

Base Closure and Realignment A/OA-10 Beddown Environmental Assessment Moody Air Force Base, Georgia



Draft
August 2006



FINDING OF NO SIGNIFICANT IMPACT

NAME OF THE PROPOSED ACTION

Implementation of Defense Base Realignment and Closure Commission (BRAC) recommendations for Moody Air Force Base (AFB), Georgia.

DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

The Proposed Action includes implementing the following recommendations: the United States Air Force (Air Force) would distribute 68 T-38C and 45 T-6A aircraft to other Air Education and Training Command locations to consolidate training; Moody AFB would receive 48 A/OA-10 aircraft to stand up a new Air Combat Command (ACC) active duty unit; Moody AFB would receive base-level TF34 engine intermediate maintenance, establishing a TF34 Centralized Intermediate Repair Facility (CIRF); and the Air Force would relocate base-level ALQ-184 intermediate maintenance, establishing a CIRF for ALQ-184 electronic countermeasure pods at an alternate location. The beddown of 48 aircraft at Moody AFB would require 40 renovation and construction projects to be completed over a period of five years and would require a personnel increase of 1,002 military and civilian positions. A/OA-10 training flights would take place in existing Military Operations Areas (MOAs), Military Training Routes and ranges. During training, A/OA-10s would employ defensive countermeasures such as chaff and flares in airspace authorized for their use and deploy training munitions, including inert bombs and white phosphorous rockets, on approved ranges.

The No-Action Alternative would not locate the 48 A/OA-10s at Moody AFB at this time. Based on ACC mission requirements, No Action could affect the schedule for implementing BRAC 2005 actions.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Proposed Action and No-Action Alternative: The Environmental Assessment (EA) provides an analysis of the potential environmental consequences associated with the Proposed Action and the No-Action Alternative. Eleven resource categories received thorough evaluation to identify potential environmental consequences.

Airspace Management and Air Traffic Control: Under the Proposed Action, total aircraft sorties would decrease by 53 percent and the number of airfield operations would be reduced by 80 percent as a result of the proposed beddown of the A/OA-10 aircraft and the removal of the T-6A and T-38C aircraft. No changes to the structure or management of the airspace would be required, and no significant adverse environmental consequences are anticipated as a result of the Proposed Action.

Noise: Under the Proposed Action, noise levels in the vicinity of Moody AFB would decrease as a result of the overall reduction of airfield operations. Noise levels from aircraft sortie-operations in the military training airspace would decrease or would not change in Moody 1 MOA, Moody 3 MOA, Live Oak MOA, Bulldog 1 and 2 MOA, and on VRs-1065 and -1066. Maximum noise levels projected for Moody 2 North MOA, Moody 2 South MOA, and R-3008 would increase by 1, 2, and 3 dB, respectively, and since a 5-dB change is necessary for loudness to be noticeable, this increase would not be significant. Existing overflight avoidance procedures for noise-sensitive areas under the affected airspace would continue to be observed. Therefore, no significant change to the noise environment within the affected airspace would occur with implementation of the Proposed Action.

Safety: Implementation of the Proposed Action would increase safety risks during construction; however, these risks would be reduced with implementation of standard construction safety practices.

Increased use of Grand Bay Range would include the use of white phosphorous rockets for target marking purposes and inert heavyweight bombs. Specific existing range safety and fire safety procedures would be in place to minimize any potential safety issues associated with the use of this training ordnance. With a reduction in total sortie operations, flight safety risks are anticipated to be less than those experienced with the T-6A and T-38C aircraft. No significant adverse environmental consequences are anticipated.

Air Quality: Air emissions from construction-related and operational training activities would be generated both on base and within the region. In either case, these emissions would be less than 10 percent of emissions for the Southwest Georgia Interstate Air Quality Control Region, which is in attainment for all federal and state air quality standards. Therefore, a formal air quality conformity determination is not required.

Physical Resources: Construction of facilities to support the Proposed Action would not be expected to significantly affect the geology, soils, water quality, and resources of the region. Sediment control practices would be implemented in accordance with requirements of the Georgia Erosion and Sedimentation Control Act, and a General Permit for Discharges of Storm Water from Construction Activities would be required. Construction activities are not anticipated to take place at any location within the 100-year floodplain.

For the Proposed Action, existing hazardous waste management practices would continue to be used to comply with state and federal regulations. Construction to support the beddown of the A/OA-10s has the potential to affect Environmental Restoration Program (ERP) sites SD-16 and FT-07. Coordination with the Moody AFB ERP Manager, as well as a waiver from ACC policy concerning any construction disturbances near these ERP sites, would be necessary. Waivers would identify the appropriate control measures that would be required for the activities at the ERP sites, and no long-term adverse environmental consequences are anticipated. Demolition activities would generate approximately 811 tons of construction debris. If not recycled, these materials would be disposed of at landfills that have adequate capacity without having a significant effect on the overall capacity.

Biological Resources: Construction activities on Moody AFB would have no adverse effects to sensitive species, wetlands, or wildlife, because facility development would occur in or adjacent to areas that have been previously developed. Use of Grand Bay Range with inert training munitions, including white phosphorous rockets, would occur within an impact area that has no significant areas of vegetation and a low density of wildlife. While wetlands are located within Grand Bay Range near the edge of the main bomb circle, there is a low probability that an inert munition would land within a wetland. Should this occur, the munition would remain in place until the base determines that removal is practicable. With the use of Townsend Range limited to inert strafing rounds, subscale practice bombs, inert rockets, chaff, and flares, no significant adverse environmental consequences are anticipated. Consultation with the United States Fish and Wildlife Service (FWS) in compliance with Section 7 of the Endangered Species Act has been completed concerning potential impacts to the eastern indigo snake, flatwoods salamander, bald eagle, and wood stork. The FWS concurred with the finding that the Proposed Action may affect, but is not likely to adversely affect, federally endangered or threatened species and that no further action is required.

Cultural Resources: Construction to support the implementation of the Proposed Action and use of Grand Bay and Townsend ranges is not expected to have significant adverse impacts to cultural resources on base. One project on the east side of the runway is within a half mile of a site eligible for listing in the National Register of Historic Places. Monitoring is recommended to ensure that no adverse effects occur during construction. No significant architectural resources have been identified. If resources were inadvertently discovered, construction activities would be halted, the State Historic

Preservation Office (SHPO) would be notified, and procedures outlined in the National Historic Preservation Act (NHPA) would be followed. Consultation with the Georgia SHPO, in compliance with Section 106 of the NHPA, has been completed and they are in agreement with the finding that no historic structures that are listed in or eligible for listing in, the NRHP will be affected by the Proposed Action.

Land Use Resources: Construction to support the implementation of the Proposed Action would have the potential to disturb approximately 10 acres, primarily within the developed area of the main base. This development would be consistent with the Base General Plan. Implementation of the Proposed Action would reduce overall the total number of aircraft sorties within the military training airspace and airfield operations, thereby reducing the area exposed to the 65-dB noise contour. No significant adverse environmental consequences would be expected with the implementation of the Proposed Action.

Transportation: With the implementation of the Proposed Action, construction-related traffic would have a negligible effect on traffic volumes. With the addition of 1,002 personnel, it is anticipated that daily commuting traffic could increase by approximately 14 percent. Any potential congestion that might occur at the Base gates from increased commuting to off base housing may be overcome with the construction of the Magnolia Grove housing, which would access the base from Stone Road. No significant adverse environmental consequences would be expected to transportation resources.

Socioeconomics: Employment and earnings associated with the Proposed Action are not expected to have any significant adverse environmental consequences. There would be a slight beneficial increase in regional economic activity with the implementation of the Proposed Action.

Environmental Justice: With the implementation of the Proposed Action, there would be no disproportionately high or adverse impacts to minority or low-income communities and no disproportionate health and safety risks to children.

No-Action Alternative: Under the No-Action Alternative, the proposed beddown of A/OA-10 aircraft and drawdown of T-38C and T-6A aircraft would not occur.

CONCLUSION

Based on the analysis of the EA, which is hereby incorporated by reference and was conducted in accordance with requirements of the National Environmental Policy Act, Council on Environmental Quality regulations, and Air Force Instruction 32-7061, and review of the public and agency comments submitted during the 30-day public comment period, I conclude that implementation of the Proposed Action or the No Action Alternative would not result in significant impacts to the quality of the human or the natural environment. For these reasons, a finding of no significant impact (FONSI) is made and preparation of an Environmental Impact Statement is not warranted.



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12 Sep 2006

DATE

**BASE REALIGNMENT AND CLOSURE
COMMISSION (BRAC)
ENVIRONMENTAL ASSESSMENT
MOODY AIR FORCE BASE, GEORGIA**

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CONTENTS

TABLES	vii
FIGURES	ix
ACRONYMS	xi
1.0 PURPOSE AND NEED FOR THE BRAC A/OA-10 BEDDOWN	1-1
1.1 Background	1-1
1.1.1 Aircraft Characteristics of the A/OA-10	1-1
1.1.2 Moody AFB.....	1-3
1.2 Purpose of BRAC A/OA-10 Beddown.....	1-3
1.3 Need for BRAC A/OA-10 Beddown.....	1-5
2.0 DESCRIPTION OF THE PROPOSED ACTION AND NO-ACTION ALTERNATIVE	2-1
2.1 Elements Affecting Moody AFB.....	2-2
2.1.1 Proposed Action Activities, Facilities, and Personnel	2-3
2.1.2 No-Action Alternative at Moody AFB.....	2-10
2.2 Elements Affecting Moody AFB Airspace	2-10
2.2.1 A/OA-10 Training Flights within Moody AFB Airspace	2-12
2.2.2 Air-to-Ground Training	2-12
2.2.3 Defensive Countermeasures.....	2-18
2.2.4 No-Action Alternative within the Moody AFB Airspace.....	2-19
2.3 Environmental Impact Analysis Process	2-20
2.3.1 Environmental Assessment Process	2-20
2.3.2 EA Organization	2-20
2.3.3 Scope of Resource Analysis	2-21
2.3.4 Public and Agency Input	2-21
2.4 Regulatory Compliance.....	2-21
2.5 Environmental Comparison of Alternatives	2-22
3.0 AFFECTED ENVIRONMENT AND CONSEQUENCES	3-1
3.1 Airspace Management and Air Traffic Control	3-1
3.1.1 Existing Conditions	3-4
3.1.2 Environmental Consequences.....	3-9
3.2 Noise.....	3-11
3.2.1 Existing Conditions	3-14
3.2.2 Environmental Consequences.....	3-16
3.3 Safety	3-18
3.3.1 Definition of the Resource	3-18
3.3.2 Existing Conditions	3-18
3.3.3 Environmental Consequences.....	3-25
3.4 Air Quality.....	3-27

3.4.1	Definition of Air Quality	3-28
3.4.2	Existing Conditions	3-28
3.4.3	Environmental Consequences	3-29
3.5	Physical Resources	3-33
3.5.1	Definition of Physical Resources	3-33
3.5.2	Existing Conditions	3-34
3.5.3	Environmental Consequences	3-46
3.5.4	No-Action Alternative	3-49
3.6	Biological Resources	3-50
3.6.1	Definition of Biological Resources	3-50
3.6.2	Existing Conditions	3-51
3.6.3	Environmental Consequences	3-66
3.7	Cultural Resources	3-77
3.7.1	Definition of Cultural Resources	3-77
3.7.2	Existing Conditions	3-78
3.7.3	Environmental Consequences	3-80
3.8	Land Use	3-82
3.8.1	Definition of Land Use	3-82
3.8.2	Existing Conditions	3-82
3.8.2	Environmental Consequences	3-96
3.9	Transportation	3-97
3.9.1	Definition of Transportation	3-97
3.9.2	Existing Conditions	3-97
3.9.3	Environmental Consequences	3-99
3.10	Socioeconomics	3-100
3.10.1	Definition of Socioeconomics	3-100
3.10.2	Existing Conditions	3-100
3.10.3	Environmental Consequences	3-102
3.11	Environmental Justice	3-103
3.11.1	Definition of Environmental Justice	3-103
3.11.2	Existing Conditions	3-104
3.11.3	Environmental Consequences	3-105
4.0	CUMULATIVE EFFECTS AND OTHER ENVIRONMENTAL CONSIDERATIONS	4-1
4.1	Cumulative Effects Analysis	4-1
4.1.1	Past, Present, and Reasonably Foreseeable Actions	4-2
4.1.2	Cumulative Effects Analysis	4-4
4.1.3	Summary of Cumulative Effects	4-4
4.1.4	Irreversible and Irretrievable Commitment of Resources	4-4
5.0	REFERENCE	5-1
6.0	LIST OF PREPARERS	6-1
	APPENDIX A ORDNANCE AND DEFENSIVE COUNTERMEASURES	A-1

APPENDIX B PUBLIC AND AGENCY CORRESPONDENCE..... B-1

APPENDIX C AIRSPACE..... C-1

APPENDIX D NOISE.....D-1

APPENDIX E AIR QUALITY E-1

APPENDIX F SOLID WASTE/MUNITIONS.....F-1

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TABLES

2.1-1. Existing and Proposed Aircraft Assigned to Moody AFB.....	2-3
2.1-2. Current and Proposed Annual Airfield Operations.....	2-4
2.1-3. Proposed Action Facility Requirements.....	2-5
2.1-4. Manpower Requirements.....	2-10
2.2-1. Projected A/OA-10 Training Activities.....	2-13
2.2-2. Baseline and Projected Annual Sortie-Operations.....	2-17
2.2-3. Historical, Current, and Proposed Annual Ordnance Used at Grand Bay/ Townsend Ranges.....	2-18
2.2-4. Existing and Proposed Annual Chaff and Flare Use.....	2-19
2.5-1. Reviews and Permits Required to Implement Moody AFB A-10 Beddown.....	2-22
2.6-1. Summary of Impacts by Resource.....	2-23
3.1-1. Proposed Changes in Annual Aircraft Sorties.....	3-10
3.1-2. Proposed Changes in Annual Airfield Operations at Moody AFB.....	3-10
3.1-3. Proposed Changes in Annual Airspace Sortie Operations.....	3-11
3.2-1. SELs (dB) for Aircraft based at Moody AFB.....	3-14
3.2-2. Baseline Noise Contour Acreage in the Vicinity of Moody AFB.....	3-14
3.2-3. Baseline Noise Levels in Affected Airspace.....	3-16
3.2-4. Baseline and Projected Noise Contour Acreage in the Vicinity of Moody AFB.....	3-17
3.2-5. Noise Levels in Affected Airspace under the Proposed Action.....	3-18
3.3-1. Moody AFB Projected Class A Mishaps (Current Conditions).....	3-20
3.3-2. Class A Mishaps at or Near Moody AFB.....	3-21
3.3-3. Impacts of Bird Strikes at Moody AFB.....	3-22
3.3-4. Bird Strikes for Selected Aircraft at Moody (2000 to 2005).....	3-22
3.3-5. Quantity Distance Zones.....	3-23
3.3-6. Moody AFB Projected Class A Mishaps (Current Conditions and Proposed Action).....	3-26
3.4-1. Moody AFB Baseline Emissions.....	3-28
3.4-2. Baseline Emissions Inventory for Lowndes County.....	3-29
3.4-3. Proposed Action Construction Air Emissions by Activity.....	3-31
3.4-4. Proposed Action Annual Aircraft Emissions.....	3-31
3.4-5. Munitions Emissions at Grand Bay Range.....	3-32
3.4-6. Munitions Emissions at Townsend Range.....	3-33
3.4-7. Summary of Air Emissions Compared to Lowndes County.....	3-33
3.5-1. Moody AFB Environmental Restoration Sites Land Use Controls.....	3-44
3.6-1. Sensitive Wildlife Species Known to Occur at Moody AFB and Grand Bay Range.....	3-54
3.6-2. Round-tailed Muskrat (<i>Neofiber alleni</i>) Surveys (GADNR) Moody AFB Area.....	3-57
3.6-3. Federal- and State-Listed Protected Species that Occur or Potentially Occur in the Vicinity of Townsend Range.....	3-62
3.6-4. Sensitive Wildlife Species Potentially Occurring in Counties under Affected Airspace.....	3-64
3.8-1. Land Use under Affected Airspace.....	3-94
3.9-1. Moody AFB Baseline Population.....	3-101
3.11-1. 2000 Population and Environmental Justice Data.....	3-104

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FIGURES

1.1-1. Location..... 1-4
2.1-1. Proposed Action – Main Base 2-7
2.1-2. Proposed Action – Munitions Storage Area 2-8
2.2-1. Types of Training Airspace 2-11
2.2-2. Primary Airspace Associated with A/OA-10 Beddown at Moody AFB..... 2-16
2.3-1. EA Process 2-20
3.1-1. Moody AFB..... 3-5
3.2-1. Baseline and Proposed Noise Contours for Moody AFB and Vicinity 3-15
3.6-1. Grand Bay-Banks Lake Ecosystem Wetlands. 3-52
3.6-2. Land Cover Types and Confirmed Flatwoods Salamander Site..... 3-59
3.6-3. Townsend Range Land Use and Wetlands 3-60
3.8-1. Base Map 3-83
3.8-2. Land Use 3-85
3.8-3. Townsend Land Use..... 3-89
3.8-4. Vicinity Land Use 3-90

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ACRONYMS

347 FW	347th Fighter Wing
347 TFW	347 th Tactical Fighter Wing
ACAM	Air Conformity Applicability Model
ACBM	Asbestos-Containing Building Materials
ACC	Air Combat Command
ACM	Air Combat Maneuvers
ACOE	U.S. Army Corps of Engineers
ACS	Air Control Squadron
AEF	Aerospace Expeditionary Forces
AETC	Air Education and Training Command
AFB	Air Force Base
AFI	Air Force Instruction
AFOSH	Air Force Occupational Safety and Health
AGL	above ground level
AICUZ	Air Installation Compatible Use Zone
AQCR	Air Quality Control Region
ARTCC	Air Route Traffic Control Center
ATC	air traffic control
BAI	Backup Aircraft Inventory
BASH	Bird/Wildlife Aircraft Strike Hazard
BDU	Bomb Dummy Unit
BFM	Basic Fighter Maneuvers
BHPO	Base Historic Preservation Office
BMP	best management practice
BRAC	Base Realignment and Closure
C&D	construction and demolition
CATEX	categorical exclusion
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CIRF	Centralized Intermediate Repair Facility
CO	carbon monoxide
CWA	Clean Water Act
CY	calendar year
dB	decibel
dBA	decibel A-weighted
DNL	day-night average sound level
DNL _{mr}	onset rate adjusted monthly day-night average sound level
DoD	U.S. Department of Defense
EA	Environmental Assessment
EAF	Expeditionary Air Force
EMIS	Environmental Management Information System
EO	Executive Order
EOD	Explosive Ordnance Disposal

BRAC Environmental Assessment

EPCRA	Emergency Planning and Community Right-to-Know Act
ERP	Environmental Restoration Program
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation
FICON	Federal Interagency Committee on Noise
FICUN	Federal Interagency Committee on Urban Noise
FS	Fighter Squadron
FY	fiscal year
GDNR	Georgia Department of Natural Resources
GEPD	Georgia Environmental Protection Division
GESCA	Georgia Erosion and Sedimentation Control Act
H ₃ PO ₄	orthophosphoric acid
HAP	hazardous air pollutants
HHS	U.S. Department of Health and Human Services
ICRMP	Integrated Cultural Resources Management Plan
IFF	Introduction to Fighter Fundamentals
IFR	Instrument Flight Rules
IICEP	Interagency and Intergovernmental Coordination for Environmental Planning
IR	Instrument Route
KIAS	knots indicated airspeed
LATN	Low-Altitude Tactical Navigation
LBP	lead-based paint
LOLA	Live Ordnance Loading Area
MOA	Military Operations Area
MR_NMAP	Military Operating Area and Range Noise Model
MSL	above mean sea level
MSW	municipal solid waste
MTR	Military Training Route
NAAQS	National Ambient Air Quality Standards
NAS	National Airspace System
NEI	National Emissions Inventory
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act
nm	nautical mile
NMAP	NOISEMAP
NOTAM	Notice to Airmen
NO _x	nitrogen oxide
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NWR	National Wildlife Refuge
PAI	Primary Aircraft Inventory
PM ₁₀	particulate matter less than or equal to 10 micrometers in diameter
QD	quantity distance
RAPCON	Radar Approach Control
RCO	Range Control Officer
RCRA	Resource Conservation and Recovery Act

ROI	region of influence
RQS	Rescue Squadron
RQW	Rescue Wing
RWY	Runway
SAP	Satellite Accumulation Point
SEL	sound exposure level
SFG	Security Forces Group
SPCC	Spill Prevention, Control, and Countermeasures
SR	Slow Route
SUA	Special Use Airspace
SULMA	special-use land management area
SW	Southwest
SWPPP	Stormwater Pollution Prevention Plan
TO	Technical Order
TRI-DDS	Toxic Release Inventory-Data Delivery System
TSCA	Toxic Substances Control Act
ULDC	Unified Land Development Code
USC	United States Code
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
V	Victor Route
VFR	visual flight rules
VR	Visual Route
WMA	Wildlife Management Area

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1.0 PURPOSE AND NEED FOR THE BRAC A/OA-10 BEDDOWN

In 2005, The Defense Base Realignment and Closure (BRAC) Commission issued recommendations that included specific recommendations at Moody Air Force Base (AFB), Georgia. These recommendations were approved by the President on September 15, 2005, and forwarded to Congress. Congress did not alter any of the Commission's recommendations, and on November 9, 2005, the recommendations became law. The Commission's recommendations must now be implemented as provided for in the Defense Base Realignment and Closure Act of 1990 (Public Law 101-510), as amended.

The commission made the following recommendations concerning Moody AFB:

- a. Moody AFB would distribute 68 T-38C aircraft to other Air Education and Training Command (AETC) locations to consolidate training.
- b. Moody AFB would distribute 45 T-6A aircraft to other AETC locations to consolidate training.
- c. Moody AFB would receive 48 A/OA-10 aircraft to stand up a new Air Combat Command (ACC) active duty unit.
- d. Moody AFB would receive base-level TF34 engine intermediate maintenance, establishing a TF34 Centralized Intermediate Repair Facility (CIRF).
- e. Moody AFB would relocate base-level ALQ-184 intermediate maintenance, establishing a CIRF for ALQ-184 electronic countermeasure pods at an alternate location.

This Draft Environmental Assessment (EA) analyzes the potential environmental consequences associated with the BRAC recommendation to beddown the A/OA-10 aircraft at Moody AFB according to the requirements of the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality (CEQ) Regulation of 1978, and 32 Code of Federal Regulations (CFR) Part 989, titled "the Environmental Impact Analysis Process." 32 CFR Part 989 addresses the implementation of NEPA and directs Air Force officials to consider the environmental consequences of any proposal as part of the decision-making process.

1.1 Background

1.1.1 Aircraft Characteristics of the A/OA-10

The A/OA-10-Thunderbolt II, also nicknamed the Warthog, is a high-survivability and extremely versatile aircraft designed specifically for close air support of ground forces, providing defense against tanks and other armored vehicles. The twin-engine jet aircraft, piloted by a one-person crew, has excellent maneuverability at low airspeeds and altitude, with accurate weapons delivery. It is the first aircraft specially designed for close air support of

ground troops. The OA-10, which is the observation version of the A-10, functions as a forward air controller. This aircraft provides observational reports on ground targets and assists the A-10s in placing their armaments.

The A/OA-10 capabilities were proven during Operation Desert Storm when the aircraft was credited with destroying over 1,000 Iraqi tanks, 1,200 artillery pieces, and 2,000 other vehicles. The A/OA-10s were also credited with destroying military structures, radars, bunkers, SCUD missile launchers, anti-aircraft artillery batteries, command posts, surface-to-air missile sites, and aircraft. The A/OA-10 aircraft was also used extensively in response to the Kosovo crisis and in Iraq for Operation Iraqi Freedom. It is currently being used in Iraq for Operation Enduring Freedom.

The A/OA-10 aircraft has two General Electric TF34-GE-100 turbofan engines, each of which produces 9,065 pounds of thrust. The A/OA-10 is not equipped with an afterburner and, thus, is not capable of supersonic flight. Therefore, it is incapable of creating a sonic boom. The aircraft can travel at up to 420 miles per hour, with a range of 695 nautical miles (nm) (800 statute miles), and has a ceiling of 45,000 feet. The aircraft is 53.3 feet, 4 inches long, and has a height of 14.7 feet and a wingspan of 57.5 feet.

Thunderbolt IIs have Night Vision Imaging Systems, goggle-compatible single-seat cockpits forward of their wings, and a large bubble canopy that provides pilots all-around vision. The pilots are protected by titanium armor that also protects parts of the flight-control system. The redundant primary structural sections allow the aircraft to enjoy better survivability during close air support than did previous aircraft. The aircraft can survive direct hits from armor-piercing and high-explosive projectiles up to 23 mm. Their self-sealing fuel cells are protected by internal and external foam. Manual systems back up their redundant hydraulic flight-control systems. This permits pilots to fly and land when hydraulic power is lost.

The Thunderbolt II can be serviced and operated from bases with limited facilities near battle areas. Many of the aircraft's parts are interchangeable left and right, including the engines, main landing gear, and vertical stabilizers. Avionics equipment includes communications, inertial navigation systems, fire control and weapons delivery systems, target penetration aids, and night vision goggles. Their weapons delivery systems include head-up displays that indicate airspeed, altitude, dive angle, navigation information, and weapons aiming references; a low-altitude safety and targeting enhancement system that provides constantly computing impact point freefall ordnance delivery; and Pave Penny laser-tracking pods under the fuselage. The aircraft also have armament control panels and infrared and electronic countermeasures to handle surface-to-air-missile threats.

The A-10's armament includes one 30 mm GAU-8/A seven-barrel Gatling gun; up to 16,000 pounds (7,200 kilograms) of mixed ordnance on eight under-wing and three under-fuselage pylon stations that can include 500 pound (225 kilograms) Mk-82 and 2,000 pounds (900 kilograms) Mk-84 series low/high drag bombs, incendiary cluster bombs, combined effects munitions, mine dispensing munitions, AGM-65 Maverick missiles, and laser-guided/electro optically guided bombs; infrared countermeasure flares; electronic countermeasure chaff; jammer pods; 2.75-inch rockets; illumination flares; and AIM-9 Sidewinder missiles.

1.1.2 Moody AFB

Moody AFB is located in south-central Georgia 10 miles northeast of the City of Valdosta on 11,402 acres of federally owned land in Lowndes and Lanier counties (Figure 1.1-1). The installation consists of the main base (5,094 acres), Grand Bay Range (5,874 acres), and the Grassy Pond Recreation Area annex (489 acres), which is located 25 miles southwest of the main base. There are 5,068 military and civilian personnel assigned to Moody AFB.

Moody AFB is home to the 347th Rescue Wing (RQW), whose primary mission is to organize, train, and employ combat-ready pararescue HH-60 and HC-130 forces. The wing executes worldwide combat search and rescue and peacetime operations in support of humanitarian interests, U.S. national security, and the global war on terrorism. Moody AFB also hosts and supports AETC's 479th Flying Training Group, which is responsible for Joint Primary Aircraft Training using the T-6A aircraft and Introduction to Fighter Fundamentals (IFF) using the T-38C aircraft. Moody AFB also hosts the ACC's 820th Security Forces Group (SFG), with three security forces squadrons. Their mission is to provide force protection for initial U.S. "first in" forces to any operating location in support of the Air Force Global Engagement Mission.

While numerous force structure changes have occurred over the years at Moody AFB, those that have a direct bearing on the action under consideration started in 1975, with the activation of the 347th Tactical Fighter Wing (347 TFW) as the host unit at Moody AFB. In that same year, the 347 TFW began to transition from T-37 and T-38 aircraft to F-4E aircraft. In 1987, the 347 TFW began the conversion from F-4s to the F-16. In 1991, the 347 TFW lost the "Tactical" designation and became the 347th Fighter Wing (347 FW). In 1994, a decision was made to beddown HC-130 and A/OA-10 aircraft, making Moody AFB one of three composite wings in the Air Force; at that time, the 347 FW was redesignated as the 347th Wing. A decision was made in 1996 to move two combat search-and-rescue squadrons of six HH-60 helicopters (41st Rescue Squadron [RQS]) and nine HC-130 air refueling aircraft (71 RQS) from Patrick AFB, Florida, to Moody AFB. In September 1998, in accordance with Quadrennial Defense Review recommendations, the 41 RQS was assigned an additional 6 HH-60 aircraft (bringing the Primary Aircraft Inventory [PAI] to 14 HH-60s). At the same time, the decision was made to inactivate the 70th Fighter Squadron (70 FS) and relocate the 24 assigned A/OA-10 aircraft to other locations.

In fiscal year (FY) 2000, a decision was made to establish an IFF pilot training program with 57 T-38 aircraft. The Air Force, in an effort to streamline fighter squadron operations, made a decision to deactivate the 68 FS and 69 FS and relocate the 36 F-16 aircraft and 1,259 military manpower authorizations associated with the aircraft from Moody AFB to other locations.

1.2 Purpose of BRAC A/OA-10 Beddown

The overall mission of the Air Force is defense of the United State and fulfillment of the directives of the President and Secretary of Defense. The Secretary of Defense made it clear that the primary goal for the BRAC process was military transformation. This round of BRAC represents a significant step forward in transforming the Air Force. To meet these requirements, the Air Force must develop and operate combat and support aircraft and personnel. While Moody AFB currently supports the initial training of Air Force pilots, this transformation would



Figure 1.1-1. Location

return Moody AFB to the role of preparing A/OA-10 pilots for combat missions. Moody AFB would provide a variety of training opportunities with nearby Army and Special Forces units.

The infrastructure of Moody AFB previously supported the training of A/OA-10 and F-16 pilots and provides facilities for combat aircraft. Transformation of Moody AFB to the A/OA-10 aircraft permits maximum use of this infrastructure while expanding the strike capabilities of the Air Force. The same airspace and ranges will be occupied for flight training exercises operating out of Moody AFB as are currently utilized by AETC T-38C and T-6A aircraft operating from Moody AFB. The A/OA-10s will use established instrument approaches and departures at Moody AFB.

1.3 Need for BRAC A/OA-10 Beddown

The need to transform Moody AFB is to comply with the Base Closure and Realignment Act of 1990 and to improve the ability of the United States to respond rapidly to the geopolitical challenges of the 21st century. In previous rounds of BRAC, the explicit goal was to save money and downsize the military to reap a peace dividend. In the 2005 BRAC cycle, the U.S. Department of Defense (DoD) and Air Force sought to reorganize its installation infrastructure to more efficiently support forces, increase operational readiness, and facilitate new ways of doing business. Thus, BRAC represents more than cost savings. It supports advancing the goals of transformation, improving military capabilities, and enhancing military values. The Air Force needs to carry out the Commission's recommendations at Moody AFB to achieve the objectives for which Congress established the BRAC process.

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2.0 DESCRIPTION OF THE PROPOSED ACTION AND NO-ACTION ALTERNATIVE

The Proposed Action is to implement the BRAC recommendations for Moody AFB. This chapter describes the Proposed Action and the No-Action Alternative, which would maintain the current force structure at Moody AFB.

Implementation of the BRAC recommendations at Moody AFB is proposed to take place over a period of approximately 5 years and would involve construction of facilities to support the beddown of the A/OA-10 aircraft and relocation of personnel needed to operate and maintain the aircraft and associated facilities.

Each of the two squadrons would be composed of up to 24 PAI A/OA-10s plus two Backup Aircraft Inventory (BAI) A/OA-10s. As such, the A/OA-10 squadrons would include up to 48 PAI and four BAI aircraft. PAI consists of the aircraft authorized and assigned to perform the squadron's missions in training, deployment, and combat. BAI includes those aircraft additional to the PAI that are used as substitutes for PAI aircraft.

The beddown of the aircraft would take place in the following stages:

- 1st A/OA-10 Squadron would begin September 2007
- 2nd A/OA-10 Squadron would begin December 2008

A/OA-10 training is needed to maintain operational capabilities. The A/OA-10 needs both air-to-air and air-to-ground training airspace and range facilities for pilots to achieve and maintain skills. Moody AFB has adequate training airspace and does not propose any airspace changes. The associated Grand Bay Range and nearby Townsend Range provide air-to-ground capabilities for close-in A/OA-10 training.

ACTIVITIES AFFECTING MOODY AFB

- BEDDOWN TWO A/OA-10 SQUADRONS OVER A PERIOD OF APPROXIMATELY 5 YEARS.
- CONDUCT FLYING SORTIES AT THE BASE FOR TRAINING AND DEPLOYMENT.
- CONSTRUCT THE FACILITIES AND INFRASTRUCTURE NECESSARY TO SUPPORT THE A/OA-10 SQUADRONS.
- IMPLEMENT THE PERSONNEL CHANGES AT THE BASE TO CONFORM TO THE A/OA-10 SQUADRON REQUIREMENTS.

ELEMENTS AFFECTING MOODY AFB AIRSPACE

- CONDUCT A/OA-10 TRAINING FLIGHTS IN MOAs, MILITARY TRAINING ROUTES (MTRs), AND RANGES.
- EMPLOY DEFENSIVE COUNTERMEASURES, (CHAFF AND FLARES) IN AIRSPACE AUTHORIZED FOR THEIR USE.
- TRAIN FOR MUNITIONS DEPLOYMENT

The proposed beddown of the A/OA-10 aircraft would involve several activities at Moody AFB. These activities would occur at the base and in the associated training airspace.

This chapter also presents proposed activities at the base, training use of Special Use Airspace (SUA), use of air-to-ground ranges, and personnel associated with a Moody AFB A/OA-10 beddown. The No-Action Alternative is described in conformance with the CEQ regulations (40 CFR 1502.14[d]) in Section 2.2.4.

2.1 Elements Affecting Moody AFB

The proposed beddown of an A/OA-10 aircraft at Moody AFB could affect three aspects of the base:

1. The beddown and flight activity of an aircraft with different performance characteristics from existing aircraft at Moody AFB could affect the base and its environs. This section describes existing and proposed flight activities near the base.
2. The beddown would require the planning, design, and construction of facilities at Moody AFB over a period of years.
3. The beddown would affect the numbers and responsibilities of base personnel.

Flight Activities: A/OA-10 aircraft would use the base runways and fly in the base environs very much the same as they did when they were stationed at Moody AFB in the mid- to late-1990s. This includes takeoffs and landings, training, and deployments.

The Air Force anticipates that, by completion of the beddown, the A/OA-10 squadrons would fly approximately 15,800 sorties per year from Moody AFB. Additionally, the Air Force could continue occasional use of other locations at the same levels currently used previously by A/OA-10s stationed at Moody AFB in the late 1990s. Based on projected requirements and deployment patterns under the Aerospace Expeditionary Forces (AEF) program, the A/OA-10 squadrons would fly additional sorties at overseas airfields during deployments or at other locations for exercises or in preparation for deployments.

Operational A/OA-10 squadrons proposed for Moody AFB would be integrated into the Air Force's Expeditionary Air Force (EAF) Construct. The EAF Construct grew out of the need for the United States to deploy forces worldwide, despite the reduction in U.S. overseas basing and personnel. Under the EAF, the Air Force has divided its forces into 10 AEFs and two Aerospace Expeditionary Wings to make worldwide deployments more predictable and manageable. An AEF is a "package" (group of different types of aircraft with a mixture of capabilities suited to the tasking) deployed to overseas locations for about 90 days. These AEFs consist of wings or squadrons from multiple U.S. bases that operate as a unit or are integrated with other forces overseas. Pre- and/or post-deployment training, at locations other than a "home" base, also occurs for about another 30 days out of the year. Squadrons or wings at the bases are rotated into the AEF program on a 15-month cycle.

On average, each squadron (up to 24 PAI aircraft) would be deployed for 120 days per year (90 days AEF and 30 days pre- or post-AEF training). In addition, each squadron would participate in training exercises and operate out of another U.S. or overseas base for an average of 1 week per year, flying another 220 sorties at remote locations other than Moody AFB. Some of the A/OA-10 sorties, while deployed, would involve ordnance delivery training or missile firing at approved ranges such as the Nellis Range Complex in Nevada, Utah Test and Training Range, or Eglin AFB ranges, including over-water ranges in the Gulf of Mexico.

A SORTIE IS THE FLIGHT OF A SINGLE AIRCRAFT FROM TAKEOFF TO LANDING.
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Moody AFB Facilities: The Moody AFB beddown is for two squadrons of A/OA-10 aircraft. While the A/OA-10 is a proven weapon system and Moody AFB supported 24 aircraft in the past, additional facilities would be required to ensure the combat readiness and capability of the system. These new and renovated facilities will provide support for the A/OA-10 maintenance and operational procedures.

