake from "may affect, but is not likely to adversely affect" to "may adversely affect," and requested the Service initiate formal consultation for the snake. They maintained their "no affect" determination for all other listed species.

For the species discussed below, the FLARNG has made a determination of "no affect."

Everglade snail kite

The proposed action occurs within the consultation area of the endangered Everglade snail kite. The snail kite has not been documented at APAFR; however, one snail kite was observed at Lake Arbuckle west of APAFR during a Christmas bird count in 1994. In addition, there have been no records of either snail kite nests or roost sites at AFAFR. Consequently, APAFR has not developed a management plan for this species. Because the snail kite has not been documented at APAFR, and they are not known to use the habitat in the vicinity of the MAs, the Service supports the FLARNG's "no affect" determination for the snail kite.

Sand and Bluetail mole skink

The proposed action occurs within the consultation area of both the threatened sand skink and the threatened bluetail mole skink. Neither skink is known to occur or has been documented at APAFR. In addition, a herpetological survey conducted in scrub and sandhill habitat at APAFR and at the nearby Arbuckle Tract of the Lake Wales State Forest from May 1994 to October 1998 using a variety of sampling techniques, revealed no evidence of either skink (Branch and Hokit 2000). Consequently, monitoring has not been conducted and a management plan has not been drafted for either species. The Service supports the FLARNG's "no affect" determination for both skink species.

Highlands tiger beetle

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The Highlands tiger beetle is a candidate for listing as threatened or endangered by the Service. The tiger beetle, which is restricted to open, sandy, well-drained dunes in Highlands and southern Polk Counties, has not been documented at APAFR. Because the tiger beetle prefers the Florida rosemary (*Ceratiola ericoides*) scrub habitat of the Lake Wales Ridge, and APAFR contains no actual Florida rosemary scrub habitat, it is unlikely the tiger beetle occurs on site. Consequently, monitoring has not been conducted and a management plan has not been drafted for the tiger beetle. The Service supports the FLARNG's "no affect" determination for the tiger beetle.

Wood stork

The endangered wood stork has been observed throughout APAFR, but is not known to nest at APAFR or on adjacent areas (U.S. Navy [Navy] 2005). A wading bird study, including the wood stork, is currently being conducted at APAFR (Navy 2005). Although there are no specific management activities for the wood stork, habitats are maintained and managed in accordance with APAFR's Endangered Species Management Plan (ESMP) and Integrated Natural Resources Management Plan (INRMP).

The wood stork typically utilizes freshwater marshes, ponds, ditches, tidal creeks and pools, impoundments, pine/cypress depressions, and swamp sloughs for foraging. They forage most effectively in shallow-water areas with highly concentrated prey, such as wetland depressions subject to seasonal drying. During the training action, the majority of vehicular traffic will take place along constructed and established roads in designated uplands. Some vehicles may accidentally go into wetlands; however, management actions have been incorporated into the proposed action to avoid and minimize potential impacts to sensitive habitats such as wetlands.

Potential impacts to the wood stork would not be expected based on wood stork occurrence, location of suitable habitat, and frequency and duration of the proposed action. Based on the information provided, the Service supports the FLARNG's "no affect" determination for the wood stork.

Audubon's crested caracara

Although the threatened Audubon's crested caracara is occasionally observed on APAFR, there are no data regarding population size (Navy 2005). The caracara uses a variety of habitats at APAFR that are managed primarily through prescribed fires to promote native vegetation and fauna. The only known caracara nest is several miles southeast of the Bravo Range HE impact area, and the proposed action is not expected to increase risk to the caracara. The Service supports the FLARNG's "no affect" determination for the caracara.

Bald eagle

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The bald eagle is a frequent visitor to APAFR and two nesting sites are regularly used. One nesting site (FWC nest number PO-010) is located on the northwestern portion of the range between Deadins Pine Swamp and Arbuckle Lake. The southern nesting site (FWC nest number HI-016) is on the southeast portion of the range, off Orange Hammock Trail, south of the pine plantation, on County Line Road (Navy 2005).

No known nest sites exist within the MAs. The closest nesting location is approximately 0.5 mile from MA-2 in the northwestern portion of the range. The Service supports the FLARNG's "no affect" determination for the bald eagle.

Florida panther

Florida panther radio-collared data from the FWC for the period extending from February 1981 to December 2003 indicates one individual was reported on the extreme northwest region of APAFR on May 18, 20, and 27, 1998. The same panther was also documented a short distance from the above-stated location and off APAFR on four different occasions between May 25 and June 3, 1998. Review of the same dataset maintained by the FWC for the presence of panthers within a 10-mile radius of the perimeter of APAFR indicates one individual was recorded approximately 20 times in 1998, 1999, and 2000. This individual was primarily observed in the northwest corner of the range, but also to the north and southwest. Beyond the 10-mile radius, this individual was again documented primarily in the north and northwest region of the range over the same timeframe. This panther was not recorded in this area after June 2000. A 2-day survey conducted by the FWC in 2003 at APAFR revealed no evidence of panthers (Navy 2005).

The occurrence of the Florida panther within the MAs or Bravo Range HE impact area would be extremely rare. Because the occurrence of the Florida panther on APAFR is extremely low, changes in habitat use or breeding behavior would not be expected. Consequently, the Service supports the FLARNG's "no affect" determination for the Florida panther.

Wireweed

Located only in Polk and Highlands Counties, wireweed is endemic to the ridges in the Lake Wales, Winter Haven, and APAFR areas, where it readily disperses to bare sandy soils associated with disturbed areas (Service 1999). Wireweed is commonly found in Florida rosemary scrub, which is not present at APAFR; however, some rosemary plants do exist in sand pine scrub habitats. Threats to wireweed involve the destruction of scrub habitat and the lack of large-scale disturbance events. Consequently, the recovery plan for this species involves management of the habitat through prescribed fires.

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Approximately 150 sites have been identified as potential habitat for wireweed at APAFR (Orzell 2004). As of August 2004, 39 percent of these sites have been surveyed. The species was not found in any of the MAs during the 2001 through 2004 survey. Based on the absence of the species within any of the MAs, the Service supports the FLARNG's determination for the wireweed.

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For the species discussed below, the FLARNG has made a determination of "no affect" or "is not likely to adversely affect."

Red-cockaded woodpecker

The proposed action occurs within the consultation area of the endangered RCW. In 2003, 22 active RCW clusters were documented at APAFR, which is similar to the number of clusters ($n = 21$) reported from APAFR during the mid-1970s, suggesting that the population has remained stable (USAF 2000). RCW clusters are distributed throughout the range but are concentrated in the north-central, northwest, northeastern, and eastern portions of the range.

At APAFR, all RCW groups occur in longleaf pine (*Pinus palustrus*) habitat, though historically they occurred in slash pine (*P. elliottii* var. *densa*). The distribution of longleaf pine at APAFR is patchy with small tracts scattered throughout a matrix of habitat types unsuitable or of low habitat value for RCWs. The distribution of longleaf pine that has potential as RCW habitat has been delineated and managed as HMUs. The HMUs are managed for RCW nesting and foraging and include all areas currently occupied by RCWs and those areas that have potential to support the RCW. Current management practices in RCW HMUs include prescribed burning, mechanized vegetation treatments, and planting of longleaf pine. In addition, translocation of the RCW and cavity augmentation with artificial cavities is a part of the habitat management plan (USAF 2000). Since 1998, APAFR staff has translocated 17 RCWs, and to date, 5 of the translocated birds have successfully fledged a total of 9 birds (Navy 2005). The entire RCW population at APAFR and one-fifth of all potential RCW habitat is surveyed annually (Navy 2005).

Federal lands play a crucial role in the recovery of the RCW in south Florida as the vast majority of existing RCW populations occur on Federal lands (Service 2003). APAFR is a designated essential support population because it supports one of the largest remaining populations in the ecologically unique South/Central Florida Recovery Unit (Service 2003). Furthermore, the decline and local extirpation of RCWs on private lands continues despite efforts to establish conservation partnerships with private landowners. The MAs included in the proposed action encompass 2,188 acres of habitat designated as HMUs for the RCW (Table 2).

From 1992 to 2000, four active cavity trees have been lost due to prescribed fires, three from ordnance-ignited wildfire, and two from beetle infestation (USAF 2000). There have not been any known incidents of direct mortality of adult RCWs or of the loss of an entire cluster of cavity trees. If wildfires reach a cavity, the potential for damage or loss of a cavity that may or may not contain eggs or nestlings would exist. Ordnances used during training are inert and all fuel is expended prior to reaching the target; thus, wildfires are not expected to result from proposed action.

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Table 2. HMUs for the RCW within the six proposed MAs.

Maneuver Area	HMU Area	Foraging Area	Total Area
1 - Big Plantation	108		534
2 - Willingham	670		670
3 - Delta	133	12	133
4 - Bubba	425		428
5 - Alexander	343		344
6 - Ramsey	509		509
Total	2,188	12	2,618

The Service and the FWC worked in close partnership with APAFR to develop the ESMP for management of the RCW, FGS, and FSJ. The plan outlines conservation measures to ensure the persistence of the three focal species and their habitats while simultaneously facilitating the military training mission. The FLARNG has agreed to incorporate avoidance considerations outlined in the ESMP as they relate to the proposed action. Specifically, the proposed action will not occur within a 200-foot buffer of any RCW cavity trees or RCW cluster centers, and transient activities such as vehicle maintenance and hand digging within the vicinity of RCW nesting habitat will be limited to two hours or less per day. Also, there will be no assembly area operations, combat support areas, or camouflage netting within the vicinity of RCW nesting habitat.

Twelve acres of RCW foraging habitat overlap the Delta MA (Table 2). Activities within the MA may result in noise disturbance to foraging RCWs, though disturbance will be limited to a maximum of 25 days per year. The Service believes potential noise-related effects will be minimal and will not significantly impact RCW foraging habits. Other potential impacts include damage to lateral roots of forage trees as a result of vehicular travel and soil compaction. The extent to which this disturbance affects tree vigor or mortality, however, is not well documented (U.S. Department of the Army [Army] 1996); as cited in Service (1998). Considering the low frequency of training activities throughout the year and the relatively small area of affected foraging habitat within the MA (approximately 9 percent of the total area), impacts to forage trees are expected to be negligible.

The Service supports the FLARNG's determination that the proposed action "may affect, but is not likely to adversely affect" the RCW.

Florida grasshopper sparrow

The proposed action occurs within the consultation area of the endangered FGS. There are no FGS HMUs within the proposed MAs but HMUs do overlap portions of the Bravo Range ordnance impact area. Potential impacts to FGS based on the MLRS firing actions were addressed in the FLARNG's 1996 EA and subsequent letter from the Service. However, the Service was concerned that due to

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recent significant population declines, the effects of the action could affect the sparrow in a manner or to an extent not previously considered.

Three FGS sub-populations (Bravo, Echo, and Delta Trail Area-OQ Ranges) are recognized at APAFR and have been surveyed from 1996 to 2004. These surveys show a steady decline in the overall population, with the sub-population at the Bravo/Foxtrot Range impact areas having been possibly extirpated (Tucker and Bowman 2004). The total population size reported at APAFR during 2002 was 162 sparrows distributed between the three populations with the largest population (100 sparrows) reported at Echo Range (Delany 2002). In 2003, the FGS population at APAFR declined significantly with a total of 12 male sparrows and 1 additional bird of unknown sex detected. No sparrows were detected in the smallest population (Bravo Range) and the remaining birds were distributed between the other two populations (Delta Trail Area-OQ and Echo Ranges) (Bowman and Tucker 2003). During the 2004 breeding season, a total of 15 male sparrows were detected with only one of those being detected at Bravo Range (Delany et al. 2005).

The FGS was listed as endangered due to habitat loss, limited distribution, and a declining population (51 FR 27495). Florida grasshopper sparrows are strongly habitat-specific, occupying only native fire-maintained dry prairie, which occur almost exclusively on a few parcels of public land. Five primary FGS populations occur on public lands in Florida: three at APAFR; one at Kissimmee Prairie Preserve Sate Park (KPPSP); and one at Three Lakes Wildlife Management Area (TLWMA). Besides these public lands, there is little potential habitat remaining for the FGS in Florida. There is one FGS population known from a privately-owned ranch in Okeechobee County, but it has not been thoroughly assessed since 2001. The populations at KPPSP and TLWMA have fluctuated but appear stable; however, the concurrent and unexplained decline of the three populations at APAFR is cause for concern (Delany et al. 2005). Small population size, small geographic range size, and specialized habitat requirements have all been cited as possible risk factors for extinction (Webb et al. 2002), and evidence suggests that the APAFR populations are currently in danger of extirpation (Delany et al. 2005).

The risk of habitat degradation from ordnance-ignited wildfires was identified as a potential impact to the FGS as a result of the ordnance delivery action. Risk of ordnance-ignited wildfires within the portions of the ranges where FGSs occur, however, is very low since the RRPRs are inhert and all fuel is expended prior to reaching the target. Other potential impacts as a result of the action include bird mortality, nest destruction or abandonment, disruption in normal behaviour, and habitat degradation from direct ordnance impact or associated noise. These types of impacts would be extremely rare and have never been documented in association with existing training at APAFR (Navy 2005).

The Service does not believe the proposed action presents a significant increased risk the FGS and supports the FLARNG's determination that the proposed action "may affect, but is not likely to

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adversely affect" the FGS.
Florida scrub-jay

The proposed action occurs within the consultation area of the threatened FSJ. Populations of the FSJ on APAFR are divided into four different groups. These four groups include the north and south bombing range ridges; a group occupying a ridge along the Kissimmee River; and a small group scattered throughout APAFR. From 1991 to 1999, the FSJ population on APAFR declined by 36.4 percent from 99 groups to 63 groups (USAF 2000). The population continued to decline to 51 groups from 1999 to 2001 (Navy 2005). A small increase to 54 groups was observed during 2003, which was attributed to high survival of adults and juveniles, successful reproduction in 2002, and a large number of immigrants in 2003 (Navy 2005). An increase to 56 groups was documented in 2004 (Navy 2005).