BRAC will relocate 68 T-38C aircraft and 45 T-6A aircraft from Moody AFB. The departure of these aircraft permits the possible reuse of some base facilities and provides space that had been previously used by the departing squadrons.

2.1.1 Proposed Action Activities, Facilities, and Personnel

Proposed Action Activities. The BRAC decision to draw down T-38C aircraft and T-6A aircraft will reduce total aircraft based at Moody AFB by 113. The proposed beddown of up to 48 PAI and four BAI A/OA-10 aircraft would backfill the number of aircraft assigned to Moody AFB. Table 2.1-1 presents the types and number of aircraft currently assigned and proposed for Moody AFB. This table permits a comparison of current aircraft assignments and proposed A/OA-10 beddown assignments.

Table 2.1-1. Existing and Proposed Aircraft Assigned to Moody AFB

<i>Aircraft Type</i>	NUMBER ASSIGNED	
	<i>Current</i>	<i>Proposed</i>
T-38C	68	0
T-6A	45	0
A/OA- 10	0	48
HC-130	9	9
HH-60	14	14

Moody AFB supports operations of T-38C, T-6A, HC-130, and HH-60 aircraft, as well as a range of transient users. Levels of aviation operations supported by the installation are shown in Table 2.1-2. An operation can be a takeoff or departure, a landing or arrival, or a touch-and-go within a closed pattern around the airfield.

Proposed Action Facilities. Implementation of the Proposed Action would include 40 construction, renovation, or infrastructure improvement projects during the period 2006 to 2010 as identified in Table 2.1-3. The majority of the projects would be located within the central portion of the base as shown in Figure 2.1-1 and at the munitions storage area illustrated in Figure 2.1-2. Two projects (nos. 8 and 9) in Table 2.1-3 would be constructed at Grand Bay Range. The Proposed Action would include construction of 22 new facilities with a total square footage of 345,596. It would also include renovations of 18 facilities involving 123,700 square feet.

Table 2.1-2. Current and Proposed Annual Airfield Operations

<i>Aircraft</i>	ARRIVALS		DEPARTURES		CLOSED PATTERNS		TOTAL		<i>All</i>
	<i>Day</i>	<i>Night</i>	<i>Day</i>	<i>Night</i>	<i>Day</i>	<i>Night</i>	<i>Day</i>	<i>Night</i>	
Current Operations									
T-38C	20,781	0	20,781	0	21,342	0	62,904	0	62,904
T-6A	25,807	1,216	25,807	1,216	151,152	7,957	202,497	10,658	213,155
A/OA-10	0	0	0	0	0	0	0	0	0
HC-130	1,795	199	1,795	199	904	100	4,494	498	4,992
HH-60	1,430	476	1,430	476	2,250	750	5,110	1,702	6,812
Other	450	50	450	50	5,756	640	6,656	740	7,396
Total	50,263	1,941	50,263	1,941	181,404	9,447	281,661	13,598	295,259
Proposed Operations									
T-38C	0	0	0	0	0	0	0	0	0
T-6A	0	0	0	0	0	0	0	0	0
A/OA-10	14,220	1,580	14,220	1,580	7,200	800	35,640	3,960	39,600
HC-130	1,795	199	1,795	199	904	100	4,494	498	4,992
HH-60	1,430	476	1,430	476	2,250	750	5,110	1,702	6,812
Other	450	50	450	50	5,756	640	6,656	740	7,396
Total	17,895	2,305	17,895	2,305	16,110	2,290	51,900	6,900	58,800

Notes: An airfield operation represents the single movement or individual portion of a flight in the base airfield airspace environment, such as one landing, one takeoff, or one transit of the airport traffic area.

A sortie consists of a single military aircraft from takeoff through landing. A single sortie generates at least two airfield operations (takeoff and landing).

Each multiple pattern at the airport consists of two operations: a touchdown immediately followed by a takeoff. These are additional to the initial takeoff and final landing of each sortie at the airfield.

Day sortie = 0700-2200L;

Night sortie = 2200-0700L

Table 2.1-3. Proposed Action Facility Requirements

<i>Project Number</i>	<i>Project Name</i>	<i>Fiscal Year</i>	<i>Building Square Feet</i>
Operations and Maintenance (O&M) Projects			
1	Convert A-10 Munitions Inspection Facility, Bldg 1107	06	2,370
2	Convert A-10 Munitions Operations Facility, Bldg 1122	06	1,345
3	Convert A-10 Precision Guided Munitions, Bldg 1108	06	6,049
4	Construct Munitions Gov Vehicle Yard, 110 Area	06	15,005
5	Construct Holding Area Munitions, Bldg 1725	06	2,280
6	Construct Chapel Annex Addition, Bldg 110	06	1,775
7	Construct Additions to Recreation Center, Bldg 583	06	12,700
8	Construct Range Storage Facility, Grand Bay Range	06	5,619
9	Construct Range Maintenance Facility, Grand Bay Range	06	2,002
10	Convert A-10 Fuels Maintenance Hangar, Bldg 788	06	N/A
11	Construct Wing Tank Storage	06	44,014
12	Construct Flight Kitchen, Bldg 796	06	4,004
13	Convert A-10 Weapons Loads Training and Maintenance Hangar, Bldg 701	06	N/A
14	Convert A-10 Field Training Detachment, Bldg 585	06	2,002
15	Convert A-10 Fab/Structure Shop, Bldg 785	06	2,002
16	Construct Weapons Vault Addition, Bldg 636	06	700
17	Construct Mobility Bag Mezzanine, Bldg 647	06	1,582
18	Construct Maintenance Trailer, Bldg 1105	06	3,000
19	Convert A-10 Aircraft Maintenance Unit, Bldg 772	07	N/A
20	Convert A-10 Aircraft Maintenance Unit, Bldg 770	07	9,600
21	Convert A-10 Avionics Maintenance Facility, Bldg 771	07	7,998
22	Convert A-10 Group Life Support, Bldg 798	07	3,692
23	Convert A-10 Pilot Conditioning Facility, Bldg 707	07	2,702
24	Convert A-10 HQ Group/OSS, Bldg 792	07	22,012
25	Convert A-10 Flight Squadron #1 and #2 Ops, Bldg 704	07	N/A
26	Convert A-10 Flight Simulator, Bldg 590	07	13,509
27	Restripe A-10 Parking Ramp	07	N/A
28	Convert A-10 Hush House, Bldg 4128	07	N/A
29	Convert A-10 ECM Pod Storage, Bldg 711	07	10,075

Table 2.1-3. Proposed Action Facility Requirements (continued)

<i>Project Number</i>	<i>Project Name</i>	<i>Fiscal Year</i>	<i>Building Square Feet</i>
Military Construction Projects			
30	Weapons Release Shop	07	16,600
31	Fuel Cell Hangar, 2 Bay	07	25,876
32	A-10 Engine Trim Pad	07	34,445
33	Dormitory – 120 Person	08	42,600
34	LOLA/Ramp/Gun Berm	09	62,754
35	Child Development Center	09	13,530
36	Add/Alter Dental Clinic	09	2,000
37	Transient Lodging Facility	09	4,650
38	Visiting Officers Quarters	09	9,750
39	Community Activity Center	09	12,700
40	TF-34 Engine Shop (CIRF)	09	30,010

N/A = Not applicable, no additional building square footage proposed, utility and infrastructure work only.

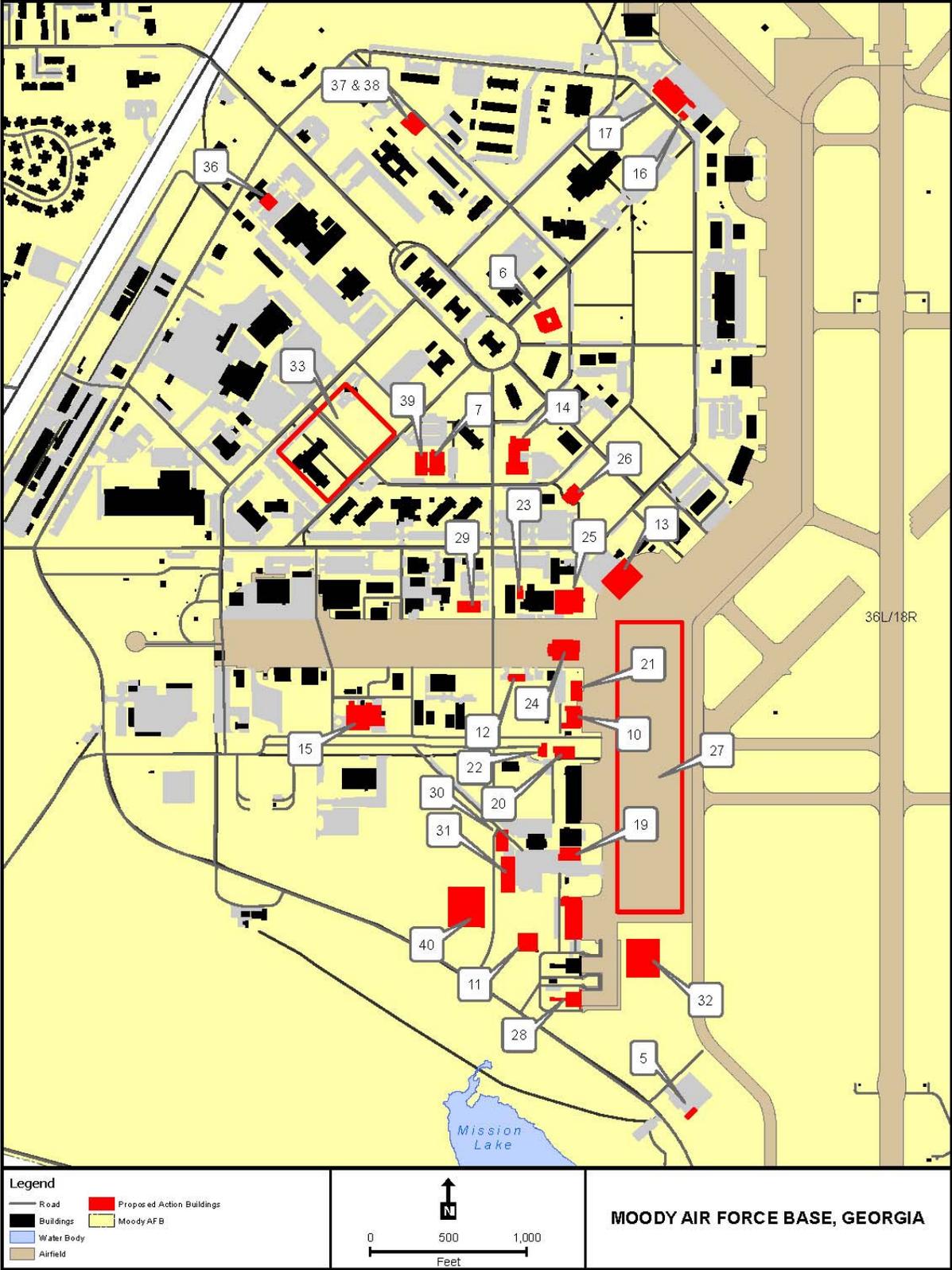


Figure 2.1-1. Proposed Action – Main Base

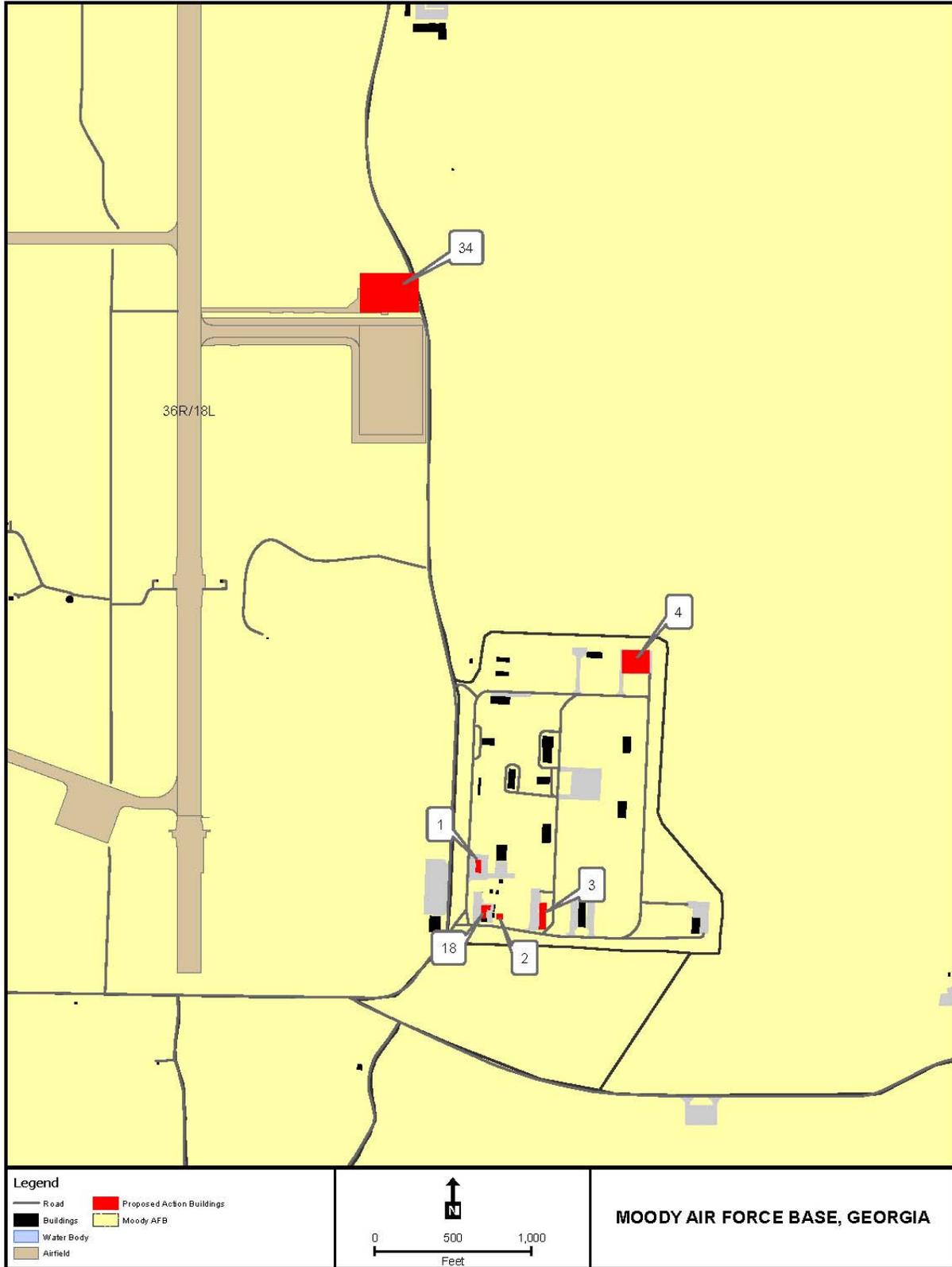


Figure 2.1-2. Proposed Action – Munitions Storage Area

Most construction would occur from late 2006 through 2008, although some projects would continue through 2010. In total, the construction, renovation, and infrastructure improvements for the Proposed Action would affect about 10 acres. Affected acres represent the area covered by the construction footprints of the proposed facilities plus the surrounding lands where construction-related clearing and grading would occur. Infrastructure upgrades, such as connecting new facilities to water and power systems, would also count as affected area on the base.

Demolition and Renovation Activities. Prior to demolition and renovation of facilities, Moody AFB would contract to have any asbestos-containing materials and lead-based paint (LBP) removed and properly disposed in accordance with federal and state regulations. Site preparation would include establishing a buffer zone around the involved facilities. The proposed demolition would include complete dismantling and removal of all facility structures, equipment, and machinery, in accordance with applicable regulatory requirements to ensure proper handling and disposition of the waste. All utilities would be capped or disconnected. Materials from all facilities proposed for demolition would be recycled to the greatest extent practicable.

The demolition contractor would dispose of the remaining materials in an approved landfill in accordance with state and local regulations and utilizing an established haul route for equipment delivery and debris removal. The demolition would involve minimal ground disturbance, and any areas that may be disturbed by the demolition would be restored to prevent any long-term soil erosion. Frequent spraying of water on exposed soil during ground disturbance and demolition activities, proper soil stockpiling methods, and prompt replacement of ground cover or pavement are standard construction procedures that could be used to minimize the amount of dust generated during demolition.

Construction Activities. With the start of building construction, each building site would be graded, and sediment and erosion controls would be installed. These standard construction practices may include the installation of a silt fence, storm drain inlet protection, temporary sediment traps, and diversion dikes within project limits prior to commencement of any onsite work. All development activities would be performed in accordance with current security and force protection requirements.

Prior to construction or demolition at any site, a construction laydown area and haul route would be established and coordinated with 347th Civil Engineering Squadron. Appropriate erosion and siltation controls would be implemented and maintained in effective operating condition prior to and throughout all construction and demolition activities.

Similarly, fugitive dust would be controlled by the use of standard construction practices. In all cases where construction disturbs the existing vegetation or other ground surface, the contractor would revegetate the area as approved by the base or restore the surface as directed by the base.

Proposed Action Personnel. Beddown of the two squadrons of A/OA-10 aircraft would require personnel to operate and maintain the system and to provide necessary support services. More personnel, particularly for maintenance, would be needed for the A/OA-10 squadrons than are used at the base currently. As such, total on-base military and civilian personnel would be increased by 1,002 positions from the personnel numbers associated with the departing T-38C

and T-6A squadrons. Table 2.1-4 details the manpower requirements to support the two squadrons of A/OA-10 aircraft. In addition to the government positions presented in Table 2.1-4, 288 contractor positions would no longer be needed to support the T-38C and T-6A aircraft.

Table 2.1-4. Manpower Requirements

	MANPOWER REQUIREMENTS			
	<i>Officer</i>	<i>Enlisted</i>	<i>Civilian</i>	<i>Total</i>
T-38C/T-6A	-362	-225	-51	-638
ALQ-184	0	-24	0	-24
T-34 Engine CIRF	1	71	0	+72
A/OA-10/BOS ¹	130	1399	63	+1592

Note: 1. Requirements for two squadrons.

2.1.2 No-Action Alternative at Moody AFB

No Action for this EA means that implementation of the BRAC recommendations would not occur at Moody AFB at this time. Analysis of the No-Action Alternative provides a benchmark and enables decision-makers to compare the magnitude of the environmental effects of the Proposed Action. Section 1502.14(d) of NEPA requires an EA to analyze the No-Action Alternative. In this case, as a result of BRAC action, 68 T-38C aircraft and 45 T-6A aircraft are scheduled to be relocated from Moody AFB. If No Action resulted in no A/OA-10 aircraft being assigned to Moody AFB, there would be no A/OA-10-related personnel changes and no facility construction.

For this EA, No Action is the baseline conditions which currently have 68 T-38C aircraft and 45 T-6A aircraft based at Moody AFB. Taking no action could have local impacts and negatively affect the overall program for integrating the A/OA-10 into the Air Force inventory. This could delay the fielding of the A/OA-10 for operations and deployment. Delaying action could also add cost to the overall program.

2.2 Elements Affecting Moody AFB Airspace

There are three types of training airspace used by Moody AFB aircraft for training (Figure 2.2-1). Airspace managed by Moody AFB associated with this proposed A/OA-10 beddown includes Military Operations Areas (MOAs), Military Training Routes (MTRs), and Restricted airspace supporting Grand Bay Range.

Operational requirements and performance characteristics of the A/OA-10 dictate that most training would occur in MOAs. MOAs are established by the Federal Aviation Administration (FAA) to separate military training aircraft from non-participating instrument flight rules aircraft (those not using the MOA for training). When a MOA is active, the FAA routes other air traffic around it. Nonparticipating military and civil aircraft flying under visual flight rules

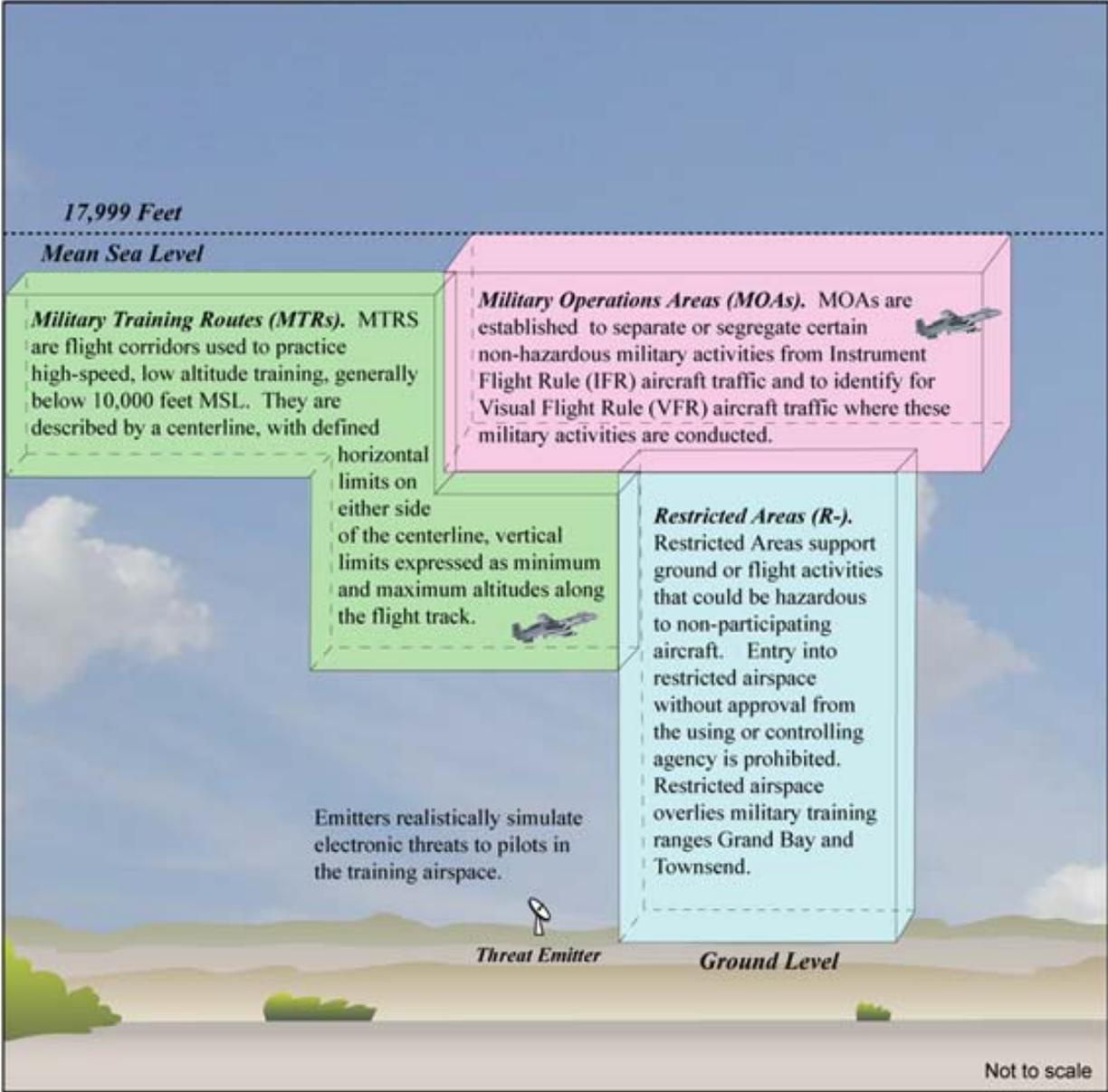


Figure 2.2-1. Types of Training Airspace

(VFR) may transit an active MOA by employing see-and-avoid procedures. When flying under instrument rules, nonparticipating aircraft must obtain an air traffic control (ATC) clearance to enter an active MOA.

The A/OA-10 would conduct numerous related training activities to fulfill its mission requirements. Table 2.2-1 describes the projected A/OA-10 air-to-air missions and air-to-ground training missions. The A/OA-10 would fly one and 1½- to 2-hour-long missions, including takeoff, transit to and from the training airspace, training activities, and landing. Depending upon the distance and type of training activity, the A/OA-10 could spend from 30 to 60 minutes in a training airspace. The A/OA-10 would use the full, authorized capabilities of the airspace units used for training, operating from the surface to 18,000 feet above mean sea level (MSL). Actual flight altitudes would depend upon the lower and upper limits of specific airspace units.

A/OA-10 aircraft would fly training flights in one or more of the Moody AFB airspace units. Activities in the training airspace are termed *sortie-operations*. A *sortie-operation* is defined as the use of one airspace unit by one aircraft. Each time a single aircraft flies in a different airspace unit, one sortie-operation is counted for that unit. Thus, a single aircraft can generate several sortie-operations in the course of a mission. The affected airspace units at Moody AFB consist of five primary MOAs used on a continuing basis for routine training and are presented in Figure 2.2-2.

2.2.1 A/OA-10 Training Flights within Moody AFB Airspace

The current sortie-operations in Moody AFB MOAs and on MTRs are presented in Table 2.2-2. After the beddown, the A/OA-10s would fly 55 percent of the sortie-operations in the primary MOAs. Table 2.2-2 compares existing training of T-38C and T-6A aircraft with the proposed training activity of Moody AFB-based A/OA-10 aircraft.

A/OA-10 pilots would use MTRs for point-to-point and navigational training at subsonic speeds (Figure 2.2-2). Table 2.2-2 presents estimated A/OA-10 MTR use. The A/OA-10 has both air-to-air and air-to-ground training missions and is projected to use the MTRs for navigational training substantially less than the current T-6A use.

2.2.2 Air-to-Ground Training

The Moody AFB A/OA-10 air-to-ground training would represent an important part of the A/OA-10 training program. Projected air-to-ground training activities for the two A/OA-10 squadrons are presented in Table 2.2-1.

Air-to-ground training also includes ordnance delivery training. All ordnance delivery training would adhere to the requirements and restrictions of the ranges. Table 2.2-3 presents the historical, current, and proposed air-to-ground munitions expended at Grand Bay and Townsend ranges. The historical use represents the level of activity experienced during the 1990s when both A-10 and F-16 aircraft were stationed at Moody AFB. In some cases, the historical use was greater than the levels proposed with the beddown of the two squadrons of A/OA-10 aircraft under the Proposed Action. The primary training ordnance carried by the

Table 2.2-1. Projected A/OA-10 Training Activities

<i>Activity</i>	<i>Description</i>	<i>Airspace Type</i>	<i>Altitude (feet)</i>	<i>Time in Airspace</i>
Aircraft Handling Characteristics	Training for proficiency in use and exploitation of the aircraft's flight capabilities (consistent with operational and safety constraints), including, but not limited to, high/maximum angle of attack maneuvering, energy management, minimum time turns, maximum/optimum acceleration and deceleration techniques, and confidence maneuvers.	MTR and MOA	500 above ground level (AGL) to 18,000 MSL	0.5 to 1.0 hour
Basic Fighter Maneuvers (BFM)	Training designed to apply aircraft (1 versus 1) handling skills to gain proficiency in recognizing and solving range, closure, aspect, angle, and turning room problems in relation to another aircraft to either attain a position from which weapons may be launched or defeat weapons employed by an adversary.	MOA	500 AGL to 18,000 MSL	0.5 to 1.0 hour
Air Combat Maneuvers (ACM)	Training designed to achieve proficiency in formation (2 versus 1 or 2 versus 1+1) maneuvering and the coordinated application of BFM to achieve a simulated kill or effectively defend against one or more aircraft from a pre-planned starting position. Use of defensive countermeasures (chaff, flares). ACM may be accomplished from a visual formation or short range to beyond visual range.	MOA	500 AGL to 18,000 MSL	0.5 to 1.0 hour
Low-Altitude Training	Aircraft offensive and defensive operations at low altitude, G-force awareness at low altitude, aircraft handling, turns, tactical formations, navigation, threat awareness, defensive response, defensive countermeasures (chaff/flares) use, low-to-high and high-to-low altitude intercepts, missile defense, combat air patrol against low/medium altitude adversaries.	MTR and MOA	500 AGL to 5,000 AGL	0.5 to 1.0 hour

Table 2.2-1. Projected A/OA-10 Training Activities (continued)

<i>Activity</i>	<i>Description</i>	<i>Airspace Type</i>	<i>Altitude (feet)</i>	<i>Time in Airspace</i>
Tactical Intercepts	Training (1 versus 1 up to 4 versus multiple adversaries) designed to achieve proficiency in formation tactics, radar employment, identification, weapons employment, defensive response, electronic countermeasures, and electronic counter countermeasures.	MOA	500 AGL to 18,000 MSL	0.5 to 1.0 hour
Night Operations	Aircraft intercepts (1 versus 1 up to 4 versus multiple adversaries) flown between the hours of sunset and sunrise, including tactical intercepts, weapons employment, offensive and defensive maneuvering, chaff/flare, and electronic countermeasures.	MOA	500 AGL to 18,000 MSL	0.75 to 1.5 hour
(Dissimilar) Air Combat Tactics (D)ACT	Multi-aircraft and multi-adversary (2 versus multiple to larger force exercises) conducting offensive and defensive operations, combat air patrol, defense of airspace sector from composite force attack, intercept and simulate and destroy bomber aircraft, destroy/avoid adversary ground and air threats with simulated munitions and defensive countermeasures, strike-force rendezvous and protection.	MOA	500 AGL to 18,000 MSL	0.5 to 1.0 hour
Basic Surface Attack	Air-to-ground simulated delivery or delivery of inert ordnance, such as training ordnance, on a conventional bombing range.	MOA and Range	Surface to 18,000 MSL	0.5 to 1.0 hour
Tactical Weapons Delivery	More challenging multiple attack headings and profiles; pilot is exposed to varying visual cues, shadow patterns, and the overall configuration and appearance of the target.	MOA and Range	Surface to 18,000 MSL	0.5 to 1.0 hour

Table 2.2-1. Projected A/OA-10 Training Activities (continued)

<i>Activity</i>	<i>Description</i>	<i>Airspace Type</i>	<i>Altitude (feet)</i>	<i>Time in Airspace</i>
Surface Attack Tactics	Practiced in a block of airspace such as a MOA or Restricted Area that provides room to maneuver. Defensive countermeasures may be deployed. Precise timing during the ingress to the target is practiced, as is target acquisition. Training ordnance is used only on approved ranges. Training includes egress from the target area and reforming into a tactical formation.	MOA and Range	Surface to 18,000 MSL	0.5 to 1.0 hour

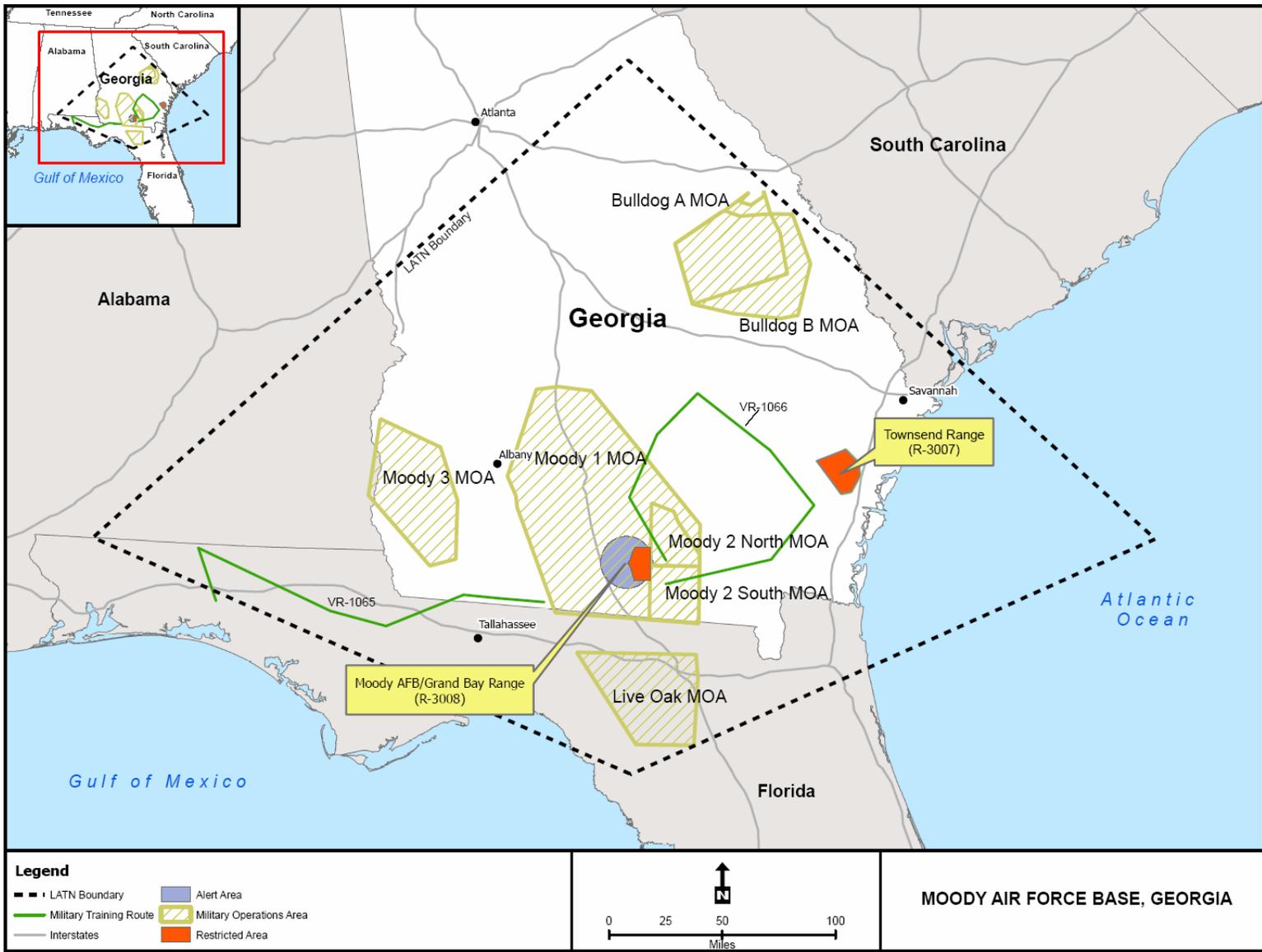


Figure 2.2-2. Primary Airspace Associated with A/OA-10 Beddown at Moody AFB

Table 2.2-2. Baseline and Projected Annual Sortie-Operations

Airspace Unit	Floor	Ceiling	Baseline Use						Projected Use				
			T-38C	T-6A	HC-130	HH-60	Other	Total	A/OA-10	HC-130	HH-60	Other	Total
Moody 1	8,000 MSL	17,999 MSL	8,102	8,533	8	0	27	16,670	3,760	8	0	27	3,795
Moody 2 North	500 AGL	7,999 MSL	2,499	0	456	412	29	3,396	2,004	456	412	29	2,901
Moody 2 South	100 AGL	7,999 MSL	2,499	0	456	412	29	3,396	2,004	456	412	29	2,901
Moody 3	8,000 MSL	17,999 MSL	16	0	0	0	421	437	1,962	0	0	421	2,389
Live Oak	8,000 MSL	17,999 MSL	3,350	0	0	0	44	3,394	572	0	0	44	616
Bulldog A	500 AGL	17,999 MSL	0	0	0	0	2,075	2,075	312	0	0	2,075	2,387
Bulldog B	10,000 MSL	17,999 MSL	0	0	0	0	1,785	1,785	168	0	0	1,785	1,953
R-3007 Townsend Range	Surface	Unlimited	0	0	0	0	4,000	4,000	764	0	0	4,000	4,764
R-3008 Grand Bay	Surface	Unlimited	2,523	0	229	337	5	3,094	2,964	229	337	5	3,535
VR-1065	100 AGL	1,500 AGL	0	0	00	0	14	14	16	0	0	14	30
VR-1066	100 AGL	1,500 AGL	63	307	0	0	5	375	20	0	0	5	25
LATN	100 AGL	1,500 MSL	0	1,981	575	1,140	0	3,696	5,000	575	1,140	0	6,715

AGL = above ground level

LATN = Low-Altitude Tactical Navigation

MSL = above mean sea level

VR = visual route

Table 2.2-3. Historical, Current, and Proposed Annual Ordnance Used at Grand Bay/ Townsend Ranges

Ordnance	<i>Historical Use¹</i>	<i>Current Conditions</i>	<i>Proposed Action</i>	<i>Historical Use¹</i>	<i>Current Conditions (FY05)</i>	<i>Proposed Action</i>
	Grand Bay	Grand Bay	Grand Bay	Townsend	Townsend	Townsend
BDU-33	20,220	50	5,700	19,785	7,200	8,600
BDU-50/MK-82	0	0	276	0	641	641
MK-83	0	0	0	0	93	93
BDU-56/MK-84	0	0	32	0	76	76
7.62-mm (HH-60)	134,400	268,800	268,800	0	145,000	145,000
20-mm (Transient)	139,784	19,230	19,230	253,800	25,000	25,000
30-mm (A-10)	259,350	0	354,000	12,500	33,850	83,500
2.75 Rockets (A-10)	2,110	0	920 ²	875	158	388

Note: 1. Air Force 1998a.