The HMUs for FSJs are managed for breeding habitat and matrix habitats for the dispersal of FSJs. These HMUs are managed using prescribed fires and mechanical methods. Monitoring the FSJ populations according to the ESMP consists of an annual survey of all FSJ habitats on APAFR, which is conducted in late June and early July. In addition, all nests are located and nestlings banded. The MAs included in the proposed action originally encompassed 52 acres of habitat designated as HMUs for the FSJ (Table 3). Per the Service's request, the FLARNG agreed to redraw the boundaries of the MAs to exclude all FSJ HMUs. Based on the FLARNG's actions to avoid impacting FSJ habitat, the Service supports the FLARNG's determination that the proposed action will have "no affect" on the FSJ.

Table 3. HMUs for the FSJ within the six proposed MAs.

Maneuver Area	HMU Area	Total Area
1 - Big Plantation		534
2 - Willingham	13	670
3 - Delta		133
4 - Bubba		428
5 - Alexander	15	344
6 - Ramsey	24	509
Total	52	2,618

Pigeon wings

Pigeon wings occur in the vegetative communities along the Lake Wales Ridge in Highlands, Polk, and Orange Counties. It has been estimated that less than 3,000 plants are located in these three counties. This threatened species is usually not found in high density and it appears fire management may be vital to its long-term survival and recovery. Though this species may exist in a continuum of scrub to

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sandhills (high pineland) vegetation, it is most prevalent in an intermediate vegetative complex referred to as turkey oak barrens (Christman 1988). Christman and Judd (1990) reported the species from scrub, turkey oak barrens, and the edges of high pines. This plant is threatened by habitat loss due to conversion to agricultural, residential and commercial uses; fragmentation of existing populations and habitat degradation by off-road vehicle use; trash dumping; and trampling.

Pigeon wings are know to occur on APAFR and a total of 57 sites have been identified as potential habitat for this species (Orzell 2004). As of August 2004, 89 percent of the sites had been surveyed (Navy 2005). As a result of the surveys, a 0.072-acre area of pigeon wing was found within MA-2. Consequently, the FLARNG has agreed to redraw the boundaries of the MA to exclude the pigeon wing patch. The Service supports the FLARNG's determination that the proposed action will have "no affect" on the pigeon wing.

For the species discussed below, the FLARNG has made a determination of "likely to adversely affect."

Eastern indigo snake

Approximately 50,000 acres of upland habitat at APAFR provide potential habitat for the threatened eastern indigo snake (Legare and Breininger 2002). A study of the distribution of the eastern indigo snake at APAFR showed it to be widespread in a variety of habitats including oak scrub, pine plantations, oak hammock, pine flatwoods, sand pine scrub, dry prairie, hardwood swamp, and disturbed areas (Franz et al. 1998). Because indigo snakes use a variety of habitat types and they have large home ranges at APAFR (Navy 2005), it is likely that indigo snakes occur in the MAs and target areas. The potential exists for disturbance or harm to individual indigo snakes within the MAs due to tracked vehicle use during the training maneuvers. Potential impacts to indigo snakes from tracked vehicle use include injury or direct mortality due to maneuvers within the MAs, injury or mortality on access roads by vehicles under the proposed action, and disturbance, fragmentation, or destruction of habitat within the MAs.

The FLARNG has agreed to use the Service's *Draft Standard Protection Measures for the Eastern Indigo Snake* (2002) while moving all vehicles to and from maneuvering areas. These movements will be confined to established tank trails or roads and maximum speeds will not exceed 25 miles per hour. Though these protective measures may minimize impacts to snakes while on established trails or roads, they are unlikely to provide any protection while maneuvering within the MAs. The FLARNG has determined the proposed action "may adversely affect" the eastern indigo snake. Based on the information provided, the Service supports the FLARNG's determination and is providing this biological opinion in conclusion of formal consultation.

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BIOLOGICAL OPINION

DESCRIPTION OF PROPOSED ACTION

Proposed Action

The proposed action is to expand the 3-116th training and maneuver area at APAFR to enable the 3-116th to conduct battalion level Multiple Launch Rocket System (MLRS) training, fulfilling their training requirements to become certified as combat capable and ready. Battalion level MLRS training includes section, platoon, and battery certification for a minimum of 6 weekends per year and one 15-day annual training exercise. This would require one to four MAs per weekend training exercise, which would be used simultaneously.

Battalion Training and Certification

The training events described below include spatial and temporal requirements common to all comprehensive battalion training actions.

Section Training

The first type of event is a section certification and occurs over the course of 2 weekends. This certification requires use of a training area for static tasks such as donning chemical protection gear, first aid, radio use and protocol, land navigation, and weapons maintenance. This certification requires a separate MA (Table 4). A total of 18 sections will be rotated through the MAs for training. Each section may occupy a different MA or multiple sections may use a single MA. The personnel and equipment used during a typical section training weekend is shown in Table 5.

Table 4. Annual, temporal, and spatial training requirements per training event.

	Section Certification	Section Certification	Platoon Certification	Platoon Certification	Annual Training	Battery Training[1]	Battery Training
Field Time	24 hours	24 hours	24 hours	24 hours	10 days	24 hours	24 hours
Total Time	48 hours	48 hours	48 hours	48 hours	15 days	48 hours	48 hours
A Battery	1 MA	1 MA	1 MA	1 MA	1 MA	1 MA	1 MA
B Battery			1 MA	1 MA	1 MA	1 MA	1 MA
C Battery			1 MA	1 MA	1 MA	1 MA	1 MA
HHS Battery (HHSB)[2]			1 MA	1 MA	1 MA	1 MA	1 MA
Total	**1 MA**	**1 MA**	**4 MAs**	**4 MAs**	**4 MAs**	**1–4 MAs**	**1–4 MAs**

[1] From one to three firing batteries may train during the same weekend.

[2] The Headquarters and Headquarters Service Battery may locate with one of the firing batteries, using one less MA.

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Table 5. Maneuver Area assets for various types of battalion training.

Vehicles (Tracked)[1]	Type of Vehicle	Section Certification[2]	Battery Training[3]	Platoon Certification	
				Battalion Resources	Battalion TOC and ALOC (HHSB)
M270 (T)	Launcher	2	6	18	
M985	Ammunition Truck		12	36	
M989	Ammunition Trailer		12	36	1
M577 (T)	Command Post Carrier	1	3	9	3
M978	Fuel Tanker		2	6	1
M97x	Wrecker			3	
M88 (T)	Recovery Vehicle			3	1
2.5 Ton Truck	Truck			9	9
5 Ton Truck	Truck			3	
HMMWV	Light Vehicle	2	4	21	22
#events/year		2	2	2	2
Personnel		9	69	273[4]	116
MAs used		1	1-4	3	1

[1] T=Tracked. If not tracked, then it is wheeled.
[2] Typically, two section would go out at a time to a single MA
[3] Resources for a single battery.
[4] Number of personnel per MA would be 91.

Platoon Training

The second type of event is a platoon certification and is accomplished over the course of 2 weekends (Table 4). This event requires the entire battalion to be in the field. Each battery would generally occupy a different MA. Typically, they would travel to the MA early Saturday morning, perform their training in the afternoon or late evening, and then move to a different MA. Two platoons in a battery may move together, but it is more typical to move one platoon at a time. The units move to a rally point and then move together as a platoon. Next, they go to a release point within the MA and then move to their own operational area (OPAERA). The personnel and equipment used during a typical training weekend for platoon certification is shown in Table 5.

Annual Training

The third type of training event is the 15-day annual training (Table 4). During this event, the entire battalion remains in the field conducting maneuver training. The battalion maneuvers through the training area and is presented with different training scenarios. Consequently, the battalion needs an additional area large enough to hold three firing batteries through which to rotate the battalion. During the maneuver training, each battery is removed individually to fire inert rockets during a strictly controlled live fire exercise. Annual training requires four MAs for training of the battalion plus a live fire area and

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a corresponding impact area for the inert rockets.

Battery Training

The fourth type of training event is battery training. After the annual training in which each battery is evaluated, the evaluators, along with the battery commander and the battalion commander, may determine that his battery is insufficiently prepared for deployment to combat. Each battery commander may then potentially need 2 weekends to retrain his soldiers to the proper standard (Table 4). The personnel and equipment used during a typical training weekend for platoon certification is shown in Table 5. The amount of retraining each battery needs is at the discretion of the battery commander. If retraining were to occur at the same time, the four batteries would need a maximum of four MAs per weekend. However, depending on the retraining needs, they could need from one to four MAs.

Multiple Launch Rocket System Operations

The FLARNG would use existing maneuver points during training exercises. These points are not adequate for the launchers but they could be used for wheeled vehicles. During the 15-day annual training, each of the three firing batteries would conduct a highly controlled live fire with RRPR. Live fire would occur over an approximately 72-hour period, with 4 hours needed per section. Each section would rotate to firing point A-6 on the main airfield at different times and would fire 3 rounds for a total of 54 rounds into the approved HE impact area on Bravo Range. The rounds are non-energetic once they have expended their propellant with the exception of a smoke marking charge. The section would return to the hide area within the MA once the rocket firing was completed. This rotation would continue over a 3-day period until all sections completed their live fire training.

Preferred Alternative

Under the preferred alternative, six MA sites were identified that would be able to support battalion maneuver training (Table 6). Any of the six MAs would be individually or collectively scheduled and used during a given training exercise. The FLARNG would provide a preliminary training schedule for the year in advance, and would coordinate the scheduling with APAFR for the 6 weekends and one 15-day annual training event. Regardless of the number of MAs scheduled per month, the MLRS battalion would only schedule training areas at APAFR for
1 weekend per month. The MLRS typically uses existing roads and tank trails approximately 75 to 90 percent of the time and goes off-road approximately 10 to 25 percent of the time when executing "hide," "load," and "firing" exercises.

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Table 6. Proposed battalion maneuver areas for MLRS.

Maneuver Area	Acres	Wetland Acres
1 - Big Plantation	534	124
2 - Willingham	670	17
3 - Delta	133	2
4 - Bubba	428	35
5 - Alexander	344	37
6 - Ramsey	509	124
Total	2,618	339

Action Area

The action area is defined as all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action. The Service has determined that the action area for the proposed project is the 2,563 acres which comprises the six MAs at APAFR (Figure 1). In addition, because tracked and other vehicles will be traveling to and from MAs, the area of the tank trails and roads could potentially be affected by the project.

STATUS OF THE SPECIES AND CRITICAL HABITAT RANGE WIDE

Species Description

The eastern indigo snake is the largest non-venomous snake in North America, obtaining lengths of up to 8.5 feet (2.6 meters). Its color is uniformly lustrous-black, dorsally and ventrally, except for a red or cream-colored suffusion of the chin, throat, and sometimes the cheeks. Its scales are large and smooth (the central 3 to 5 scale rows are lightly keeled in adult males) in 17 scale rows at mid-body. Its anal plate is undivided. In the Keys, adult eastern indigo snakes seem to have less red on their faces or throats compared to most mainland specimens. Several researchers have informally suggested that Lower Keys eastern indigo snakes may differ from mainland snakes in ways other than color.

Critical Habitat

Critical habitat has not been designated for this species.

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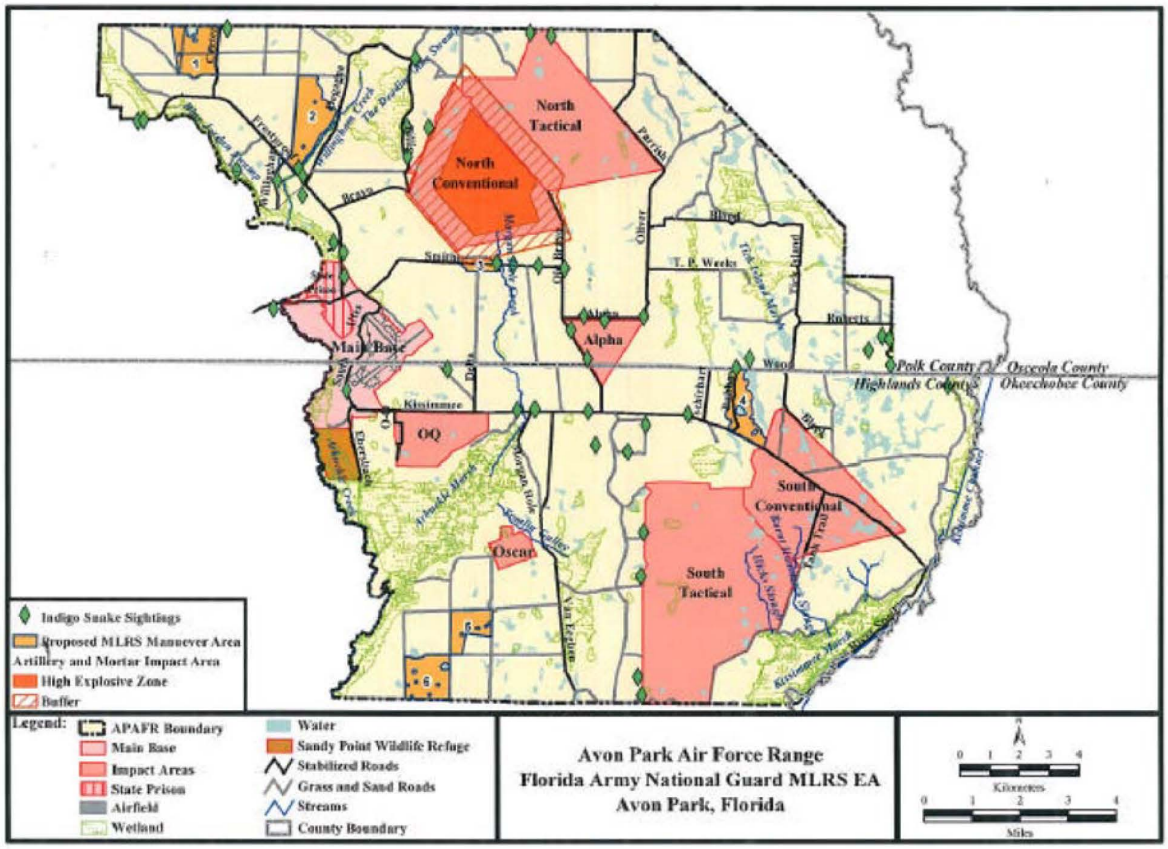

Figure 1. Location of proposed Multiple Launch Rocket Systems Maneuver Areas and documented eastern indigo snake sightings at Avon Park Air Force Range.