2. This includes approximately 250 M151-White Phosphorous rockets.

A/OA-10 will be the Bomb Dummy Unit (BDU)-33, although there would also be proposed the use of 500-, 1,000-, and 2,000-pound inert heavyweight bombs and approximately 250 2.75-inch rockets equipped with M156 white phosphorous warheads used to designate targets for attack or rescue. When triggered by a fuse, the warhead case ruptures and scatters the phosphorous particles. The exposed phosphorous reacts (ignites) spontaneously when exposed to oxygen and produces the smoke cloud and associated thermal signature. Also used by the A/OA-10 aircraft as part of the combat search and rescue missions would be the employment of illumination flares (LUU-1, LUU-2, and LUU-19) over Grand Bay Range. A/OA-10 live-fire training would occur during specialized training or exercises at ranges authorized for these activities. An estimated 222 annual missions (approximately 1.5 percent of total A/OA-10 missions) would be flown by the A/OA-10s at exercises and training away from Moody AFB. A portion of these missions would involve ordnance delivery training. The negligible level of use of these remote ranges and the current level of use by others suggest that projected A/OA-10 use does not warrant additional detailed environmental analysis for these ranges.

2.2.3 Defensive Countermeasures

Chaff and flares are the principal defensive countermeasures dispensed by military aircraft to avoid detection or attack by enemy air defense systems. A/OA-10 pilots must train to employ defensive countermeasures such as RR-188 chaff and M206 and MJU-7 flares. A bundle of chaff consists of approximately 0.5 to 5.6 million fibers, each thinner than a human hair, that are cut to reflect radar signals and, when dispensed from aircraft, form an electronic “cloud” that breaks the radar signal and temporarily hides the maneuvering aircraft from radar detection. Flares ejected from aircraft provide high-temperature heat sources that mislead heat-sensitive or heat-seeking targeting systems. Defensive chaff and flares are used to keep aircraft from being successfully targeted by weapons such as surface-to-air missiles, anti-aircraft artillery, or other aircraft. Appendix A describes A/OA-10 chaff and flares used in defensive training.

Effective use of chaff and flares in combat requires frequent training by aircrews to master the timing of deployment and the capabilities of the defensive countermeasure and by ground crews to ensure safe and efficient handling of chaff and flares. Defensive countermeasures deployment in Moody AFB authorized airspace is governed by a series of regulations based on safety, environmental considerations, and defensive countermeasures limitations. These regulations establish procedures governing the use of chaff and flares over ranges, other government-owned and controlled lands, and non-government-owned or controlled areas. Chaff and flares would continue to be used in the primary and secondary MOAs.

Flares burn for 3 to 4 seconds at a temperature in excess of 2,000 degrees Fahrenheit (°F) to simulate a jet exhaust. During the burn, a flare descends approximately 400 feet. The burning magnesium pellet is completely consumed, and four or five plastic pieces and aluminum-coated Mylar wrapping material falls to the ground. Restrictions for flare use are described below.

Table 2.2-4 presents the existing and proposed chaff and flare use by airspace unit. Within Moody AFB airspace, the two squadrons of A/OA-10s could annually use nearly 36,600 bundles of chaff per year in the MOAs. This level of use would represent almost twice the amount currently used. The amount of chaff used in each MOA would be proportional to the number of sortie-operations conducted by the A/OA-10s.

Table 2.2-4. Existing and Proposed Annual Chaff and Flare Use

<i>Airspace Unit</i>	<i>Current Chaff</i>	<i>Proposed Chaff</i>	<i>Current Flares</i>	<i>Proposed Flares</i>
Moody 1 MOA	6,212	18,812	4,636	14,876
Moody 2 North MOA	2,590	4,390	0	0
Moody 2 South MOA	2,590	4,390	0	0
Moody 3 MOA	7,152	8,952	7,283	9,643
Live Oak MOA	0	0	110	818
R-3007	0	0	27,880	38,980
W-158E	0	0	4,020	4,020
Total	18,544	36,544	43,929	68,337

MOA = Military Operations Area

The A/OA-10 would release up to 68,337 flares per year in the MOAs, over Grand Bay Range, and in Warning Area-158E. This level of use would represent an increase of 24,408 flares annually over current use. The number of flares used in each airspace would be proportional to the number of sortie-operations conducted by the A/OA-10s.

2.2.4 No-Action Alternative within the Moody AFB Airspace

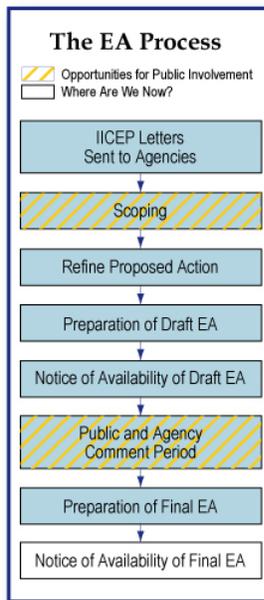
The No-Action Alternative would not beddown two A/OA-10 squadrons at Moody AFB at this time. One T-38C squadron and one T-6A squadron have been identified as aircraft to be relocated as part of the BRAC legislation. ACC mission requirements mean that No Action for the A/OA-10 beddown could affect the schedule for BRAC action at Moody AFB. No Action for this EA is equivalent to baseline use of SUA. Table 2.2-2, above, presents the airspace training associated with existing T-38C and T-6A Aircraft. This airspace usage is what would be expected under No Action.

2.3 Environmental Impact Analysis Process

This EA for the implementation of BRAC recommendation at Moody AFB has been prepared in accordance with NEPA (42 United States Code [USC] 4321-4347), CEQ Regulations (40 CFR § 1500-1508), and 32 CFR 989, *et seq.*, *Environmental Impact Analysis Process* (Air Force Instruction [AFI] 32-7061). NEPA is the basic national requirement for identifying environmental consequences of federal decisions. NEPA ensures that environmental information is available to the public, agencies, and the decision-maker before decisions are made and before actions are taken.

2.3.1 Environmental Assessment Process

Compliance with NEPA guidance for preparation of an EA involves several steps, depicted in Figure 2.3-1.



**Figure 2.3-1.
EA Process**

The environmental analysis process includes public and agency review of information pertinent to the Proposed Action and alternatives and provides a full and fair discussion of potential consequences to the natural and human environment. Interagency and Intergovernmental Coordination for Environmental Planning (IICEP) letters were sent, and responses received through 16 July 2006 are included in Appendix B.

In this EA, the No-Action Alternative means that the implementation of the BRAC recommendations for Moody AFB would not occur concurrently with the T-38C and T-6A BRAC realignment. The Air Force analyzes alternatives for beddown facilities to ensure that fully informed decisions are made after review of the comprehensive, multidisciplinary analysis of potential environmental consequences.

A/OA-10 Beddown EA	
Chapter 1.0 Purpose and Need for BRAC A/OA-10 Beddown	
1.1	Background
1.2	Purpose of BRAC A/OA-10 Beddown
1.3	Need for BRAC A/OA-10 Beddown
Chapter 2.0 Description of Proposed Action and No-Action Alternative	
2.1	Elements Affecting Moody AFB
2.2	Elements Affecting Moody AFB Airspace
2.3	Environmental Impact Analysis Process
2.4	Regulatory Compliance
2.5	Environmental Comparison of Alternatives
Chapter 3.0 Affected Environment and Consequences	
3.1	Airspace Management and Air Traffic Control
3.2	Noise
3.3	Safety
3.4	Air Quality
3.5	Physical Resources (Water, Soils, Hazardous Materials)
3.6	Biological Resources
3.7	Cultural Resources
3.8	Land Use
3.9	Transportation
3.10	Socioeconomics
3.11	Environmental Justice
Chapter 4.0 Cumulative Impacts	
4.1	Cumulative Effects Analysis
Chapter 5.0 References	
Chapter 6.0 List of Preparers	

2.3.2 EA Organization

This EA is organized into the following chapters and appendices. Chapter 1.0 describes the purpose and need of the proposal to beddown the A/OA-10 at Moody AFB. A detailed description of the Proposed Action and the No-Action Alternative is provided in Chapter 2.0. Additionally, Chapter 2.0 provides a comparative summary of the effects of the Proposed Action and the No-Action Alternative with respect to the various environmental resources.

Chapter 3.0 describes both the existing conditions and potential consequences of the Proposed Action and the No-Action Alternative at Moody AFB. Chapter 4.0 presents a cumulative analysis, considers the relationship between short-term uses and long-term productivity identified for the resources affected, and summarizes the irreversible and irretrievable commitment of resources if the Proposed Action or an alternative were implemented. Chapter 5.0 contains references cited in the EA and lists the individuals and organizations contacted during the preparation of the EA. A list of document preparers is included in Chapter 6.0.

In addition to the main text, the following appendices are included in this document: Appendix A, Ordnance and Defensive Countermeasures Appendix B, Public and Agency Correspondence; Appendix C, Airspace; Appendix D, Noise; Appendix E, Air Quality; and Appendix F, Solid Waste/Munitions.

2.3.3 Scope of Resource Analysis

The Proposed Action and alternatives have the potential to affect certain environmental resources. These potentially affected resources have been identified through scoping, communications with state and federal agencies, and review of past environmental documentation. Specific environmental resources with the potential for environmental consequences include airspace management and ATC, noise, safety, air quality, physical resources, biological resources, cultural resources, land use, socioeconomics, and environmental justice.

2.3.4 Public and Agency Input

The Air Force initiated early public and agency involvement in the environmental analysis of the implementation of the BRAC recommendations for Moody AFB. The Air Force distributed IICEP letters to solicit agency input on the proposal. The Air Force has published an advertisement in the local newspapers, *The Valdosta Daily Times* and the *Lanier County News*, announcing the availability of the Draft EA for a 30-day public review. Copies of the Draft EA have been made available to the public in the Valdosta-Lowndes County and Miller Lackland libraries. In accordance with the NEPA, agency comments were reviewed and incorporated into this Final EA and the Air Force considered these comments in their decision-making process. No public comments were received during the comment period.

2.4 Regulatory Compliance

This EA has been prepared to satisfy the requirements of NEPA (Public Law [P.L.] 91-190, 42 USC 4321 *et seq.*) as amended in 1975 by P.L. 94-52 and P.L. 94-83. The intent of NEPA is to protect, restore, and enhance the environment through well-informed federal decisions. In addition, this document was prepared in accordance with Section 102 (2) of NEPA, regulations established by the CEQ (40 CFR 1500-1508), and AFI 32-7061 (i.e., 32 CFR Part 989). Table 2.5-1 presents other review and permits that may be required if the BRAC recommendations were implemented at Moody AFB.

Implementation of the Proposed Action will involve coordination with several organizations and agencies. Letters were sent to the appropriate U.S. Fish and Wildlife Service (USFWS) offices as well as state agencies, informing them of the Proposed Action and the No-Action Alternative and requesting data regarding applicable protected species. Appendix B includes copies of relevant coordination letters sent by the Air Force.

**Table 2.5-1. Reviews and Permits Required to Implement
Moody AFB A-10 Beddown**

<i>Review/Permit</i>	<i>Responsible Agency(ies)</i>	<i>Action Requiring Analysis, Permit Review, and/or Permit</i>
Federal		
NEPA	Air Force	Beddown of two A/OA-10 squadrons
Air Conformity Review Under the Clean Air Act Amendments	Air Pollution Control District/ Air Force	Federal action (i.e., beddown of A/OA-10 squadrons) potentially changing of air emissions in an area designated as attainment for one or more criteria pollutants designated under the Clean Air Act
Section 7 of the Federal Endangered Species Act	U.S. Fish and Wildlife Service / Air Force	Construction and operational changes associated with beddown of the A/OA-10
Native American Graves and Repatriation Act	Air Force	Notification of potential construction disturbance
State		
Permit to Construct and Operate New Stationary Source	Georgia Department of Natural Resources / Air Force	Construction and operation of new facilities and other structures
National Pollution Discharge Elimination System Permit	Georgia Department of Natural Resource / Air Force	Land alternation of more than 1 acres
NHPA Section 106	Consultation with State Historic Preservation Office and Notification to Advisory Council on Historic Preservation	Potential consequences to historic properties

2.5 Environmental Comparison of Alternatives

Table 2.6-1 compares the environmental consequences for the Proposed Action and No-Action Alternative. This summary table is derived from the detailed consequences sections for each environmental resource presented in Chapter 3.0 for Moody AFB.

Table 2.6-1. Summary of Impacts by Resource

	<i>Proposed Action</i>	<i>No-Action Alternative</i>
Airspace Management	Daily airfield operations decrease by approximately 80 percent and total aircraft sorties decrease by 53 percent compared to existing conditions.	Continued use of Moody AFB by T-38C and T-6A aircraft.
Noise	Noise levels in the vicinity of the base would be reduced. Noise levels beneath the training airspace would not undergo any substantial changes	Continued use of Moody AFB by T-38C and T-6A aircraft.
Safety	Munitions, chaff and flare use would increase from the change from training to combat-type aircraft. Personnel and facilities able to handle munitions, chaff, and flares are available and no significant environmental consequences are anticipated. Class A accident potential risk expected to be less than that for T-38C and T-6A.	Continuation of current Bird/Wildlife Aircraft Strike Hazard, ordnance, and other safety conditions.
Air Quality	Valdosta area is in air quality attainment for all criteria pollutants. Local air quality or visibility not significantly affected. No significant change projected to air quality within Valdosta area. No conformity determination required.	No renovation or new construction and no change from current emissions.
Physical Resources	Renovation and construction in previously disturbed areas. Existing hazardous materials facilities available to support A/OA-10 aircraft. No significant effects on earth or water resources, hazardous materials, hazardous wastes, munitions-related debris or Environmental Restoration Program.	No ground disturbing activities. Hazardous wastes would be generated at current levels.
Biological Resources	No sensitive biological species affected. Birds and mammals associated with the base and its environs not expected to be adversely affected.	No change from existing conditions. On-base biological resources would continue to be managed in accordance with the INRMP.
Cultural Resources	No historic structures would be affected by on-base construction. The Air Force has consulted with the Georgia SHPO and no significant environmental consequences to these resources have been identified.	No additional construction or ground disturbing activities. Cultural resources on base would continue to be managed in accordance with the ICRMP.
Land Use and Transportation	Renovation and construction consistent with base general plan. Off-base area affected by 65 dB noise contour reduced. No significant environmental consequences to transportation resources.	No change to noise environment on base and environs. No construction or personnel changes. No significant changes in traffic volumes.
Socioeconomics	Total regional socioeconomic stimulation from additional \$54 million in renovation and construction. Base authorized and other positions increased by 1,002 jobs, or over 17 percent of Moody AFB positions. No significant socioeconomic consequences to housing and services.	No change in base personnel before retirement of T-38C and T-6A aircraft.
Environmental Justice	No disproportionate impact upon minority or low income populations or upon children.	No change from existing conditions.

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3.0 AFFECTED ENVIRONMENT AND CONSEQUENCES

3.1 Airspace Management and Air Traffic Control

Airspace in the United States is managed by the FAA to provide for its orderly and safe use. The National Airspace System (NAS) includes all airspace over the United States from 60,000 feet down to, but not including, the ground. Over the years, the FAA has promulgated numerous regulations that divide the airspace into different classifications and provide complex rules for operating within each classification.

National airspace is divided into two broad categories: controlled airspace (Classes A through E airspace) and uncontrolled airspace (Class G airspace). Within these two categories, there are six classifications that determine the flight rules, pilot qualifications, and aircraft capabilities required to operate within any section of the airspace. These classifications are broadly based on the complexity and density of aircraft movements, the nature of operations conducted within the airspace, the level of safety required, and the national and public interest. Refer to Figure C-1 in Appendix C for a depiction of the various classes of airspace discussed below.

Controlled and Uncontrolled Airspace

Class A Airspace. This class consists of all airspace from 18,000 feet MSL to 60,000 feet MSL, including the airspace overlying the waters within 12 nm of the coast of the contiguous 48 states and Alaska. All operations within Class A airspace must be under Instrument Flight Rules (IFR) and are under the direct control of FAA controllers. Class A airspace starts at 18,000 feet MSL and is not specifically charted. Class A airspace is dominated by commercial aircraft using routes between 18,000 and 45,000 feet MSL.

Class B Airspace. Class B airspace surrounds the nation's busiest commercial service airports. At its core, it extends from the surface up to 10,000 feet MSL. Class B airspace is charted on sectional, IFR en route (low altitude), and terminal charts. The configuration of each Class B airspace area is individually tailored and consists of a surface area with an additional two or more layers; it is designed to contain all published instrument procedures once an aircraft enters the airspace. An ATC clearance is required for all aircraft to operate in the area, and all aircraft that are so cleared receive separation services from air traffic controllers. Class B airspace is typically associated with major metropolitan airports such as the Atlanta Hartsfield International Airport, Georgia.

Class C Airspace. This airspace surrounds mid-size airports with a large number of commercial flight operations. It normally extends from surface to 4,000 feet AGL with a radius of 5 nm with an outer circle from 1,200 feet AGL with a 10-nm radius. An operating control tower serviced by a radar approach control is a key component of Class C airspace, and aircraft must maintain two-way radio communications with the local ATC entities. Class C airspace is associated with city airports such as the Tallahassee Regional Airport, Florida.

BRAC Environmental Assessment

Class D Airspace. This airspace is applied to airports with operating control towers where the traffic volume does not meet Class C or Class B standards. This area usually extends from the surface to 2,500 feet AGL and has a size and shape individually tailored to the airport. All aircraft operating within Class D airspace must be in two-way radio communications with the ATC facility. The airspace in the immediate vicinity of Valdosta Regional Airport and Moody AFB, Georgia, is Class D airspace.

Class E Airspace. This airspace includes all airspace from 14,500 feet MSL up to, but not including 18,000 feet MSL. Class E airspace also includes all other controlled airspace necessary for IFR operations at lower altitudes but not already classified as A, B, C, or D. This includes airspace where low-level airways (Victor Routes) and IFR transition areas are found and can be as low as 700 feet AGL. These airways frequently intersect approach and departure paths from both military and civilian airfields. The majority of Class E airspace is located where more stringent airspace controls have not been established.

Class G Airspace. Class G airspace is uncontrolled airspace and includes all airspace not otherwise designated as A, B, C, D, or E. Operations within Class G airspace are governed by the principle of see and avoid. Limits of uncontrolled airspace typically extend from the surface to 700 feet AGL but can extend above these altitudes to as high as 14,500 feet MSL. Air traffic controllers do not have the authority to exercise control over aircraft operations within uncontrolled airspace. Primary users of uncontrolled airspace are general aviation aircraft operating under VFR.

Special Use Airspace

In addition to the broad categories and classifications of airspace, the FAA also designates certain airspace as SUA. An SUA consists of airspace within which specific activities must be confined, or where limitations are imposed on aircraft not participating in those activities. Although most SUA involves military activity, other areas involve civilian users such as the Department of Energy or the U.S. Secret Service. The FAA has designated SUAs that are listed in FAA Order 7400.8E and are also published in DoD Flight Information Publications AP/1A and AP/1B. These SUAs are also charted on IFR and VFR en route charts. SUA designations in the Moody AFB region of influence (ROI) include MOAs and Restricted Areas.

MOAs. MOAs are non-regulatory SUAs with defined vertical and lateral limits. These areas are used by military aircraft to perform air combat maneuvers, intercepts, and acrobatics. MOAs are designated to increase safety for civilian IFR and VFR traffic. When a MOA is active (in use), all IFR traffic is rerouted around the area. Non-participating VFR traffic may enter the active MOA, but see-and-avoid procedures must be used. MOAs are charted on VFR and IFR en route charts.

Restricted Areas (R-). Restricted areas contain airspace within which flight of aircraft, while not wholly prohibited, is subject to restrictions. This is designated rulemaking airspace where restrictions are placed on all non-participating aircraft. This airspace is used to contain hazardous military activities and lies within the territorial airspace of the United States. The term “hazardous” implies, but is not limited to, live firing of weapons, ordnance delivery, and/or

aircraft testing. Most restricted areas have specific hours of operations, and users must have permission from the controlling agency before flight through the defined areas.

Other Airspace

Military Training Routes. MTRs are flight corridors dedicated to low-level flight operations (below 10,000 feet MSL) that can exceed 250 knots indicated airspeed (KIAS). An MTR is composed of a centerline surrounded by a defined corridor width. They are designed to minimize disturbances to people, property, and other potentially sensitive land areas. Descriptions of MTRs are published with special operating instructions to avoid airports and noise-sensitive areas. Individual military installations also assist in controlling and scheduling MTRs to avoid sensitive areas. There are two types of MTRs: Instrument Routes (IRs) and Visual Routes (VRs); additionally, although not officially an MTR, there are Slow Routes (SRs), where the airspeed must be below 250 KIAS. IRs are mutually developed by the DoD and FAA to provide for military operational training requirements that cannot be met under the aircraft speed restrictions in Federal Aviation Regulation (FAR) 91.117. IRs require that IFR flight plans and procedures be followed. VRs require IFR flight plans to the entry point and after the exit point of the VR, and VRs must be flown in VFR conditions. SRs cover those MTRs that are used for military flight operations slower than 250 KIAS; they require VFR conditions for the entire SR.

Route widths vary on different MTR segments, and some public or private airports may be encompassed by the route boundaries. However, FAA policy (FAA Handbook 7610.4) and military MTR flight procedures require that airports be avoided to the extent practical by at least 1,500 feet AGL vertically or 3 nm laterally. Ongoing coordination between the MTR scheduling agency and airport owners/operators helps minimize any conflicts between MTR activity and airport operations. FAA Flight Service Stations are notified by the military when individual MTRs are scheduled for use so that civil pilots can obtain their active status prior to conducting flight near a given route. Both military and civil pilots are responsible to see and avoid each other while operating along or near an MTR.

Low-Altitude Tactical Navigation (LATN). A LATN is airspace associated with low-speed and low-altitude training conducted by military aircrews. Altitudes within these areas are consistent with normal VFR flight and are limited to below 1,500 feet AGL, with airspeed not to exceed 250 KIAS. An LATN area covers large areas of uncontrolled airspace and facilitates operational flexibility (flight patterns are not confined to narrow flight corridors and direction of flight is not restricted). The purpose of LATN areas is to conduct random VFR low-altitude navigation training. Military aircraft are required to follow all existing FARs while flying within an LATN, and most units place additional restrictions and guidance for avoidance of sensitive areas of concern. Non-participating civil and military aircraft may fly within an LATN area. Both military and civil pilots are responsible to see and avoid each other while operating in a LATN area. The FAA does not consider an LATN area to be SUA; therefore, formal airspace designation in accordance with FAA Handbook 7400.2 is not required. For the same reason, LATN areas are not included on FAA charts or publications.

3.1.1 Existing Conditions

3.1.1.1 Moody AFB and Vicinity

Airspace Environment

Airspace areas associated with the Moody AFB airfield consist of those designated to serve civil and military aircraft operating to and from the base or transiting the immediate local area. Controlled airspace is designated around Moody AFB to support local airfield operations. Valdosta Radar Approach Control (RAPCON) at Moody AFB provides service to Moody AFB and 10 other airports in the region. Valdosta RAPCON is responsible for directing military aircraft passing from one SUA to another (including R-3008 [Grand Bay Range], Moody 1 MOA, and Moody 2 North/South MOAs) within their controlling area and directing non-participating aircraft around, above, or beneath these SUA units. Moody ATC tower is responsible only for aircraft within the Moody AFB Class D airspace. The Class D airspace immediately surrounding the base is defined by a cylinder centered on the airfield with a radius of 7 nm and extending from the surface up to and including 2,500 feet MSL (refer to Appendix C, Figure C-1).

Moody AFB has two active parallel runways: Runway (RWY) 18L/36R is 9,300 feet long by 150 feet wide, and RWY 18R/36L is 8,000 feet long by 150 feet wide (Figure 3.1-1). Both runways are north-south oriented and support VFR and IFR operations.

Air Traffic Control Operations

Policies and procedures for flight operations, ATC, and airfield operations are established in Moody AFB Instruction 11-250, *Aircrew Operational Procedures/Air Traffic Control/Airfield Operations*. All aircraft using Moody AFB are subject to the provisions of these regulations and instructions.

An airfield operation is different from a sortie in that one sortie consists of one aircraft flying an entire mission, from take-off to final landing. For example, an ATC count of one sortie may comprise two airfield operations, consisting of a departure and arrival, or several operations if the sortie returns and practices additional approaches in a closed pattern mode. All “tower” operations are limited to aircraft entering the Moody AFB Class D airspace.

Airfield operations will fluctuate daily. To account for this fluctuation, daily operations are based on an annual busy day using 260 operational flying days per year. For Moody AFB, this equates to approximately 1,136 airfield operations per day based on a baseline level of 295,259 annual airfield operations (refer to Table 2.2-2). Baseline airfield operations are dominated by T-38 and T-6 arrivals, departures, and closed patterns. Moody-based HC-130s and HH-60s add a small component to the overall airfield operations. Transient aircraft from other bases that enter Moody AFB airspace include military aircraft (fixed-wing and rotary-wing), and the arrivals and departures of civilian cargo/troop-moving aircraft (B-767, B-757). Moody ATC and Valdosta RAPCON have new facilities located on Moody AFB and can easily accommodate the daily airfield operations and activities in the surrounding airspace (R-3008).

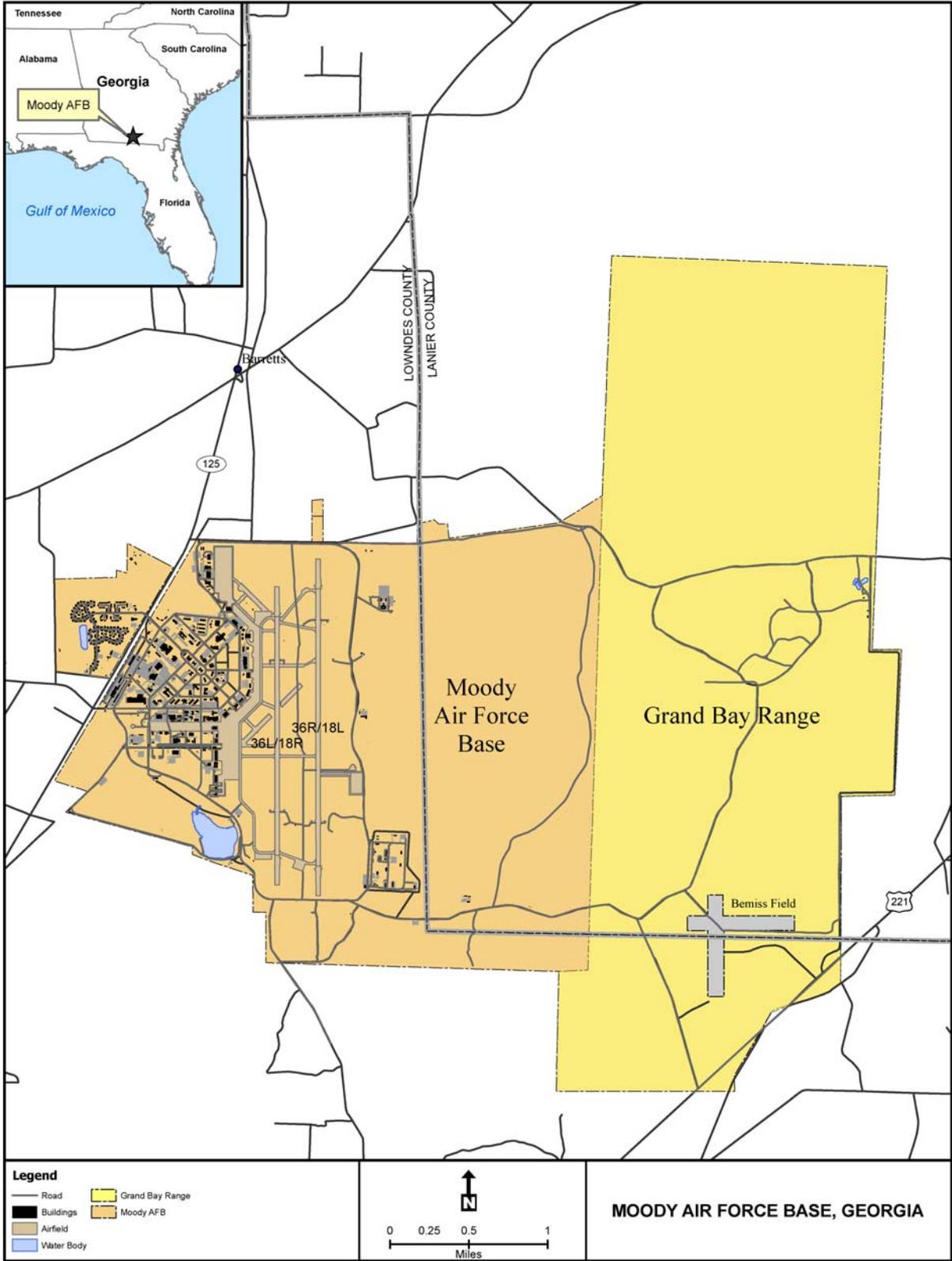


Figure 3.1-1. Moody AFB

3.1.1.2 Airspace

The locations of the airspace units and ranges that encompass the ROI are shown in Figure 2.2-2. Table C-1 in Appendix C details current, baseline, and proposed annual airspace use (day and night) by aircraft type and airspace. Table C-2 provides detailed flight profiles (i.e., time in airspace, speed, power settings, and altitude) for all aircraft using the airspace associated with the Proposed Action.

Military Operations Areas

Moody 1 MOA. The Moody 1 MOA covers approximately 6,164 square nm (nm²) in south-central Georgia and a small portion of north Florida (Figure 2.2-2). Moody 1 MOA encompasses the airspace from 8,000 feet MSL up to but not including 18,000 feet MSL. Normal hours of use are 6:00 a.m.–11:00 p.m., Monday through Friday. Occasionally the airspace is used during Saturday and Sunday when posted in a Notice to Airmen (NOTAM). The Jacksonville Air Route Traffic Control Center (ARTCC) is the controlling agency, with the 347 RQW at Moody AFB the using agency. There are 13 public and 11 private airports that are located beneath or adjacent to the MOA and are controlled by Moody ATC to provide separation from military airspace. Nine MTRs underlie Moody 1 MOA airspace: IRs -019 and -016 and VRs -094, -095, -1001, -1002, -1003, -1004, and -1066. In addition, four federal airways or Victor Routes (V) pass through portions of the Moody 1 MOA: V5, V537, V578, and V579.

Moody 2 North/South MOAs. Moody 2 North/South MOAs, covering approximately 318 and 405 nm² respectively, are located beneath the southeastern corner of Moody 1 MOA (Figure 2.2-2). Moody 2 North MOA encompasses airspace from 500 feet AGL up to but not including 8,000 feet MSL, and Moody 2 South MOA encompasses airspace from 100 feet AGL up to but not including 8,000 feet MSL. Normal hours of use for both Moody 2 North/S MOAs are 6:00 a.m.–11:00 p.m., Monday through Friday. This airspace is also occasionally used during Saturday and Sunday when posted in a NOTAM. Jacksonville ARTCC is the controlling agency and the 347 RQW at Moody AFB is the using agency. No federal airways transit this airspace. Five MTRs (IR-016, and VRs -1002, -1003, -1004, and -1066) pass through this airspace and require coordination with Moody AFB. Homerville Public Airport is the only airport beneath the Moody 2 North MOA; there are no airports directly beneath Moody 2 South MOA.

Moody 3 MOA. Covering approximately 1,800 nm², Moody 3 is located in southwest Georgia, with the northwest edge just inside Alabama (Figure 2.2-2). Moody 3 MOA encompasses the airspace from 8,000 feet MSL up to but not including 18,000 feet MSL. Normal hours of operations of use are 6:00 a.m.–11:00 p.m., Monday through Friday. Occasionally the airspace is used during Saturday and Sunday when posted in a NOTAM. The Jacksonville ARTCC is the controlling agency, and the 347 RQW at Moody AFB is the scheduling and using agency. There are eight MTRs beneath Moody 3 MOA: IRs- 017, -019, -021, -057, and -059 and VRs -1001, -1005, and -1017; there are no federal airways located within the airspace. There are seven airports (three civil and four private) located beneath the airspace. The 8,000-foot MSL floor allows civil aircraft access to these airports and to transit through the area at lower altitudes. Aircraft flying under IFR are directed below, above, or around the MOA when it is in use.

Live Oak MOA. Live Oak MOA is located over north-central Florida and covers an area of approximately 1,300 nm² (Figure 2.2-2). Live Oak MOA encompasses the airspace from 8,000 feet up to but not including 18,000 feet MSL. Normal hours of operations are from 6:00 a.m.–11:00 p.m., Monday through Friday. Occasionally, the airspace is used on Saturdays and/or Sundays when posted in a NOTAM. Jacksonville ARTCC is the controlling agency, and the 347 RQW at Moody AFB is the scheduling and using agency. Two federal airways (V537 and 579) pass through Live Oak MOA, and eight MTRs underlie the airspace: IRs -016, 019, 032, 033 and VRs -1001, -1002, -1003, and -1006). Fifteen small private and public airports are located underneath or immediately adjacent to the MOA. Military aircraft not using the airspace and civilian aircraft flying IFR are generally directed around, beneath, or above the MOA by Jacksonville ARTCC to avoid conflicts with military training activities being conducted within the MOA.

Bulldog A and B MOAs. The Bulldog A and B MOAs are located in east-central Georgia, between the cities of Macon and Augusta, and cover an area of approximately 2,100 nm² (Figure 2.2-2). The flight altitudes of Bulldog A are 500 feet AGL to 17,999 feet MSL and of Bulldog B are 10,000 to 17,999 feet MSL. Atlanta ARTCC is the controlling agency and the airspace is scheduled by the 20th Operations Support Squadron, Scheduling, Shaw AFB, South Carolina. There is one federal airway (V70) that passes through Bulldog B MOA and 11 airports (five private and six public) that underlie or are adjacent to the Bulldog A and B MOAs. When both MOAs are active, Atlanta ARTCC directs IFR civil and military aircraft not using the MOA around, above, or below the boundaries of the MOAs.

Military Training Routes

The MTRs described below are those on which pilots are required to follow VFR. The two VRs extend from a floor of 100 feet AGL to a ceiling of 1,500 feet AGL. The ceilings of these MTRs are well below the minimum assigned altitude for aircraft operating on the overlying federal airways.

VR-1065. VR-1065 contains VFR traffic that extends from a floor of 100 feet AGL to a ceiling of 1,500 feet AGL. VR-1065 begins midway between Valdosta, Georgia, and Tallahassee, Florida (Figure 2.2-2). The route then proceeds west, to just northeast of Eglin AFB, where it turns south and ends just east of Eglin AFB. There are eight small public airports near this MTR, three of which have instrument approach transition zones. Several overflight restrictions apply to areas beneath the track (refer to Appendix A, VR-1065).

VR-1066. This MTR contains VFR traffic extending from 100 to 1,500 feet AGL. The MTR is immediately adjacent to Moody 2 South MOA, and the route begins at the MOA boundary (Figure 2.2-2). There are six small public airports near this MTR, five of which have instrument approach transition zones. There are also special operating procedures that apply, which include limiting aircraft from flying below 1,500 feet AGL for portions of the route (refer to Appendix A, VR-1066).

Restricted Areas (R-)

R-3008 (A, B, C, C[A] and D) – Grand Bay Range. Grand Bay Range is located in south-central Georgia, north of Valdosta and directly to the east of the Moody AFB runways (Figure 3.1-1).

The airspace associated with R-3008 encompasses an area of approximately 105 nm². Grand Bay Range airspace is subdivided into five main components: “A” from surface to 10,000 feet MSL, “B” from 100 feet AGL to 10,000 feet MSL, “C” from 500 feet AGL to 10,000 feet MSL, “C”(A) from surface to 1,500 feet AGL, and “D” from 10,000 feet MSL to 23,000 feet MSL (FL 230) (refer to Appendix A, R-3008). The current operating hours are 7:00 a.m.-10:00 p.m., with other times by NOTAM 6 hours in advance. Valdosta RAPCON at Moody AFB maintains control over this restricted area. The location, size, and altitude structure of R-3008 present few limitations on other aircraft in the area. When the Moody 1, 2 N, and 2 S MOAs are not in use, most of the north-south IFR traffic transits between the cities of Valdosta and Atlanta, west of R-3008. East and west IFR traffic uses corridors north of R-3008. Currently, this restricted area complex has little effect on the transit of civil traffic through this area.

R-3007 (A, B, C, D)-Townsend Range. Townsend Range (an Air-to-Ground training range) includes an impact area, surrounding buffer area, and airspace overlying the land area. The restricted airspace, part of the Coastal Airspace Complex, was recently approved and charted by the FAA (August and September 2006). The restricted airspace is located approximately 40 NM southwest of Savannah, Georgia (Figure 2.2-2). Townsend Range airspace is subdivided into four components: “A” from surface up to but not including 13,000 feet MSL; “B” from 1,200 feet AGL up to but not including 13,000 feet MSL; “C” from 100 feet AGL up to but not including 13,000 feet MSL; and “D” 13,000 feet MSL to 23,000 feet MSL or as designated by Savannah CRTC. Each sub-division of R-3007 will be activated on a real-time use basis. Access will be provided and airspace will be excluded within 3 nm and below 1,500 feet AGL of charted public airports. The current published hours are 7:00 a.m. until 10:00 p.m. Monday through Friday and other times by NOTAM. The Controlling Agency for R-3007 is Jacksonville ARTCC. There are no published federal airways/jet routes that interact with R-3007 and general and commercial aircraft through this region is little affected by activities within R-3007. However, simultaneous use of R-3007 and other components of the Coastal Airspace Complex (Coastal MOAs 1-8) have historically caused traffic to be rerouted over and/or around this area to alleviate some of the congestion. Most IFR traffic currently transits the area above the restricted area to the east.

LATN Areas

LATN areas cover large areas of uncontrolled airspace and facilitate operational flexibility to conduct random VFR low-altitude navigation training. Military aircraft are required to follow all existing FARs while flying within a LATN area. There are no restrictions to other civilian or military aircraft from flying within the same area. The FAA does not consider a LATN area an SUA and does not formally chart or identify these areas on FAA charts. Each local military facility that has a capability and requirement to fly low-level VFR below 250 KIAS usually identifies a geographic area surrounding the facility for this training.

Moody AFB LATN Area. The Moody AFB LATN area encompasses more than 85,000 nm² of airspace and is defined by the coordinates N34° 20' W83° 57' to N30° 57' W79° 20' to 29° 38' W83° 12' to N30° 57' W87° 04' to the beginning point. This LATN area generally covers southeastern Alabama, northern Florida, most of the state of Georgia, and a small portion of South Carolina (Figure 2.2-2). The LATN area is designed so that there are few or no multiple flight patterns over any one location due to LATN area operations. Currently, HH-60s and

HC-130s from Moody AFB use the LATN area and fly at altitudes from 100 to 1,500 feet AGL (HH-60s) and 300 to 1,500 feet AGL (HC-130s).

3.1.2 Environmental Consequences

This section analyzes impacts of the Proposed Action on the structure, management, and use of the affected airspace. This evaluation focuses on whether the Proposed Action would require alteration of airspace management procedures and assesses the capability of the airspace to accommodate the proposed use. Impacts could occur if implementation of the Proposed Action and alternative affects the movement of other air traffic in the area, ATC systems or facilities, or accident potential for mid-air collisions between military and non-participating civilian operations. Potential impacts were assessed to determine the extent that proposed aircraft changes would make to existing relationships with federal airways, transition areas, and airport-related air traffic operations. Also considered were the potential effect to IFR and VFR air traffic.

The ROI for the Proposed Action and alternatives includes controlled airspace (Moody AFB) and SUA used for military aircrew training (MOAs, MTRs, and Restricted Areas). For the purpose of this EA, a detailed analysis of potential impacts of the Proposed Action on the Moody LATN is not presented. This is due to the following reasons: (1) The LATN covers a very large area (over 85,000 nm²) and the relative randomness of aircraft operations within this large airspace (e.g., flight patterns are not confined to a flight corridor and direction of flight is not restricted) makes it difficult to determine impacts to specific resource areas; (2) all military aircraft operations would be similar to civilian and commercial aircraft operating within the LATN under VFR; and (3) there would be less than 26 sortie-operations per day. In addition, no changes to the baseline structure or management of the LATN would be required to support the Proposed Action, and the airspace would be able to accommodate the proposed increase in sortie-operations.

3.1.2.1 Proposed Action

Moody AFB and Vicinity

Under the Proposed Action, no changes to the airspace structure associated with Moody AFB or to the ATC procedures for its management would occur. Moody AFB aircraft would continue to follow existing approach and departure routes and procedures and would operate within the same airspace as they do under baseline conditions.

Under the Proposed Action, total aircraft sorties at Moody AFB would decrease by approximately 53 percent as a result of the proposed beddown of the A/OA-10 aircraft and the removal of the T-6 and T-38 aircraft (Table 3.1-1). Additionally, the number of airfield operations would be reduced by approximately 80 percent due to the reduction in closed pattern flights of T-6 and T-38 aircraft (Table 3.1-2). Approximately 12 percent of the proposed airfield operations would be at night (i.e., after 10 p.m. and before 7:00 a.m.). This decrease in daily and annual operations would provide more flexibility and reduce impacts on airspace management and increase available airspace capacity. With implementation of the Proposed Action, there would be no significant impacts to the airspace management at Moody AFB.

Table 3.1-1. Proposed Changes in Annual Aircraft Sorties

<i>Aircraft</i>	<i>Baseline Sorties</i>	<i>Proposed Sorties</i>	<i>Change</i>
T-38	17,784	0	-17,784
T-6	20,350	0	-20,350
HC-130	1,994	1,994	0
HH-60	1,906	1,906	0
A/OA-10	0	15,800	15,800
Other	500	500	0
Total	42,534	20,200	-22,334

Table 3.1-2. Proposed Changes in Annual Airfield Operations at Moody AFB

<i>Aircraft</i>	Baseline Airfield Operations		Proposed Airfield Operations		Change	
	<i>A/D*</i>	<i>CP*</i>	<i>A/D*</i>	<i>CP*</i>	<i>A/D*</i>	<i>CP*</i>
T-38	41,562	21,342	0	0	-41,562	-21,342
T-6	54,046	159,109	0	0	-54,046	-159,109
HC-130	3,988	1,004	3,988	1,004	0	0
HH-60	3,812	3,000	3,812	3,000	0	0
A/OA-10	0	0	31,600	8,000	31,600	8,000
Other	1,000	6,396	1,000	6,396	0	0
Total	104,408	190,851	40,400	18,400	-64,008	-172,451

*A/D = approaches and departures; CP = closed patterns.

Airspace

Under the Proposed Action, training operations by A/OA-10 aircraft would occur in Moody 1, Moody 2 North, Moody 2 S, Moody 3, Live Oak, and Bulldog A and B MOAs; VR-1065; VR-1066; Grand Bay Range (R-3008); Townsend Range (R-3007); and the Moody LATN area. Operations by T-38 and T-6 aircraft would cease in Moody 2 North, Moody 2 South, Moody 3, and Live Oak MOAs; Grand Bay Range (R-3008); VR-1065; VR-1066; and the Moody LATN area. Overall annual airspace use would decrease by 13,340 sortie-operations (a 34 percent reduction) (Table 3.1-3).

MOAs. Under the Proposed Action, there would be sortie-operation decreases in Moody 1, 2 N, 2 S, and Live Oak MOAs, and increases in Moody 3, Bulldog A, and Bulldog B MOAs. The largest increase would be in the Moody 3 MOA, increasing from 437 annual sortie-operations to 2,389 annual sortie-operations. With these increased flight activities in the MOAs, there would be no impact to general aviation in the region. Additionally, existing see-and-avoid procedures and avoidance measures for civil aviation aircraft under the MOAs would continue to occur. Military and civilian aircraft flying under IFR would continue to be directed beneath, over, or around the MOAs to avoid conflicts with proposed sortie-operations. The scheduling, coordination processes, and procedures currently used to manage these MOAs are well established and would need no modification to support implementation of the Proposed Action. Therefore, no significant impacts to MOA airspace or civilian aviation would occur under the Proposed Action.

Table 3.1-3. Proposed Changes in Annual Airspace Sortie Operations

<i>Airspace</i>	<u>Baseline Sortie-Operations</u>			<u>Proposed Sortie-Operations</u>			<u>Change</u>		
	<i>Day</i>	<i>Night</i>	<i>Total</i>	<i>Day</i>	<i>Night</i>	<i>Total</i>	<i>Day</i>	<i>Night</i>	<i>Total</i>
Moody 1 MOA	16,638	32	16,670	3,675	120	3,795	-12,963	88	-12,875
Moody 2 N MOA	2,999	397	3,396	2,504	397	2,901	-495	0	-495
Moody 2 S MOA	2,999	397	3,396	2,504	397	2,901	-495	0	-495
Moody 3 MOA	421	16	437	2,357	32	2,389	1,936	16	1,952
Live Oak MOA	3,394	0	3,394	592	24	616	-2,802	24	-2,778
Bulldog A MOA	2,054	21	2,075	2,366	21	2,387	312	0	312
Bulldog B MOA	1,758	27	1,785	1,926	27	1,953	168	0	168
R-3007	4,000	0	4,000	4,764	0	4,764	764	0	764
R-3008	2,722	372	3,094	3,051	484	3,535	329	112	441
VR-1065	14	0	14	30	0	30	16	0	16
VR-1066	375	0	375	25	0	25	-350	0	-350

MTRs. Under the Proposed Action, the number of sortie-operations within VR-1065 would increase by 16 annually, and there would be a decrease of 350 annual sortie-operations within VR-1066. No changes to the baseline structure or management would be required to support the Proposed Action. VR-1065 would easily be able to accommodate the small increase in sortie-operations, with no significant impacts occurring under the Proposed Action.

Restricted Areas (R-). As shown in Table 3.1.3, the total number of annual sortie-operations would increase in R-3007 by 764 and in R-3008 by 441. On an average day there would be an increase of less than three daily sortie-operations for the Townsend Range restricted area (on 18 percent increase), and an increase of 1.6 daily sortie-operations at Grand Bay Range restricted area (approximately 15 percent increase). Both restricted airspace scheduling and management would not change due to the Proposed Action. Both R-3007 and R-3008 have excess time capacity for increased use. No significant impacts to restricted airspace are anticipated as a result of the Proposed Action.

3.1.2.2 No-Action Alternative

Under the No-Action Alternative, the proposed beddown of A/OA-10 aircraft, drawdown of T-38 and T-6 aircraft, and associated change in airspace utilization would not occur. Consequently, baseline conditions as described in Section 3.1.1 would remain unchanged. Therefore, there would be no impacts to airspace and airspace management at Moody AFB and the currently utilized airspace.

3.2 Noise

Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying (FICON 1992). Human response to noise can vary according to the type and characteristic of the noise source, the distance between the noise source and the receptor, the sensitivity of the receptor, and the time of day.

Due to wide variations, noise is measured using a logarithmic scale expressed in decibels (dB). Thus, a 10-dB increase in noise corresponds to a 100-percent increase in the perceived sound. Under most conditions, a 5-dB change is necessary for a noise increase to be noticeable (USEPA 1972). Sound measurement is further refined by using an A-weighted decibel (dBA) scale that emphasizes the range of sound frequencies that is most audible to humans (between 1,000 and 8,000 cycles per second). All sound levels analyzed in this EA are A-weighted; the term dB implies dBA unless otherwise noted (refer to Appendix D, *Aircraft Noise Analysis*, for more detailed discussion on noise).

In this EA, a single-event noise such as an overflight is described by the sound exposure level (SEL), airfield noise levels are measured in day-night average sound level (DNL), and airspace noise levels are calculated using the onset rate adjusted monthly day-night sound level (DNL_{mr}). Both DNL and DNL_{mr} noise metrics incorporate a “penalty” for night time events occurring between the hours of 10:00 p.m. and 7:00 a.m. to account for increased annoyance. A more thorough description of these noise metrics is provided below.

The ROI for the Proposed Action includes Moody AFB and vicinity; Moody 1, Moody 2 North, Moody 2 South, Moody 3, Live Oak, Bulldog A, and Bulldog B MOAs; VRs -1065 and -1066; and Restricted Areas R-3007 and R-3008.

Sound Exposure Level

The SEL measurement is used to describe such noise events as overflying aircraft. The SEL is a measurement that takes into account both the intensity and the duration of a noise event. The SEL measurement is composed of the following components: (1) a period of time when an aircraft is approaching a receptor and noise levels are increasing, (2) the instant when the aircraft is closest to the receptor and the maximum noise level is experienced, and (3) the period of time when the aircraft moves away from the receptor, resulting in decreased noise levels.

Noise generated by aircraft is often assessed in terms of a single event, which is incorporated into SEL measurements. The frequency, magnitude, and duration of single noise events vary according to aircraft type, engine type, power setting, and airspeed. Therefore, individual aircraft noise data are collected for various types of aircraft and engines at different power settings at various phases of flight. These values form the basis for the individual-event noise descriptors at any location and are adjusted to the location by applying appropriate corrections for temperature, humidity, altitude, and variations from standard aircraft operating profiles and power settings.

Day-Night Average Sound Level

The DNL is the energy-averaged sound level measured over a 24-hour period, with a 10 dB penalty assigned to noise events occurring between 10:00 p.m. and 7:00 a.m. DNL values are obtained by averaging the SEL values for a given 24-hour period. DNL is the preferred noise metric of the U.S. Department of Housing and Urban Development, FAA, EPA, and DoD.

Studies of community annoyance in response to numerous types of environmental noise show that DNL correlates well with impact assessments; there is a consistent relationship between

DNL and the level of annoyance. The “Schultz Curve” (see Appendix D) shows the relationship between DNL noise levels and the percentage of the population predicted to be highly annoyed. This same relationship can be applied to DNL_{mr} noise levels, since DNL_{mr} is always equal to or greater than DNL for a given condition.

Most people are exposed to sound levels of 50 to 55 dB (DNL) or higher on a daily basis. Research has indicated that about 87 percent of the population is not highly annoyed by outdoor sound levels below 65 dB (DNL) (FICUN 1980). Therefore, the 65-dB (DNL) noise contour is typically used to help determine compatibility of military operations with local land use, particularly for land use associated with airfields. For comparison purposes, normal conversation (at a distance of 3 feet) is approximately 60 dB, loud speech is approximately 70 dB, and the sound of a train approaching a subway platform is approximately 90 dB. At approximately 120 dB, sound can be intense enough to induce pain, while at 130 dB, immediate and permanent hearing damage can result (National Park Service 1997).

Onset Rate Adjusted Day-Night Average Sound Level

Noise from aircraft operations within Restricted Areas and MOAs and along MTRs is measured and evaluated differently than that within an airfield environment. Aircraft operations at airfields tend to be continuous or patterned, while sortie-operations in airspace are sporadic. Noise from military overflights also differs from airfield and community noise because of the low-altitude and high-speed characteristics of military aircraft maneuvers within MTRs, MOAs, and Restricted Areas. Military jet aircraft can exhibit a rate of increase in sound level (onset rate) of up to 150 dB per second. The DNL metric is adjusted to account for the surprise, or startle, effect of the onset rate of aircraft noise with an adjustment of up to 11 dB added to the normal SEL. Because of the sporadic occurrence of aircraft overflights in MOAs and along MTRs, the number of daily operations is determined from the calendar month with the highest number of operations in each area and is used to designate the DNL_{mr} .

Noise Modeling

Noise contributions from aircraft operations and ground engine run-ups at Moody AFB airfield were calculated using the NOISEMAP (NMAP) computer model, the standard noise estimation methodology used for military airfields. NMAP uses the following data to develop noise profiles: aircraft types, runway utilization patterns, engine power settings, airspeeds, altitude profiles, flight track locations, number of operations per flight track, engine run-ups, and time of day.

Noise levels resulting from aircraft operating in the affected MOAs, MTRs, and Restricted Areas were calculated with the Military Operating Area and Range Noise Model (MR_NMAP Version 2.2) (which incorporates NMAP technology). Calculations of noise levels may yield differing results for adjacent airspace elements, depending on the type, level, and frequency of training events. Resultant noise levels were based on the number of monthly sortie-operations, time of day, aircraft altitudes, average time in airspace, engine power settings, and airspeed.

3.2.1 Existing Conditions

3.2.1.1 Moody AFB and Vicinity

Using the OMEGA Version 11.5 computer model, SEL values were calculated for various altitudes for baseline aircraft at Moody AFB (Table 3.2-1).

Table 3.2-1. SELs (dB) for Aircraft based at Moody AFB

<i>Distance (ft)</i>	<i>T-6A</i>	<i>HH-60</i>	<i>HC-130</i>	<i>T-38</i>
500	89	91	96	113
1,000	85	87	91	107
2,000	80	81	85	101
2,500	78	79	83	98
8,000	69	68	72	83
KIAS	200	140	200	200

Notes: SEL values calculated under standard atmospheric conditions. Due to the varying power settings and airspeeds of aircraft, average power settings were used for noise analysis of aircraft operating in the airfield environment.

Aircraft flying in airfield airspace generally adhere to established flight paths and consistently overfly the same areas surrounding the airfield. At Moody AFB, noise from flight operations typically occurs beneath main approach and departure corridors and in areas immediately adjacent to the parking ramps and aircraft staging areas. As aircraft take off and gain altitude, their contribution to the noise environment drops to levels indistinguishable from existing background noise.

Land use guidelines identified by the Federal Interagency Committee on Urban Noise are used to determine compatible levels of noise exposure for various types of land use surrounding airports (FICUN 1980); 65 to 85+ dB (DNL) noise contours are frequently used to help determine compatibility of aircraft operations with local land use. These guidelines are included in Appendix D. Figure 3.2-1 represents the baseline 65–85 dB (DNL) noise contours in 5-dB increments surrounding the Moody AFB airfield. Table 3.2-2 presents the baseline acreage exposed to noise levels greater than 65 dB (DNL), based on baseline yearly aircraft operations shown in Table 2.2-2).

Table 3.2-2. Baseline Noise Contour Acreage in the Vicinity of Moody AFB

<i>Noise Contour (DNL)</i>	<i>Baseline (acres)</i>
65 – 70 dB	6,468
70 – 75 dB	3,253
75 – 80 dB	1,692
80 – 85 dB	979
85+ dB	707
Total	13,099

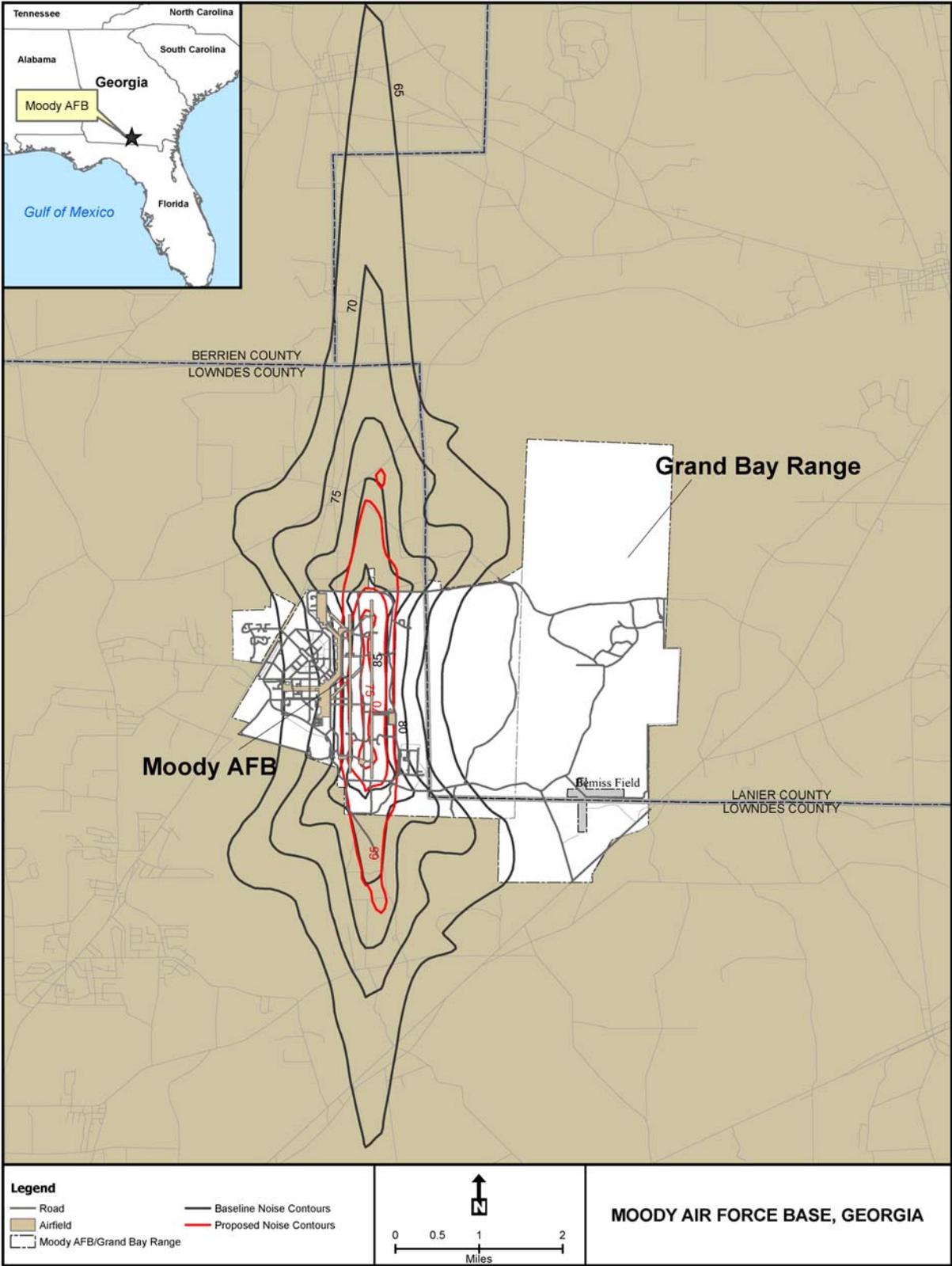


Figure 3.2-1. Baseline and Proposed Noise Contours for Moody AFB and Vicinity

Moody AFB received three noise complaints from the immediate vicinity of Moody AFB in the period from 1 July 2005 through 26 June 2006. Of these, two concerned HH-60 aircraft and one concerned a T-38 aircraft (Moody AFB 2006).

3.2.1.2 Airspace

Tables C-1 and C-2 in Appendix C present the average operational parameters for aircraft that contribute to the noise environment in affected airspace units. Baseline noise levels calculated for potentially affected airspace are presented in Table 3.2-3.

Table 3.2-3. Baseline Noise Levels in Affected Airspace

<i>Airspace</i>	<i>Annual Sortie-Operations</i>	<i>dB (DNL_{mr})</i>
Moody 1 MOA	16,670	<45
Moody 2 N MOA	3,396	46
Moody 2 S MOA	3,396	46
Moody 3 MOA	437	<45
Live Oak MOA	3,394	<45
Bulldog A MOA	2,075	<45
Bulldog B MOA	1,785	<45
VR-1065	14	<45
VR-1066	375	<45
R-3007 (Townsend Range)	4,000	63
R-3008 (Grand Bay Range)	3,094	53

Moody AFB received nine noise complaints from areas beneath various airspace units in the period from 1 July 2005 through 26 June 2006 (Moody AFB 2006). Of these, six were from the LATN area and concerned HH-60, HC-130, and F-16 aircraft (Moody AFB 2006).

3.2.2 Environmental Consequences

Noise effects in the vicinity of Moody AFB were analyzed using the NMAP computer model and the noise parameters contained in the program for the A/OA-10 aircraft. These values were then plotted to form noise contours in 5-dB increments ranging from 65 to 85+ dB (DNL). By comparing these contours to the baseline noise environment, and by overlaying the contour plot map of the vicinity, the degree of change and the extent of the noise effects were identified.

Projected noise levels for MOAs, MTRs, and Restricted Areas were calculated using the MR_NMAP computer program (which incorporates NMAP technology). The degree of change under the proposed action was identified by comparing changes in noise levels to baseline levels. The noise metric used for airspace is the DNL_{mr}.

The ROI for noise analysis includes the Moody AFB aerodrome, MOAs, MTRs, and Restricted Areas proposed for use by the A/OA-10 aircraft.

3.2.2.1 Proposed Action

Moody AFB and Vicinity

Under the Proposed Action, the total acreage in the vicinity of Moody AFB exposed to noise levels greater than 65 dB would significantly decrease from baseline conditions. Figure 3.2-1 presents baseline and projected noise contours in the vicinity of Moody AFB. Acreage exposed to noise levels between 65 dB and 85+ dB (DNL) under baseline conditions and the Proposed Action is presented in Table 3.2-4.

Table 3.2-4. Baseline and Projected Noise Contour Acreage in the Vicinity of Moody AFB

<i>Average Noise Level (DNL)</i>	<i>Baseline (acres)</i>	<i>Proposed (acres)</i>	<i>Change from Baseline (acres)</i>	<i>% Change from Baseline</i>
65-70 dB	6,468	932	-5,536	-86%
70-75 dB	3,253	493	-2,760	-85%
75-80 dB	1,692	127	-1,565	-92%
80-85 dB	979	0	-979	-100%
85+ dB	707	0	-707	-100%
Total	13,099	1,552	-11,547	-88%

As can be seen in Figure 3.2-1, the replacement of T-38 and T-6 aircraft with the A/OA-10 aircraft would provide less overall noise impacts. This aircraft and mission change, in addition to the reduction of the large number of closed patterns and overall reduction of airfield operations (approximately 80 percent), would result in a reduction in aircraft-associated noise at Moody AFB.

Airspace

Under the Proposed Action, there would be a reduction in sortie-operations in Moody 1 MOA, Moody 2 North MOA, Live Oak MOA, and VR-1066 and an increase in sortie-operations in Moody 2 South MOA, Moody 3 MOA, Bulldog A MOA, Bulldog B MOA, VR-1065, R-3007, and R-3008. Noise levels associated with five of the MOAs (Moody 1, Moody 3, Bulldog A and B, and Live Oak) would occur at 8,000 feet MSL or higher, and noise levels associated with these are virtually indistinguishable from background noise and are at levels where less than 3 percent of the population become highly annoyed (Finegold et al. 1994). Noise levels under both baseline and proposed conditions for these MOAs and VRs-1065 and 1066 are <45 dB (DNL_{mr}). (Table 3.2-5).

Maximum noise levels projected for Moody 2 North MOA, Moody 2 South MOA, and R-3008 would increase by 1, 2, and 3 dB (DNL_{mr}), respectively (Table 3.2-5). Since a 5-dB change is necessary for loudness to be noticeable (USEPA 1974), this increase would not be significant. In addition, the projected noise levels are equal to or less than the 65 dB (DNL) noise contour that is typically used to determine compatibility of military operations with local land use. Existing overflight avoidance procedures for noise-sensitive areas under the affected airspace would continue to be observed. Therefore, no significant change to the noise environment within the affected airspace would occur with implementation of the Proposed Action.

Table 3.2-5. Noise Levels in Affected Airspace under the Proposed Action

<i>Airspace</i>	<i>Baseline DNL_{mr} (dB)</i>	<i>Proposed DNL_{mr} (dB)</i>	<i>Change (dB)</i>
Moody 1 MOA	<45	<45	0
Moody 2 N MOA	46	47	1
Moody 2 S MOA	46	48	2
Moody 3 MOA	<45	<45	0
Live Oak MOA	<45	<45	0
Bulldog A MOA	<45	<45	0
Bulldog B MOA	<45	<45	0
VR-1065	<45	<45	0
VR-1066	<45	<45	0
R-3007	63	63	0
R-3008	53	56	3

3.2.2.2 No-Action Alternative

Under the No-Action Alternative, the proposed beddown of A/OA-10 aircraft, drawdown of T-38 and T-6 aircraft, and the associated change in airspace utilization would not occur. Consequently, baseline conditions, as described in Section 3.2.1, would remain unchanged. Therefore, there would be no changes to the noise environment at Moody AFB and within the currently utilized airspace.

3.3 Safety**3.3.1 Definition of the Resource**

This section addresses ground, flight, and explosive safety associated with operations conducted on Moody AFB and on the Grand Bay and Townsend Ranges. Ground safety considers issues associated with operations and maintenance activities that support range operations, including fire response. Flight safety considerations address aircraft mishaps and Bird/Wildlife Aircraft Strike Hazards (BASHs). Explosive safety discusses the management and use of ordnance or munitions associated with training activities.

3.3.2 Existing Conditions**3.3.2.1 Ground Safety**

Day-to-day operations and maintenance activities conducted at Moody AFB are performed in accordance with applicable Air Force safety regulations, published Air Force Technical Orders (TOs), and standards prescribed by Air Force Occupational Safety and Health (AFOSH) requirements. Specific safety requirements and responses to events that may occur on the range are detailed in published range operating procedures.

Air Force standards also specify fire and crash emergency service requirements associated with the type of fire, as well as crash response equipment and the number of personnel necessary to handle an aircraft mishap. These standards are based on the number and type of aircraft, type of flying missions, and size of the buildings at the installation. Moody AFB's fire and crash emergency services meet these standards. In addition, the Moody AFB fire department has mutual support agreements with nearby communities in case an exceptionally severe aircraft mishap occurs (Air Force 2000).

Specific procedures are also implemented for minimizing the risk of fire from range operations. When a high fire potential has been declared, the Range Control Officer (RCO) notifies 347th OSS/OSTR, which, in turn, notifies scheduled range users of the hazard and resultant operational limitations (i.e., cold spots required, no pyrotechnic materials allowed, etc.). During dry periods, specific targets and ranges with a high fire risk are continuously evaluated for the safety of planned operations. In the event of a large fire on the range, the RCO will close the range and notify all appropriate organizations. Any pilot observing a fire on or near the range complex is required to notify the RCO immediately (Air Force 2001a).

3.3.2.2 Flight Safety

Potential aircraft accidents may occur as a result of mid-air collisions, collisions with manmade structures or terrain, weather-related accidents, mechanical failure, pilot error, or wildlife-aircraft collisions. Flight risks apply to all aircraft; they are not limited to the military. Flight safety considerations addressed in this section include aircraft mishaps and BASHs.

Aircraft Mishaps

The Air Force defines four categories of aircraft mishaps: Classes A, B, and C and High Accident Potential. Class A mishaps result in loss of life, permanent total disability, a total cost in excess of \$1 million, destruction of an aircraft, or damage to an aircraft beyond economical repair. Class B mishaps result in total costs of more than \$200,000, but less than \$1,000,000, or result in permanent partial disability, but they do not result in fatalities. Class C mishaps involve costs of more than \$10,000, but less than \$200,000, or a loss of worker productivity of more than 8 hours. High Accident Potential represents minor incidents not meeting any of the criteria for Classes A, B, or C (Air Force 2006a). This section focuses on Class A mishaps because of their potential to affect private property or the public.

Based on historical data on mishaps at all installations and under all conditions of flight, the military services calculate Class A mishap rates per 100,000 flying hours for each type of aircraft in the inventory. It should be noted that these mishap rates do not consider combat losses due to enemy action. The Class A mishap rate per 100,000 flying hours, along with an estimation of the flying hours per aircraft associated with current conditions, can be used to compute a statistical projection of anticipated time between Class A mishaps. In evaluating this information, it should be emphasized that the data presented are only statistically predictive. Actual mishaps are caused by many factors, not simply the amount of flying time of the aircraft. Table 3.3-1 summarizes this information for Moody AFB. Shown are the aircraft currently using the base, the mishap rate for that type aircraft, the flying time that aircraft spends on the range, and the statistically predicted time between Class A mishaps.

Table 3.3-1. Moody AFB Projected Class A Mishaps (Current Conditions)

<i>Aircraft</i>	<i>Air Force-wide Total Class A Mishaps^a</i>	<i>Air Force-wide Mishap Rate^a</i>	<i>Annual Sorties at Moody AFB</i>	<i>Total Flight Time per Year (Hours)^b</i>	<i>Projected Class A Mishap (in Years)</i>
T-38	194	1.47	17,784	9,603	7.1
C-130	151	0.9	1,994	1,994	55.7
T-6	3	1.3	20,350	16,077	4.8
H-60	18	4.46	1,906	2,992	7.5

^aAir Force 2006a.

^bComputed by multiplying total sorties per airspace segment in baseline year by the time spent in each airspace segment.

It is impossible to predict the precise location of an aircraft accident, should one occur. Major considerations in any accident are loss of life and damage to property. The probability of an aircraft crashing into a populated area is extremely low, but it cannot be totally discounted. Several factors are relevant in the case of Moody AFB: The region around the base is made up for the most part of rural or natural areas; pilots of aircraft are instructed to avoid direct overflight of population centers at very low altitudes; and, finally, the limited amount of time the aircraft is over any specific geographic area limits the probability that a disabled aircraft would crash into a populated area.

Actual Class A mishaps occurring near Moody AFB over the last 13 years are summarized in Table 3.3-2. There are well-established procedures for responding to aircraft mishaps on non-Air Force property. When normal, scheduled flying is in progress, Moody AFB maintains highly trained emergency response teams, which are available to respond to aircraft crashes off site. Moody AFB maintains mutual aid agreements with local fire departments that detail each party's responsibility when responding to a mishap. The base also conducts regular aircraft mishap training exercises.

Bird/Wildlife Aircraft Strike Hazards

Bird/wildlife aircraft strikes constitute a safety concern because of the potential for damage to aircraft or injury to aircrews or local populations if an aircraft crash should occur. During the years 1985 to 2005, the Air Force BASH Team documented 66,642 bird strikes. Of these, 27 resulted in Class A mishaps where the aircraft was destroyed. These occurrences constituted approximately 0.04 percent of all reported bird-aircraft strikes (Air Force 2006a).

Although aircraft may encounter birds at altitudes of 30,000 feet (9,144 meters) MSL or higher, most birds fly close to the ground. Over 97 percent of reported bird strikes occur below 3,000 feet (914 meters) AGL. Approximately 30 percent of bird strikes happen in the airport environment, and almost 55 percent occur during low-altitude flight training (Air Force 2006a). In addition, aircraft face collision dangers from other wildlife, such as deer, during takeoff or landing.

Table 3.3-2. Class A Mishaps at or Near Moody AFB

<i>Date</i>	<i>Aircraft</i>	<i>Cause</i>	<i>Fatalities</i>
Feb 1993	F-16C	Fire In Afterburner/ Flameout	0 (Successful Eject)
Feb 1993	F-16	Aircraft Crashed at Night West of Moody AFB	0 (Successful Eject)
Oct 1994	F-16C	Hydraulic Failure/Gear- up Landing	0 (Successful Ground Egress)
Aug 1995	OA-10A	Aircraft Fire	0 (Successful Eject)
Apr 1997	OA-10A	Aircraft Struck Radio Tower	0 (Successful Eject)
Apr 1997	F-16C	Loss of Thrust	0 (Successful Eject)
Oct 1999	F-18/A (Navy Blue Angels)	Pilot "Blacked-Out" during Moody Air Show Rehearsal	2 (Unsuccessful Eject)
Nov 2000	F-16	Aircraft struck a private Aircraft East of Tampa, FL	1 (Unsuccessful Eject)
Oct 2001	HH-60G	Aircraft Over Banked, High Sink Rate, Crashed In River	0 (Successful Ground Egress)
Apr 2004 (Savannah, GA)	T-6A	Aircraft Crashed After Takeoff	2

Source: Kelly 2006

A BASH exists at Moody AFB and in its vicinity due primarily to local deer populations, resident birds, and migratory bird species. The Safety Office developed the BASH plan, 347 RQW Plan 91-202, *Bird Aircraft Strike Hazard Plan*, with inputs from other installation organizations. The fully integrated plan incorporates habitat modification with BASH dispersal techniques to minimize the presence of wildlife species on the airfield (Air Force 2006b).