Life History

Eastern indigo snakes breed between November and April, with females depositing 4 to 12 eggs during May or June (Moler 1992). Young hatch in approximately 3 months; there is no evidence of parental care; and, they take 3 to 4 years to reach sexual maturity. Female eastern indigo snakes can store sperm and delay fertilization of eggs. There is a single record of a captive snake laying five eggs (at least one of which was fertile) after being isolated for more than 4 years. There is no information on the eastern indigo snake lifespan in the wild, although one captive individual lived 25 years, 11 months (Shaw 1959).

The eastern indigo snake is a generalized predator and will eat any vertebrate small enough to be overpowered. Food items include fish, frogs, toads, snakes (venomous, as well as non-venomous), lizards, turtles, turtle eggs, small alligators, birds, and small mammals (Keegan 1944; Babis 1949; Kochman 1978; Steiner et al. 1983).

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Population Dynamics

Eastern indigo snakes require a mosaic of habitats. Interspersion of tortoise-inhabited sandhills and wetlands improves habitat quality for this species. Eastern indigo snakes require sheltered retreats from winter cold and desiccating conditions, and often use burrows of the gopher tortoise (*Gopherus polyphemus*) when available. In habitats lacking gopher tortoises, snakes may take shelter in hollowed root channels, hollow logs, or the burrows of rodents, armadillos, or crabs. Over most of its range in Florida, the eastern indigo snake frequents diverse habitats such as pine flatwoods, scrubby flatwoods, floodplain edges, sand ridges, dry glades, tropical hammocks, edges of freshwater marshes, muckland fields, coastal dunes, and xeric sandhill communities. Eastern indigos also use agricultural lands and various types of wetlands, with higher population concentrations occurring in the sandhill and pineland regions of northern and central Florida. In extreme south Florida (*i.e.,* the Everglades and Florida Keys), eastern indigo snakes are found in tropical hardwood hammocks, pine rocklands, freshwater marshes, abandoned agricultural land, coastal prairie, mangrove swamps, and human-altered habitats (Steiner et al. 1983). It is thought that they prefer hammocks and pine forests since most observations occur there and use of these areas is disproportionate compared to the relatively small total area of these habitats (Steiner et al. 1983).

In Georgia, the average range of the eastern indigo is 12 acres during the winter (December through April), 106 acres during late spring/early summer (May through July), and 241 acres during late summer and fall (August through November) (Speake et al. 1978). Adult males have larger home ranges than adult females and juveniles; their ranges average 554 acres, reducing to 390 acres in the summer (Moler 1985a). In contrast, a gravid female may use from 3.5 to 106 acres (Smith 1987). In Florida, home ranges for females and males range from 5 to 371 acres and 4 to 805 acres, respectively (B. Smith, Dynamac, personal communication, 2003). At the Archbold Biological Station, average home range size for females was determined to be 47 acres and overlapping male home ranges to be 185 acres (Layne and Steiner 1996).

Status and Distribution

The eastern indigo snake was listed as threatened on January 31, 1978, (43 FR 4028) due to population declines caused by habitat loss, over-collecting for the domestic and international pet trade, and mortality caused by rattlesnake collectors who gas gopher tortoise burrows to collect snakes.

Law enforcement has reduced pressure from the pet trade. However, because of its relatively large home range, this snake is especially vulnerable to habitat loss, degradation, and fragmentation (Lawler 1977; Moler 1985b). Extensive tracts of undeveloped land are important for maintaining eastern indigo snakes.

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Tasks identified in the recovery plan for this species include: habitat management through controlled burning, testing experimental miniature radio transmitters for tracking juveniles, maintenance of a captive breeding colony at Auburn University, recapture of formerly released snakes to confirm survival in the wild, educational lectures and field trips, and efforts to obtain landowner cooperation in conservation efforts (Service 1999).

The indigo snake ranges from the southeastern United States to northern Argentina. This species has eight recognized subspecies, two of which occur in the United States: the eastern indigo and the Texas indigo (*D. c. erebennus*). In the United States, the eastern indigo snake historically occurred throughout Florida and in the coastal plain of Georgia and has been recorded in Alabama and Mississippi. It may have occurred in southern South Carolina, but its occurrence there cannot be confirmed. Georgia and Florida currently support the remaining endemic populations of the eastern indigo snake. The eastern indigo occurs throughout most of Florida and is absent only from the Dry Tortugas and Marquesas Keys and regions of north Florida where cold temperatures and deeper clay soils exist (Cox and Kautz 2000).

The primary threat to the eastern indigo snake is habitat loss due to development and fragmentation. In the wildland urban interface areas, residential housing is also a threat because it increases the likelihood of snakes being killed by property owners and domestic pets.

To protect and manage this species for recovery, large expanses of land must be protected. Management of these lands must be directed towards maintaining and enhancing the diversity of plant and animal assemblages within these properties. Where these goals are achieved, eastern indigo snakes will directly benefit because of improved habitat conditions. Land managers are encouraged to utilize fire as a tool to maintain biodiversity in fire dependent ecosystems.

ENVIRONMENTAL BASELINE

The environmental baseline includes the effects of past and present impacts of all Federal, State, or private actions and other human activities in the action area; the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation; and the impact of State or private actions, which are contemporaneous with the consultation in progress.

Status of the Species within the Action Area

Indigo snakes have been documented in or around MA-1, MA-2, MA-3, and MA-4 (Figure 1). Most sightings occur along roads, which is probably due to the fact that they are more easily detected when in the open. A current study by Dynamac Corporation is examining the distribution and abundance of the indigo snake and how APAFR-related actions and public land uses at the range affect the species. Although the study is ongoing, preliminary mean home range is estimated to be 457 acres for males and

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247 acres for females. Because indigo snakes use a variety of habitats and have very large home ranges, indigo snakes likely occur throughout APAFR.

Management of the indigo snake is through general management and maintenance of the habitat, and by implementing the Service's *Draft Standard Protection Measures for the Eastern Indigo Snake* (Service 2002).

Past and ongoing Federal actions affecting the indigo snake within the action area include two recent actions the Service has formally consulted on regarding training exercises at APAFR. A biological opinion was issued on May 5, 2005, for the Joint Integrated Fires Exercise at APAFR and incidental take was estimated to be 21.4 male and 39.69 female indigo snakes. Another biological opinion was issued on June 7, 2005 for the Air-to-ground Bombing exercise at APAFR and incidental take was anticipated not to exceed 11 snakes annually.

Factors Affecting the Species' Environments within the Action Area

In a letter dated November 5, 2004, the Service recommended that the USAF request consultation on the existing level of military activity currently taking place at APAFR (*e.g.*, cattle grazing, other military training, timber management, hunting, fishing, camping, controlled burns, prison operations), as our records do not show that such a consultation has taken place. In addition, the Service indicated that it would be to the USAF's advantage, as it would automatically require separate consultation for other armed services activities that would be distinct from USAF actions. Avon Park Air Force Range is currently in formal consultation under section 7 of the ESA with the Service on the draft update to the 2001 INRMP 2004-2009. In addition, the USAF is under formal consultation on their ESMP to address all listed species present on APAFR.

EFFECTS OF THE ACTION

This section includes an analysis of the direct and indirect effects of the proposed action on the eastern indigo snake and snake habitat.

Factors to be considered

Indigo snakes have been documented in or around MA-1, MA-2, MA-3, and MA-4 (Figure 1). Because indigo snakes use a variety of habitats and have very large home ranges, indigo snakes likely occur throughout APAFR. This action will take place when the snakes are likely to be present in the area. The duration of the project is approximately 25 days per year. The severity of the action on the indigo is not known.

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Analyses for effects of the action

Direct Effects

Snakes may be injured or killed during the action by tracked vehicles. This activity may cause individuals to leave the area, abandon den sites, and possibly miss foraging and mating opportunities. Above ground refugia may be lost during the training exercises. Individual snakes fleeing the area may be more vulnerable to predation. Some snakes may seek underground refugia, if available. Short-term detrimental impacts to habitat may occur.

To minimize adverse impacts, vehicle operators will follow the Service's *Draft Standard Protection Measures for the Eastern Indigo Snake* (Service 2002). Additionally, gopher tortoise mounds will be flagged and operators will be notified to avoid them.

Indirect Effects

Indirect effects are those that are caused by or result from the proposed action, are later in time, and are reasonably certain to occur. There are no indirect effects anticipated by the proposed action.

Species Response to the Proposed Action

It is anticipated that 2,563 acres of potential habitat within action area, which represents 2.4 percent of the area of APAFR, may be impacted by the proposed action. The number of individuals present in the action area is not known. However, the Service estimates that approximately 5.6 male and 10.4 female snakes may be present within the action area. This estimate is based on a mean home range of 457 acres for male and 247 acres for female snakes at APAFR. The number of snakes expected to be present on the roads and trails is not known and would vary over time and space.

The species is sensitive to habitat fragmentation. This project is not expected to result in permanent fragmentation, but may result in short-term habitat fragmentation. The species' sensitivity to this type of activity is expected to be high, though disruption of normal behavior and activity is anticipated to be brief.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, Tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

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Since the proposed action is located on a Federal military installation, there are no actions that may occur within the action area that would not be subject to consultation.

CONCLUSION

After reviewing the status of the eastern indigo snake and the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the species. No critical habitat has been designated for the eastern indigo snake; therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulation pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns such as breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns, which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are nondiscretionary and must be undertaken by the Service so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, for the exemption in action 7(o)(2) to apply. The Service has a continuing duty to regulate the activity covered by this incidental take statement. If the Service (1) fails to assume and implement the terms and conditions or (2) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, the applicant must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement.

AMOUNT OR EXTENT OF TAKE

The Service anticipates incidental take of the Eastern indigo snake will be difficult to detect for the following reasons: (1) wide-ranging distribution, (2) patchy distribution within suitable habitat, and (3)

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apparently suitable habitat may not be occupied. However, the Service anticipates incidental take of the indigo snake associated with training activities over 2,563 acres. The incidental take is expected to be in the form of harm, harassment, and direct mortality.

Due to the lack of site-specific surveys, in conjunction with the wide-ranging activity and use of a variety of habitat types by the eastern indigo snake, it is difficult to determine the exact number of snakes that will be taken. Indigo snakes have been documented in or around MA-1, MA-2, MA-3, and MA-4. Because indigo snakes use a variety of habitats and have very large home ranges, they likely occur throughout APAFR. Consequently, proposed action would potentially impact the indigo snake including injury or direct mortality.

The Service estimates that approximately 5.6 male and 10.4 female snakes may be present within the action area. The number of snakes expected to be present on the roads and trails is not known and would vary over time and space. Based on the proposed level of use of the six MAs, the Service anticipates the proposed action may result in the incidental take of one indigo snake/year/MA, for a total of 6 snakes annually.

EFFECT OF THE TAKE

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take of the eastern indigo snake. The FLARNG will work with APAFR's staff to coordinate their operational training schedules to the greatest extent practical to minimize potential adverse effects on natural resource compliance, management, and monitoring requirements.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the ESA, the FLARNG must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

(1) Vehicle and equipment operators will be notified to avoid all snakes and burrows if at all possible. Training units will be educated to recognize the eastern indigo snake. If any snake is encountered, it will be avoided or allowed to leave the area on its own before vehicle or equipment use is resumed;

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(2) The FLARNG will submit annual monitoring reports on the effects of training activities, and shall document the date(s) and duration of the activities, and the effects to the eastern indigo snake and their habitat. The report shall also summarize monitoring of the post-action response of species and document any species sightings, including locations of sightings. Reports shall be submitted upon completion of an annual training event; and

(3) Upon locating a dead, injured, or sick individual of a federally listed species, initial notification must be made to the nearest Service Law Enforcement Office (Fish and Wildlife Service; 9549 Koger Boulevard, Suite 111; St. Petersburg, Florida 33702; 727-570-5398). Secondary notification should be made to the Florida Fish and Wildlife Conservation Commission, South Region; 3900 Drane Field Road; Lakeland, Florida 33811-1299; 800-282-8002. Care should be taken in handling sick or injured specimens to ensure effective treatment and care, or in the handling of dead specimens to preserve biological material in the best possible state for later analysis as to the cause of death. In conjunction with the care of sick or injured specimens or preservation of biological materials from a dead animal, the finder has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take would represent new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The FLARNG must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to further minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The Service is not proposing any conservation recommendations at this time.

REINITIATION NOTICE

This concludes formal consultation on the proposed action. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded, as defined by the action area measures provided in this project description; (2) new

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information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have any questions regarding this project, please contact Mary Peterson at 772-562-3909, extension 327, or Allen Webb at extension 246.