Moody aircraft generally use southern Georgia and northern Florida as the primary low-level flying area. Mountainous low-level operations are also conducted in Tennessee, northern Georgia, and western portions of North and South Carolina. These areas have many features that attract a variety of birds, from migratory waterfowl to upland species to shore birds. The two most hazardous types are the raptors (hawks, black vultures, and turkey vultures) and migratory waterfowl. Deer on the runways may also pose a serious hazard. Deer populations are estimated to be roughly 21 per square mile (Air Force 2006b).

Over the last 6 years, there have been a total of 478 reported incidents of bird-aircraft strikes around Moody AFB, or an average of approximately 80 bird strikes per year. Table 3.3-3 summarizes bird strikes at the installation for all aircraft, and lists the damage incurred as a result of these strikes. Table 3.3-4 lists bird strikes during the same period for the T-6, T-38, HC-130, and HH-60 aircraft.

Table 3.3-3. Impacts of Bird Strikes at Moody AFB

<i>Year</i>	2000	2001	2002	2003*	2004*	2005*
# of Bird Strikes	28	41	53	137	100	119
Damaging Bird Strikes	5	4	2	6	0	6
Total Cost of Damage	\$51,053	\$166,020	\$27,276	\$173,653	\$0	\$575,510

Source: Kelly 2006

*Note: Documentation of bird strikes increased after Moody AFB hired the services of a wildlife biologist from the U.S. Department of Agriculture in 2003.

Table 3.3-4. Bird Strikes for Selected Aircraft at Moody (2000 to 2005)

<i>Aircraft</i>	<i># of Bird strikes</i>
T-6	36
T-38	18
HC-130	75
HH-60	39
Total	168

Source: Kelly 2006

In the immediate vicinity of Moody AFB, bird populations are controlled through aggressive habitat management procedures. When birds congregate, various bio-acoustic and pyrotechnic dispersal techniques are employed to reduce the bird density, with physical means employed to remove deer, alligators, turtles, and tortoises from the airfield. If required, other control measures that could be used are detailed in the unit BASH Plan (Air Force 2006b).

The presence of birds and the size and density of flocks are monitored by aircrew using Moody AFB and by range controllers. As the presence of birds increases, thereby creating an elevated safety risk, flight operations may be limited, modified, or even completely curtailed until the risk is reduced (Air Force 2006b).

3.3.2.3 Explosive Safety

Explosive safety quantity distance (QDs) areas are established under Air Force Manual 91-201, *Explosives Safety Standards*. The QDs are separation distances between explosive storage areas such as storage igloos, handling areas such as weapon loading areas, and other areas such as "hot" cargo pads. QDs are based on the maximum storage capacity of each facility to prevent explosive propagation from one storage facility to another. Additionally, QDs are established to provide a safety zone between the explosive storage areas and the surrounding areas. Moody AFB has developed Explosive Safety Zones and associated QDs around Main Base areas where munitions are stored or handled (Table 3.3-5) (Air Force 2006c).

Table 3.3-5. Quantity Distance Zones

Location	Radius (ft)	Location	Radius (ft)
Munitions Storage Igloos (2)	3,150	Combat Aircraft Parking Ramp	400
Rapid Assembly Munitions Site	1,475	Combat Aircraft Parking Ramp	100
Suspected Vehicle Parking Areas	1,400	C-130 Ramp	400
Hot Cargo Pad	1,400	C-130 Ramp Exercise Area	800
Holding Area for Munitions	400	EOD Range	2,010
AIM-120 Exercise Area	800	Suspected Unexploded Ordnance	1,250

Source: Air Force 2006c

On the ranges, use of ordnance during training is normally limited to designated impact areas. Ordnance currently used at Moody AFB includes training and inert bombs and gun and cannon ammunition fired from aircraft and helicopters. The use of live ordnance is prohibited on Grand Bay Range and Townsend Range. The predominant training bomb used on the range is the BDU-33. This is a small training bomb weighing approximately 25 pounds, composed of ferrous metals and equipped with a small spotting charge that serves as an aid for visual scoring of delivery accuracy.

Range training operations are covered under AFI 13-212V1_ACCSUP1, Supplement 1, *Weapons Ranges*, and ANGI 13-312 and Townsend Range local supplements. The supplement assigns responsibilities and defines operating criteria for both routine and emergency situations at Moody AFB and Townsend Range. Safety standards require safeguards on weapons systems and ordnance to ensure against inadvertent releases. All munitions mounted on aircraft are equipped with mechanisms that preclude release or firing without activation of an electronic arming circuit. System malfunctions or material failures that could result in either an accidental firing of ordnance or the release of a dud component that fails to operate properly cannot be totally discounted. However, studies have shown that the probability of such accidents is so small that the risk associated with the occurrence can be essentially discounted (ACC 1999).

In accordance with AFI 13-212, *Range Planning and Operations*, Moody AFB has the range impact areas cleared on a regular basis. Trained Explosive Ordnance Disposal (EOD) personnel inspect all debris. If items are deemed hazardous or unknown, EOD uses a small charge to eliminate the danger of explosion.

When live (high-explosive) ordnance impacts a target, it detonates, and the effects of this detonation are blast and overpressure in the immediate vicinity of the target. When a training (inert) air-to-ground weapon impacts on or near the target, it may skid, bounce, or burrow under the ground for some distance from the point of impact, coming to rest at some distance from that point. The military services have analyzed extensive historical data on ordnance and incorporated those data into a computer program (called SAFE-RANGE). SAFE-RANGE considers the type of ordnance, the aircraft, the delivery profile, the target type, and other data

such as the demonstrated accuracy of the aircraft's bombing and navigation system. The program then calculates an area around the target within which either effects from live ordnance will spread or the specific training or inert ordnance under consideration will come to rest. This area has dimensions in front of, behind, and on either side of the target. The results reflect (at a 95 percent confidence level) the geographic area that will contain 99.99 percent of the specific weapon's deliveries and their effects (Air Force 2001a).

Operations conducted by 347 RQW aircrews have been subjected to these analyses, and detailed operating procedures published by the air-to-ground ranges that support 347 RQW training ensure that all safety standards are met for the type of ordnance delivered and the delivery profile associated with that ordnance delivery.

3.3.2.4 Chaff and Flare Use

Chaff and defensive flares are managed as ordnance. Chaff and flares are authorized for use by A-10 squadrons. Use is governed by detailed operating procedures to ensure safety. Chaff, which is ejected from an aircraft to reflect radar signals, is small fibers of aluminum coated silica packed into approximately 4-ounce bundles. When ejected, chaff forms a brief electronic "cloud" that temporarily masks the aircraft from radar detection. Although the chaff may be ejected from the aircraft using a small pyrotechnic charge, the chaff itself is not explosive (Air Force 1997). Recently, approximately 18,600 bundles of chaff were expended within Moody AFB airspace. Two 1-inch by 1-inch plastic or nylon pieces and one 1-inch by 1-inch felt piece fall to the ground with each released chaff bundle. Appendix A provides an expanded discussion of chaff.

Defensive training flares consist of small pellets of highly flammable material that burn rapidly at extremely high temperatures. Their purpose is to provide a heat source other than the aircraft's engine exhaust to mislead heat-sensitive or heat-seeking targeting systems and decoy them away from the aircraft. The flare, essentially a pellet of magnesium, ignites upon ejection from the aircraft and burns completely within approximately 3.5 to 5 seconds, or approximately 400 feet from its release point (Air Force 1997). Recently, approximately 43,900 flares were expended within Moody AFB airspace.

The existing use of flares as defensive countermeasures results in small plastic, nylon, and aluminum-coated mylar pieces falling to the ground. As discussed in Appendix A, "Characteristics of Flares," flare residual materials are generally light, with a high surface-to-weight ratio. This results in essentially no likelihood of a flare end cap, piston, or wrapper causing injury in the highly unlikely event residual material from a flare struck a person or an animal. The only exception is the flare safe and initiation (S&I) device, which falls with the force of a medium-sized hailstone. Calculations of the likelihood of an S&I device striking an individual take into consideration the population density under the airspace, the number of flares deployed, and the amount of time the population was outside and unprotected even by a hat.

3.3.3 Environmental Consequences

This section addresses potential impacts to safety. The issues that have a potential to affect safety are evaluated relative to the degree to which the activity increases or decreases safety risks to military personnel, the public, and property. Issues addressed in this section are ground safety (including fire resulting from an aircraft mishap); flight safety (including mishap and bird-strike potential), and explosives safety. The potential for the Proposed Action to increase these risks is assessed, as well as the Air Force's capability to manage these risks.

3.3.3.1 Proposed Action

Ground Safety

Ground operations and maintenance activities on Moody AFB would continue to be conducted using the same processes and procedures as under current operations. All actions would be accomplished by technically qualified personnel and would be conducted in accordance with applicable Air Force safety requirements, approved technical data, and AFOSH standards.

To support the conversion to A-10 training, several facilities would be constructed, while other facilities would be altered or have additional space developed. Additionally, some facilities may be demolished to accommodate new construction. No unique construction practices or materials are required to construct these facilities. During construction, standard industrial safety standards and best management practices (BMPs) would be followed. No unusual ground safety risks would be expected from these activities.

Moody AFB's fire and crash emergency response services meet required Air Force standards. TO 00-105E-9, *Aircraft (Fire Protection), Revision 11*, dated 1 February 2006, provides detailed fire response information for U.S. Air Force, U.S. Army, and selected commercial aircraft. The TO details fire response procedures and personal protection equipment requirements associated with each aircraft. Among the aircraft covered under the TO are current aircraft operated at Moody AFB, as well as the A-10 (Air Force 2006d).

Moody AFB maintains mutual aid agreements with local fire departments in the surrounding area. Should an A-10 crash occur in one of these areas, community firefighters may attempt to extinguish any resulting fire. Consequently, any unique training associated with A-10 crash response would also have to be extended to personnel from local fire departments.

Flight Safety

The Air Force calculates Class A mishap rates per 100,000 flying hours for each type of aircraft in the inventory. The Class A mishap rate per 100,000 flying can be used to compute a statistical projection of anticipated time between mishaps. Over the 30 years the A-10 has been in the inventory, 100 aircraft have been destroyed in non-combat mishaps. This is an average of 2.9 mishaps per year over the life of the aircraft, or a lifetime rate of approximately 2.30 mishaps per 100,000 flying hours. During the last 10 years (1995 to 2005), the numbers are slightly better. Since 1995, there have been 20 A-10 Class A mishaps or 2.0 per year and a mishap rate of 1.53 (Air Force 2006a).

Table 3.3-6 summarizes projected time between mishaps for aircraft at Moody AFB. The table presents the statistically predicted time between Class A mishaps for current conditions and for conditions under the Proposed Action. As previously stated this analysis makes only a statistical prediction regarding the frequency of mishaps and may not represent real-world conditions. Actual mishaps for Moody AFB aircraft are summarized in Table 3.3-2. Current safety policies and procedures at the base are designed to ensure that the potential for aircraft mishaps is reduced to the lowest possible level. These safety policies and procedures would continue under the Proposed Action.

Table 3.3-6. Moody AFB Projected Class A Mishaps (Current Conditions and Proposed Action)

<i>Aircraft</i>	<i>Air Force-wide Total Class A Mishaps^a</i>	<i>Air Force-wide Mishap Rate^a</i>	<i>Annual Sorties at Moody AFB Proposed Action</i>	<i>Total Flight Time per Year (Hours)^b Proposed Action</i>	<i>Projected Class A Mishap (in Years) Current Conditions</i>	<i>Projected Class A Mishap (in Years) Proposed Action</i>
C-130	151	0.9	1,994	1,994	55.7	55.7
T-38	194	1.47	0	0	7.1	-
T-6	3	1.3	0	0	4.8	-
H-60	18	4.46	1,906	2,992	7.5	7.5
A-10	100	2.3	15,800	10,902	-	4.0

^aAir Force 2006a

^bComputed by multiplying total sorties per airspace segment in baseline year times the time spent in each airspace segment.

Over the last 6 years there have been 478 reported incidents of bird-aircraft strikes around Moody AFB, with 168 strikes associated with the T-6, T-38, HC-130, and HH-60 aircraft (Section 3.3.2.2). Under the Proposed Action, the number of total annual sorties for all aircraft at the base would drop by approximately 47 percent, from 42,534 to 20,200. It would be expected that the number of bird strikes per year would similarly decrease. The overall risk associated with bird-aircraft strikes is expected to remain low; none of the bird-aircraft strikes occurring at the base were Class A mishaps.

Explosives Safety

The Proposed Action would include construction/renovation of facilities where munitions may be stored (e.g., Munitions Holding Area, Building 1725; Munitions Inspection Facility, Building 1107; Munitions Operations Facility, Building 1122; etc.). Additionally, other ordnance storage areas may be constructed to support the A-10 mission. These facilities would be designed and fully licensed for the ordnance they store. Additionally, Moody AFB would develop/implement appropriate QDs to mitigate potential hazards associated with the storage of munitions at these locations.

The primary training munition associated with A-10 operations is the 30mm round fired from the aircraft Vulcan cannon. As part of the Proposed Action, it is projected that 354,000 and 62,500

rounds of 30mm ammunition would be fired at Grand Bay Range and Townsend Range, respectively. Other ammunition that would continue to be expended at these ranges includes 20mm, 7.62mm, BDU-33s, and 2.75-inch rockets. Additionally, the Proposed Action would include the use of *inert* 500- and 2,000-pound bombs (MK-82 and MK-84). All training bombs and munitions would be delivered to existing targets. Because the types of bombs and munitions to be used at the ranges are similar to current conditions, the Proposed Action would not be expected to prevent or significantly limit the ability of the range manager to conduct EOD and range maintenance activities. Aircrews would also continue to expend chaff and flares during training, in accordance with existing range operating procedures. All ordnance would be handled by trained and qualified personnel in accordance with all explosive safety standards and detailed published technical data.

As part of the range safety process, weapon safety footprints would be generated using the SAFE-RANGE program that defines the personnel evacuation area during training activities. Safety footprints act as an overlay that restricts activities that could normally occur within and adjacent to training areas. Footprints are generally developed considering several factors, such as weapon maximum "fly-out" capability, blast fragmentation distances, and blast overpressure levels. Weapon safety footprints for ballistic weapons, such as bullets, are derived using statistical methods and include safety zones for initial impacts as well as ricochets. Standard safety procedures also exist to ensure limited public access to affected training areas during training.

On the aircraft, there are several electro-mechanical safeguards specifically designed to prevent the accidental, inadvertent, or uncommanded release of ordnance. Because the aircraft's bombing system is a man-made, electro-mechanical system, it is impossible to state categorically that an accidental release of ordnance could never occur; however, safety risk analyses show that the risk of accidental releases that could have serious consequences is so small that it can be essentially discounted (ACC 1999). While the occurrence of an accidental release is not impossible, it is highly improbable.

Alternatively, there is the potential for a commanded release to be ineffective, resulting in "hung" ordnance. In such an event, following range operating procedures, the RCO would direct the pilot to follow "hung ordnance" procedures. If these were ineffective, the pilot would be directed to avoid overflight of populated areas and return to a military location where ordnance technicians could dispose of the ordnance. Implementation of the Proposed Action would not result in heightened explosive safety concerns.

3.3.3.2 No-Action Alternative

Under the No-Action Alternative, operations on the base and throughout the region would continue under current conditions. Therefore, implementation of this alternative would have no net impact on safety.

3.4 Air Quality

Identifying the affected area for an air quality assessment requires knowledge of sources of air emissions, pollutant types, emission rates and release parameters, proximity to other emissions sources, and local conditions. Refer to Appendix E, Air Quality, for review of air quality and associated methodologies used for emissions calculations.

3.4.1 Definition of 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. The levels of pollutants are generally expressed by concentration in units of parts per million or micrograms per cubic meter. For this air quality analysis, the ROI centers on Lowndes County, Georgia, where Moody AFB is located.

The baseline standards for pollutant concentrations are the National Ambient Air Quality Standards (NAAQS) and state air quality standards. These standards represent the maximum allowable atmospheric concentration that may occur while still protecting public health and welfare. Further discussion of the NAAQS and state air quality standards are included in Appendix E.

3.4.2 Existing Conditions

Moody AFB is located near Valdosta, Georgia, in Lowndes County, which is part of the Southwest (SW) Georgia Interstate Air Quality Control Region (AQCR). The Proposed Action will be compared to both Moody AFB baseline emissions and the emissions in the SW Georgia AQCR. Moody AFB baseline emissions are presented in Table 3.4-1. SW Georgia AQCR emissions were obtained from the U.S. Environmental Protection Agency's (USEPA) 2002 National Emissions Inventory (NEI), which are presented in Table 3.4-2. The SW Georgia AQCR data include emissions data from point sources, area sources, and mobile sources. *Point sources* are stationary sources that can be identified by name and location. *Area sources* are point sources 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. *Mobile sources* are any kind of

Table 3.4-1. Moody AFB Baseline Emissions

Source Category	Emissions tons/year					
	CO	NO _x	SO _x	VOC	PM ₁₀	HAPs
Aircraft*	76,426.14	5,599.61	1,232.32	6,375.13	1,804.87	--
Stationary Sources	132.5	12.5	3.4	61.8	18	4.5
AGE	27.4	6.6	3.3	4	3.6	--
Personal Vehicle Use	122	12.1	<0.1	18.2	0.5	--
Vehicle Operations	75.5	64.4	<0.1	11.6	4.8	--
Total	76,783.54	5,695.21	1,239.02	6,470.73	1,831.77	4.50

* Aircraft emissions calculated using baseline numbers stated in Section 2

Source: Air Force 2000. *Final Environmental Assessment Joint Primary Aircraft Training System (JPATS)/T-6A Beddown*. Moody AFB, Georgia. March 2000

HAP = hazardous air pollutants

Table 3.4-2. Baseline Emissions Inventory for SW Georgia AQCR

<i>Source Category</i>	Emissions (tons/year)				
	<i>CO</i>	<i>NO_x</i>	<i>SO₂</i>	<i>VOC</i>	<i>PM₁₀</i>
Area Source	12,900	2,707	4,624	20,224	177,541
Non-Road Source	47,935	8,402	753	6,412	739
On-Road	240,709	28,333	1,037	20,493	716
Point Source	7,312	7,803	14,719	4,556	4,189
Total	308,857	47,224	21,133	51,685	183,185

vehicle or equipment with a gasoline or diesel engine, an airplane, or a ship. On-road and non-road are two types of mobile sources. On-road consists of vehicles such as cars, light trucks, heavy trucks, buses, engines, and motorcycles. Non-road sources are aircraft, locomotives, diesel and gasoline boats and ships, personal watercraft, lawn and garden equipment, agricultural and construction equipment, and recreational vehicles (USEPA 2005).

Construction projects, additional personnel, based aircraft changes, and munitions use are the main issues generated by the Proposed Action and will be the focus of the air analysis. This includes emissions from heavy construction machinery, semi-tractor trailer rigs, dust (particulate matter) from unpaved roads, white phosphorous use and emissions associated with military aircraft, and vehicle exhaust from contracted employees' personal vehicles. For the analysis of the Proposed Action, a threshold on an individual pollutant-by-pollutant basis has been established. The individual pollutant emissions from the project would not exceed 10 percent of SW Georgia AQCR emissions for each corresponding pollutant as represented in the USEPA 2002 NEI (USEPA 2002).

3.4.3 Environmental Consequences

In order to evaluate the air emissions and their impact to the overall ROI, the emissions associated with the project activities were compared to the total emissions on a pollutant-by-pollutant basis for the ROI's 2002 NEI data. Potential impacts to air quality are identified as the total emissions of any pollutant that equals 10 percent or more of the ROI's emissions for that specific pollutant. The 10 percent criteria approach is used in the General Conformity Rule as an indicator for impact analysis for non-attainment and maintenance. Although Lowndes County is an attainment area, the General Conformity Rule's impact analysis was utilized to provide a consistent approach to evaluating the impact of construction and aircraft emissions.

A DoD-developed model, the Air Conformity Applicability Model (ACAM), used by the U.S. Air Force for conformity evaluations, was utilized to provide a level of consistency with respect to emissions factors and calculations. Air emissions estimated using ACAM were compared to the established 10 percent criterion for SW Georgia AQCR as represented in the USEPA 2002 NEI (USEPA 2002). Emissions associated with change in aircraft types and operations, munition use, and construction activities are the main issues generated by the Proposed Action and were the focus of the air analysis. Air quality issues associated with operational activities at Moody AFB

after the completion of construction are not included in this evaluation; however, the anticipated changes in aircraft types at Moody AFB were incorporated into the evaluation.

Fugitive dust, nitrogen oxide (NO_x), and carbon monoxide (CO) constitute the majority of the emissions from construction activities and the project overall. A construction operation incorporates grading operations, construction worker trips, stationary equipment (e.g., generators and saws), mobile equipment, non-residential architectural coatings, and acres paved. Approximately 7 percent of the total particulate matter less than or equal to 10 micrometers in diameter (PM₁₀) emissions for the project are associated with grading activities during the early stages of the construction phase. PM₁₀, CO, and NO_x are the primary pollutants of concern from construction activities, constituting 12 percent of overall project emissions. A majority of the CO emissions are associated with stationary equipment (e.g., saws and generators), while the NO_x emissions are primarily associated with mobile sources.

The air analysis focuses on the affects of the addition of aircraft, construction projects, increase in personnel, and use of white phosphorous. The loss of aircraft was accounted for in the analysis. All gains and construction projects were distributed over FY 2007 and 2008.

3.4.3.1 Proposed Action

The Proposed Action requires the addition/renovation of A/OA-10 and the loss of T-38C and T-6A aircraft, an increase in military and civilian personnel, construction of 40 structures/buildings, and an increase in munitions to be used at both Grand Bay and Townsend ranges.

Construction Emissions. Under the Proposed Action, construction/renovation of 40 buildings at Moody AFB would occur over a period of 4 years (FY 2006–2010). This will cause an increase in fugitive dust emissions affecting the local air quality temporarily. Annual emissions expected from construction projects are summarized in Table 3.4-3 for the life of the project, assuming all construction would be completed within 6 months of the start date. During proposed construction activities, BMPs (i.e., wetting down of dirt) would be enacted to minimize potential fugitive dust emissions. There would be no significant degradation of local or regional air quality as a result of proposed construction activities.

Aircraft Emissions. With the addition of 48 A/OA-10 and loss of 45 T-6A and 68 T-38C aircraft, the aircraft emissions are expected to decrease. The annual sorties are expected to decrease by 53 percent with the Proposed Action, thus decreasing annual emissions from aircraft (Table 3.4-4). Thus, no significant impact to the local and regional air quality is expected.

Munitions Emissions. The munition of primary concern is the 2.75-inch rocket carrying white phosphorous, to be used at Grand Bay Range. White phosphorous used in military projectiles burns spontaneously when exposed to air and produces dense white smoke made up of various oxides of phosphorous. The USEPA considers white phosphorous a hazardous air pollutant (HAP). However, as discussed below, projected levels of HAP emissions are not significant compared to major source thresholds, and white phosphorous munitions are not one of the listed source categories.

Table 3.4-3. Proposed Action Construction Air Emissions by Activity

<i>Source Category</i>		Emissions (tons/ year)				
		<i>CO</i>	<i>NO_x</i>	<i>SO₂</i>	<i>VOC</i>	<i>PM₁₀</i>
Life of Project 2006-2010	Grading Equipment	0.05	0.20	0.02	0.02	0.02
	Grading Operations	0.00	0.00	0.00	0.00	6.01
	Acres Paved	0.00	0.00	0.00	0.00	0.00
	Mobile Equipment	15.50	36.95	4.57	3.38	2.98
	Residential Arch. Ctgs.	0.00	0.00	0.00	0.02	0.00
	Stationary Equipment	105.10	2.72	0.14	3.93	0.08
	Workers Trips	1.74	0.10	0.00	0.11	0.01
	Totals	122.39	39.98	4.73	7.47	9.10

CO = carbon monoxide

NO_x = nitrogen oxidePM₁₀ = particulate matter less than or equal to 10 micrometers in diameterSO₂ = sulfur dioxide

VOC = volatile organic compound

Table 3.4-4. Proposed Action Annual Aircraft Emissions

<i>Aircraft Operations</i>		Emissions (tons/ year)				
		<i>CO</i>	<i>NO_x</i>	<i>SO₂</i>	<i>VOC</i>	<i>PM₁₀</i>
Annual	Auxiliary Ground Equipment	316.13	504.35	31.01	35.01	18.64
	AFO – Afterburner	0.00	0.00	0.00	0.00	0.00
	AFO – Approach	20.55	46.52	5.76	2.97	17.58
	AFO – Taxi/Idle-In	80.05	66.58	9.45	67.14	32.47
	AFO – Intermediate	2.72	15.98	1.65	0.69	2.41
	AGO – Afterburner	0.05	0.10	0.01	0.01	0.03
	AGO – Approach	0.67	1.74	0.21	0.12	0.73
	AGO – Taxi/Idle-In	0.42	0.45	0.06	0.33	0.22
	AGO – Intermediate	0.18	1.03	0.11	0.04	0.16
	Totals	420.77	636.75	48.25	106.30	72.24

White phosphorous smoke is typically deposited as phosphoric acid or phosphate compounds on land and water. White phosphorous reacts rapidly in air. However, in some cases particles may be coated with a protective layer of oxides preventing further oxidation, thus increasing the lifetime of the elemental phosphorous in the air and on the ground after deposition. It is estimated that up to 10 percent of the phosphorous from white phosphorous rockets enters the atmosphere as unburned. Assuming that the smoke consists entirely of orthophosphoric acid (H₃PO₄) results in a conservatively large estimate of smoke mass, since H₃PO₄ has the highest smoke-to-phosphorus mass ratio or “yield factor” of any of the combustion products. A yield factor of 7.9-to-1 smoke to white phosphorous (assuming 90 percent relative humidity) and 250 rockets with white phosphorous (at 2.2 pounds of phosphorus per rocket) could produce 4,300 pounds (2.17 tons) of white phosphorous smoke (Air Force 2003). Assuming that all of the white phosphorous would combust and be released as PM₁₀ as describe above, then this Proposed Action would result in an estimated increase of 2.17 tons per year. These levels are minimal when compared to the regional PM₁₀ emissions. No impacts are expected from the use of white phosphorous rockets to the local or regional air quality.

Munitions Emissions. Munitions were evaluated for both Grand Bay Range and Townsend Range. The A/OA-10 mission will not affect the number of 7.62 and 20mm rounds expended currently. Munitions analyzed include BDU-33; LUU-1, LUU-2, and LUU-19 Flares; RR-188 Chaff; and 2.75 Rockets with and without white phosphorous. White phosphorous was assumed to be expended only on Grand Bay Range. A summary of munitions emissions are illustrated in Table 3.4-5 for Grand Bay Range and Table 3.4-6 for Townsend Range.

Summary. Emissions generated by the Proposed Action are summarized in Table 3.4-7. Emissions are compared to the SW Georgia AQCR as well as Moody AFB baseline emissions. All emissions will remain below 10 percent of the region’s current air emissions, illustrating minimal impact to the air quality in the area. A temporary spike in emissions from construction activities is expected. Negative impacts are not expected with the Proposed Action.

Table 3.4-5. Munitions Emissions at Grand Bay Range

<i>Munition</i>	<i>Number of Items</i>	<i>NEW* (lbs)</i>	Emissions (tons/yr)				
			<i>CO</i>	<i>NO_x</i>	<i>SO₂</i>	<i>VOC</i>	<i>PM₁₀</i>
7.62mm	268,800	0	0.09	0.01	0.00	0.00	0.00
20mm	19,230	0.0285	0.07	0.00	0.00	0.00	0.00
30mm	354,000	0.1019	4.51	0.17	0.00	0.00	0.25
BDU-33	4,900	0.083	0.00	0.00	0.00	0.00	0.00
2.75 Rockets	696	1.7	0.00	0.00	0.00	0.00	0.00
Total Emissions			4.67	0.18	0.00	0.00	0.25

* NEW = Net Explosive Weight

Source: AP-42, 2005

Table 3.4-6. Munitions Emissions at Townsend Range

Munition	Number of Items	NEW* (lbs)	Emissions (tons/yr)				
			CO	NO _x	SO ₂	VOC	PM ₁₀
7.62mm	0	0	0.00	0.00	0.00	0.00	0.00
20mm	253,800	0.0285	0.90	0.03	0.00	0.00	0.05
30mm	50,000	0.1019	0.64	0.02	0.00	0.00	0.04
BDU-33	2,100	0.083	0.00	0.00	0.00	0.00	0.00
2.75 Rockets	450	1.7	0.00	0.00	0.00	0.00	0.00
Total Emissions			1.54	0.05	0.00	0.00	0.09

* NEW = Net Explosive Weight
Source: AP-42, 2005

Table 3.4-7. Summary of Air Emissions Compared to SW Georgia AQCR

Emission Activities	Emissions (tons/year)				
	CO	NO _x	SO ₂	VOC	PM ₁₀
Construction	122.39	39.98	4.73	7.47	9.10
Aircraft	420.77	636.75	48.25	106.30	72.24
Munitions (Grand Bay Range)	4.73	0.18	0	0	0.26
White Phosphorous	0	0	0	0	2.17
Total	547.83	676.91	52.98	113.77	85.10
AQCR 59 Emissions	547.89	676.91	52.98	113.77	83.77
Percentage of AQCR 59 Emissions	0.18%	1.43%	0.25%	0.22%	0.05%

3.4.3.2 No-Action Alternative

Since the 2005 BRAC report requires that these activities occur at Moody AFB, the present baseline is the No-Action Alternative, which is for comparison purposes solely.

3.5 Physical Resources

3.5.1 Definition of Physical Resources

Physical resources include existing earth and water resources and hazardous materials and waste management within and immediately adjacent to the ROI for the Proposed Action. The ROI for the Proposed Action consists of Moody AFB where construction and ground-disturbing activities would occur. Ground-disturbing activities would not occur on land under any airspace unit proposed for use under the Proposed Action. Therefore, these areas are excluded from further analysis of earth resources for the Proposed Action.

Earth resources are defined as the geology, topography, and soils of a given area. The geology of an area includes bedrock materials, mineral deposits, and fossil remains. Topography refers to terrain, dominant landforms, and other visible features. Soils are unconsolidated materials on or near the surface and are defined by classifications and associations. A soil classification is a

broad term for the general type of soil found in a larger area (e.g., hydric, alluvial, or clay soils). Soil associations are site-specific based on the particular soil type or complex found at that location. Water resources include both surface and subsurface water. Surface water includes all lakes, ponds, rivers, streams, impoundments, and wetlands within a defined area or watershed. Subsurface water, commonly referred to as groundwater, is typically found in certain areas known as aquifers. Aquifers are areas of mostly high porosity soil where water can be stored between soil particles and within soil pore spaces. Groundwater and surface water are both impacted by stormwater infiltration and runoff generated during rain events.

The Clean Water Act (CWA) of 1972 is the primary federal law that protects the nation's waters, including lakes, rivers, aquifers and coastal areas. The primary objective of the CWA is to restore and maintain the integrity of the nation's waters. Stormwater management is regulated under the National Pollutant Discharge Elimination System (NPDES) section of the CWA and the Georgia Erosion and Sedimentation Control Act (GESCA). All construction and industrial activities that have the potential to impact stormwater quality or disturb more than 1.0 acre of land must be permitted under NPDES (or the equivalent GESCA) regulations.

Hazardous materials are identified and regulated under the Comprehensive Environmental Response, Compensation, and Liability Act; the Occupational Safety and Health Administration; and the Emergency Planning and Community Right-to-Know Act (EPCRA). Hazardous materials have been defined in AFI 32-7086, *Hazardous Materials Management*, to include any substance with special characteristics that could harm people, plants, or animals. Hazardous waste is defined in the Resource Conservation and Recovery Act (RCRA) as any solid, liquid, contained gaseous or semisolid waste, or any combination of wastes that could or do pose a substantial hazard to human health or the environment. Waste may be classified as hazardous because of its toxicity, reactivity, ignitibility, or corrosivity. In addition, certain types of waste are "listed" or identified as hazardous in 40 CFR 263.

Solid wastes are wastes that do not meet the requirement for hazardous waste and whose disposal is not regulated under RCRA. Solid wastes are regulated under the Solid Waste Disposal Act (42 U.S.C. 3251 et seq.), which established guidelines for solid waste collection, transport, separation, recovery, and disposal systems. RCRA amended this act by shifting the emphasis from disposal to recycling and reuse of recoverable materials.

3.5.2 Existing Conditions

3.5.2.1 Earth Resources

Geology

Geologically, Moody AFB is located within the Georgia Lower Coastal Plain. The predominant landform on about 80% of this area consists of moderately dissected, irregular plains of marine origin formed by deposition of continental sediments onto the submerged shallow continental shelf, which was later exposed when the sea receded from this area. Rock units formed during the Mesozoic and Cenozoic Eras consist of Cretaceous marine sediments (sands and clays) and Tertiary marine deposits (siliceous strata with lignitic, sandy, and argillaceous deposits). The most important stratigraphic unit is the Suwannee Limestone, which contains the upper

portions of the Floridan Aquifer. This layer ranges in thickness from approximately 200 to 250 feet and is usually less than 200 feet below ground surface.

Topography

Moody AFB is located in the Tifton Upland District, East Gulf Coastal Plain Section, Coastal Plain Province, Atlantic Plain Major Division physiographic province. The Tifton Upland District is characterized by flat to sloping plateaus separated by shallow river valleys, broad wetland depressions, and karst topography. Elevations in this area range from 480 feet in the north to 150 feet in the southeast indicating the regional slope.

The northwestern and northern boundary of this area is the base of the Pelham Escarpment which rises as much as 200 feet above the Dougherty Plain. The eastern boundary follows the eastern drainage divide of the Alapaha River. Specifically, Moody AFB is located on the level plateau between the Withlacoochee River on the west and the Alapaha River on the east. The eastern portion of the base, Grand Bay Range, is primarily located in a low area known as Grand Bay Swamp. Land surface elevations on Moody AFB vary from its lowest point on the eastern portion at approximately 190 feet MSL to about 240 feet MSL near the center of the base. Slopes range from 0 to 5 percent. Moody AFB also contains karst topographical traits. Karst topography is marked by circular depressions formed from groundwater erosion of the underlying limestone. The depressions, also known as lime sinks or sinkholes, vary greatly in size and depth and are partially filled with alluvium from the surrounding uplands. Some contain large amounts of peat and are often inundated with water throughout the year (USDA 1979). These characteristics exist at Moody AFB due to the thinner overburden materials and higher elevations of the underlying limestone layers (Moody AFB 1994). Consequently, testing of soil stability and load bearing capacity is a requirement before implementing any construction project (USDA 1979).

Soils

Moody AFB is located in the Tifton Upland District of the Lower Coastal Plain. Surface soils are typically characterized by sandy clay interbedded with fine sand to coarse-grained sand and sandy limestone (USDA 1979). General characteristics of this region include well-drained soils and slopes ranging from 0 to 12 percent. The upland soils were formed from deep sedimentary sands and clays, with lower alluvial soils formed from eroded uplands (Moody AFB 1994). The two most dominant soil associations at Moody AFB include the Tifton-Pelham-Fuquay and the Dasher associations. The majority of the cantonment area (located immediately east of State Highway 125) consists of the Tifton-Pelham-Fuquay association containing soils with a sandy surface layer and loamy subsoil. The Dasher association covers the majority of the Grand Bay Range and consists of soils in marshes, swamps, and drainageways.

Soil erosion has not historically been a problem at Moody AFB due to the relatively level terrain and the current practice of keeping military vehicles in previously disturbed training areas and on existing roadways (paved and dirt). Most of the undeveloped areas on the eastern portion of the installation consist of generally poorly drained organic soil in swamps, marshes, and poorly defined drainages. In order to allow construction in these areas, the soils can require costly preparation and maintenance efforts; however, mitigation is practical should mission increases necessitate further expansion to the east. A Section 404 permit must be obtained from

the U.S. Army Corps of Engineers (ACOE) prior to initiating construction projects in wetland soils and a Finding of No Practicable Alternative is required by AFI 32-7064.

Descriptions of the predominant soil associations on Moody AFB include the following:

Tifton-Pelham-Fuquay. This association consists of nearly level and gently sloping soils on ridge tops, hillsides, and in drainage ways that dissect the ridges. The ridges are typically less than 1 mile wide, and the drainage ways range from about 50 to 250 feet wide. This association makes up about 36 percent of the soils in Lowndes County. Tifton soils make up about 49 percent of the association, Pelham soils about 16 percent, the Fuquay soils about 8 percent, and the minor soils about 27 percent. Tifton and Fuquay soils are generally located along the ridges, and Pelham soils are in drainage ways and intermittently ponded depressions. Tifton soils are well drained and nearly level or very gently sloping. Typically, the surface layer is brown loamy sand about 8 inches thick. The subsoil is sandy-clay loam and extends to a depth of 60 inches or more. Pelham soils are poorly drained and nearly level. Typically, the surface layer is black loamy sand about 8 inches thick. The subsurface layer is gray loamy sand about 17 inches thick. The subsoil extends to a depth of 65 inches or more. Fuquay soils are well drained and nearly level or very gently sloping. Typically, the surface layer is dark grayish-brown loamy sand about 7 inches thick. The subsurface layer is light yellowish-brown loamy sand about 14 inches thick. The subsoil is dominantly sandy-clay loam and extends to a depth of 60 inches or more. Minor soils in this association are the well-drained Dothan, Nankin, and Sunsweet soils and the moderately well-drained Stilson soils. Dothan, Nankin, and Sunsweet soils are on ridges and hillsides, as are Tifton and Fuquay soils, and the more sloping Sunsweet soils are on short hillsides. Stilson soils occur on low uplands.

Most of the cultivated land in Lowndes County is on Tifton and Fuquay soils. Corn, tobacco, soybeans, cotton, and peanuts are the major agricultural crops. Also, some areas are used for permanent pasture. The main concern of management is control of erosion on the gently sloping soils. Pelham soils are used mainly for producing timber, but some areas are in pasture. This association generally has slight limitations for most non-farm uses, but because of wetness and flooding, Pelham soils are severely limited for crop production.

Dasher or Swamp-Istokpoga. These soils are characteristic of swampy areas and level, very poorly drained organic soils in flooded areas.

Mascotte-Albany-Pelham. These soils have a sandy surface layer and loamy or sandy subsoil and are found on flats and in depressions and drainages.

Leefield-Pelham-Clarendon. These soils have a sandy surface layer and loamy subsoil and are found on low uplands and in depressions. These soils occur on roughly 75 acres of Moody AFB. Prime farmland soils in the Lowndes and Lanier County area include Carnegie Sandy Loam, Cowarts Loamy Sand, Dothan Loamy Sand, Irvington Loamy Sand, Tifton Loamy Sand, Clarendon Loamy Sand, and Nankin Sandy Loam. Hydric soils cover at least 60 to 70 percent of Grand Bay Range and 20 to 30 percent of the main base. Predominant soils, from wettest to driest sites in the area are Dasher (Swa), Johnston (Jo, Job), Alapaha (At), Mascott (Mn), Oluste (Oa), Pelham (Pe, Pl), Leefield (Le, Lsa), and Stilson (Se).

3.5.2.2 Water Resources

Surface Water

Moody AFB is located within the Alapaha Watershed Unit. The Alapaha Watershed Unit is approximately 1.2 million acres in size, and drains to the southwest, into the Upper Suwannee River Watershed (1.7 million acres). The Upper Suwannee River Watershed drains into the Lower Suwannee River Watershed (1 million acres) which in turn flows into the Gulf of Mexico. Watershed health in the Alapaha Watershed is described as being of "better quality." Watershed health within the Upper and Lower Suwannee River Watersheds is described as being "less serious" (USEPA 1999). Surface water from the eastern portion of Moody AFB flows towards Grand Bay Creek, located at the southeastern portion of the installation. Grand Bay Creek then flows southeast into the Alapaha River and eventually empties into the Suwannee River. Surface water from the southern part of the main base flows into Mission Lake, which in turn flows into Grand Bay. Surface water on the northwestern portion of the main base flows into Beatty Branch, which then flows into Cat Creek and then into the Withlacoochee River (Air Force 1999a).

Approximately 5,500 acres of Moody AFB are covered by wetlands. A major feature of this basin is the Grand Bay/Banks Lake wetland complex, which partially occurs within the political boundaries of Moody AFB. Exclusive of the Okefenokee Swamp, the Grand Bay/Banks Lake wetland complex of over 13,000 acres is the largest freshwater lake/swamp system in the coastal plain of Georgia. This complex is composed of several broad Carolina bays (1 to 4 miles across), which are collectively referred to as "Grand Bay," and shallow lakes, interconnected by cypress-black gum swamp. Open water in this area is primarily confined to Banks Lake, which occupies about 13 square miles; however, only about 25 percent of Banks Lake has open water – the remainder is classified as shrub or swamp areas. A smaller open water area located in the Grand Bay/Banks Lake wetland complex is Shiner Pond, which is located along the northern boundary of Moody AFB. This area is approximately 65 acres in size but contains vast areas with cypress trees and other vegetative cover. Water flow through Grand Bay is generally southeastern and southward. There are several canals and natural streams in the area. The northern parts of Banks Lake and approximately one-third of the shrub swamp area known as Old Field Bay drain to the northeast into Mill Creek, a tributary of Big Creek, which discharges to the Alapaha River, and ultimately into the Suwannee River. Between Old Field Bay and Grand Bay lies a system of open marsh and creek swamp. Watersheds from the two bays converge here to form Grand Bay Creek, the major surface water collector for the wetlands complex. Southern parts of Banks Lake, and the remainder of Grand Bay, drain to the southeast through Grand Bay Creek. Grand Bay Creek also flows into the Alapaha River. Water levels throughout the Grand Bay-Banks Lake ecosystem are controlled through a series of natural and artificial dikes along with a variety of water control structures and several spillways. The surface waters of the Grand Bay system are "blackwater" systems, characterized by very soft, poorly buffered, acid waters (pH of 4.5 to 6.5) of relatively low fertility. The characteristic brown tint of these waters is caused primarily by the presence of high concentrations of humic acids.

Wetlands are considered sensitive habitats and are subject to federal regulatory authority under Section 404 of the CWA and Executive Order (EO) 11990, *Protection of Wetlands*. Jurisdictional

wetlands are defined by ACOE as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (Army 1987). Areas meeting the federal wetland definition are under the jurisdiction of the ACOE. Like vegetation, the affected environment for wetlands includes only those areas potentially subject to ground disturbance.

EO 11988, *Floodplains Management*, directs government agencies to avoid adverse effects and incompatible development in floodplains. If construction is unavoidable, then the agencies must ensure the action conforms to applicable floodplain protection standards, and that accepted flood-proofing and other flood protection measures are applied to the construction. The cantonment area of Moody AFB is not located within any known floodplains (Federal Emergency Management Agency 1982).

Groundwater

Groundwater occurs within two major water-bearing zones, the surficial aquifer system and the Floridan aquifer system. Although groundwater is generally 10 to 20 feet below the ground surface, the main water-bearing formation underlying Moody AFB is an artesian aquifer containing naturally high concentrations of sulfate, hydrogen sulfide, and iron. The water quality is attributable to the presence of the sulfate minerals gypsum and celestite in the host rock. The surficial aquifer is composed of fine to coarse sands, gravels, silt, clayey silts, and clays. Water quality is generally good, and yields are usually less than 50 gallons per minute. The Floridan aquifer, consisting primarily of carbonate rock, is also present in the area (approximately 27 square miles). The Floridan aquifer furnishes almost all the local water for commercial, industrial, domestic, irrigation, and municipal use. The aquifer is typically encountered at a depth of 150 feet and is usually under artesian conditions. Background groundwater analyses have confirmed that several metals occur naturally in the area of Moody AFB. Recordable levels of barium, cadmium, copper, iron, manganese, and zinc occur in the groundwater. Water quality and groundwater yields within this aquifer are generally considered good (Air Force 1999a).

Moody AFB operates an internal water system that includes three wells located near the water treatment plant. The three wells (Numbers 3, 16, and 17), have a combined annual average withdrawal rate of 0.80 million gallons per day and supply the main cantonment and family housing areas. In addition, there are seven wells located throughout the remainder of Moody AFB that are non-operational and considered temporarily abandoned.

Stormwater and Wastewater

Moody AFB manages its stormwater under the requirements of two permits issued by the Georgia Environmental Protection Division (GEPD) which govern stormwater discharges from industrial activities and from construction activities.

The GEPD requirements contain all the provisions of the federal NPDES program. Given the military mission of Moody AFB, there is a potential for the generation of non-point source (i.e. stormwater) pollution, in the form of sediment, nutrients, pesticides, oils, greases, and debris, which, if captured and transported by stormwater runoff, have the potential to enter the waters

on and around Moody AFB. The Environmental Flight has developed and implemented a Stormwater Pollution Prevention Plan (SWPPP) to minimize non-point source pollution entering the waters of Moody AFB through the use of BMPs. Any new construction projects on Moody AFB that would disturb more than 1 acre are required to develop a project-specific SWPPP, implement BMPs, and notify the GEPD about the project.

Moody AFB discharges stormwater collected on the base to surrounding surface water bodies through 53 identified outfalls. These outfalls are fed by approximately 211,235 linear feet of storm drainage lines comprised of several materials, such as concrete, reinforced concrete, corrugated metal, vitrified clay, terra cotta, and cast iron. Storm water ultimately flows into Beatty Creek (10 outfalls), Mission Lake (14 outfalls), or Grand Bay Swamp (29 outfalls). Five of the most significant discharge points are equipped with oil-water separators and oil sorbent booms to reduce the discharge of petroleum products. Moody AFB conducts regular sampling and visual inspections of the outfalls to verify compliance with the permit conditions for the discharge of stormwater.

Of the 53 outfalls, 23 have been determined to receive stormwater runoff from activities regulated under the industrial stormwater permit. The Moody AFB SWPPP, which specifies the actions necessary to comply with the stormwater permit and general stormwater management regulations in general, has determined that the total drainage area of base activities subject to industrial stormwater regulation is approximately 826 acres. Approximately 302 acres of this total area, or about 37%, is covered by impervious surfaces (e.g. roadways, parking areas, buildings) that increase the quantity of runoff from a rainfall event. A typical open vegetated area can absorb from 60% to 80% of the rainfall falling on its surface. Conversely, an area covered by an impervious material will absorb less than 10% of the rainfall, greatly increasing the quantity of runoff that must be handled and transported off-site by the storm sewer system. For example, a nominal 0.5 inch rainfall falling uniformly over the 826 acre area would generate a total of about 1.5 million cubic feet of water. If the entire 826 acres was covered by open vegetated soil which absorbed 70% of the water, only about 450,000 cubic feet of water runoff would be left to be transported by the storm sewer system. However, if 37% of the same area was now covered by impervious surfaces that only allowed 5% of the water to be absorbed, approximately 54% of the 0.5 inch rainfall, or about 800,000 cubic feet of water would be created as runoff to be channeled to the outfalls by the storm sewer system. In this simplistic example, covering slightly more than a third of the regulated area by impervious surfaces would almost double the amount of stormwater runoff that could be generated.

Additionally, non-point source pollution from stormwater runoff is mitigated by implementing erosion and sedimentation control practices around construction sites in accordance with the Georgia Erosion and Sediment Control Act, as amended. For any construction activities which will disturb one acre or more of soil, an Erosion, Sedimentation, and Pollution Control Plan is

generated which defines the actions that will be taken during the project to reduce erosion and limit the transport of sediment off the project site. The plan requires:

- Design of BMPs to control soil erosion and sedimentation at the site
- Conduct inspection within 7 days of construction start
- Conduct weekly inspections by qualified personnel
- Record onsite daily rainfall data
- Sample stormwater discharge(s) or receiving streams for turbidity
- Maintain records onsite: plans, inspections, rainfall, analysis
- Submit summary monthly monitoring reports to Environmental Protection Division

Moody AFB facilities and activities discharge domestic and industrial wastewater to an on-base wastewater treatment facility that was constructed during the 1940s and significantly upgraded in 1995. The facility is located adjacent to the Base Golf Course, the northwest corner of the base. The treatment facility is an installation owned and contractor operated trickling filter wastewater plant. A NPDES permit (GA0020001) was issued under the Georgia Department of Natural Resources (GDNR), Environmental Protection Division. The permit allows effluent discharge at an average rate of 0.75 million gallons per day with a maximum of 1.125 million gallons per day; this is equivalent to the capacity of the plant. Industrial wastewater comprises approximately 5 percent of the total flow to the wastewater treatment facility. This consists of boiler blow down and water discharged from the oil/water separators located near the aircraft and vehicle maintenance facilities and the base fire department. There are 27 lift stations in the system and approximately 131,500 linear feet of sanitary sewer lines comprised of asbestos cement, cast iron, polyvinyl chloride, terra cotta, reinforced concrete, steel, and ductile iron. Manholes are brick and concrete. The wastewater treatment plant consists of a conventional biological treatment facility with trickle filters, clarifiers, and chlorination before discharging to Beatty Creek. The sludge that is generated during treatment is anaerobically digested, dewatered, and disposed of in a local landfill. Approximately 160 cubic yards are disposed of annually after testing for toxic materials. A previously completed sewer rehab project repaired many degraded sections through the use of sliplining and pipe busting. The project has shown dramatic improvements to reducing the inflow and infiltration of groundwater and stormwater into the sanitary sewer system. Inflow and infiltration reaching the plant has been reduced substantially. Also, no overflows or surcharging at the plant has occurred since the repairs. Additionally, there are seven septic systems in use around the installation. The base meets all treated wastewater discharge requirements.

3.5.2.3 Hazardous Materials and Waste Management

Hazardous Materials Management

A variety of products containing hazardous materials are used by the installation as part of day-to-day operations. The HAZMART, located in Building 934, is responsible for managing these hazardous materials. Shop personnel are required to coordinate the purchase of potentially hazardous materials with the HAZMART and obtain a control number for the

material. Hazardous materials are managed by means of the Environmental Management Information System (EMIS) computer database.

EMIS is an automated environmental tracking tool that controls and manages the use of hazardous materials from “cradle to grave.” It provides for hazardous materials management, chemical distribution point management, and shelf-life and waste management. It tracks supply data, vendor information, shops, employees, and authorizations to use hazardous materials. Using EMIS, Moody AFB employs procedures to minimize the use of hazardous materials. This is achieved through pollution prevention alternatives that involve inventory reduction, product substitution, elimination, recycling, and reuse.

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

Hazardous Waste Management

Moody AFB is classified as a Large Quantity Generator of hazardous waste per Federal Guidelines Title 40 of CFR 260.10 and 262.34. The installation maintains a USEPA hazardous waste generator identification number (#GA0570024109) as required in 40 CFR 262.12.

Hazardous wastes generated at the installation are associated primarily with the maintenance and operation of jet aircraft. Typical hazardous wastes include waste paint, paint-stripper, paint-contaminated rags, and degreasers. Fluids, such as used oil, are tested to determine whether they should be disposed as hazardous or non-hazardous waste. Waste oil, jet fuel, antifreeze, brake fluids, and batteries are disposed through the Defense Reutilization and Marketing Office (Air Force 2005a). During calendar year (CY) 2005, the installation generated 31,710 pounds of hazardous wastes (Downey 2006). All generated wastes are disposed at permitted off-site facilities.

Hazardous wastes are initially accumulated at 56 hazardous waste Satellite Accumulation Points (SAPs) located throughout the installation. Each SAP is under the control of the shop supervisor for the process generating the waste and inspected weekly. The maximum volume of waste that may be accumulated at these sites is 55 gallons of a hazardous waste or 1 quart of an acute hazardous waste. Once this storage volume is exceeded, hazardous wastes are transported to the 90-day accumulation site (Building 934), which is used as the central collection point for the installation. At this location, hazardous waste may be stored for up to 90 days prior to off-site disposal (Air Force 2005a).

Moody AFB has implemented a *Hazardous Waste Management Plan* that identifies hazardous waste generation areas and addresses the proper packaging, labeling, storage, and handling of hazardous wastes. The plan also addresses record keeping; spill contingency and response requirements; and education and training of appropriate personnel in the hazards, safe handling, and transportation of these materials. Procedures and responsibilities for responding to a

hazardous waste spill or other incident are also described in the 347 RQW Facility Response Plan and the Moody AFB Spill Prevention, Control, and Countermeasures (SPCC) Plan (Air Force 2005b).

Munitions-Related Debris

Munition fragments and residues are generated on a recurring basis at Grand Bay Range and Townsend Range as a result of the range training missions. Common ordnance used at the two ranges includes 7.62-mm, 20-mm, and 30-mm ammunition, 25-pound BDU-33s, and 2.75-inch rockets. Approximately 5,800 and 5,200 pounds of munitions-related debris were generated at Grand Bay and Townsend Ranges, respectively, as shown in Appendix F, Table F.2-2 and F.2-3. These estimates are based on the number and types of ordnance used when A-10s and F-16s were operational at Moody AFB (Table 2.2-3) and include the chemical composition data obtained from the Toxic Release Inventory-Data Delivery System (TRI-DDS). The TRI-DDS database, which is a product of the Joint Service Emergency Planning and Community Right-to-Know (EPCRA) Workgroup, is intended to provide a consistent method to assess chemical constituent data that may be used by DoD installations when reporting chemical releases and waste management practices. See Appendix F for information regarding the annual quantity of munitions debris generated.

Under current practice, munitions debris is recovered and/or removed from the ranges for the purpose of storage, reclamation, and disposal as solid waste. Occasionally, the charge in a training munition fails to detonate. If this occurs, EOD personnel will destroy all explosive hazards and then supervise the collection of any resulting debris. HQ ACC/A3AR provides a range residue removal contract to periodically visit ACC ranges and dispose of range residues. In accordance with AFI 13-212, the ranges are cleared of munition debris on a regularly basis, with a complete boundary-to-boundary debris clearance conducted every five 5 years (Air Force 2001a).

Solid Waste

Municipal solid waste (MSW) generated at Moody AFB is currently disposed at the Pecan Row Landfill, located in Valdosta, through the base's refuse and recycling contractor, Sloane and Associates. The installation has also implemented a comprehensive recycling program to divert certain materials from the MSW stream. Recycling services are performed by the installation under the Qualified Recycling Program. Materials collected include mixed paper, metallic cans, glass, plastics, and cardboard. Recyclable materials are collected curbside and transported to the Recycling Center, where they are sorted, baled, and stored until they can be transported to an approved recycler. During CY 2004, the base disposed of 1,203 tons of MSW, while diverting another 511 tons of materials for recycling (Fowler 2006).

Currently, the disposal of construction and demolition (C&D) debris at Moody AFB depends upon the sources of generation. Disposal of the debris is performed by the contractor on a job-specific basis. Some C&D debris, such as concrete, bricks, asphalt shingles, and soil, is stockpiled on the base at a construction rubble yard located near the Recycling Center. Moody does not have a C&D landfill, but it does have a C&D debris recycling plan which that incorporates the practice of temporarily stockpiling demolition debris. The rubble is segregated into separate piles for concrete, asphalt, etc. When sufficient volumes of the rubble are present

(5,000 to 10,000 cubic yards), it is ground (“reconditioned”), after which it can be used as a road base for unpaved roadways at the base as needed (Air Force 2001b).

Environmental Restoration Program

The Environmental Restoration Program (ERP) is used by the U.S. Air Force to identify, characterize, clean up, and restore sites contaminated with toxic and hazardous substances, low-level radioactive materials, petroleum, oils, lubricants, and other pollutants and contaminants. Although widely accepted at one time, the procedures followed for managing and disposing of wastes resulted in contamination of the environment. The ERP has established a process to evaluate past disposal sites, control the migration of contaminants, identify potential hazards to human health and the environment, and remediate the sites.

At Moody AFB, the ERP was initiated to address contamination from past activities, which included fuel storage and disposal, dichlorodiphenyl-trichloroethane disposal, EOD, fire-training exercises, and landfill operations. Of the 42 ERP sites located at the base, 29 have been approved by the GDNR for No Further Action, 12 have corrective actions ongoing (10 by active remediation and 2 by natural attenuation), and 1 is under investigation (Site SD-43, Southwest Surface Disposal Area). Digging restrictions are in place at several of the landfill/disposal sites: LF-01, LF-04, LF 03/36, SD-43, and SS-21 (Evans 2006) and land use controls are in place at 12 sites as identified in Table 3.5-1. Since some remedies require an extended period of time to reduce the volume or toxicity of contaminants, any construction that occurs on or near these sites requires a waiver from Headquarters ACC, Environmental Division (HQ ACC/A7V) (HQ ACC/CEV). The goal of the waiver process is to control reasonably foreseeable impacts to human health or the environment.

Lead-Based Paint

Lead was used as an additive and pigment in paints for many years prior to 1978; therefore, older structures on the base which that have multiple layers of older paint are potential sources of lead. Any projects that require alteration or demolition of identified or older structures are reviewed by the Civil Engineering and Bio-environmental Office, and may trigger the requirement for LBP surveys. Project designs stipulate appropriate abatement and disposal requirements for LBP. Projects that are likely to crush lead-containing coatings to a form that can be inhaled or ingested are managed in accordance with federal, state, and local transportation, treatment, storage, and disposal requirements. The Moody AFB *Lead Based Paint Management Plan* provides specific policy and guidance to identify and address LBP hazards and to protect the public from exposure to these hazards. The plan also provides guidance on proper management/disposal of material containing LBP (Air Force 2001b).

Asbestos

Asbestos-containing building materials (ACBM) have been identified in older base structures. ACBM is managed in accordance with the base’s *Asbestos Management Plan & Asbestos Operations Plan*, established in November 2000. The plan specifies procedures for removal, encapsulation, enclosure, and repair activities associated with ACBM abatement projects and is designed to

Table 3.5-1. Moody AFB Environmental Restoration Sites Land Use Controls

<i>Site ID</i>	<i>Risks</i>	<i>Contaminants</i>			<i>Land Use Controls</i>
		<i>Groundwater</i>	<i>Soil</i>	<i>Surface Soil/Sediment</i>	
Burma Road Landfill, LF-01	Ingestion of GW, direct contact with soils during excavation	Chromium, TRPH, benzene, TCE	TRPH	Not sampled	Land Disturbance Restricted; Groundwater Use Prohibited
Southwest Landfill, LF-03	Ingestion of GW, direct contact with soils during excavation	VOCs, SVOCs, metals	VOCs, SVOCs, metals	VOCs, metals	Land Disturbance Restricted; Groundwater Use Prohibited
Northeast Landfill, LF-04	Ingestion of GW, direct contact with soils during excavation	VOCs	VOCs	VOCs	Land Disturbance Restricted; Groundwater Use Prohibited
Former Fire Department Training Area, FT-07	Ingestion of GW, dermal contact/ inhalation from soil contaminants	VOCs, SVOCs, lead	VOCs, SVOCs	None	Groundwater Use Prohibited
Flightline Storm Drain Outfall and Mission Lake, SD-16	Ingestion of GW	VOCs	None	None	Groundwater Use Prohibited
BX Service Station, SS-21	Ingestion of GW, direct contact with soils during excavation	TRPH, VOCs	TRPH, VOCs	VOCs	Land Disturbance Restricted; Groundwater Use Prohibited
EMS Multiple Shops, Bldg. 785, SS-24	Ingestion of GW	VOCs	None	None	Groundwater Use Prohibited
Vehicle Maintenance Facility, SS-31	Ingestion of GW	VOCs	None	None	Groundwater Use Prohibited

Table 3.5-1. Moody AFB Environmental Restoration Sites Land Use Controls (continued)

<i>Site ID</i>	<i>Risks</i>	<i>Contaminants</i>			<i>Land Use Controls</i>
		<i>Groundwater</i>	<i>Soil</i>	<i>Surface Soil/Sediment</i>	
Unnamed Creek Area Debris Site, LF-36	Ingestion of GW, soils, and sediments	VOCs	Metals	Metals and radiological	Land Disturbance Restricted; Groundwater Use Prohibited
Flightline Area (Apron A/B), SS-38	Ingestion of GW	VOCs	None	None	Groundwater Use Prohibited
LF-42, South Gate Fill Site	Ingestion of GW	VOCs, PAHs	PAHs, metals	None	Groundwater Use Prohibited
SD-43	Ingestion of GW, soils, and sediments	Under investigation	Under investigation	Metals, under investigation	Land Disturbance Restricted; Groundwater Use Prohibited
<p><u>Notes:</u> BX= Base Exchange EOD= Explosive Ordnance Disposal GW= Groundwater PAH = Polycyclic Aromatic Hydrocarbon POL= Petroleum, oil, and lubricant SVOC= Semivolatile Organic Compound TRPH= Total Recoverable Petroleum Hydrocarbons VOC= Volatile Organic Compound</p>					

protect base personnel and residents from exposure to airborne asbestos fibers. The base manages asbestos in-place where possible, removing it only when there is a threat to human health or the environment or when it is in the way of construction or demolition. Removal and disposal of ACBM is carried out in strict compliance with all applicable federal, state, and local laws, rules, regulations, and standards. Although considered a solid waste, C&D debris must be characterized in accordance with RCRA characterization requirements to determine whether to dispose of it as solid waste or hazardous waste (Air Force 2001b).

3.5.3 Environmental Consequences.

3.5.3.1 Proposed Action

Geology and Soils

Under the Proposed Action, proposed renovations or construction of the new facilities would not significantly affect the overall geologic unit underlying Moody AFB. No unique geologic features or geologic hazards are present on the installation. Planning and design activities will avoid known areas of karst topography. Therefore, potential impacts to earth resources would be minimal, and no significant impacts would occur as a result of implementation of the Proposed Action. The installation is primarily on a level plateau. No significant topographic features would be affected by proposed building renovations or construction. Therefore, no significant impacts to topography would occur as a result of implementation of the Proposed Action.

Surface Water

The most significant impact of the Proposed Action will involve several construction projects to be implemented to create buildings and paved areas supporting the new mission activities. All together these new project will create approximately 300,000 square feet of new impervious surfaces at various locations throughout the base. This will increase the total impervious areas for industrial activities, and produce a corresponding increase in stormwater runoff, by a maximum of about 2.3 %. Overall, this increase should be well within the available capacity of the existing storm sewer system. If local capacity problems arise, the construction of detention ponds to capture and temporarily hold some runoff can be incorporated into the facility designs to reduce the immediate impact on the local storm sewers. The storm drainage system is capable of supporting moderate growth and no major improvements are planned. All projects must comply with AFI 32-704, Water Quality compliance and Engineering Technical Letter 03-1 Storm Water Construction Standards. Potential increases in erosion and sediment transport due to the actual construction are possible, but should be mitigated by adherence the construction stormwater permit requirements and the Erosion, Sedimentation, and Pollution Control Plan that will be prepared for each project.

The existing Live Ordnance Loading Area (LOLA) hot cargo pad on the east side of the runway would be expanded on the north side, up to an area of approximately 2,400 square yards. The size of the expanded pad will depend on the size and configuration of wetlands in the area so that no wetland areas are directly impacted. None of the other construction projects are expected to be located within the 100 year floodplain or threaten wetland areas.

Groundwater

The addition of impervious surfaces associated with the proposed construction would be minimal and would have no significant effect on groundwater resources. Shallow aquifers may see some reduction in recharge due to the reduced infiltration, but the overall impact will be small. Therefore, no significant impacts to groundwater resources would occur as a result of implementation of the Proposed Action. Proposed construction and renovation activities would not occur within any known 100-year floodplains. Therefore, no significant impacts to floodplains would occur as a result of implementation of the Proposed Action

Hazardous Materials Management

New buildings would be constructed utilizing normal construction methods, which would limit the use, to the extent possible, of hazardous materials. Petroleum products and other hazardous materials (e.g., paints) would be used during construction/renovation activities. These materials would be stored in the proper containers, employing secondary containment as necessary to prevent/limit accidental spills. All spills and accidental discharges of petroleum products, hazardous materials, or hazardous waste would be reported.

Moody AFB has developed emergency response procedures and site specific contingency plans for all hazardous materials and waste storage/generation locations. Procedures and responsibilities for responding to a hazardous waste spill or other incident are described in the *347 RQW Facility Response Plan*, the *Hazardous Waste Management Plan*, and the *Moody AFB SPCC Plan (Air Force 2005b)*

Hazardous Waste Management

Development associated with the proposed action would not be expected to generate hazardous wastes; however, renovation/demolitions of some of buildings could result in the production of minor amounts of lead or asbestos wastes (see discussion in following sections).

Hazardous and non-hazardous waste would be generated as a result of maintenance functions associated with new flying units on the base. These wastes would be consistent with the type currently generated at Moody AFB, and would include waste paints and thinners, spent solvents, used oils, absorbents contaminated with fuels or oils, batteries, etc. Moody AFB would establish new SAPs at generation locations, and personnel managing these locations would be properly trained in waste management.

A quantitative assessment of the potential increase in the quantity of regulated waste (hazardous and non-hazardous) generated as a result of the Proposed Action is not possible. However, management of these wastes would be performed according to prescribed procedures already in place. Base personnel indicate that any increases in waste generation would pose no adverse impacts on the current waste management system (Downey 2006). No change to permits or management would be required and no adverse environmental impacts from implementation of the Proposed Action are anticipated.

Munitions Related Debris

Approximately 16,438 and 6,708 pounds of munition-related debris would be generated under the Proposed Action on annual basis at Grand Bay and Townsend Ranges, respectively. This represents an increase of 185.5 and 28.4 percent over baseline quantities at these two ranges, respectively (See Appendix F, Tables F.2-2 and F.2-3 for information regarding the annual quantity of munitions debris generated). The type of munitions-related debris would be similar as currently generated, and would primarily consist of metallic fragments. Munition debris would be recovered and/or removed from the ranges for the purpose of disposal on a regular basis, with a complete boundary-to-boundary debris clearance conducted every 5 years. No significant adverse impacts are associated with munition-related debris generated as a result of the proposed action.

Solid Waste

Solid waste would be generated during development activities under the Proposed Action, which involves the construction/renovation of numerous buildings. Based on sampling studies documented in "Characterization of Building-Related Construction and Demolition Debris in the United States" (Franklin Associates 1998), it was assumed that an average of 3.6 pounds per square foot of C&D debris would be generated during construction/renovation. The resulting total quantity of C&D debris generated as a result of these activities is estimated to be 811 tons. This debris would not be generated at one time, but would coincide with the construction/renovation projects schedule from FY07 to FY10. Calculations regarding C&D debris generation are presented in Appendix F.

As previously indicated, the disposal of C&D debris at Moody AFB is typically performed by the contractor on a job-specific basis, although some C&D debris is stockpiled on the base at a construction rubble yard located near the Recycling Center. Personnel at the at the Pecan Row Landfill, which receives the MSW and C&D debris from the base, indicate that the estimated quantity of C&D debris generated from the Proposed Action would have no significant impact on landfill capacity or life expectancy. Coordination between Moody AFB, waste contractors, developers, and the local landfill prior to construction would further minimize any potential impacts associated with disposal of C&D debris.

Environmental Restoration Program Sites

Implementation of the proposed development project would involve construction on or near two ERP sites. The Wing Tank Storage Project (Table 2.1-3 #11) would be constructed near ERP site SD-16, and the LOLA Project (Table 2.1-3 #34) is located near ERP Site FT-07. Construction activities at this, or one of the other proposed locations, may impact existing wells or underground piping associated with the ERP groundwater monitoring program (Evans 2006).

The Moody AFB Environmental Restoration Office must be coordinated with onsite locations for all construction projects located on or near ERP sites. Moody AFB must request a waiver to construct on the ERP site from HQ ACC prior to proceeding with the construction process. Construction Waivers must be completed for construction work proposed on or near ERP sites to ensure potential risks to worker health and safety are disclosed and proper precautions are

taken. All construction activities would be coordinated with the Environmental Office to ensure that appropriate measures (e.g., relocating groundwater monitoring wells) are implemented prior to commencement of construction activities. Additionally, should any unusual odor, soil, or groundwater coloring be encountered during construction in any areas, the Environmental Office would be contacted immediately. No significant impacts related to ERP issues are anticipated from the Proposed Action (Evans 2006).

Lead-Based Paint

Materials containing LBP have been found in older buildings on the base. These materials do not have to be treated as hazardous waste as long as they are not removed from a structure prior to demolition. Demolition/renovation of structures known to contain LBP would be conducted in accordance with applicable regulations: Toxic Substances Control Act (TSCA), Titles I and IV, and the Occupational Safety and Health Act. Proper disposal of lead-containing wastes would also be conducted in accordance with state and federal regulations, including TSCA and the Occupational Safety and Health Act. Further, these wastes would be accompanied by a waste manifest and disposed at a state-approved facility. The appropriate management of LBP is not expected to create adverse impacts. LBP would not be employed for new construction; therefore, there would be beneficial impacts from the removal of existing LBP.

Asbestos

Twenty-two structures are planned for renovation or have additions or alterations as a result of the Proposed Action. Ten of these structures were constructed after 1987 and have not been surveyed for the presence of ACBM given their construction date. Twelve structures included in the Proposed Action have been surveyed, and three structures (Bldgs. 701, 704, and 785) have identified ACBM. C&D debris generated as a result of renovation/demolition activities at these three buildings would be characterized in for the presence of asbestos requirements to determine whether to dispose of it as solid waste or hazardous waste (Air Force 2001b). Proper disposal of asbestos wastes would be conducted as directed by the Clean Air Act National Emission Standards for Hazardous Air Pollutants (40 CFR 61.40 through 157) and Georgia Clean Air Act. A certified contractor would be used when removing/disposing of all ACBM. Contractor personnel would have to be trained and certified. Also, the contractor would need to submit an Asbestos Work/Disposal Plan for any demolition. Transport and disposal documentation records, including signed manifests, would also be required. The Environmental Office would review all construction project programming documents, designs, and contracts. Project designs must stipulate appropriate abatement and disposal requirements for ACBM/LBP. Implementation of these management requirements would mitigate any adverse impacts resulting from ACBM. ACBM would not be employed for new construction; therefore, there would be beneficial impacts associated with the removal of existing ACBM.

3.5.4 No-Action Alternative

Under the No-Action Alternative, the Proposed Action and resulting construction and other activities would not occur. Consequently, baseline conditions would remain unchanged.

Implementation of the No-Action Alternative would not change current activities associated with approved force structure actions at Moody AFB; therefore, there would be no impacts to earth resources at Moody AFB, the airspace, or any other physical resources.

No adverse impacts associated with hazardous materials/wastes, munitions-related debris, ERP sites, ACBM, LBP, and solid wastes are anticipated under the No-Action Alternative. Moody AFB would continue to operate as it does currently.

3.6 Biological Resources

This section describes biological resources found on the terrestrial areas of Moody AFB, Grand Bay Range, Townsend Range, and the airspace associated with the Proposed Action. Emphasis is placed on identifying sensitive habitats and species that are within federal and/or state mandates or that are of special concern. Biological resources include the species and the habitats within which they occur.

3.6.1 Definition of Biological Resources

This section focuses on species or vegetation types that are important to the function of the ecosystem or are protected under federal or state law. For purposes of the EA, these resources are divided into four major categories: vegetation; wetlands; wildlife; and sensitive species including threatened, endangered, or sensitive plant and animal species.

Vegetation includes all existing terrestrial plant communities with the exception of wetlands or threatened, endangered, or sensitive plant species. The affected environment for vegetation includes only those areas potentially subject to ground disturbance.

Wetlands are considered sensitive habitats and are subject to federal regulatory authority under Section 404 of the CWA and EO 11990, *Protection of Wetlands*. Jurisdictional wetlands are defined by ACOE as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances support a prevalence of vegetation typically adapted for life in saturated soil conditions (Army 1987). Areas meeting the federal wetland definition are under the jurisdiction of the ACOE. Like vegetation, the affected environment for wetlands includes only those areas potentially subject to disturbance.

Wildlife includes all vertebrate animals with the exception of those identified as sensitive species (threatened, endangered, or sensitive). Wildlife includes fish, amphibians, reptiles, birds, and mammals.

Sensitive species are defined as those plant and animal species listed as threatened, endangered, or proposed as such, by the USFWS or state fish and wildlife agencies. The federal Endangered Species Act protects federally listed threatened and endangered plant and animal species. Federal species of concern are not protected by law; however, these species could become listed and, therefore, are protected at any time. The Florida Fish and Wildlife Conservation Commission, Florida Department of Environmental Protection, and the GDNR through the Georgia Natural Heritage Program also protect state-listed plant and animal species through

their respective state fish and wildlife and administrative codes. Additionally, the Florida Natural Areas Inventory, a non-government organization, maintains databases of state species of concern, many of which are not afforded legal protection. The ROI for biological resources for the Proposed Action and alternative consists of Moody AFB, Grand Bay Range, Townsend Range, and the airspace associated with the Proposed Action.

3.6.2 Existing Conditions

This section describes the potentially affected biological resources within the areas of the Proposed Action.

3.6.2.1 Moody AFB

Vegetation

Moody AFB is located in extreme southern Georgia within the Lower Coastal Plains and Flatwoods section of the Outer Coastal Plain Mixed Forest province of the U.S. lowland ecoregion. The cantonment area of Moody AFB is actively landscaped with a variety of native and non-native trees, shrubs, and grasses.