Sincerely yours,

James J. Slack
Field Supervisor
South Florida Ecological Services Office

cc:
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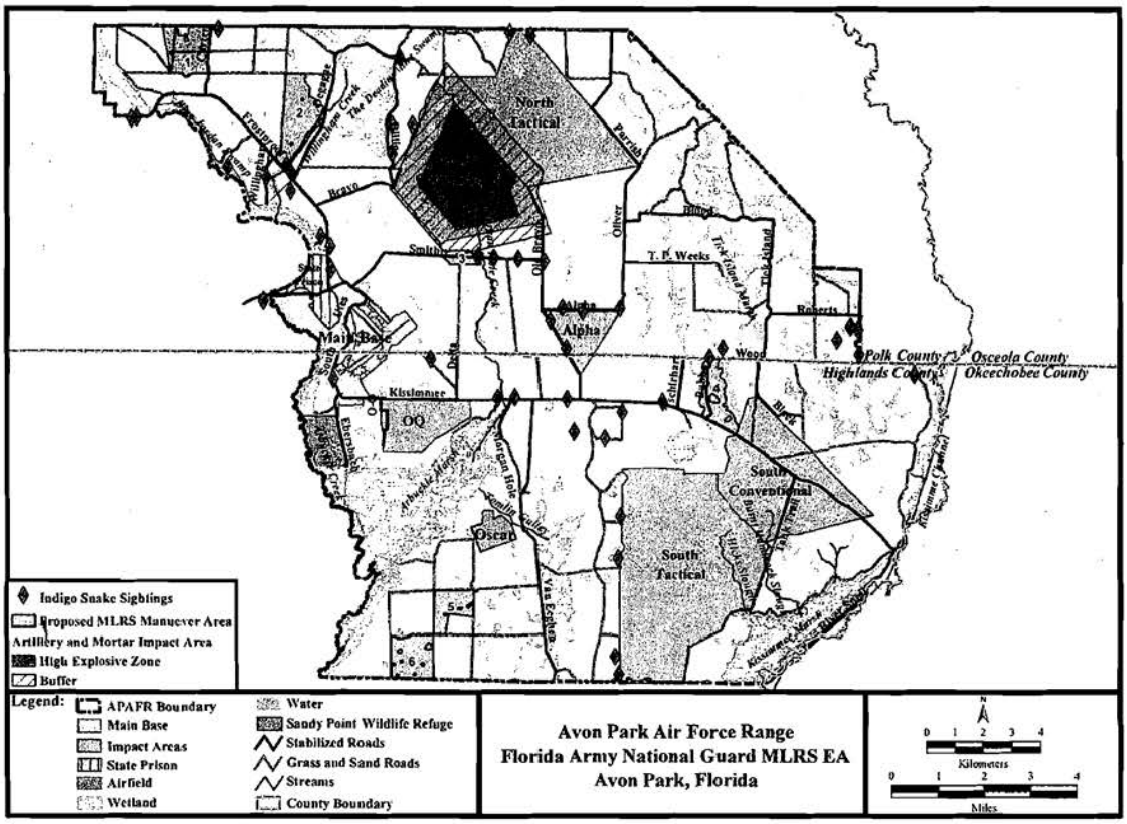

Figure 1. Location of proposed Multiple Launch Rocket Systems Maneuver Areas and documented eastern indigo snake sightings at Avon Park Air Force Range.

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From: russell.robinson@fl.ngb.army.mil on behalf of Robinson, Russell K Mr FL-ARNG [russell.robinson@fl.ngb.army.mil]
Sent: Monday, September 19, 2005 2:18 PM
To: Mary Peterson, USFWS
Cc: Allen Webb; Widener, Mark S MAJ FL-ARNG; Fleming, Harriet Mrs FL-ARNG; Wiley, Amy A Mrs FL-ARNG; Daniels, Karen L.
Subject: Final Comments on Proposed APAFR MLRS USFWS BO

Attachments: Final Response to USFWS Biological Opinion.doc

Good Afternoon Mary,

Thank you for extending the comment period regarding this proposed USFWS BO for the expanded MLRS training at Avon Park Air Force Range. I have attached our comment matrix for your consideration. We do not see these as major changes and would like to get the final BO issued as soon as possible. Please advise on an anticipated date whereby we can adjust our Environmental Assessment schedule, if needed. Once again, thank you in advance for your expeditious reply and consideration in this matter.

Sincerely,

Russell K. Robinson
CIV, EN, FLANG
Conservation Manager
(904) 823-0275
DSN 822-0275
Fax: (904) 823-0189

<<Final Response to USFWS Biological Opinion.doc>>

Response to USFWS Biological Opinion

Page #	Statement	Response
1	2nd paragraph. States that "The FLARNG also provided determinations of '**may affect**, but is not likely to adversely affect'" for the Florida scrub jay and pigeon wings..."	In their letter to the USFWS dated July 28, the FLARNG provided determinations of "**no effect** or is not likely to adversely affect" for these species. Page 10 of the biological opinion correspondence of August 19 states the Service agrees with the FLARNG determination of "**no effect**" for the FSJ. Page 11 of the biological opinion correspondence states the Service agrees with the FLARNG determination of "**no effect**" for the pigeon wing. The FLARNG will change the language in the EA to match the BO of "**no effect**"
1	2nd paragraph. States that "The FLARNG also provided determinations of '**may affect**, but is not likely to adversely affect'...wireweed..."	In their letter to the USFWS dated July 28, the FLARNG provided a determination of "**no effect**" for this species. Page 6 of the biological opinion correspondence agrees with the FLARNGs determination of "**no effect**". The FLARNG will change the language in the EA to match the BO of "**no effect**"
3-4	5th paragraph on p.3 discusses firing. On p. 4, this paragraph concludes that "The FLARNG also indicated that the firing action had not changed since the 1996 EA; thus, they believed that it was not necessary to reinitiate consultation on the ordnance delivery action."	Please add a statement to this paragraph that the Service agreed that it was not necessary to reinitiate consultation on firing. This was agreed upon at the July 21st meeting.

9	3rd paragraph. States that "The risk of habitat degradation from ordnance-ignited wildfires was identified as a potential impact to the FGS as a result of the ordnance delivery action." 4th paragraph States that "The Service does not believe the proposed action presents a significant increased risk the FGS and supports the FLARNG's determination that the proposed action of "**no affect**" to the FGS.	No statement to this effect is in the EA. USFWS and FLARNG agreed that firing will not change as a result of this proposed action and therefore does not need to be assessed. Please insert the word "to" between the words "risk" and "the".
11	5th paragraph. States that "The FLARNG has agreed to use the Service's *Draft Standard Protection Measures for the Eastern Indigo Snake* (2002) …"	According to your 08SEP05 e-mail, the Service has agreed to remove "Draft".
19	2nd paragraph. States that "The FLARNG has agreed to use the Service's *Draft Standard Protection Measures for the Eastern Indigo Snake* (2002) …"	According to your 08SEP05 e-mail, the Service has agreed to remove "Draft".
20	2nd paragraph. States that "The FLARNG has agreed to use the Service's *Draft Standard Protection Measures for the Eastern Indigo Snake* (2002) …" 2nd paragraph, 2nd sentence States that "Additionally, gopher tortoise mounds will be flagged and operators will be notified to avoid them."	According to your 08SEP05 e-mail, the Service has agreed to remove "Draft". Request this sentence to be deleted; subject addressed in Terms and Conditions # 1. (next comment)
22	Terms and Conditions Item# 1 "Vehicle and equipment operators will be notified to avoid all snakes and burrows if at all possible. Training units will be educated to recognize the eastern indigo snake. If any snake is encountered, it will be avoided or allowed to leave the area on its own before vehicle or equipment use is resumed;"	The FLARNG will comply. Burrows will be marked annually. Training units will be educated to avoid the indigo snake.
23	Terms and Conditions Item# 2 The FLARNG will submit annual monitoring reports on the effects of training activities, and shall document the date(s) and duration of the activities, and the effects to the eastern indigo snake and their habitat. The report shall also summarize monitoring of the post-action response of species and document any species sightings, including locations of sightings. Reports shall be submitted upon completion of an annual training event; and"	It is more accurate to state that the FLARNG will conduct an annual survey and submit an annual monitoring report no later than September 30 each year. In this way, the annual report will be submitted to the Service even if the FLARNG does not conduct an annual training event.

23	Terms and Conditions Item# 3 "Upon locating a dead, injured, or sick individual of a federally listed species, initial notification must be made to the nearest Service Law Enforcement Office (Fish and Wildlife Service; 9549 Koger Boulevard, Suite 111; St. Petersburg, Florida 33702; 727-570-5398). Secondary notification should be made to the Florida Fish and Wildlife Conservation Commission, South Region; 3900 Drane Field Road; Lakeland, Florida 33811-1299; 800-282-8002. Care should be taken in handling sick or injured specimens to ensure effective treatment and care, or in the handling of dead specimens to preserve biological material in the best possible state for later analysis as to the cause of death. In conjunction with the care of sick or injured specimens or preservation of biological materials from a dead animal, the finder has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed."	The FLARNG will comply with these requests.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
South Florida Ecological Services Office
1339 20th Street
Vero Beach, Florida 32960

September 22, 2005

Colonel Richard J. Gallant
Florida Army National Guard
Saint Francis Barracks
Post Office Box 1008
Saint Augustine, Florida 32085-1008

Service Log No.:	4-1-05-PL-10734
Date Received:	December 20, 2004
Formal Consultation Initiation Date:	August 4, 2005
Project:	Multiple Launch Rocket System Expanded Training Use Areas at Avon Park Air Force Range
Counties:	Highlands and Polk

Dear Colonel Gallant:

This document transmits the Fish and Wildlife Service's (Service) biological opinion based on our review of the Florida Army National Guard (FLARNG) proposed artillery training at Avon Park Air Force Range (APAFR), Highlands and Polk Counties, and its adverse effects on the threatened eastern indigo snake (*Drymarchon corais couperi*) in accordance with section 7 of the Endangered Species Act of 1973, as amended (ESA) (87 Stat. 884; 16 U.S.C. 1531 *et seq.*). This document also transmits the Service's view of the effects of the proposed action on other federally protected species at APAFR in accordance with the ESA. Acronyms and abbreviations used throughout this letter are outlined in Table 1.

The FLARNG proposes to expand the 3-116th training and maneuver area at APAFR to enable the 3-116th to conduct battalion-level Multiple Launch Rocket System (MLRS) training, fulfilling their training requirements to become certified as combat capable and ready. Battalion level MLRS training includes section, platoon, and battery certification for a minimum of 6 weekends-per-year and one 15-day annual training exercise. This would require one to four maneuver areas (MAs) per weekend training exercise, which would be used simultaneously.

In their March 18, 2005, draft Environmental Assessment (EA), the FLARNG provided a determination of "no affect" for all federally protected animal species except the eastern indigo snake, which they made a determination of "may affect, but is not likely to adversely affect." In a letter to the Service dated July 28, 2005, the FLARNG modified their determination for the snake to "may adversely affect" and requested initiation of formal consultation. The FLARNG also made determinations of "no affect, or is not likely to adversely affect" for pigeon wings

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(*Clitoria fragrans*) and "no affect" for wireweed (*Polygonella basiramia*). They modified their "no affect" determinations to "no affect, or is not likely to adversely affect" for the red-cockaded woodpecker (*Picoides borealis*) (RCW), the Florida scrub-jay (FSJ) (*Aphelocoma coerulescens*), the Florida grasshopper sparrow (FGS) (*Ammodramus savannarum floridanus*). They maintained their "no affect" determinations for the Everglade snail kite (*Rostrhamus sociabilis plumbeus*), the sand skink (*Neoseps reynoldsi*), the bluetail mole skink (*Eumeces egregious lividus*), the Highlands tiger beetle (*Cicindela highlandensis*), the wood stork (*Mycteria americana*), the Audubon's crested caracara (*Caracara cheriway*), the bald eagle (*Haliaeetus leucocephalus*), and the Florida panther (*Puma concolor coryi*).

THREATENED AND ENDANGERED SPECIES

For the species discussed below, the FLARNG has made a determination of "no affect."

Everglade snail kite

The proposed action occurs within the consultation area of the endangered Everglade snail kite. The snail kite has not been documented at APAFR; however, one snail kite was observed at Lake Arbuckle west of APAFR during a Christmas bird count in 1994. In addition, there have been no records of either snail kite nests or roost sites at APAFR. Consequently, APAFR has not developed a management plan for this species. Because the snail kite has not been documented at APAFR, and they are not known to use the habitat in the vicinity of the MAs, the Service supports the FLARNG's determination for the snail kite.

Sand and Bluetail mole skink

The proposed action occurs within the consultation area of both the threatened sand skink and the threatened bluetail mole skink. Neither skink is known to occur or has been documented at APAFR. In addition, a herpetological survey conducted in scrub and sandhill habitat at APAFR and at the nearby Arbuckle Tract of the Lake Wales State Forest from May 1994 to October 1998 using a variety of sampling techniques, revealed no evidence of either skink (Branch and Hokit 2000). Consequently, monitoring has not been conducted and a management plan has not been drafted for either species. The Service supports the FLARNG's determination for both skink species.

Highlands tiger beetle

The Highlands tiger beetle is a candidate for listing as threatened or endangered by the Service. The tiger beetle, which is restricted to open, sandy, well-drained dunes in Highlands and southern Polk Counties, has not been documented at APAFR. Because the tiger beetle prefers the Florida rosemary (*Ceratiola ericoides*) scrub habitat of the Lake Wales Ridge, and APAFR contains no actual Florida rosemary scrub habitat, it is unlikely the tiger beetle occurs on-site. Consequently,

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monitoring has not been conducted and a management plan has not been drafted for the tiger beetle. Based on this information, the Service supports the FLARNG's determination for the tiger beetle.

Wood stork

The endangered wood stork has been observed throughout APAFR, but is not known to nest at APAFR or on adjacent areas (U.S. Navy [Navy] 2005). A wading bird study, including the wood stork, is currently being conducted at APAFR (Navy 2005). Although there are no specific management activities for the wood stork, habitats are maintained and managed in accordance with APAFR's Endangered Species Management Plan (ESMP) and Integrated Natural Resources Management Plan (INRMP).

The wood stork typically utilizes freshwater marshes, ponds, ditches, tidal creeks and pools, impoundments, pine (*Pinus* sp.)/cypress (*Taxodium ascends*) depressions, and swamp sloughs for foraging. They forage most effectively in shallow-water areas with highly concentrated prey, such as wetland depressions subject to seasonal drying. During the training action, the majority of vehicular traffic will take place along constructed and established roads in designated uplands. Some vehicles may accidentally go into wetlands; however, management actions have been incorporated into the proposed action to avoid and minimize potential impacts to sensitive habitats such as wetlands.

Potential impacts to the wood stork would not be expected based on wood stork occurrence, location of suitable habitat, and frequency and duration of the proposed action. Based on the information provided, the Service supports the FLARNG's determination for the wood stork.

Audubon's crested caracara

Although the threatened Audubon's crested caracara is occasionally observed on APAFR, there are no data regarding population size (Navy 2005). The caracara uses a variety of habitats at APAFR that are managed primarily through prescribed fires to promote native vegetation and fauna. The only known caracara nest is several miles southeast of the Bravo Range high explosive (HE) impact area, and the proposed action is not expected to increase risk to the caracara. The Service supports the FLARNG's determination for the caracara.

Bald eagle

The bald eagle is a frequent visitor to APAFR and two nesting sites are regularly used. One nesting site (Florida Fish and Wildlife Conservation Commission [FWC] nest number PO-010) is located on the northwestern portion of the range between Deadins Pine Swamp and Arbuckle Lake. The southern nesting site (FWC nest number HI-016) is on the southeast portion of the

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range, off Orange Hammock Trail, south of the pine plantation, on County Line Road (Navy 2005).

No known nest sites exist within the MAs. The closest nesting location is approximately 0.5 mile from MA-2 in the northwestern portion of the range. Based on the above information, the Service supports the FLARNG's determination for the bald eagle.

Florida panther

Florida panther radio telemetry data from the FWC for the period extending from February 1981 to December 2003 indicates one individual was reported on the extreme northwest region of APAFR on May 18, 20, and 27, 1998. The same panther was also documented a short distance from the above-stated location and off APAFR on four different occasions between May 25 and June 3, 1998. Review of the same dataset maintained by the FWC for the presence of panthers within a 10-mile radius of the perimeter of APAFR indicates one individual was recorded approximately 20 times in 1998, 1999, and 2000. This individual was primarily observed in the northwest corner of the range, but also to the north and southwest. Beyond the 10-mile radius, this individual was again documented primarily in the north and northwest region of the range over the same timeframe. This panther was not recorded in this area after June 2000. A 2-day survey conducted by the FWC in 2003 at APAFR revealed no evidence of panthers (Navy 2005).

The occurrence of the Florida panther within the MAs would be extremely rare. Because the occurrence of the Florida panther on APAFR is extremely low, changes in habitat use or breeding behavior would not be expected. Consequently, the Service supports the FLARNG's determination for the Florida panther.

Wireweed

Located only in Polk and Highlands Counties, wireweed is endemic to the ridges in the Lake Wales, Winter Haven, and APAFR areas, where it readily disperses to bare sandy soils associated with disturbed areas (Service 1999). Wireweed is commonly found in Florida rosemary scrub, which is not present at APAFR; however, some rosemary plants do exist in sand pine scrub habitats. Threats to wireweed involve the destruction of scrub habitat and the lack of large-scale disturbance events. Consequently, the recovery plan for this species involves management of the habitat through prescribed fires.

Approximately 150 sites have been identified as potential habitat for wireweed at APAFR (Orzell 2004). As of August 2004, 39 percent of these sites had been surveyed. The species was not found in any of the MAs during the 2001 through 2004 survey. Based on the absence of the species within any of the MAs, the Service supports the FLARNG's determination for the wireweed.

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For the species discussed below, the FLARNG has made a determination of "no affect, or is not likely to adversely affect."

Red-cockaded woodpecker

The proposed action occurs within the consultation area of the endangered RCW. In 2003, 22 active RCW clusters were documented at APAFR, which is similar to the number of clusters (n = 21) reported from APAFR during the mid-1970s, suggesting that the population has remained stable (U.S. Air Force [USAF] 2000). RCW clusters are distributed throughout the range but are concentrated in the north-central, northwest, northeastern, and eastern portions of the range.

At APAFR, all RCW groups occur in longleaf pine (*Pinus palustrus*) habitat, though historically they occurred in slash pine (*P. elliottii* var. *densa*). The distribution of longleaf pine at APAFR is patchy with small tracts scattered throughout a matrix of habitat types unsuitable or of low habitat value for RCWs. The distribution of longleaf pine that has potential as RCW habitat has been delineated and managed as habitat management units (HMUs). The HMUs are managed for RCW nesting and foraging and include all areas currently occupied by RCWs and those areas that have potential to support the RCW. Current management practices in RCW HMUs include prescribed burning, mechanized vegetation treatments, and planting of longleaf pine. In addition, translocation of the RCW and cavity augmentation with artificial cavities is a part of the habitat management plan (USAF 2000). Since 1998, APAFR staff has translocated 17 RCWs, and to date, five of the translocated birds have successfully fledged a total of nine birds (Navy 2005). The entire RCW population at APAFR and one-fifth of all potential RCW habitat is surveyed annually (Navy 2005).

Federal lands play a crucial role in the recovery of the RCW in south Florida as the vast majority of existing RCW populations occurs on Federal lands (Service 2003). APAFR is a designated essential support population because it supports one of the largest remaining populations in the ecologically unique South/Central Florida Recovery Unit (Service 2003). Furthermore, the decline and local extirpation of RCWs on private lands continues despite efforts to establish conservation partnerships with private landowners. The MAs included in the proposed action encompass 2,137 acres of habitat designated as HMUs for the RCW (Table 2).

From 1992 to 2000, four active cavity trees have been lost due to prescribed fires, three from ordnance-ignited wildfire, and two from beetle infestation (USAF 2000). There have not been any known incidents of direct mortality of adult RCWs or of the loss of an entire cluster of cavity trees. If wildfires reach a cavity, the potential for damage or loss of a cavity that may or may not contain eggs or nestlings would exist. Ordnances used during training are inert and all fuel is expended prior to reaching the target; thus, wildfires are not expected to result from proposed action.

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The Service and the FWC worked in close partnership with APAFR to develop the ESMP for management of the RCW, FGS, and FSJ. The plan outlines conservation measures to ensure the persistence of the three focal species and their habitats, while simultaneously facilitating the military training mission. The FLARNG has agreed to incorporate avoidance considerations outlined in the ESMP as they relate to the proposed action. Specifically, the proposed action will not occur within a 200-foot buffer of any RCW cavity trees or RCW cluster centers, and transient activities such as vehicle maintenance and hand digging within the vicinity of RCW nesting habitat will be limited to two hours or less per day. Also, there will be no assembly area operations, combat support areas, or camouflage netting within the vicinity of RCW nesting habitat.

Twelve acres of RCW foraging habitat overlap the Delta MA (Table 2). Activities within the MA may result in noise disturbance to foraging RCWs, though disturbance will be limited to a maximum of 25 days-per-year. The Service believes potential noise-related effects will be minimal and will not significantly impact RCW foraging habits. Other potential impacts include damage to lateral roots of forage trees as a result of vehicular travel and soil compaction. The extent to which this disturbance affects tree vigor or mortality is not well documented (U.S. Department of the Army [Army] 1996); as cited in Service (1998). Considering the low frequency of training activities throughout the year and the relatively small area of affected foraging habitat within the MA (approximately 9 percent of the total area), impacts to forage trees are expected to be negligible.

Based on the information provided, the Service supports the FLARNG's determination for the RCW.

Florida grasshopper sparrow

The proposed action occurs within the consultation area of the endangered FGS. There are no FGS HMUs within the proposed MAs but HMUs do overlap portions of the Bravo Range ordnance impact area. Potential impacts to FGS based on the MLRS firing actions were addressed in the FLARNG's 1996 EA and a subsequent letter from the Service (1996). However, the Service was concerned that due to recent significant population declines, the effects of the action could affect the sparrow in a manner or to an extent not previously considered.

Three FGS sub-populations (Bravo, Echo, and Delta Trail Area-OQ Ranges) are recognized at APAFR and have been surveyed from 1996 to 2004. These surveys show a steady decline in the overall population, with the sub-population at the Bravo/Foxtrot Range impact areas having been possibly extirpated (Tucker and Bowman 2004). The total population size reported at APAFR during 2002 was 162 sparrows distributed between the three populations with the largest population (100 sparrows) reported at Echo Range (Delany 2002). In 2003, the FGS population at APAFR declined significantly with a total of 12 male sparrows and 1 additional bird of unknown sex detected. No sparrows were detected in the smallest population (Bravo Range) and

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the remaining birds were distributed between the other two populations (Delta Trail Area-OQ and Echo Ranges) (Bowman and Tucker 2003). During the 2004 breeding season, a total of 15 male sparrows were detected with only one of those being detected at Bravo Range (Delany et al. 2005).

The FGS was listed as endangered due to habitat loss, limited distribution, and a declining population (51 FR 27495). Florida grasshopper sparrows are strongly habitat-specific, occupying only native fire-maintained dry prairie, which occur almost exclusively on a few parcels of public land. Five primary FGS populations occur on public lands in Florida: three at APAFR, one at Kissimmee Prairie Preserve State Park (KPPSP), and one at Three Lakes Wildlife Management Area (TLWMA). Besides these public lands, there is little potential habitat remaining for the FGS in Florida. There is one FGS population known from a privately-owned ranch in Okeechobee County, but it has not been thoroughly assessed since 2001. The populations at KPPSP and TLWMA have fluctuated but appear stable; however, the concurrent and unexplained decline of the three populations at APAFR is cause for concern (Delany et al. 2005). Small population size, small geographic range size, and specialized habitat requirements have all been cited as possible risk factors for extinction (Webb et al. 2002), and evidence suggests that the APAFR populations are currently in danger of extirpation (Delany et al. 2005).

Potential impacts as a result of the action include bird mortality, nest destruction or abandonment, disruption in normal behavior, and habitat degradation from direct ordnance impact or associated noise. These types of impacts would be extremely rare and have never been documented in association with existing training at APAFR (Navy 2005).

The Service does not believe the proposed action presents a significant increased risk to the FGS and supports the FLARNG's determination for the FGS.

Florida scrub-jay

The proposed action occurs within the consultation area of the threatened FSJ. Populations of the FSJ on APAFR are divided into four different groups. These four groups include the north and south bombing range ridges; a group occupying a ridge along the Kissimmee River; and a small group scattered throughout APAFR. From 1991 to 1999, the FSJ population on APAFR declined by 36.4 percent from 99 groups to 63 groups (USAF 2000). The population continued to decline to 51 groups from 1999 to 2001 (Navy 2005). A small increase to 54 groups was observed during 2003, which was attributed to high survival of adults and juveniles, successful reproduction in 2002, and a large number of immigrants in 2003 (Navy 2005). An increase to 56 groups was documented in 2004 (Navy 2005).

The HMUs for FSJs are managed for breeding habitat and matrix habitats for the dispersal of FSJs. These HMUs are managed using prescribed fires and mechanical methods. Monitoring the FSJ populations according to the ESMP consists of an annual survey of all FSJ habitats on

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APAFR, which is conducted in late June and early July. In addition, all nests are located and nestlings banded. The MAs included in the proposed action originally encompassed 52 acres of habitat designated as HMUs for the FSJ (Table 3). Per the Service's request, the FLARNG agreed to redraw the boundaries of the MAs to exclude all FSJ HMUs. Based on the FLARNG's actions to avoid impacting FSJ habitat, the Service supports the FLARNG's determination for the FSJ.

Pigeon wings

Pigeon wings occur in the vegetative communities along the Lake Wales Ridge in Highlands, Polk, and Orange Counties. It has been estimated that less than 3,000 plants are located in these three counties. This threatened species is usually not found in high density and it appears fire management may be vital to its long-term survival and recovery. Though this species may exist in a continuum of scrub to sandhills (high pineland) vegetation, it is most prevalent in an intermediate vegetative complex referred to as turkey oak (*Quercus laevis*) barrens (Christman 1988). Christman and Judd (1990) reported the species from scrub, turkey oak barrens, and the edges of high pines. This plant is threatened by habitat loss due to conversion to agricultural, residential and commercial uses, fragmentation of existing populations and habitat degradation by off-road vehicle use, trash dumping, and trampling.

Pigeon wings are know to occur on APAFR and a total of 57 sites have been identified as potential habitat for this species (Orzell 2004). As of August 2004, 89 percent of the sites had been surveyed (Navy 2005). As a result of the surveys, a 0.072-acre area of pigeon wing was found within MA-2. Consequently, the FLARNG has agreed to redraw the boundaries of the MA to exclude the pigeon wing patch. Based on actions to avoid impacting pigeon wings, the Service supports the FLARNG's determination.

For the species discussed below, the FLARNG has made a determination of "likely to adversely affect."

Eastern indigo snake

Approximately 50,000 acres of upland habitat at APAFR provide potential habitat for the threatened eastern indigo snake (Legare and Breininger 2002). A study of the distribution of the eastern indigo snake at APAFR showed it to be widespread in a variety of habitats including oak (*Quercus* spp.) scrub, pine plantations, oak hammock, pine flatwoods, sand pine scrub, dry prairie, hardwood swamp, and disturbed areas (Franz et al. 1998). Because indigo snakes use a variety of habitat types and they have large home ranges at APAFR (Navy 2005), it is likely that indigo snakes occur in the MAs and along the roads and trails. The potential exists for disturbance or harm to individual indigo snakes within the MAs and along the roads and trails due to tracked vehicle use during the training maneuvers. Potential impacts to indigo snakes from tracked vehicle use include injury or direct mortality due to maneuvers within the MAs,

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injury or mortality on access roads by vehicles under the proposed action, and disturbance, fragmentation, or destruction of habitat within the MAs.

The FLARNG has agreed to use the Service's *Standard Protection Measures for the Eastern Indigo Snake* (Service 2002) while moving all vehicles to and from maneuvering areas. These movements will be confined to established tank trails or roads and maximum speeds will not exceed 25 miles per hour. Though these protective measures may minimize impacts to snakes while on established trails or roads, they are unlikely to provide any protection while maneuvering within the MAs. The FLARNG has determined the proposed action "may adversely affect" the eastern indigo snake. Based on the information provided, the Service supports the FLARNG's determination and is providing this biological opinion in conclusion of formal consultation.

This biological opinion is based on information provided in the March 18, 2005, draft EA, telephone conversations, emails, meetings, and other sources of information. A complete administrative record of this consultation is on file in the South Florida Ecological Services Office, Vero Beach, Florida.

The Use of Best Scientific and Commercial Information by the Service

The Service uses the most current and up-to-date scientific and commercial information available. The nature of the scientific process dictates that information is constantly changing and improving as new studies are completed. The scientific method is an iterative process that builds on previous information. As the Service becomes aware of new information, we will ensure it is fully considered in our decisions, evaluations, reviews, and analyses as it relates to the base of scientific knowledge and any publications cited in our documents.

Specifically, there is one such document cited in this biological opinion the Service acknowledges has been affected in its cited form by new scientific information. The Service has taken these new sources of information into account when using this document to help guide our analysis and decisions. This document is the South Florida Multi-Species Recovery Plan (MSRP) of 1999 (Service 1999).

South Florida Multi-Species Recovery Plan

The MSRP was designed to be a living document and it was designed to be flexible to accommodate the change identified through ongoing and planned research and would be compatible with adaptive management strategies. These principals are set forth in both the transmittal letter from the Secretary of the Interior and in the document itself. As predicted, this is what indeed occurred in the intervening years since the MSRP was published. The Service uses the MSRP in the context it still presents useful information when taken in conjunction with all the new scientific information developed subsequent to its publication.