Approximately 50–75 percent of the base is undeveloped and contains a wide variety of habitats, including extensive areas of wetlands. Evergreen shrubs, palmetto, and pond pine (*Pinus serotina*) dominate the vegetation surrounding wetlands. Areas that are relatively elevated and well-drained are characterized by extensive pine flatwoods composed of longleaf pine (*Pinus palustris*) and slash pine with palmetto, gallberry, blueberry (*Vaccinium* spp.), wax myrtle (*Myrica cerifera*), greenbriar (*Smilax* spp.), bracken fern (*Pteridium aquilinum*), and muscadine (*Vitis rotundifolia*) dominating the understory. Hardwoods and a mixture of pines are found in the higher elevation uplands and include live oak (*Quercus virginiana*), water oak (*Quercus nigra*), laurel oak (*Quercus laurifolia*), loblolly (*Pinus taeda*) and slash pine. Stands of younger pines are primarily planted loblolly pine (*Pinus taeda*) (Air Force 2000).

Wetlands

Moody AFB is located within the Suwannee River Basin, which discharges to the northeastern Gulf of Mexico (Gulf). Major drainages in this basin that affect Moody AFB include the Withlacoochee River to the west and the Alapaha River to the east (Moody AFB 2001). Characteristic wetland communities on Moody AFB include emergent marshes, shrub and hardwood swamps, blackgum-cypress swamps, blackwater creek floodplains, and Carolina bays. East of the developed portion of Moody AFB and contained within the Grand Bay Range is an association of major wetlands known as Carolina bays; these make up the Grand Bay/Banks Lake complex, which is discussed in the Grand Bay Range section below and shown in Figure 3.6-1.

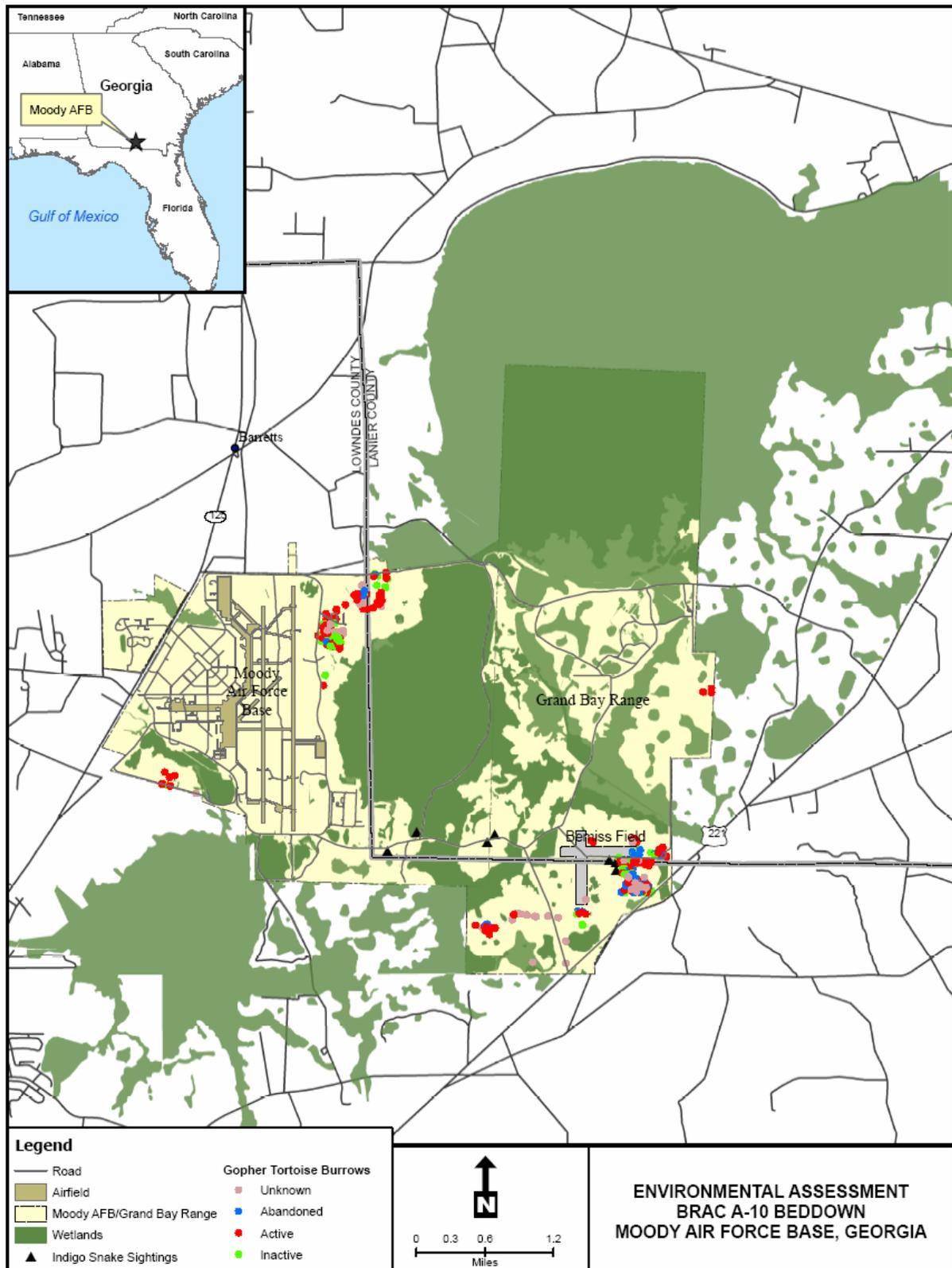


Figure 3.6-1. Grand Bay-Banks Lake Ecosystem Wetlands.

Wildlife

The developed portion of the base, the cantonment area, contains habitats and species more typical of rural and agricultural areas where disturbance has previously occurred. The pine flatwoods and extensive wetland areas that dominate the undeveloped areas of Moody AFB support a variety of fish and wildlife species.

The undeveloped portions of Moody AFB in the southern and eastern areas (Figure 3.6-1) provide resting and overwintering habitat for several species of ducks, including ring-necked duck (*Aythya collaris*), American wigeon (*Anas americana*), green-winged teal (*Anas crecca*), blue-winged teal (*Anas discors*), and bufflehead (*Bucephala albeola*). Wood duck (*Aix sponsa*) are present in fair numbers during winter migration, as well as during the summer months. In addition, the wetland areas support large rookeries of wading bird species, including great blue heron (*Ardea herodias*), little blue heron (*Egretta caerulea*), black-crowned night heron (*Nycticorax nycticorax*), yellow-crowned night heron (*Nycticorax violaceus*), green heron (*Butorides virescens*), snowy egret (*Egretta thula*), great egret (*Ardea alba*), American bittern (*Botaurus lentiginosus*), least bittern (*Ixobrychus exilis*), and white ibis (*Eudocimus albus*). Other bird species commonly found at Moody AFB either as breeding residents or migratory visitors include turkey vulture (*Cathartes aura*), osprey (*Pandion haliaetus*), red-tailed hawk (*Buteo jamaicensis*), red-shouldered hawk (*Buteo lineatus*), wild turkey (*Meleagris gallopavo*), northern bobwhite (*Colinus virginianus*), common moorhen (*Gallinula choropus*), blue jay (*Cyanocitta cristata*), Carolina wren (*Thryothorus ludovicianus*), northern mockingbird (*Mimus polyglottus*), mourning dove (*Zenaida macroura*), summer tanager (*Piranga rubra*), yellow warbler (*Dendroica petechia*), and several species of sparrows and wood warblers (Moody AFB 2001).

Common mammals found at Moody AFB include Virginia opossum (*Didelphis virginiana*), eastern cottontail (*Sylvilagus floridanus*), gray fox (*Urocyon cinereoargenteus*), striped skunk (*Mephitis mephitis*), white-tailed deer (*Odocoileus virginianus*), eastern gray squirrel (*Sciurus carolinensis*), and eastern woodrat (*Neotoma floridana*). The wetland areas support a diverse assemblage of amphibian species including spring peeper (*Hyla crucifer*), southern chorus frog (*Pseudacris nigrita*), eastern newt (*Notophthalmus viridescens*), and tiger salamander (*Ambystoma tigrinum*) (Moody AFB 2001).

Reptiles found on the installation include common box turtle (*Terrapene carolina*), ground skink (*Scincella lateralis*), eastern glass lizard (*Ophisaurus ventralis*), southern water snake (*Nerodia fasciata*), and rough earth snake (*Virginia striatula*) (Moody AFB 2001).

Sensitive Species

A total of seven threatened, endangered, or sensitive wildlife species listed by the USFWS or State of Georgia are known to occur at Moody AFB (Table 3.6-1). The majority of these occurrences are from the undeveloped areas to the east of the runways and primarily in the Grand Bay Range/Bemiss Field area described in the section below. The round-tailed muskrat (*Neofiber alleni*), eastern indigo snake (*Drymarchon corais couperi*) and gopher tortoise (*Gopherus polyphemus*) are permanent residents, while the bird species are all transient visitors.

Table 3.6-1. Sensitive Wildlife Species Known to Occur at Moody AFB and Grand Bay Range

Common Name	Scientific Name	Status	
		Federal	State
Reptiles			
American alligator	<i>Alligator mississippiensis</i>	T (S/A)	-
Eastern indigo snake	<i>Drymarchon corais couperi</i>	T	T
Gopher tortoise	<i>Gopherus polyphemus</i>	FSC	T
Birds			
Peregrine falcon	<i>Falco peregrinus</i>	-	E
Southern bald eagle	<i>Haliaeetus l. leucocephalus</i>	T	E
Wood stork	<i>Mycteria americana</i>	E	E
Mammals			
Round-tailed muskrat	<i>Neofiber alleni</i>	-	T

Notes:

E = endangered

T = threatened

FSC = federal species of concern

S/A = similarity of appearance

Sources: Air Force 2000, Moody AFB 2001, and USFWS 2006.

The gopher tortoise is currently under review by the USFWS for potential listing as federally threatened. There are seven gopher tortoise colonies on Moody AFB and Grand Bay Range (Figure 3.6-1). Exact census of gopher tortoise populations is difficult due to the relatively small amount of time tortoises spend outside of burrows. Therefore, burrow counts are typically used to determine population size. Moody AFB colonies are located south of the cantonment area and east of the runway (Figure 3.6-1). The gopher tortoise utilizes habitat that has well-drained, sandy soils in forest and grassy areas associated with pine overstory, open understory, and sunny areas for nesting (USFWS 2006).

The eastern indigo snake is large, heavy bodied, non-venomous snake that averages approximately 6 feet in length. During winter the indigo snake utilizes habitat preferred by gopher tortoises. During warm months, indigo snakes forage in creek bottoms, upland forests, and agricultural fields (USFWS 2006). Major threats include habitat loss due to uses such as farming, construction, forestry, and pasture and overcollecting for pet trade (USFWS 2006). Gopher tortoises are present on the installation in large numbers, and over 90 percent of indigo snakes in southern Georgia have been found to use gopher tortoise burrows as winter dens. Therefore, it is probable that indigo snakes are present on the installation, and most likely occupy areas inhabited by gopher tortoises (Moody AFB 2001).

The southern bald eagle (*Haliaeetus l. leucocephalus*) and wood stork (*Mycteria americana*) may occasionally forage at Moody AFB, particularly in the northeast portion of the base, near Banks Lake. The bald eagle utilizes inland waterways and estuarine areas, and their main source of prey is fish. They may also feed on squirrels, waterfowl, muskrats, rabbits, and carrion (USFWS 2006). Moody AFB has no permanent wood stork colonies. They are only present on a sporadic basis while migrating. Wood storks have been observed in several places on Moody, including Grassy Pond,

Lot Pond, Shiner Pond, Dudley's Hammock, and Grand Bay Creek. Wood storks feed in fresh and brackish wetlands and near cypress or other wooded swamps. Threats to the wood stork include declining numbers due primarily to loss of suitable feeding habitat, particularly in south Florida. Other factors include loss of nesting habitat, prolonged drought/flooding, raccoon predation on nests, and human disturbance of rookeries (USFWS 2006).

The round-tailed muskrat (*Neofiber alleni*) is known to occur at Moody AFB. The round-tailed muskrat, although similar in morphology and ecology to the common muskrat (*Ondatra zibethicus*), is found less often in open water and is more strictly nocturnal, with crepuscular activity peaks. Round-tailed muskrats are apparently colonial in both marshes and muck fields. The round-tailed muskrat may wander or disperse a few or several hundred meters from permanent water. In 1993-94, The Nature Conservancy conducted comprehensive inventories for rare and endangered species as part of the Natural Heritage Inventory Report. The report concluded that in 1993-94, 60 houses (27 rats) existed in Moody Bay.

The peregrine falcon (*Falco peregrinus*), delisted by the USFWS from the federal list of threatened and endangered species but still listed as endangered by the State of Georgia, is known only as an occasional migratory visitor. The American alligator (*Alligator mississippiensis*) occurs at Moody AFB in wetland areas and is federally listed as threatened due to its "similarity of appearance" to the American crocodile (*Crocodylus acutus*), which is endangered. A flatwoods salamander survey was conducted on the installation from 2002-2005 by Indiana-Purdue University. No flatwoods salamanders or striped newts were recorded from the installation, and the survey concluded that there was no potential for flatwoods salamanders to occur on the installation due to marginal habitat and geographic isolation from other known populations (Palis 2005). No federally or state-listed plant species are known to occur at Moody AFB (Moody AFB 2001).

3.6.2.2 Grand Bay Range

Vegetation

The list of vegetation within Moody AFB applies to Grand Bay Range, since the two areas are adjacent. The vegetation list identified Section 3.6.2.1 for Moody AFB applies to Grand Bay Range.

Located in the southern portion of Grand Bay Range and to the west of Bemiss Field is a unique natural community known as Dudley's Hammock. Being slightly more elevated than the surrounding swamp or flatwoods, a hammock has a different appearance than the surrounding wetlands and is relatively dry. The 120-acre Dudley's hammock is characterized by broad-leaved evergreen trees, including southern magnolia (*Magnolia grandiflora*), water oak, live oak, and the rare spruce pine (*Pinus glabra*). Understory species include staggerbush (*Lyonia* sp.), farkleberry (*Vaccinium arboreum*), and Elliott's blueberry (*Vaccinium elliottii*). Growing on the mature southern magnolias is the rare green-fly orchid (*Epidendrum conopseum*), the northernmost of the epiphytic orchids. Dudley's hammock is one of the few locations in Georgia where green-fly orchids can be found and is probably the only known and remaining hammock of this kind in Georgia. Bemiss Field was active during the 1940s as an auxiliary airstrip to Moody AFB. The previous asphalt cover has been removed, so the existing field is composed predominantly of

perennial grass. The deep soil compaction resulting from the initial airstrip construction in the 1940s and the current grass mowing regime have inhibited forest invasion of the majority of Bemiss Field. Where trees have naturally invaded, their growth is poor. In addition, the GDNR maintains wildlife food plots in the vicinity and immediately adjacent to Bemiss Field. These 0.5- to 1-acre food plots provide forage for wildlife species (Air Force 2000).

Wetlands

A major feature of this basin is the Grand Bay/Banks Lake wetland complex, which partially occurs within the political boundaries of Moody AFB and Grand Bay Range. Exclusive of the Okefenokee Swamp, the Grand Bay/Banks Lake wetland complex of over 13,000 acres is the largest freshwater lake/swamp system in the coastal plain of Georgia. This complex is composed of several broad Carolina bays (1 to 4 miles across), which are collectively referred to as "Grand Bay," and shallow lakes, interconnected by cypress-black gum swamp. Open water in this area is primarily confined to Banks Lake, which occupies about 13 square miles; however, only about 25 percent of Banks Lake has open water, and the remainder is classified as shrub or swamp areas (Moody AFB 2001).

A smaller open water area located in the Grand Bay/Banks Lake wetland complex is Shiner Pond, which is located in the northern section of Grand Bay Range. This area is approximately 65 acres but contains vast areas with cypress trees and other vegetative cover. Attributes of this wetland complex are shown in Figure 3.6-1. Water flow through Grand Bay is generally southeastern and southward. There are several canals and natural streams in the area. The northern parts of Banks Lake and approximately one-third of the shrub swamp area known as Old Field Bay drain to the northeast into Mill Creek, a tributary of Big Creek, which discharges to the Alapaha River and ultimately into the Suwannee River. Between Old Field Bay and Grand Bay lies a system of open marsh and creek swamp. Watersheds from the two bays converge here to form Grand Bay Creek, the major surface water collector for the wetlands complex. Southern parts of Banks Lake, and the remainder of Grand Bay, drain to the southeast through Grand Bay Creek. Grand Bay Creek also flows into the Alapaha River (Moody AFB 2001).

Wildlife

The Grand Bay/Banks Lake complex is the largest blackwater wetland system in Georgia outside the Okefenokee Swamp. The same list of wildlife within Moody AFB applies to Grand Bay Range, since the two areas are adjacent to each other. All species of birds, reptiles, and mammals identified above in Section 3.6.2.1 are considered permanent or transient wildlife on Grand Bay Range.

Sensitive Species

Table 3.6-1 identifies seven protected species known to occur at Grand Bay Range. The majority of the threatened, endangered, or sensitive wildlife species listed by the USFWS or State of Georgia are primarily from the Grand Bay Range/Bemiss Field area (Figure 3.6-1). The round-tailed muskrat (*Neofiber alleni*), eastern indigo snake (*Drymarchon corais couperi*) and gopher tortoise (*Gopherus polyphemus*) are permanent residents while the bird species are all transient visitors.

The gopher tortoise is currently under review by the USFWS for potential federal listing as threatened. Both indigo snakes and gopher tortoises are known to occur at Bemiss Field, primarily at the east end of the east-west runway. Three sightings of indigo snakes were recorded in the eastern portion of Bemiss Field in 1991. In 1995, the GDNR released two confiscated indigo snakes in a gopher tortoise colony at Bemiss Field. Subsequent sightings in 1996 of an adult and juvenile snake at Bemiss Field suggest that indigo snakes are reproducing in the vicinity of Bemiss Field or immigration has occurred in this area. There are seven gopher tortoise colonies on Moody AFB and Grand Bay Range (Figure 3.6-1). Grand Bay Range colonies are located primarily near Bemiss Field (Figure 3.6-1). Because eastern indigo snakes depend largely upon gopher tortoise burrows for shelter, management that increases suitability and extent of gopher tortoise habitat should benefit indigo snakes. The installation conducts prescribed burning and timber management to increase habitat and habitat quality for the gopher tortoise (Moody AFB 2001).

The round-tailed muskrat (*Neofiber alleni*) is known to occur at Grand Bay Range. GDNR conducted aerial and airboat surveys of Grand Bay Range from 1989 through 1997 and found numerous houses (see Table 3.6-2). Recent surveys for the flatwoods salamander from Palis, 2005 and Moody AFB Natural Resources personnel indicate muskrat houses were sited in the isolated wetlands south of the strafe bed on Grand Bay Range (Evans 2006).

**Table 3.6-2. Round-tailed Muskrat (*Neofiber alleni*) Surveys
Moody AFB Area**

<i>Year</i>	<i>Method</i>	<i>Area</i>	<i>Month</i>	<i>No. Houses</i>
1989	Airboat	Grand Bay	Feb-April	74
1990	Airboat	Grand Bay	April	97
1990	Helicopter	Grand Bay	March	118
1991	Helicopter	Grand Bay	April	113
1991	Helicopter	Rat Bay	April	30
1992	Helicopter	Grand Bay	April	237
1992	Helicopter	Rat Bay	April	31
1993	Helicopter	Grand Bay	April	81
1993	Helicopter	Rat Bay	April	27
1994	Helicopter	Grand Bay	March	230
1994	Helicopter	Rat Bay	March	47
1994	Helicopter	Old Field Bay	March	60
1996	Helicopter	Grand Bay	April	238
1996	Helicopter	Rat Bay	April	6
1996	Helicopter	Old Field Bay	April	46
1997	Helicopter	Grand Bay	April	162
1997	Helicopter	Rat Bay	April	21
1997	Helicopter	Old Field Bay	April	182

Source: Evans 2006

The southern bald eagle (*Haliaeetus l. leucocephalus*) and wood stork (*Mycteria americana*) may occasionally forage at Grand Bay Range. Wood storks have been observed in several places on Moody, including Grassy Pond, Lot Pond, Shiner Pond, Dudley's Hammock, and Grand Bay Creek. Wood storks feed in fresh and brackish wetlands and near cypress or other wooded swamps. The peregrine falcon (*Falco peregrinus*), delisted by the USFWS from the federal list of threatened and endangered species but still listed as endangered by the State of Georgia, is known only as an occasional migratory visitor. The American alligator (*Alligator mississippiensis*) occurs at Grand Bay Range in wetland areas and is federally listed as threatened due to its "similarity of appearance" to the American crocodile (*Crocodylus acutus*), which is endangered.

A flatwoods salamander survey was conducted on the installation from 2002-2005 by Indiana-Purdue University. No flatwoods salamanders or striped newts were recorded from the installation, and the survey concluded that there was no potential for flatwoods salamanders to occur on the installation due to marginal habitat and geographic isolation from other known populations (Palis 2005). A 1974 record from Okefenokee National Wildlife Refuge (NWR), approximately 40 miles to the east of Moody AFB, is the only historical occurrence of flatwoods salamander within the vicinity of the base (Air Force 2000).

3.6.2.3 Townsend Range

Vegetation

Townsend Range is located in the Coastal Plain physiographic province, which encompasses southern Georgia. The Coastal Plain landscape is a low, flat region of well-drained soils with some areas of gently rolling hills and poorly drained flatwoods. Much of the lands within and in the vicinity of Townsend Range have wetlands qualities per the USFWS National Wetlands Inventory. Figure 3.6-2 shows the landcover types of Townsend Range. With the exception of riverine wetlands along the Altamaha River, most of the wetlands in the area are freshwater shrub/forested wetlands of the palustrine system, which are wetlands dominated by trees, shrubs, and persistent emergent herbaceous plants (Townsend 2005).

Wetlands

The National Wetlands Inventory is a nationwide source of information on the characteristics, extent, and status of wetlands and deepwater habitats. These data are broad in nature and are to be supplemented by advanced wetland identification procedures. Such wetlands delineation has recently been completed for most of Townsend Range according to the criteria specified in the ACOE 1987 Manual for Identifying and Delineating Jurisdictional Wetlands (Army 1987). Jurisdictional wetlands were determined to occur in the target impact area (Figure 3.6-3). Many of the wetland areas located at Townsend Range have been impacted through silvicultural manipulation. (i.e., bedding of pine plantations, shift to a monoculture of pines, and draining through the creation of numerous ditches and canals).

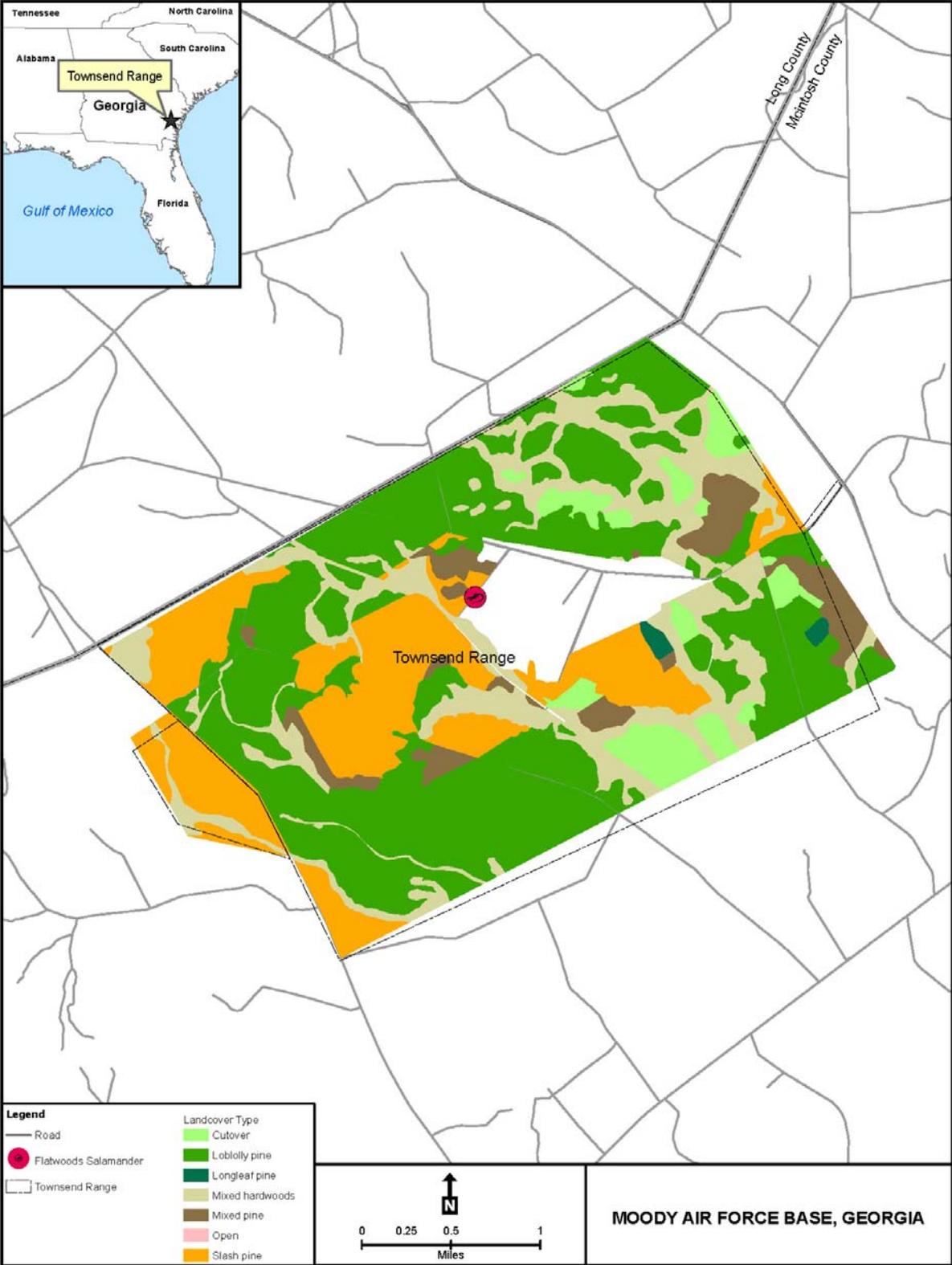


Figure 3.6-2. Land Cover Types and Confirmed Flatwoods Salamander Site

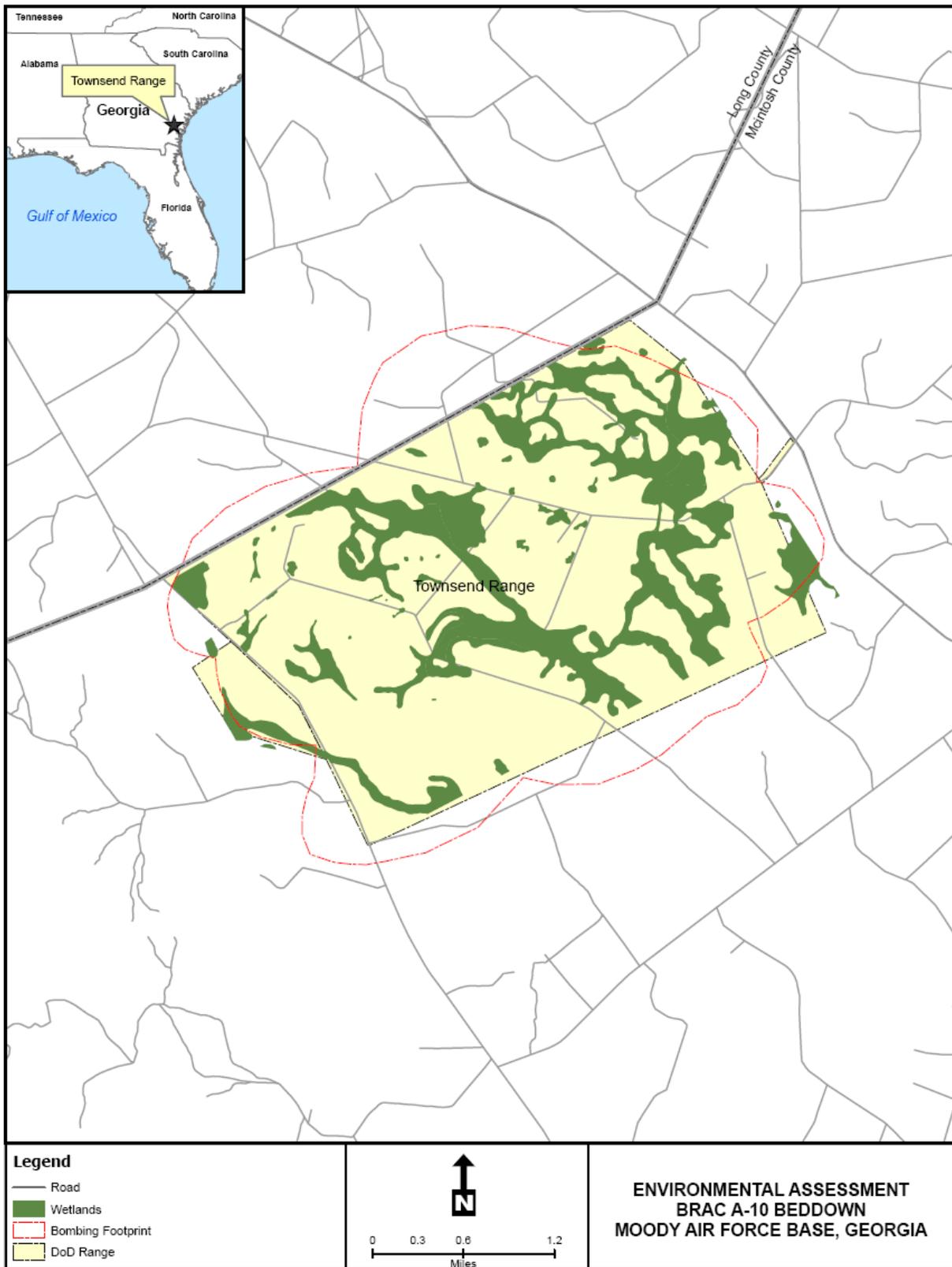


Figure 3.6-3. Townsend Range Land Use and Wetlands

Wildlife

The same list of wildlife within Moody AFB applies to Townsend Range. All species of birds, reptiles, and mammals identified above in Section 3.6.2.1. are considered permanent or transient wildlife on Townsend Range. Some areas within Townsend Range have fords across the river, which may serve as important corridors for some terrestrial wildlife. The greater Altamaha River ecosystem supports a wide array of biologically diverse ecosystems. The river and its surrounding lands also provide habitat and food sources for common game species such as waterfowl, white-tailed deer, and wild turkeys. The waters of the river are home to many species of finfish and shellfish, which support a multimillion-dollar commercial and recreational fishery and tourist industry (Townsend 2005)

Sensitive Species

The federal and state listed protected species that occur or potentially occur on Townsend Range are listed in Table 3.6-3. Confirmed federally listed species present on the range include the flatwoods salamander and wood stork. The location on Townsend Range where the flatwoods salamander has been observed in its breeding state is indicated on Figure 3.6-2. Management actions for the flatwoods salamander on Townsend Range include maintaining the current population and periodically surveying for new or undiscovered populations on the range. The wood stork has been seen flying over the range, but has not been observed nesting or feeding on the range. The federally listed red-cockaded woodpecker, piping plover, bald eagle, and Eastern indigo snake have not been located on the range despite surveys for them (Townsend 2005).

3.6.2.4 Airspace

Vegetation and Wetlands

Since the lands underlying the affected airspace would not be subjected to any ground-disturbing activities, vegetation and wetlands found there would not be affected by the Proposed Action. Therefore, plant and wetland communities underlying airspace are not discussed further.

Wildlife

The ROI for the Proposed Action includes Moody AFB and vicinity; Moody 1, Moody 2 North, Moody 2 South, Moody 3, Live Oak, Bulldog A, and Bulldog B MOAs; VRs -1065 and -1066; and Restricted Areas R-3007 and R-3008. VR-1065 and VR-1066 overlie areas dominated by slash and longleaf pine communities; therefore, wildlife found under MTR airspace would be similar to that found at Moody AFB and under the MOAs. Wildlife commonly found underlying the affected MOAs are those species typically found in the oak-hickory-pine forests of the Lower Coastal Plains and Flatwoods section of the Outer Coastal Plain Mixed Forest and are

Table 3.6-3. Federal- and State-Listed Protected Species that Occur or Potentially Occur in the Vicinity of Townsend Range

<i>Common Name</i>	<i>Scientific Name</i>	<i>Residence Status^a</i>	<i>Federal Listed Status^b</i>	<i>State Listed Status^c</i>
REPTILES AND AMPHIBIANS				
American Alligator	<i>Alligator mississippiensis</i>	LR	T/SA	-
Eastern Indigo Snake	<i>Drymarchon corais couperi</i>	UR	T	T
Gopher Tortoise	<i>Gopherus polyphemus</i>	UR	-	T
Flatwoods Salamander	<i>Ambystoma cingulatum</i>	CR	T	T
BIRDS				
Peregrine Falcon	<i>Falco peregrinus</i>	PM	-	E
Bald Eagle	<i>Haliaeetus leucocephalus</i>	PM	T	T
Wood Stork	<i>Mycteria americana</i>	CM	E	E
Red-cockaded Woodpecker	<i>Picoides borealis</i>	PR	E	E

- a. CR = Confirmed Resident
 - CM = Confirmed Migrant or Occasional Visitor
 - LR = Likely Resident
 - LM = Likely Migrant or Occasional Visitor
 - PR = Possible Resident
 - PM = Possible Migrant or Occasional Visitor
 - UR = Unlikely Resident
 - UM = Unlikely Migrant or Occasional Visitor
 - b. E = Endangered
 - T= Threatened
 - T/SA = Threatened Due to Similarity of Appearance
 - c. E = Endangered
 - T = Threatened
 - R = Rare
 - U = Unusual
- Source: Townsend 2005 and Moody AFB 2006

similar to those already discussed for Moody AFB. Common wildlife species include common box turtle, eastern garter snake (*Thamnophis sirtalis*), eastern diamondback rattlesnake (*Crotalus adamanteus*), timber rattlesnake (*Crotalus horridus*), American alligator, southern chorus frog, spring peeper, mourning dove, wild turkey, northern bobwhite, northern cardinal (*Cardinalis cardinalis*), eastern towhee (*Pipilo erythrophthalmus*), tufted titmouse (*Baeolophus bicolor*), Carolina wren, northern mockingbird, eastern bluebird (*Sialia sialis*), pine warbler (*Dendroica pinus*), hairy woodpecker (*Picoides villosus*), herons, egrets, numerous species of waterfowl, gray fox, raccoon (*Procyon lotor*), white-tailed deer, eastern gray squirrel, eastern cottontail, striped skunk, and bobcat (*Lynx rufus*) (Air Force 2000).

Sensitive Species

Seven federal endangered, threatened, and candidate species potentially occur under MOA airspace (Table 3.6-4) (Air Force 2000, Air Force 2005c). Four species are listed as endangered and three as threatened. The State of Georgia lists a total of 12 species as endangered or threatened: seven threatened and five endangered. The State of Florida lists a total of 12 species as endangered or threatened: three endangered and nine threatened. Moody 3 MOA overlies portions of Alabama; however, since only a small portion of the MOA overlies Alabama (less than 62 square miles) and since all proposed aircraft operations within Moody 3 MOA would occur 1,000 feet MSL, threatened and endangered species within Alabama are not discussed.