Colonel Richard J. Gallant

Consultation History

On December 20, 2004, the FLARNG released a preliminary draft EA as required by the National Environmental Policy Act for the M270 Multiple Launch Rocket System Expanded Training Use Areas proposed action at Avon Park.

On March 24, 2005, the FLARNG submitted a draft EA to the Service on the proposed action. The EA identified 12 federally-protected species that could be affected by the action. The FLARNG determined that the proposed action would have "no affect" on the RCW, FGS, FSJ, bald eagle, Florida panther, wood stork, Audubon's crested caracara, sand skink, bluetail mole skink, Highlands tiger beetle, and Everglade snail kite. The FLARNG determined the proposed action "may affect, but is not likely to adversely" affect the eastern indigo snake.

On April 28, 2005, the Service commented on the draft EA via email. The Service acknowledged that the FLARNG had proposed many steps to protect listed species, but was concerned that the action had the potential to adversely impact the RCW, FSJ, and eastern indigo snake. The Service stated that the proposed action may also affect two federally-protected plant species: the pigeon wing and wireweed. The Service noted that additional information would be necessary to determine whether initiation of formal consultation was appropriate.

On May 5, 2005, the Service participated in a teleconference with representatives from the FLARNG and the USAF to discuss the proposed action and potential impacts to listed species. The Service recommended including the ordnance delivery and HE impact areas in the proposed action for the purposes of consultation in accordance with section 7 of the ESA. The FLARNG noted that the action of firing rockets and the effects to HE impact areas was addressed in a previous EA (FLARNG 1996). The Service was concerned, though, that new information could reveal the effects of the action may affect listed species in a manner or to an extent not previously considered. The FLARNG agreed to consider including the firing action in the proposed action.

On June 30, 2005, the Service attended an interagency coordination meeting at APAFR with representatives from the FWC, APAFR Environmental Flight, and the FLARNG. The FLARNG's proposed action was among the topics discussed at the meeting. The participants also visited several of the proposed MAs to be used for the MLRS training exercises.

July 21, 2005, the Service met with representatives from the FLARNG at the Service's Vero Beach Ecological Services office to discuss ways to further minimize potential impacts to listed species. The FLARNG agreed to modify the footprint of three of the six MAs to completely avoid designated FSJ habitat. The FLARNG also modified the footprint of one MA to avoid a 0.072-acre area of the federally-protected pigeon wing. The FLARNG noted that no wireweed was found during surveys of the six proposed MAs in 2001 and 2004. The Service also expressed concerns that a significant amount of RCW HMUs overlapped with the proposed MAs.

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The FLARNG's draft EA addressed potential impacts due to training activities that involved moving to and from and within the MAs; but, it did not include the action of firing rockets or the effects to HE impact areas, as this was addressed in the FLARNG's 1996 EA. The Service expressed concerns that new information could reveal that the effects of the action may affect listed species in a manner or to an extent not previously considered. Specifically, the Service was concerned that ordnance-ignited wildfires could potentially impact the FGS and the FSJ by destroying nests, killing nestlings, displacing birds from occupied habitat, or destroying vegetation and trees within occupied habitat. At the meeting, the FLARNG presented information to the Service that training units would use Reduced Range Practice Rockets (RRPR), which are "cold" when they hit the HE area, so that the risk of fire was negligible. The FLARNG also indicated that the firing action had not changed since the 1996 EA; thus, they believed that it was not necessary to reinitiate consultation on the ordnance delivery action and the Service concurred.

On August 4, 2005, the Service received a letter and related information from the FLARNG summarizing the information presented at the July 21, 2005 meeting. The FLARNG modified their determination for the RCW, FSJ, and FGS from "no affect" to "no affect, or is not likely to adversely affect." They also changed their determination for the eastern indigo snake from "may affect, but is not likely to adversely affect" to "may adversely affect," and requested the Service initiate formal consultation for the snake. They made determinations of "no affect, or is not likely to adversely affect" for pigeon wings and "no affect" for wireweed, and maintained their "no affect" determinations for all other listed species.

On September 6, 2005, the Service provided the FLARNG with a draft copy of the biological opinion for the eastern indigo snake.

On September 19, 2005, the FLARNG provided the Service with comments on the draft biological opinion.

BIOLOGICAL OPINION

DESCRIPTION OF PROPOSED ACTION

Proposed Action

The proposed action is to expand the 3-116th training and maneuver area at APAFR to enable the 3-116th to conduct battalion-level MLRS training, fulfilling their training requirements to become certified as combat capable and ready. Battalion level MLRS training includes section, platoon, and battery certification for a minimum of 6 weekends-per-year and one 15-day annual training exercise. This would require one to four MAs per weekend training exercise, which would be used simultaneously.

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Battalion Training and Certification

The training events described below include spatial and temporal requirements common to all comprehensive battalion training actions.

Section Training

The first type of event is a section certification and occurs over the course of 2 weekends. This certification requires use of a training area for static tasks such as donning chemical protection gear, first aid, radio use and protocol, land navigation, and weapons maintenance. This certification requires a separate MA (Table 4). A total of 18 sections will be rotated through the MAs for training. Each section may occupy a different MA or multiple sections may use a single MA. The personnel and equipment used during a typical section training weekend is shown in Table 5.

Platoon Training

The second type of event is a platoon certification and is accomplished over the course of 2 weekends (Table 4). This event requires the entire battalion to be in the field. Each battery would generally occupy a different MA. Typically, they would travel to the MA early Saturday morning, perform their training in the afternoon or late evening, and then move to a different MA. Two platoons in a battery may move together, but it is more typical to move one platoon at a time. The units move to a rally point and then move together as a platoon. Next, they go to a release point within the MA and then move to their own operational area. The personnel and equipment used during a typical training weekend for platoon certification is shown in Table 5.

Annual Training

The third type of training event is the 15-day annual training (Table 4). During this event, the entire battalion remains in the field conducting maneuver training. The battalion maneuvers through the training area and is presented with different training scenarios. Consequently, the battalion needs an additional area large enough to hold three firing batteries through which to rotate the battalion. During the maneuver training, each battery is removed individually to fire inert rockets during a strictly controlled live fire exercise. Annual training requires four MAs for training of the battalion plus a live fire area and a corresponding impact area for the inert rockets.

Battery Training

The fourth type of training event is battery training. After the annual training in which each battery is evaluated, the evaluators, along with the battery commander and the battalion commander, may determine that his battery is insufficiently prepared for deployment to combat.

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Each battery commander may then potentially need 2 weekends to retrain his soldiers to the proper standard (Table 4). The personnel and equipment used during a typical training weekend for platoon certification is shown in Table 5. The amount of retraining each battery needs is at the discretion of the battery commander. If retraining were to occur at the same time, the four batteries would need a maximum of four MAs per weekend. However, depending on the retraining needs, they could need from one to four MAs.

Multiple Launch Rocket System Operations

The FLARNG would use existing maneuver points during training exercises. These points are not adequate for the launchers but they could be used for wheeled vehicles. During the 15-day annual training, each of the three firing batteries would conduct a highly controlled live fire with RRPR. Live fire would occur over an approximately 72-hour period, with 4 hours needed per section. Each section would rotate to firing point A-6 on the main airfield at different times and would fire three rounds for a total of 54 rounds into the approved HE impact area on Bravo Range. The rounds are non-energetic once they have expended their propellant with the exception of a smoke marking charge. The section would return to the hide area within the MA once the rocket firing was completed. This rotation would continue over a 3-day period until all sections completed their live fire training.

Preferred Alternative

Under the preferred alternative, six MA sites were identified that would be able to support battalion maneuver training (Table 6). Any of the six MAs would be individually or collectively scheduled and used during a given training exercise. The FLARNG would provide a preliminary training schedule for the year in advance, and would coordinate the scheduling with APAFR for the 6 weekends and one 15-day annual training event. Regardless of the number of MAs scheduled per month, the MLRS battalion would only schedule training areas at APAFR for 1 weekend per month. The MLRS typically uses existing roads and tank trails approximately 75 to 90 percent of the time and goes off-road approximately 10 to 25 percent of the time when executing "hide," "load," and "firing" exercises.

Action Area

The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. The Service has determined that the action area for the proposed project is the 2,566 acres which comprises the six MAs at APAFR (Figure 1). In addition, because tracked and other vehicles will be traveling to and from MAs, the area of the tank trails and roads could potentially be affected by the project.

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STATUS OF THE SPECIES AND CRITICAL HABITAT RANGE WIDE

Species Description

The eastern indigo snake is the largest non-venomous snake in North America, obtaining lengths of up to 8.5 feet (2.6 meters) (Moler 1992). Its color is uniformly lustrous-black, dorsally and ventrally, except for a red or cream-colored suffusion of the chin, throat, and sometimes the cheeks. Its scales are large and smooth (the central 3 to 5 scale rows are lightly keeled in adult males) in 17 scale rows at mid-body. Its anal plate is undivided. In the Keys, adult eastern indigo snakes seem to have less red on their faces or throats compared to most mainland specimens (Lazell 1989). Several researchers have informally suggested that Lower Keys eastern indigo snakes may differ from mainland snakes in ways other than color.

Critical Habitat

Critical habitat has not been designated for this species.

Life History

In northern Florida, eastern indigo snakes breed between November and April, with females depositing 4 to 12 eggs during May or June (Moler 1992). Young hatch in approximately 3 months and there is no evidence of parental care. Limited information on the reproductive cycle in south-central Florida suggests that the breeding and egg-laying season may be extended. In this region, breeding extends from June to January; laying occurs from April to July; and hatching occurs during mid-summer to early fall (Layne and Steiner 1996). Snakes in captivity take 3 to 4 years to reach sexual maturity (Speake et al. 1987). Female eastern indigo snakes can store sperm and delay fertilization of eggs. There is a single record of a captive snake laying five eggs (at least one of which was fertile) after being isolated for more than 4 years (Carson 1945). However, there have been several recent reports of parthogenetic reproduction by virginal snakes. Hence, sperm storage may not have been involved in Carson's (1945) example (P. Moler, FWC, personal communication 1998). There is no information on the eastern indigo snake lifespan in the wild, although one captive individual lived 25 years, 11 months (Shaw 1959).

The eastern indigo snake is a generalized predator and will eat any vertebrate small enough to be overpowered. Food items include fish, frogs, toads, snakes (venomous, as well as non-venomous), lizards, turtles, turtle eggs, small alligators, birds, and small mammals (Keegan 1944; Babis 1949; Kochman 1978; Steiner et al. 1983).

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Population Dynamics

Eastern indigo snakes require a mosaic of habitats. A study in southern Georgia found that interspersion of tortoise-inhabited sandhills and wetlands improve habitat quality for the snake (Landers and Speake 1980). Eastern indigo snakes require sheltered retreats from winter cold and desiccating conditions, and often use burrows of the gopher tortoise (*Gopherus polyphemus*) when available (Speake et al. 1978, Layne and Steiner 1996). In habitats lacking gopher tortoises, snakes may take shelter in hollowed root channels, hollow logs, or the burrows of rodents, armadillos, or land crabs (Lawler 1977, Moler 1985a, Layne and Steiner 1996). Over most of its range in Florida, the eastern indigo snake frequents diverse habitats such as pine flatwoods, scrubby flatwoods, floodplain edges, sand ridges, dry glades, tropical hammocks, edges of freshwater marshes, muckland fields, coastal dunes, and xeric sandhill communities (Service 1999). Eastern indigos also use agricultural lands and various types of wetlands, with higher population concentrations occurring in the sandhill and pineland regions of northern and central Florida. In extreme south Florida (*i.e.,* the Everglades and Florida Keys), eastern indigo snakes are found in tropical hardwood hammocks, pine rocklands, freshwater marshes, abandoned agricultural land, coastal prairie, mangrove swamps, and human-altered habitats (Steiner et al. 1983). It is thought that they prefer hammocks and pine forests since most observations occur there and use of these areas is disproportionate compared to the relatively small total area of these habitats (Steiner et al. 1983).

Indigo snakes range over large areas and into various habitats throughout the year, with most activity occurring in the summer and fall (Smith 1987, Moler 1985a). In Georgia, the average range of the eastern indigo is 12 acres during the winter (December through April), 106 acres during late spring/early summer (May through July), and 241 acres during late summer and fall (August through November) (Speake et al. 1978). Adult males have larger home ranges than adult females and juveniles; their ranges average 554 acres, reducing to 390 acres in the summer (Moler 1985b). In contrast, a gravid female may use from 3.5 to 106 acres (Smith 1987). In Florida, home ranges for females and males range from 5 to 371 acres and 4 to 805 acres, respectively (B. Smith, Dynamac, personal communication, 2003). At the Archbold Biological Station, average home range size for females was determined to be 47 acres and overlapping male home ranges to be 185 acres (Layne and Steiner 1996).

Status and Distribution

The eastern indigo snake was listed as threatened on January 31, 1978, (43 FR 4028) due to population declines caused by habitat loss, over-collecting for the domestic and international pet trade, and mortality caused by rattlesnake collectors who gas gopher tortoise burrows to collect snakes.

Effective law enforcement has reduced pressure on the species from the pet trade. However, because of its relatively large home range, this snake is especially vulnerable to habitat loss,

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degradation, and fragmentation (Lawler 1977; Moler 1985a). The primary threat to the eastern indigo snake is habitat loss due to development and fragmentation. In wildland urban interface areas, residential housing is also a threat because it increases the likelihood of snakes being killed by property owners and domestic pets. Extensive tracts of undeveloped land are important for maintaining eastern indigo snakes.

The indigo snake ranges from the southeastern United States to northern Argentina (Conant and Collins 1998). This species has eight recognized subspecies, two of which occur in the United States: the eastern indigo and the Texas indigo (*D. c. erebennus*). In the United States, the eastern indigo snake historically occurred throughout Florida and in the coastal plain of Georgia and has been recorded in Alabama and Mississippi (Diemer and Speake 1983, Moler 1985b). It may have occurred in southern South Carolina, but its occurrence there cannot be confirmed. Georgia and Florida currently support the remaining endemic populations of the eastern indigo snake (Lawler 1977). The eastern indigo occurs throughout most of Florida and is absent only from the Dry Tortugas and Marquesas Keys and regions of north Florida where cold temperatures and deeper clay soils exist (Cox and Kautz 2000).

Tasks identified in the recovery plan for this species include: habitat management through controlled burning, testing experimental miniature radio transmitters for tracking juveniles, maintenance of a captive breeding colony at Auburn University, recapture of formerly released snakes to confirm survival in the wild, educational lectures and field trips, and efforts to obtain landowner cooperation in conservation efforts (Service 1999).

To protect and manage this species for recovery, large expanses of land must be protected. Management of these lands must be directed towards maintaining and enhancing the diversity of plant and animal assemblages within these properties. Where these goals are achieved, eastern indigo snakes will directly benefit because of improved habitat conditions. Land managers are encouraged to utilize fire as a tool to maintain biodiversity in fire dependent ecosystems.

ENVIRONMENTAL BASELINE

The environmental baseline includes the effects of past and present impacts of all Federal, State, or private actions and other human activities in the action area; the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation; and the impact of State or private actions, which are contemporaneous with the consultation in progress.

Status of the Species within the Action Area

Indigo snakes have been documented in or around MA-1, MA-2, MA-3, and MA-4 (Figure 1). Most sightings occur along roads, which is likely because they are more easily detected when on

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roads. A current study by Dynamac Corporation is examining the distribution and abundance of the indigo snake and how APAFR-related actions and public land uses at the range affect the species. Although the study is ongoing, preliminary mean home range is estimated to be 457 acres for males and 247 acres for females. Because indigo snakes use a variety of habitats and have very large home ranges, indigo snakes likely occur throughout APAFR.

Management of the indigo snake is through general management and maintenance of the habitat, and by implementing the Service's *Standard Protection Measures for the Eastern Indigo Snake* (Service 2002).

Past and ongoing Federal actions affecting the indigo snake within the action area include two recent actions the Service has formally consulted on regarding training exercises at APAFR. A biological opinion was issued on May 5, 2005, for the Joint Integrated Fires Exercise at APAFR and incidental take was estimated to be 21.4 male and 39.69 female indigo snakes. Another biological opinion was issued on June 7, 2005 for the Air-to-ground Bombing exercise at APAFR and incidental take was anticipated not to exceed 11 snakes annually.

Factors Affecting the Species' Environments within the Action Area

In a letter dated November 5, 2004, the Service recommended that the USAF request consultation on the existing level of military activity currently taking place at APAFR (*e.g.*, cattle grazing, other military training, timber management, hunting, fishing, camping, controlled burns, prison operations), as our records do not show that such a consultation has taken place. In addition, the Service indicated that it would be to the USAF's advantage, as it would automatically require separate consultation for other armed services activities that would be distinct from USAF actions. Avon Park Air Force Range is currently in informal consultation under section 7 of the ESA with the Service on the draft update to the 2001 INRMP 2004-2009. In addition, the USAF is in informal consultation on their ESMP to address all listed species present on APAFR. The Service has recommended the USAF request formal consultation and submit complete initiation packages for these two plans.

EFFECTS OF THE ACTION

This section includes an analysis of the direct and indirect effects of the proposed action on the eastern indigo snake and snake habitat.

Factors to be considered

Indigo snakes have been documented in or around MA-1, MA-2, MA-3, and MA-4 (Figure 1). Because indigo snakes use a variety of habitats and have very large home ranges, indigo snakes likely occur throughout APAFR. This action will take place when the snakes are likely to be

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present in the area. The duration of the project is approximately 25 days per year. The severity of the action on the indigo is not known.

Analyses for effects of the action

Direct Effects

Direct effects are those effects that are caused by the proposed action. The direct impacts evaluated by the Service include: (1) direct injury or mortality; and (2) loss, degradation, or fragmentation of available habitat for foraging, breeding, and dispersing. The direct effects that this project may have on indigo snakes within the action area are discussed below.

The proposed action could impact 2,566 acres of potential indigo snake habitat over a period of years, primarily through operation of tracked vehicles within the six proposed MAs. Legare and Breininger (2002) estimated that approximately 50,000 acres of upland habitat at APAFR provide potential habitat for the indigo snake. Based on a home range of 457 acres for male and 247 acres for female indigo snakes, the Service estimates that a minimum of 5.6 male and 10.4 female snakes, which represents approximately 5.1 percent of the potential population of indigo snakes at APAFR, may occur on these MAs collectively. This estimate assumes that all potential habitats are occupied; that male and female snake home ranges are exclusive of other male and female snake home ranges, respectively; but that female and male snake home ranges do overlap. These assumptions have not been tested and it is possible that the actual number of snakes within the MAs and across the APAFR landscape may be higher or lower than what the Service estimated. The number of snakes expected to be present on the roads and trails is not known and would vary over time and space.

An individual MA may contain a single snake home range or may overlap with several snake home ranges, depending on the distribution and configuration of snake home ranges and the location, configuration, and size of the MAs. We have estimated that 16 snakes (male and female) may be present within the action area; however, it is difficult to determine how many snakes will be present within each MA. The MAs vary in size from 133 acres to 657 acres, with the average size of 428 acres. As stated earlier, mean home range size for indigo snakes at APAFR has been estimated at 457 acres for males and 247 acres for females. Though not all available habitats will necessarily be occupied, it is reasonable to expect that an individual MA would support all or portions of one to three snake home ranges.

Based on the proposed level of use of the six MAs, the Service anticipates the proposed action may result in the take of one indigo snake/year/MA, for a total of six snakes annually. The incidental take is expected to be in the form of harm, harassment, and direct mortality. Snakes may be injured or killed during the action by tracked vehicles. This activity may cause individuals to leave the area, abandon den sites, and possibly miss foraging and mating opportunities. Above ground refugia may be lost during the training exercises. Individual snakes

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fleeing the area may be more vulnerable to predation. Some snakes may seek underground refugia, if available. Short-term detrimental impacts to habitat may occur.

To minimize adverse impacts, vehicle operators will follow the Service's *Standard Protection Measures for the Eastern Indigo Snake* (Service 2002).

Indirect Effects

Indirect effects are those that are caused by or result from the proposed action, are later in time, and are reasonably certain to occur. The indirect impacts evaluated by the Service include: (1) increased risk of roadway mortality to snakes due to the increase in vehicular traffic; and (2) reduction in the value of snake habitat adjacent to the MAs due to habitat fragmentation. The indirect effects that this project may have on indigo snakes within the action area are discussed below.

The proposed action does not include the construction of new roads and travel to and from the MAs will be restricted to existing roads and trails. Thus, an increase vehicular traffic is not anticipated. The proposed action is not expected to result in permanent habitat fragmentation, but may result in short-term habitat fragmentation. However, the Service does not anticipate that the short-term habitat fragmentation will affect the value of adjacent habitats.

Based on the above evaluation, the Service has concluded there are no indirect effects anticipated by the proposed action.

Species Response to the Proposed Action

It is anticipated that 2,566 acres of potential habitat within the action area, which represents 2.4 percent of the area of APAFR, may be impacted by the proposed action. The number of individuals present in the action area is not known. However, the Service estimates that approximately 5.6 male and 10.4 female snakes may be present within the action area. This estimate is based on a mean home range of 457 acres for male and 247 acres for female snakes at APAFR. The number of snakes expected to be present on the roads and trails is not known and would vary over time and space.

Snakes may be injured or killed during the action by tracked vehicles. This activity may cause individuals to leave the area, abandon den sites, and possibly miss foraging and mating opportunities. Above ground refugia may be lost during the training exercises. Individual snakes fleeing the area may be more vulnerable to predation. Some snakes may seek underground refugia, if available.

The species is sensitive to habitat fragmentation. This project is not expected to result in permanent fragmentation, but may result in short-term habitat fragmentation. The species'

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sensitivity to this type of activity is expected to be high, though disruption of normal behavior and activity is anticipated to be brief.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, Tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

Since the proposed action is located on a Federal military installation, there are no actions that may occur within the action area that would not be subject to consultation.

CONCLUSION

After reviewing the status of the eastern indigo snake and the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the species. No critical habitat has been designated for the eastern indigo snake; therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulation pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns such as breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns, which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are nondiscretionary and must be undertaken by the FLARNG so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, for the exemption in action 7(o)(2) to apply. The FLARNG has a continuing duty to regulate the activity covered by this incidental take statement. If the FLARNG (1) fails to assume and implement the terms and conditions or (2) fails to require the applicant to adhere to

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the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, the FLARNG must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement.

AMOUNT OR EXTENT OF TAKE

The Service anticipates incidental take of the eastern indigo snake will be difficult to detect for the following reasons: (1) wide-ranging distribution, (2) patchy distribution within suitable habitat, and (3) apparently suitable habitat may not be occupied. However, the Service anticipates incidental take of the indigo snake associated with training activities over 2,566 acres. The incidental take is expected to be in the form of harm, harassment, and direct mortality.

Due to the lack of site-specific surveys, in conjunction with the wide-ranging activity and use of a variety of habitat types by the eastern indigo snake, it is difficult to determine the exact number of snakes that will be taken. Indigo snakes have been documented in or around MA-1, MA-2, MA-3, and MA-4. Because indigo snakes use a variety of habitats and have very large home ranges, they likely occur throughout APAFR. Consequently, the proposed action would potentially impact the indigo snake including injury or direct mortality.

The Service estimates that approximately 5.6 male and 10.4 female snakes may be present within the action area. The number of snakes expected to be present on the roads and trails is not known and would vary over time and space. An individual MA may contain a single snake home range or may overlap with several snake home ranges, depending on the distribution and configuration of snake home ranges and the location, configuration, and size of the MAs. We have estimated that 16 snakes (male and female) may be present within the action area; however, it is difficult to determine how many snakes will be present within each MA. The MAs vary in size from 133 acres to 657 acres, with the average size of 428 acres. As stated earlier, mean home range size for indigo snakes at APAFR has been estimated at 457 acres for males and 247 acres for females. Though not all available habitats will necessarily be occupied, it is reasonable to expect that an individual MA would support all or portions of one to three snake home ranges.

Based on the proposed level of use of the six MAs, the Service anticipates the proposed action may result in the take of one indigo snake/year/MA, for a total of six snakes annually. The incidental take is expected to be in the form of harm, harassment, and direct mortality.

EFFECT OF THE TAKE

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

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REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take of the eastern indigo snake. The FLARNG will work with APAFR's staff to coordinate their operational training schedules to the greatest extent practical to minimize potential adverse effects on natural resource compliance, management, and monitoring requirements.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the ESA, the FLARNG must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

(1) Surveys and marking of gopher tortoise burrows will be conducted prior to annual training. Vehicle and equipment operators will be notified to avoid all snakes and marked burrows. Training units will be educated to recognize the eastern indigo snake. If any snake is encountered, it will be avoided or allowed to leave the area on its own before vehicle or equipment use is resumed;

(2) The FLARNG will submit annual monitoring reports on the effects of training activities, and shall document the date(s) and duration of the activities, and the effects to the eastern indigo snake and their habitat. The report shall also summarize monitoring of the post-action response of species and document any species sightings, including locations of sightings. Reports shall be submitted no later than September 30 each year for the life of the proposed action; and

(3) Upon locating a dead, injured, or sick individual of a federally listed species, initial notification must be made to the nearest Service Law Enforcement Office (Fish and Wildlife Service; 9549 Koger Boulevard, Suite 111; St. Petersburg, Florida 33702; 727-570-5398). Secondary notification should be made to the Florida Fish and Wildlife Conservation Commission, South Region; 3900 Drane Field Road; Lakeland, Florida 33811-1299; 800-282-8002. Care should be taken in handling sick or injured specimens to ensure effective treatment and care, or in the handling of dead specimens to preserve biological material in the best possible state for later analysis as to the cause of death. In conjunction with the care of sick or injured specimens or preservation of biological materials from a dead animal, the finder has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed

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action. If, during the course of the action, this level of incidental take is exceeded, such incidental take would represent new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The FLARNG must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to further minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The Service is not proposing any conservation recommendations at this time.

REINITIATION NOTICE

This concludes formal consultation on the proposed action. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded, as defined by the action area measures provided in this project description; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have any questions regarding this project, please contact Mary Peterson at 772-562-3909, extension 327, or Allen Webb at extension 246.

Sincerely yours,

James J. Slack
Field Supervisor
South Florida Ecological Services Office

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cc:
APAFR, Avon Park, Florida (Paul Ebersbach)
APAFR, Avon Park, Florida (John Bridges)
FLARNG, St. Augustine, Florida (Major Mark Widener) electronic copy only
FLARNG, St. Augustine, Florida (Russell Robinson) electronic and hard copy
FLARNG, St. Augustine, Florida (Amy Wiley) electronic copy only
FLARNG, St. Augustine, Florida (Harriet Fleming) electronic copy only
FWC, Tallahassee, Florida (Hugh Boyter)
Service, SFESO, Vero Beach, Florida (Cindy Schulz)

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Table 1. Acronyms and abbreviations

Acronym/Abbreviation	Definition
ALOC	Administration and Logistics Operations Center
APAFR	Avon Park Air Force Range
EA	Environmental Assessment
ESA	Endangered Species Act of 1973, as amended
ESMP	Endangered Species Management Plan
FGS	Florida Grasshopper Sparrow
FLARNG	Florida Army National Guard
FSJ	Florida Scrub-Jay
FWC	Florida Fish and Wildlife Conservation Commission
HE	High Explosive
HHSB	Headquarters and Headquarters Service Battery
HMU	Habitat Management Unit
INRMP	Integrated Natural Resources Management Plan
KPPSP	Kissimmee Prairie Preserve Sate Park
MA	Maneuver Area
MLRS	Multiple Launch Rocket System
Navy	U.S. Navy
RCW	Red-Cockaded Woodpecker
RRPR	Reduced Range Practice Rockets
Service	Fish and Wildlife Service
TLWMA	Three Lakes Wildlife Management Area
TOC	Tactical Operations Center
USAF	U.S. Air Force

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Table 2. HMUs for the RCW within the six proposed MAs.

Maneuver Area	HMU Area	Foraging Area	Total Area
1 - Big Plantation	108		534
2 - Willingham	657		657
3 - Delta	133	12	133
4 - Bubba	425		428
5 - Alexander	329		329
6 - Ramsey	485		485
Total	2,137	12	2,566

Table 3. HMUs for the FSJ within the initial six proposed MAs.

Maneuver Area	HMU Area	Total Area
1 - Big Plantation		534
2 - Willingham	13	670
3 - Delta		133
4 - Bubba		428
5 - Alexander	15	344
6 - Ramsey	24	509
Total	52	2,618

Table 4. Annual, temporal, and spatial training requirements per training event.

	Section Certification	Section Certification	Platoon Certification	Platoon Certification	Annual Training	Battery Training[1]	Battery Training
Field Time	24 hours	24 hours	24 hours	24 hours	10 days	24 hours	24 hours
Total Time	48 hours	48 hours	48 hours	48 hours	15 days	48 hours	48 hours
A Battery	1 MA	1 MA	1 MA	1 MA	1 MA	1 MA	1 MA
B Battery			1 MA	1 MA	1 MA	1 MA	1 MA
C Battery			1 MA	1 MA	1 MA	1 MA	1 MA
HHS Battery (HHSB)[2]			1 MA	1 MA	1 MA	1 MA	1 MA
Total	**1 MA**	**1 MA**	**4 MAs**	**4 MAs**	**4 MAs**	**1-4 MAs**	**1-4 MAs**

[1] From one to three firing batteries may train during the same weekend.
[2] The Headquarters and Headquarters Service Battery (HHSB) may locate with one of the firing batteries, using one less MA.

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Table 5. Maneuver Area assets for various types of battalion training.

Vehicles (Tracked)[1]	Type of Vehicle	Section Certification[2]	Battery Training[3]	Platoon Certification	
				Battalion Resources	Battalion TOC and ALOC (HHSB)
M270 (T)	Launcher	2	6	18	
M985	Ammunition Truck		12	36	
M989	Ammunition Trailer		12	36	1
M577 (T)	Command Post Carrier	1	3	9	3
M978	Fuel Tanker		2	6	1
M97x	Wrecker			3	
M88 (T)	Recovery Vehicle			3	1
2.5 Ton Truck	Truck			9	9
5 Ton Truck	Truck			3	
HMMWV	Light Vehicle	2	4	21	22
#events/year		2	2	2	2
Personnel		9	69	273[4]	116
MAs used		1	1-4	3	1

[1] T=Tracked. If not tracked, then it is wheeled.
[2] Typically, two section would go out at a time to a single MA
[3] Resources for a single battery.
[4] Number of personnel per MA would be 91.

Table 6. Proposed battalion maneuver areas for MLRS.

Maneuver Area	Acres	Wetland Acres
1 - Big Plantation	534	124
2 - Willingham	657	17
3 - Delta	133	2
4 - Bubba	428	35
5 - Alexander	329	37
6 - Ramsey	485	124
Total	2,566	339

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APPENDIX L

SOURCE INFORMATION FOR MAP FEATURES ASSOCIATED WITH GIS FIGURES

Table L-1. Source Information for Map Features Associated With GIS Figures

Map Feature	Shapefile Name	Source	Date Received	POC Name	POC Phone Number/Contact	Figure(s)
Airfield	airfield.shp	APAFR	10/21/02	Peg Margosian	(863) 452-4119 x319	1-1, 1-2, 3-5, 4-3, 4-4, 4-5, 4-6, 4-7, 4-16, 4-20, 4-21, 4-25, 5-1 to 5-6
APAFR Boundary	boundary.shp	APAFR	10/21/02	Peg Margosian	(863) 452-4119 x319	1-1, 1-2, 3-5, 4-1, 4-3, 4-4, 4-5, 4-6, 4-7,4-10 to 4-25, 5-1 to 5-6
Artillary and Mortar Impact Area	artlzone.shp	APAFR	06/24/03	Peg Margosian	(863) 452-4119 x319	4-3
Artillary Firing Point	firepts_0203.shp	APAFR /SAIC	08/11/03	Peg Margosian/Bill Brown	(863) 452-4119 x319/(850) 609-3405	4-3
Bivouac Site	bivuac.shp	APAFR	10/21/02	Peg Margosian	(863) 452-4119 x319	4-3
Boat Ramps	boatramp.shp	APAFR	10/21/02	Peg Margosian	(863) 452-4119 x319	4-6
Campgrounds	camparea_points.shp	SAIC	03/22/04	Bill Brown	(850) 609-3405	4-6
Conventional Target	conven.shp	APAFR	05/19/03	Peg Margosian	(863) 452-4119 x319	4-3
County Boundary	countyshore_areas.shp	FDEP	10/15/99	Eric W Brockwell	(850) 488-0892	1-1, 1-2, 3-5, 4-1, 4-2, 4-3, 4-4, 4-5, 4-6, 4-7, 4-16, 4-20, 4-21, 4-25
Drop Zone	dropzone.shp	APAFR	11/07/02	Peg Margosian	(863) 452-4119 x319	4-3
ERP Site	irpbound.shp	APAFR	08/25/04	Peg Margosian	(863) 452-4119 x319	4-25
Exotic Plants - Cogongrass	cgprev.shp	APAFR	03/10/05	Peg Margosian	(863) 452-4119 x319	4-22, 4-23, 4-24
Exotic Plants - Japanese Climbing Fern	jcf04q2.shp	APAFR	03/10/05	Peg Margosian	(863) 452-4119 x319	4-20
Exotic Plants - Old World Fern	owf04q2.shp	APAFR	03/10/05	Peg Margosian	(863) 452-4119 x319	4-22, 4-23
Exotic Plants - Tropical Soda Apple	tsaprev.shp	APAFR	03/10/05	Peg Margosian	(863) 452-4119 x319	4-22, 4-23, 4-24
FEMA Floodplains	fema.shp	APAFR	10/21/02	Peg Margosian	(863) 452-4119 x319	4-16
Fences	fencline.shp	APAFR	10/21/02	Peg Margosian	(863) 452-4119 x319	4-4
Florida National Scenic Trail	existing_trails_2005.sbx	FDEP	12/01/04	Florida Geographic Data Library	(352) 392-8686	4-6
Grazing Leases	lessees.shp	APAFR	11/21/02	Peg Margosian	(863) 452-4119 x319	4-4
Habitat Management Unit	hmufgs.shp	APAFR	01/02/03	Peg Margosian	(863) 452-4119 x319	4-21

Table L-1. Source Information for Map Features Associated With GIS Figures Cont'd

Map Feature	Shapefile Name	Source	Date Received	POC Name	POC Phone Number/Contact	Figure(s)
- Florida Grasshopper Sparrow						
Habitat Management Unit - Florida Scrub Jay	hmufsj.shp	APAFR	01/02/03	Peg Margosian	(863) 452-4119 x319	4-21
Habitat Management Unit - Red-Cockaded Woodpecker	hmurcw.shp	APAFR	01/02/03	Peg Margosian	(863) 452-4119 x319	4-21
Helicopter Landing Zone	copterlz.shp	APAFR	11/07/02	Peg Margosian	(863) 452-4119 x319	4-3
Impact Areas	closarea.shp	APAFR	11/07/02	Peg Margosian	(863) 452-4119 x319	1-1, 1-2, 3-5, 4-3, 4-4, 4-5, 4-6, 4-7, 4-10 to 4-25, 5-1 to 5-6
Incorporated Areas	city_limits.shp	FDEP	03/11/98	Eric W Brockwell	(850) 488-0892	4-2
Lake Okeechobee	Lake_Okeechobee.shp	SAIC	06/04/03	Bill Brown	(850) 609-3405	4-1
Land Use (hdyrography, populated areas, right of ways, rural areas, wetland areas)	sjrwmd_landuse_1995.shp, sfwmd_landuse_1995.shp, swfwmd_landuse_1999.shp	FDEP	8/13/99, 3/19/02	Eric W Brockwell	(850) 488-0892	4-2
Main Base	closarea.shp	APAFR	11/07/02	Peg Margosian	(863) 452-4119 x319	1-1, 1-2, 3-5, 4-3, 4-4, 4-5, 4-6, 4-7, 4-10 to 4-25, 5-1 to 5-6
Major Roads	flrds.shp	ESRI	02/27/02	ESRI Data & Maps CD	http://www.esri.com	4-2
Managed Areas	flma_200501.shp	FNAI	01/30/05	Sally Jue	(850) 224-8207 x216	4-2
Management Unit Boundary	mgtpoly.shp	APAFR	10/21/02	Peg Margosian	(863) 452-4119 x319	4-6
MLRS Firing Point	firepts_0203.shp	APAFR/ SAIC	08/11/03	Peg Margosian/Bill Brown	(863) 452-4119 x319/(850) 609-3405	1-2, 4-3
MLRS Maneuver Point	firepts.shp, firepts_0203.shp	APAFR/ SAIC	7/19/05, 8/11/03	Bill Frankenberger & Peg Margosian/Bill Brown	(863) 452-4119 x319/(850) 609-3405	1-2, 4-3
MLRS Proposed Maneuver Area	mlrs_revisedmas_071905	APAFR/ SAIC	07/19/05	Peg Margosian/Bill Brown	(863) 452-4119 x319/(850) 609-3405	3-5, 4-3, 4-4, 4-5, 4-6, 4-7, 4-10 to 4-25, 5-1 to 5-6
Mortar Firing Point	firepts_0203.shp	APAFR/ SAIC	08/11/03	Peg Margosian/Bill Brown	(863) 452-4119 x319/(850) 609-3405	4-3

Table L-1. Source Information for Map Features Associated With GIS Figures Cont'd

Map Feature	Shapefile Name	Source	Date Received	POC Name	POC Phone Number/Contact	Figure(s)
Nature Trails	loop.shp, nature.shp	APAFR	11/21/02	Peg Margosian	(863) 452-4119 x319	4-6
Observation Pont	ACC_Points.shp	APAFR	10/07/03	Peg Margosian	(863) 452-4119 x319	4-3
Pistol Range	ACC_Points.shp	APAFR	10/07/03	Peg Margosian	(863) 452-4119 x319	4-3
Plant Communities	plant92.shp	APAFR	10/21/02	Peg Margosian	(863) 452-4119 x319	4-17, 4-18, 4-19
PSD Class I Areas	flma_200501.shp	FNAI	01/30/05	Sally Jue	Peg Margosian	4-1
Rare Plants - Hairy Jointweed Patch	pbfix.shp	APAFR	7/19/05	Peg Margosian	Peg Margosian	4-20
Rare Plants - Pigeonwing Patch	cfjun15.shp	APAFR	7/19/05	Peg Margosian	Peg Margosian	4-20
RCW Trees w/ 200' Buffer	rcw200ftbuff_03_outimpact .shp	SAIC	03/20/04	Bill Brown	(850) 609-3405	4-21
Restricted Airspace	r2901.shp	APAFR	10/21/02	Peg Margosian	(863) 452-4119 x319	4-2
Sandy Point Wildlife Refuge	closarea.shp	APAFR	11/07/02	Peg Margosian	(863) 452-4119 x319	3-5, 4-3, 4-5, 4-6, 4-10 to 4-15, 4-17, 4-20, 4-21, 4-25
Seasonal High Water Table	soilproperties.shp	APAFR/ SAIC	11/23/04	Peg Margosian/Bill Brown	(863) 452-4119 x319/(850) 609-3405	4-10, 4-11, 4-12
Soil Compaction index	soilproperties.shp	APAFR/ SAIC	11/23/04	Peg Margosian/ Michael Rainer & Bill Brown	(863) 452-4119 x319/(850) 609-3419	5-1, 5-2, 5-3
Soil Order	soilproperties.shp	APAFR/ SAIC	11/23/04	Peg Margosian/Bill Brown	(863) 452-4119 x319/(850) 609-3405	4-7
Soil Rutting index	soilproperties.shp	APAFR/ SAIC	11/23/04	Peg Margosian/ Michael Rainer & Bill Brown	(863) 452-4119 x319/(850) 609-3419	5-4, 5-5, 5-6
Stabilized Roads, Grass and Sand Roads	roads.shp	APAFR	10/21/02	Peg Margosian	(863) 452-4119 x319	1-1, 1-2, 3-5, 4-3, 4-4, 4-5, 4-6, 4-7, 4-10 to 4-25, 5-1 to 5-6
State Prison	closarea.shp	APAFR	11/07/02	Peg Margosian	(863) 452-4119 x319	1-1, 1-2, 3-5, 4-3, 4-4, 4-5, 4-6, 4-7, 4-10 to 4-25, 5-1 to 5-6
States	states.shp	ESRI	02/27/02	ESRI Data & Maps CD	http://www.esri.com	4-1
Streams	streams.shp	APAFR	10/21/02	Peg Margosian	(863) 452-4119 x319	1-1, 1-2, 3-5, 4-3, 4-4, 4-

Table L-1. Source Information for Map Features Associated With GIS Figures Cont'd

Map Feature	Shapefile Name	Source	Date Received	POC Name	POC Phone Number/Contact	Figure(s)
						5, 4-6, 4-7, 4-10 to 4-25, 5-1 to 5-6
Tactical Target	laser.shp	APAFR	06/24/03	Peg Margosian	(863) 452-4119 x319	4-3
Tank Trails	tanktrls.shp	APAFR	10/21/02	Peg Margosian	(863) 452-4119 x319	1-2
Timber Areas	plant92.shp	APAFR	10/21/02	Peg Margosian	(863) 452-4119 x319	4-5
Tower	ACC_Points.shp	APAFR	10/07/03	Peg Margosian	(863) 452-4119 x319	4-3
Wetland, Water	plant92.shp	APAFR	10/21/02	Peg Margosian	(863) 452-4119 x319	1-1, 1-2, 3-5, 4-3, 4-5, 4-6, 4-7, 4-20, 4-21, 4-25
Wetlands (Jurisdictional)	wetlands.shp	APAFR	10/21/02	Peg Margosian	(863) 452-4119 x319	4-13, 4-14, 4-15

APAFR = Avon Park Air Force Range
ESRI = Environmental Systems Research Institute
FDEP = Florida Department of Environmental Protection
FNAI = Florida Natural Areas Inventory
SAIC = Science Applications International Corporation