Seven species of amphibians and reptiles are listed by the USFWS, Georgia, or Florida as threatened or endangered and are potentially found under the MOAs. The flatwoods salamander is found in fire-maintained, open-canopied, mesic woodlands of longleaf/slash pine flatwoods and savannas. The major threats to this salamander are habitat destruction due to agricultural and silvicultural practices (e.g., clearcutting), fire suppression, and development. The federally threatened eastern indigo snake is found in creek bottoms, upland forests, and agricultural fields during the warm, summer months. During winter, indigo snakes den in xeric sandridge habitat preferred by gopher tortoises. Threats to indigo snakes are similar to those for the flatwoods salamander but also include over-collecting for the pet trade. A number of federally or state-listed threatened or endangered bird species potentially occur under MOA airspace: four federally listed (two threatened and two endangered), five listed by Georgia (one threatened and four endangered), and eight listed by Florida (six threatened and two endangered). The federally listed threatened piping plover (*Charadrius melodus*) would occur beneath Moody 1 and Live Oak MOAs only as a transient visitor during migration. It is known to be a winter resident along the coast of Georgia and prefers areas with expansive sand or mudflats for foraging and sand beaches for roosting. Bald eagles inhabit inland waterways and estuarine areas throughout the ROI. A total of nine bald eagle nest sites are known to occur below affected MOA airspace: seven below Moody 1 MOA, one below Moody 3 MOA, and one below Live Oak MOA; there are no known bald eagle nest sites below Moody 2 MOA. Wood storks nest in wooded swamps and forage in fresh and brackish wetlands. Seven wood stork nests are known to occur below affected MOA airspace: five below Moody 1 and two below Live Oak. The endangered red-cockaded woodpecker may be found in low numbers beneath all MOAs in mature pine forests with low understory vegetation (Air Force 2005c). Only one federally listed mammal species occurs beneath MOA airspace: the gray bat (*Myotis grisescens*). They are found in areas with caves that provide roosting habitat and forage primarily over water along rivers or lakeshores. Gray bats may potentially be found under all MOA airspace except Moody 2 North MOA (Air Force 2000).

The Indiana bat (*Myotis sodalis*) has similar habitat requirements as the gray bat discussed previously and may be found in low numbers under VR-1065. There are four recorded bald eagle nest sites underlying the eastern portion of VR-1065 and none below VR-1066. Although a wood stork nest is located approximately 0.5 mile from the edge of VR-1066, near Nahunta, Georgia, there are no known wood stork nest sites below either VR (Air Force 2000).

Table 3.6-4. Sensitive Wildlife Species Potentially Occurring in Counties under Affected Airspace

Common Name Scientific Name	Status1 Fed/Ga/ Fl/Al	Airspace Unit								
		Moody MOA				Live Oak MOA	Bulldog		VR- 1065	VR- 1066
		1	2N	2S	3		A	B		
Amphibians										
Flatwoods Salamander <i>Ambystoma cingulatum</i>	T/R/ - /Sp	X	X	X	X		X	X	X	X
Georgia Blind Salamander <i>Haideotriton wallacei</i>	- /T/ Ssc/ -	X			X				X	
Red Hills Salamander <i>Phaeognathus hubrichti</i>	T/ -/ - /Sp								X	
Reptiles										
Alligator Snapping Turtle <i>Macrolemys temminckii</i>	- /T/ Ssc/Sp	X	X	X	X				X	X
Barbour's Map Turtle <i>Graptemys barbouri</i>	- /T/ Ssc/ Sp	X			X				X	
Eastern Indigo Snake <i>Drymarchon corais couperi</i>	T/T/ T/Sp	X	X	X	X	X	X	X	X	X
Gopher Tortoise <i>Gopherus polyphemus</i>	- /T/ Ssc/ -	X	X	X	X		X	X	X	X
Short-Tailed Snake <i>Stilosoma extenuatum</i>	- / - / T/ -	X		X		X				
Birds										
Bald Eagle <i>Haliaeetus leucocephalus</i>	T/E/ T/Sp	X	X	X	X	X	X	X	X	X
Florida Sandhill Crane <i>Grus canadensis pratensis</i>	- / - / T/ -	X		X		X			X	

Table 3.6-4. Sensitive Wildlife Species Potentially Occurring in Counties under Affected Airspace (continued)

Common Name Scientific Name	Status1 Fed/Ga/ Fl/Al	Airspace Unit								
		Moody MOA				Live Oak MOA	Bulldog		VR- 1065	VR- 1066
		1	2N	2S	3		A	B		
Gull-Billed Tern <i>Sterna nilotica</i>	- /T/ - /Sp									X
Kirtland's Warbler <i>Dendroica kirtlandii</i>	E/E/ - / -									X
Least Tern <i>Sterna antillarum</i>	- /Rare/ T/ -	X				X			X	X
Peregrine Falcon <i>Falco peregrinus</i>	- /E/ E/Sp	X	X	X		X			X	X
Piping Plover <i>Charadrius melodus</i>	T/T/ T/Sp	X				X			X	
Red-Cockaded Woodpecker <i>Picoides borealis</i>	E/E/ T/Sp	X	X	X	X	X	X	X	X	X
Southeastern American Kestrel <i>Falco sparverius paulus</i>	- / - / T/ -	X		X		X			X	
Southeastern Snowy Plover <i>Charadrius alexandrinus tenuirostris</i>	- / - / T/ -								X	
Wood Stork <i>Mycteria americana</i>	E/E/ E/Sp	X	X	X	X	X	X	X	X	X
Mammals										
Choctawhatchee Beach Mouse <i>Peromyscus polionotus allophrys</i>	E/ - / E/ -								X	
Florida Black Bear <i>Ursus americanus floridanus</i>	- / - / T/ -	X		X		X			X	
Gray Bat <i>Myotis grisescens</i>	E/E/ E/Sp	X		X	X	X			X	
Indiana Bat <i>Myotis sodalis</i>	E/E/ E/Sp								X	

Table 3.6-4. Sensitive Wildlife Species Potentially Occurring in Counties under Affected Airspace (continued)

Common Name Scientific Name	Status1 Fed/Ga/ Fl/Al	Airspace Unit								
		Moody MOA				Live Oak MOA	Bulldog		VR- 1065	VR- 1066
		1	2N	2S	3		A	B		
Round-Tailed Muskrat <i>Neofiber Alleni</i>	- /T/ - / -	X								X
St. Andrews Beach Mouse <i>Peromyscus Polionotus Peninsularis</i>	E/ - / E/ -								X	

Notes: 1fed = Federal (USFWS), Ga = Georgia, Fl = Florida, Al = Alabama.
 E = Endangered.
 R = Rare.
 Sp = State Protected.
 SSC = State Species Of Concern.
 T = Threatened.
 - = Not Listed.
 Sources: Air Force 2000, Air Force 2005c

3.6.3 Environmental Consequences

This section analyzes the potential for impacts to biological resources from implementation of the Proposed Action or alternative. Impacts potentially result from the projected changes in operations at Moody AFB, Grand Bay Range, Townsend Range, and in airspace. Analysis of impacts focuses on whether and how ground-disturbing activities, mission activities, and changes in airfield and airspace operations may affect biological resources. Determination of the significance of potential impacts to biological resources is based on 1) the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource, 2) the proportion of the resource that would be affected relative to its occurrence in the region, 3) the sensitivity of the resource to proposed activities, and 4) the duration of ecological ramifications. Impacts to biological resources are significant if species or habitats of concern are adversely affected over relatively large areas or disturbances cause reductions in population size or distribution of a sensitive species. Only those impacts that have the potential for affecting biological resources within each project area (Moody AFB, Grand Bay Range, Townsend Range, and airspace) are described in the following sections. Operations that have no potential impact, such as inert weapon impacts on vegetation, are not discussed.

3.6.3.1 Proposed Action

3.6.3.1.1 Moody AFB

Vegetation

The construction on Moody AFB associated with the Proposed Action would require vegetation removal. However, no sensitive species or habitats have been documented on Moody AFB proper in the construction areas. In addition, the proposed sites are primarily developed and consist mainly of pavement and some areas of pine trees, manicured grass, and shrubs. Thus, the Air Force does not anticipate adverse impacts to vegetation from the proposed construction at Moody AFB.

Wetlands

The proposed construction activities would not occur in or near any delineated wetlands on Moody AFB; therefore, there would be no impacts to wetlands with implementation of the Proposed Action on Moody AFB. Stormwater and permitting are discussed in Section 3.5.3.

Wildlife

Construction activities associated with the proposed action would temporarily displace wildlife from suitable habitat in the immediate vicinity of the project area. There are no listed or sensitive species in the areas proposed for construction, renovation, or demolition.

The decrease in aircraft operations at Moody AFB would not be expected to impact wildlife adversely. Bird-aircraft strikes would likely be reduced. Therefore, the amount and change in the noise environment associated with the proposed action would not cause abandonment of habitat by wildlife or other adverse impacts and potentially could reduce noise levels at Moody AFB.

Sensitive Species

Due to the minor nature of the proposed construction and no documentation of sensitive species or habitats in the planned areas of construction, the Air Force does not anticipate adverse impacts to sensitive species from the proposed action on Moody AFB.

3.6.3.1.2 Grand Bay Range

General issues and concerns under the Proposed Action are associated with both the increase in ordnance requirements and the physical and chemical impacts of white phosphorous rocket use. The range is currently authorized for delivery of training weapons, including 30mm TP strafe, BDU-33 subscale practice bombs, inert rockets, chaff, and self-protection flares. The Proposed Action would introduce inert heavyweight bombs (BDU-50, BDU-56, inert MK-82, and inert MK-84), along with white phosphorus rockets and LUU-1, LUU-2, and LUU-19 illumination flares. Only 250 white phosphorous rockets are proposed to be used annually. Potential physical effects include direct and indirect impacts of inert weapons and white phosphorous rockets at Grand Bay Range. Fire risk is discussed under Safety (Section 3.3.3).

The Proposed Action will decrease sortie and aircraft operations at Grand Bay Range and increase inert munitions dropped on the range. Inert bombs include inert practice and general purpose bombs expended on Grand Bay Range during training. Generally, inert weapons lack an explosive warhead but are filled instead with concrete and/or a data-gathering telemetry package. For the purposes of analysis, these weapon systems are classified as inert, even though some may contain small amounts of explosive. Inert bombs and missiles remain relatively intact upon impact with the ground and are periodically retrieved. Upon impacting the ground, inert munitions may penetrate the earth or skip off the surface, depending on the weight of the bomb or angle of entry. Heavier bombs (>500 pounds) can penetrate up to 50 feet deep, leaving little trace of entry. Lighter bombs (5 to 50 pounds) have a tendency to skip, especially if the angle of descent is shallow.

An increase in chaff and flares would occur on Grand Bay Range; however, no significant impacts are expected. The primary chemical material produced by the combustion of flares is magnesium, which could potentially impact physical or biological receptors. The toxic effects of flare ash residue were tested on mammals, plants, and fish. Concentrations were selected to represent the high end of the range that would be found in a pyrotechnic test area. It was concluded that the effects of illumination flare ash residue was very minimal and not particularly dangerous to the environment (Air Force 1996). Magnesium is an essential human nutrient often found in nuts, cereals, and seafood. Ingestion of magnesium has very low toxicity to humans as evidenced by its use in antacids and cathartics, but is toxic to humans over the long term from inhalation exposure. Additionally, the threshold analysis for soil and surface water concentrations of flare ash are based upon toxicity studies for protection of wildlife. The analysis shows the toxicity threshold for magnesium would not be reached (Section 3.5.3).

Impacts associated with chemical aspects of white phosphorous rockets are primarily related to contamination of rangelands or wetlands with white phosphorus residue. Discussion of these aspects and their potential impacts are presented within the framework of specific resources. Lead and other toxic chemicals are also a concern. However, with 250 white phosphorous rockets utilized annually, these chemicals are not expected to exceed a significant threshold. In addition, as white phosphorus is not expected to accumulate in surface water or in vegetation, it is unlikely that wildlife on the range would ingest quantities that could cause injury or mortality. Therefore the analysis focuses on direct impacts associated with white phosphorus.

Description of White Phosphorous

White phosphorus is an element that does not occur naturally. It is manufactured from naturally occurring phosphate rocks. White phosphorus is a colorless-to-white waxy solid with a garlic-like smell that ignites spontaneously in the air. White phosphorus burns at a temperature of 2,760 degrees Celsius (C) [5,000 degrees Fahrenheit (F) and 273 Kelvin]. White phosphorus is used by the military in various types of ammunition to produce smoke for concealing troop movement and to identify targets. It is also used by industry to produce phosphoric acid and other chemicals for use in fertilizers, food additives, and cleaning compounds. Small amounts of white phosphorus were used in the past in pesticides and fireworks. The white phosphorous rockets contain 2.2 pounds of white phosphorus and 0.125 pound (2 ounces) of a high-explosive burster charge. The warhead can be configured with either an impact fuse or a proximity fuse. When the fuse detonates, it triggers the burster charge. This

ruptures the warhead case and scatters phosphorus particles. The exposed phosphorus reacts (ignites) spontaneously when exposed to oxygen and produces the smoke cloud and the associated thermal signature (Air Force 2003).

When white phosphorus is burned, the resulting byproducts are residual unburned white phosphorus and a number of oxides of phosphorus, which react with the moisture present in air to form a number of phosphorus-containing acids in the smoke (HHS 1997). Because the unexploded rocket rate of white phosphorous rockets is less than 0.04 percent, it is reasonable to assume that the majority of the white phosphorus contained in the rocket is combusted and the amount remaining in the environment is therefore minimal.

Vegetation

White phosphorous rockets will impact on the primary targets in the center of Grand Bay Range with no significant areas of vegetation in the area. White phosphorus rockets are designed to ignite on impact. Vegetation in the vicinity of an aim point is likely to be burned, resulting in a loss of native vegetation in the target area over time; however, Grand Bay Range target impact areas are generally devoid of vegetation. Any additional potential for fire is of concern for native species. To minimize the risk of wildfire, white phosphorus rocket use would not be permitted during periods of high, very high, or extreme fire danger, and fires ignited by rockets would be suppressed by onsite fire safety personnel. Impacts to vegetation from the Proposed Action would be minimal.

Wetlands

Out of 490 acres on the Grand Bay Weapons Range, 106 acres are considered wetlands. Also, there is a large jurisdictional wetland body located about 150 feet from the edge of the main bomb circle and a wetland that wraps around the western edge of the bomb circle (Lee 2006). There is a potential for inert bombs to land in or near wetlands on Grand Bay Range. Upon impacting the ground, inert munitions may penetrate the earth or skip off the surface, depending on the weight of the bomb or angle of entry. Heavier bombs (>500 pounds) can penetrate up to 50 feet deep, leaving little trace of entry. Lighter bombs (5 to 50 pounds) have a tendency to skip, especially if the angle of descent is shallow. Direct impacts to wetlands associated with an increase in inert heavyweight bombs (BDU-50, BDU-56, inert MK-82, and inert MK-84) would not be significant because of the relatively small impact area and lack of an explosion. The issue associated with using inert bombs and rockets near wetlands are primarily associated with the debris clearance, which is conducted approximately every 5 years (Lee 2006). Significant impacts to wetlands may occur if heavy machinery were used within wetlands to remove debris. Although the chance is low that a bomb would land in a jurisdictional wetland and not be easily accessible, the potential exists. Moody AFB would not enter jurisdictional wetlands to retrieve buried inert bombs due to the potential damage that may occur to wetlands when using heavy machinery. Furthermore, retrieval may not be logistically possible for deeply buried inert bombs. Direct impacts to wetlands could result from removing deeply embedded inert bombs and missiles; therefore, if a bomb missed the target and landed in a wetland, Moody AFB Natural Resources personnel would decide on a case by case basis if impacts would be greater if removed rather than left in place. Some may be left in place until the dry season or left in place completely, depending on location and size of bomb.

Given the low probability of an inert bomb to land within a wetland, the small impact area, and leaving it in place indefinitely, no changes to the natural flow of water would occur. Furthermore, no chemical residue would leach from a steel or concrete bomb casing, and it would not cause any change to the chemical properties of the wetland. Short- and long-term impacts to the wetlands would not be significant.

White phosphorus is a non-polar compound that does not dissolve readily in deep or anaerobic water conditions. White phosphorus contained in shallow surface water bodies is likely to volatilize quickly (HHS 1997). Studies found white phosphorus to persist in deep surface waters. Deeper waters have limited dissolved oxygen concentrations and therefore limited potential to oxidize the white phosphorus. White phosphorus residual levels were found to be very low or non-detectable in intermittent pond areas and mudflats (Walsh, Collins, and Racine 1995). Phosphoric acids are weak acids with low toxicity. In high concentrations, they can reduce the hardness of surface waters (i.e., remove calcium and magnesium ions) and increase aquatic plant productivity (Air Force 2003). It is unlikely that phosphoric acid concentrations in surface waters on Grand Bay Range would increase under the Proposed Action to the level that these effects would be seen as a result of white phosphorus deposition and oxidation. The surface water features within Grand Bay Range consist of intermittent drainages, wetlands, and man-made impoundments. Due to the oxidation process occurring in these types of water bodies, it is unlikely that significant concentrations of white phosphorus would remain. Because the unexploded rocket rate of white phosphorous rockets is less than 0.04 percent, it is reasonable to assume that the majority of the white phosphorus contained in the rocket is combusted, and the amount remaining in the environment is therefore minimal.

Impacts associated with chemical aspects of WP rockets are primarily related to contamination of rangelands or wetlands with white phosphorus residue. A large jurisdictional wetland body is located about 150 feet from the edge of the main bomb circle, and a wetland wraps around the western edge of the bomb circle (Lee 2006). There is a potential for white phosphorus rockets to land in or near wetlands on Grand Bay Range. Impacts to aquatic habitats would be related to the chemical properties of white phosphorus and its potential for accumulation in small isolated water bodies or wetland areas. Upon impacting the ground, detonation of the rocket, and exposure to air, however, white phosphorus reacts with oxygen and moisture in the air, leaving non-toxic residues. White phosphorus is not expected to accumulate in surface water or in vegetation. Given the small amount of white phosphorus that could possibly reach water bodies, the oxidation process occurring in wetlands, and the natural decontamination from seasonal drying cycles in wetlands, accumulation of white phosphorus in wetland areas of Grand Bay Range is unlikely to affect the wetlands.

Wildlife

The issues associated with use of inert bombs and rockets are the potential for munitions to directly strike biological resources. Direct physical impacts could result from inert bombs and rockets if wildlife were located near targets and are struck, or if broaching munitions skip and skid across the impact area or out of the impact area. Impacts associated with an increase in inert heavyweight bombs (BDU-50, BDU-56, inert MK-82, and inert MK-84) would not be significant. A complete boundary-to-boundary debris clearance is conducted every 5 years, and long-term impacts to the biological resources would not be above baseline levels. An increase in

ground vibrations would be expected given the larger bombs; however, the ground vibrations would greatly diminish through the soil and are not expected to increase impacts above normal levels.

White phosphorous smoke particle diameters range from 1-2 micrometers. Upon ignition, white phosphorus burns at a temperature of 2,760 degrees C (5,000 degrees F). As a consequence, the smoke from a white phosphorous rocket tends to pillar (i.e., rise due to the heat), forming a vertical screen, especially in conditions of high relative humidity. The smoke tends to disperse within 5-10 minutes, with faster dispersion resulting from increased turbulence, atmospheric instability, and wind speeds (Air Force 2003). The white phosphorus flame produces a hot, dense white smoke composed of particles of phosphorus pentoxide, which are converted by moist air into phosphoric acid. This acid, depending on concentration and duration of exposure, may produce a variety of topically irritant-type injuries.

The USEPA estimated that exposure concentrations could reach 202 milligrams per cubic meter (mg/m^3), as H_3PO_4 100 meters downwind from deployment and approximately $1.4 \text{ mg}/\text{m}^3$ 5,000 meters downwind. The USEPA does not expect community exposures to be severe at a distance of greater than 300 meters downwind (Army 1986, National Research Council 1999). Most smokes are not hazardous in concentrations that are useful for obscuring purposes. However, any smoke can be hazardous to health if the concentration is sufficient or if the exposure is long enough.

Because of the safety range associated with white phosphorous rockets, combined with high rocket reliability rates (>99 percent) and standard range safety procedures, it is unlikely that a rocket would land outside the restricted target impact boundaries. Therefore, wildlife resources outside of the impact area would not likely be affected. Since the smoke from white phosphorous rockets tends to rise due to heat and smoke dispersion within 5-10 minutes, wildlife within 300 meters are not expected to be affected. Birds may potentially attempt to fly directly into the smoke; however, this potential is very low and avoidance would be the most common behavior. The potential for direct mortality to wildlife within the impact area would be low due to the low densities of most wildlife species within the impact area and small area of impact. Because there is a low probability of wildlife occurring at any given site in or near the impact area and a relatively small area of impact on the ground, the likelihood of white phosphorous rocket use causing an adverse impact on wildlife is minimal.

Because white phosphorus combusts in the presence of oxygen, it is not common for white phosphorus to remain on the surface after a rocket functions, but it is possible. The probability of a white phosphorus rocket or white phosphorus particle settling in an aquatic environment would be low. There would be little opportunity for ducks, wading birds, or other bottom feeding wildlife to encounter or gather white phosphorus particles. Grand Bay Range has a low waterfowl population, and it is unlikely that wildlife on the range would ingest quantities that could cause mortality. Given the small amount of white phosphorus that could possibly reach water bodies and the natural decontamination from seasonal drying cycles in intermittent wetlands, accumulation of white phosphorus in surface waters of Grand Bay Range is unlikely to affect wildlife.

Sensitive Species

Indigo snakes and gopher tortoises are known to react to ground vibrations caused by human activity or vehicles. Response to these activities by gopher tortoises may range from withdrawal into the shell to movement from aboveground into a burrow. Indirect impacts on indigo snakes could occur if ground vibrations affected gopher tortoises in such a way as to affect their physiology, behavior, or reproduction and lead to degradation or abandonment of habitat essential to indigo snakes. However, gopher tortoise colonies are known to occur near military artillery ranges, airfields, and other areas where ground vibrations could be high (USFWS 1996). Furthermore, the closest active burrow is over 1,000 meters from the edge of the bombing circle (Lee 2006).

Indigo snakes utilize vibrations sensed through the ground via their lower jawbones for foraging and warning of approaching predators. The impact of inert munitions would send abnormal vibrations through the soil and potentially affect indigo snake behavior, foraging success, and physiology. The effect of ground vibrations on indigo snake behavior and physiology is not known. However, due to the fact that vibrations will be absorbed through sand and diminished by distance, little effect on behavior or physiology is anticipated.

Because of the safety range associated with white phosphorous rockets, combined with high rocket reliability rates (>99 percent) and standard range safety procedures, it is unlikely that a rocket would land outside the restricted target impact boundaries; however, the potential exists. Since the smoke from white phosphorous rockets tends to rise due to heat and smoke dispersion within 5-10 minutes, sensitive species within 300 meters are not expected to be affected by the smoke.

Round-tailed muskrat populations have been confirmed on Grand Bay Range, and some are found near the impact area that would be used for white phosphorus rocket training (Evans 2006). A white phosphorus rocket strike in or near an individual or a house could result in mortality and temporary damage to a house. Most populations are outside of the impact area. It is unlikely that infrequent WP rocket strikes would cause round-tailed muskrat mortality in sufficient numbers to destroy an entire colony or to adversely impact the persistence of local or regional populations.

There would be little opportunity for wood storks or bald eagles to encounter or gather white phosphorus particles. Wood storks have not been identified in or near the bombing circle at Grand Bay Range (Lee 2006). It is unlikely that wood storks or bald eagles on the range would ingest quantities that could cause injury or mortality. Furthermore, wood storks have adapted to live in fresh water and brackish wetlands. These wetlands must contain cypress, mangrove, or other similar trees that are suitable for nesting and an abundance of shallow pools in which to feed. There is no such suitable wood stork habitat near the impact areas. Wood storks feed by tactolocation also known as grope feeding. This involves wading in the shallows, not usually deeper than 20 inches, while holding their open bills vertically in the water. When a fish, usually 1 to 6 inches long, touches the bill, it snaps shut, trapping the fish. Although fish are the main source of wood storks' diet, they have been known to eat amphibians, reptiles, mammals, birds, arthropods, plant material, and even cow dung. Also, bald eagles feed primarily on fish. This type of feeding (compared to water fowl) would suggest that there is a very small potential

for wood storks or bald eagles to be affected by the introduction of white phosphorus rockets into Grand Bay Range.

Because there is a low probability of sensitive species occurring at the impact site or near the impact area and a relatively small area of impact on the ground, the likelihood of white phosphorous rocket use affecting a sensitive species is low. Consequently, the Air Force believes that implementation of the Proposed Action is not likely to adversely affect federally listed endangered or threatened species at Grand Bay Range. However, although the Air Force does not anticipate adverse impacts, the proposed action may affect these sensitive species. The USFWS has concurred with the determination that the Proposed Action may affect, but not likely to adversely affect, federally protected species.

3.6.3.1.3 Townsend Range

General issues and concerns under the Proposed Action are associated with the increase in ordnance requirements and flares. No white phosphorous rockets are proposed to be utilized on Townsend Range. The range is currently authorized for delivery of training weapons, including 30mm TP strafe, BDU-33 subscale practice bombs, inert rockets, and self-protection flares. Potential physical effects include direct and indirect impacts of inert weapons and flares at Townsend Range. Fire risk is discussed under Safety (Section 3.3.3). The Proposed Action will increase sortie and aircraft operations at Townsend Range and increase munitions dropped on the range.

Vegetation and Wetlands

Even though baseline ordnance and flares are proposed to increase, no habitat alteration is expected with respect to vegetation and wetlands.

Wildlife

The issues associated with using inert bombs and rockets are the potential for munitions to directly strike biological resources. Direct physical impacts could result from inert bombs and rockets if wildlife are located near targets and are struck, or if broaching munitions skip and skid across the impact area or out of the impact area.

The primary chemical material produced by the combustion of flares is magnesium, which could potentially impact physical or biological receptors. The toxic effects of flare ash residue were tested on mammals, plants, and fish. Concentrations were selected to represent the high end of the range that would be found in a pyrotechnic test area. It was concluded that the effects of illumination flare ash residue were very minimal and not particularly dangerous to the environment (Air Force 1996). Magnesium is an essential human nutrient often found in nuts, cereals, and seafood. Ingestion of magnesium has very low toxicity to humans as evidenced by its use in antacids and cathartics, but is toxic to humans over the long term from inhalation exposure. Additionally, the threshold analysis for soil and surface water concentrations of flare ash are based upon toxicity studies for protection of wildlife. The analysis shows the toxicity threshold for magnesium would not be reached (Section 3.5.3). An increase in chaff and flares would occur on Townsend Range; however, no significant impacts are expected.

Sensitive Species

Confirmed federally listed species present on the range include the flatwoods salamander and wood stork. The location on Townsend Range where the flatwoods salamander has been observed in its breeding state is indicated on Figure 3.6-2. The proposed increase in ordnance operations at Townsend Range would increase the risk of impacting the flatwoods salamander. The issues associated with using inert bombs and rockets are the potential for munitions to directly strike a flatwoods salamander. Direct physical impacts could result from inert bombs and rockets if salamanders are located near targets and are struck, or if broaching munitions skip and skid across the impact area or out of the impact area. Consequently, the Air Force believes that implementation of the Proposed Action is not likely to adversely affect federally endangered or threatened species at the Townsend Range. However, although the Air Force does not anticipate adverse impacts the proposed action may affect these sensitive species.

Wood storks have been seen flying over the range but have not been observed nesting or feeding on the range. Wood storks require wetland habitat for foraging needs. These wetlands need to sustain water levels long enough to support fish and crustacean species. Most storks forage in water ranging from 6 to 20 inches deep. Townsend Range does not support many wetlands that storks utilize. It would be highly unlikely that a wood stork would be impacted by increasing inert munitions. There remains the possibility of air strikes between birds and aircraft; however, the impact areas do not appear to be located along any documented wood stork flight pathways, nor do they possess any stork foraging habitat. The Air Force believes that implementation of the Proposed Action is not likely to adversely affect the wood stork at Townsend Range due to the infrequency of the species in the area and its highly migratory behavior. However, although the Air Force does not anticipate adverse impacts the proposed action may affect these sensitive species. The USFWS has concurred with the determination that the Proposed Action may affect, but not likely to adversely affect, federally protected species.

3.6.3.1.4 Airspace

General issues and concerns under the Proposed Action are associated with the increase in air traffic within the designated MOAs. Specifically, there would be increases in day and/or night flight activities in the following air spaces: Moody 1 (night), Moody 2 South (day), Moody 3 (day/night), Live Oak (night), Bulldog B (day), Townsend Range (day/night), Grand Bay Range (day/night), VR-1065 (day), and LATN (day/night). Associated with increases in flight activity in these areas, there would be an increase in the use of both chaff and/or chaff and flares at Moody 1 (chaff/flares); Moody 2 North (chaff); Moody 2 South (chaff); Moody 3 (chaff/flares); Live Oak (flares); and R-3007 (flares).

Vegetation and Wetlands

No ground-disturbing activities are associated with the airspace use in the Proposed Action, so there would be no impacts on vegetation or wetlands underlying the affected airspace. Aluminum from chaff is leachable only under strongly acidic conditions (pH of 4 or less), and the rate of dissolution of aluminum from chaff during decomposition is likely not rapid enough to increase aluminum concentrations above normal background levels.

Wildlife

The potential sources of impacts to wildlife from aircraft overflights are the increase in chaff and flares and the visual effect of the approaching aircraft and the associated subsonic noise. Visual impacts are not expected to be significant because the majority of the sortie operations would take place at altitudes greater than 1,000 feet AGL, which is higher than the altitude accounting for most reactions to visual stimuli by wildlife (Air Force 2000).

The primary exposure mechanism to biological receptors is from the ingestion of the chaff fibers. Studies designed to determine the toxicity associated with direct ingestion of chaff have concluded that chaff presents no health hazards to farm animals or toxic effects to aquatic organisms. However, aluminum is toxic to plants under acidic conditions (Air Force 1996). It is possible that aluminum from chaff could persist in the soil and sediments of water bodies until there are favorable conditions for dissolution and uptake by plants.

Haley and Kurnas (1992) found aluminum-coated glass fibers to be nontoxic to daphnia, mysid shrimp, and sheepshead minnows at concentrations up to 1,000 mg/L. The U.S. Navy conducted a study on the effects of chaff on six marine organisms in the Chesapeake Bay: a benthic polychaete worm (*Nereis succine*), various life stages of the American oyster (*Crassostrea virginica*), the blue mussel (*Mytilus edulis*), the blue crab (*Callinectes sapidus*), the filter-feeding menhaden (*Brevoortia tyrannus*), and the killifish (*Fundulus heteroclitus*). The organisms were exposed to concentrations of chaff that were much higher than the concentrations that would result from normal chaff training operations. No significant increases in mortality were noted (Air Force 1996).

Studies on the effects of noise on wildlife have been conducted predominantly on mammals and birds. Studies of subsonic aircraft disturbances on ungulates (e.g., pronghorn, bighorn sheep, elk, and mule deer) in both laboratory and field conditions have shown that effects are transient and of short duration and suggest that the animals habituate to the sounds. Similarly, the impacts to raptors and other birds (e.g., waterfowl) from aircraft low-level flights were found to be brief and insignificant and not detrimental to reproduction (Air Force 2000).

Although Moody 2 South, Moody 3 MOA, Bulldog A MOA, Bulldog B MOA, Townsend Range, Grand Bay Range, and the LATN airspaces would see an increase in air traffic, changes to the number and types of overflights are not expected to result in significant impacts to wildlife or wildlife populations. Most aircraft activity would occur at altitudes greater than 1,000 feet MSL. In addition, due to the random nature of flight within the MOAs and the large area of land overflowed, the probability of an animal, nest, or other defined location experiencing overflights more than once per day would be low. Therefore, potential impacts to wildlife from the proposed increase in sortie operations in the MOAs would not be significant. Section 3.3.3, Safety, establishes that bird-aircraft strikes would continue to be non-existent to rare in MOAs, MTRs, and the LATN area.

Sensitive Species

The potential impacts from aircraft overflights in MOAs and MTRs on threatened and endangered species are expected to be similar to those discussed previously for wildlife. As

discussed in Section 3.6.2.4, Biological Resources, bald eagles, red-cockaded woodpeckers, and wood storks are known to nest under portions of the affected airspace. Nine bald eagle and seven wood stork nest sites are known to occur beneath Moody 1, Moody 3, and Live Oak MOAs.

The effects of aircraft noise on the bald eagle have been studied relatively well, compared to most wildlife species. Overall, there have been no reports of reduced reproductive success or physiological risks to bald eagles exposed to aircraft overflights or other types of military noise (Air Force 2005c). Most researchers have documented that pedestrians and helicopters were more disturbing to bald eagles than fixed-wing aircraft, including military jets. In contrast to the bald eagle, little research has been conducted on the effects of aircraft noise on the wood stork. Kushlan (1979) compared the responses of various species of colonial nesting birds (including a small number of wood storks) to three types of census methods for rookeries: ground-based, helicopter, and fixed wing censuses. In general, most species were more disturbed by the human intrusion of the ground-based census than by helicopters or fixed-wing aircraft flying as low as 200 feet AGL. Rodgers and Smith (1995) found that nesting wood storks had the smallest flush distance in response to disturbance compared to other similar species. Wood storks did not flush from their nests until an intruder (human or motorized boat) was within, on average, about 50 feet. Potential noise impacts to red-cockaded woodpeckers can be decreased by maintaining a distance of 100 meters or greater from any active nest along the flight path. Red-cockaded woodpecker guidelines would be followed as determined by Moody AFB red-cockaded woodpecker management guidelines or the INRMP.

In summary, for most of the ROI, average noise exposure from aircraft would be comparable or slightly higher to that experienced in the current airspace, which has not resulted in reports of significant negative impacts to sensitive species and other wildlife. Since all aircraft activity within these MOAs would occur at altitudes greater than 1,000 feet MSL, there would be no effects to any of these species with implementation of the Proposed Action within these MOAs.

To minimize disturbance to bald eagle nest areas and reduce potential BASHs, military aircraft would avoid nest areas by 1 mile laterally and 1,500 feet AGL from September 15 through June 1. In addition, military aircraft would avoid the wood stork colony to the north of Nahunta, Georgia, and immediately adjacent to VR-1066 by 1 mile laterally from March through June. The USFWS updates wood stork and bald eagle locations to Moody AFB Natural Resources every 2-3 years. This updated information is provided to the Moody AFB flying communities to ensure these lateral rules are followed. Therefore, the Proposed Action will have no effect on bald eagles or wood storks underlying the airspace in the Proposed Action. Other protected species (amphibians, reptiles, and mammals identified in Section 3.6.3.4) are not likely to be affected, since all operations are above 1,000 feet and a slight increase in air traffic would not disturb ground dwelling species.

3.6.3.2 No Action

Under the No-Action Alternative, the proposed beddown of A-10 aircraft, the associated construction activities at Moody AFB, and the increase in airspace utilization would not occur. Consequently, baseline conditions, as described in Section 3.6.2, would remain unchanged. Implementation of the No-Action Alternative would not change current activities associated

with approved actions at Moody AFB, Grand Bay Range, Townsend Range, and airspace; therefore, there would be no impacts to biological resources.

3.7 Cultural Resources

3.7.1 Definition of Cultural Resources

Cultural resources consist of prehistoric and historic districts, sites, structures, artifacts, and any other physical evidence of human activity considered relevant to a culture or community for scientific, traditional, religious, or other reasons. They include archaeological resources (both prehistoric and historic), historic architectural resources, and American Indian sacred sites and traditional cultural properties. Historic properties (as defined in 36 CFR 60.4) are significant archaeological, architectural, or traditional resources that are defined as either eligible or ineligible for listing in the National Register of Historic Places (NRHP). Under the National Historic Preservation Act (NHPA), Moody AFB is required to consider the effects of its undertakings on historic properties listed or eligible for listing in the National Register. NHPA obligations for a federal agency are independent from NEPA and must be complied with even when an environmental document is not required. When both are required, Moody AFB coordinates NEPA compliance with its NHPA responsibilities to ensure that historic properties are given adequate consideration in the preparation of environmental documents such as Environmental Assessments and Environmental Impact Statements. As per AFI 32-7065 Sections 3.3.1 and 3.3.2 and 36 CFR 800.8, Moody AFB has incorporated NHPA Section 106 review into the NEPA process or substituted the NEPA process for a separate NHPA Section 106 review of alternatives.

On 21 November 1999, the DoD published its American Indian and Alaska Native Policy, which emphasizes the importance of respecting and consulting with tribal governments on a government-to-government basis. The policy requires that, before a decision is made, an assessment be conducted, through consultation, of the effects of proposed DoD actions that may have the potential to significantly affect protected tribal resources, tribal rights, and Indian lands.

Other applicable guidance and directives associated with cultural resource management include EO 11593, *Protection and Enhancement of the Cultural Environment* (36 FR 8921 [13 May 1971]); EO 13006, *Locating Federal Facilities on Historic Properties in Our Nation's Central Cities* (FR 26071 [24 May 1996]); EO 13287, *Preserve America* (68 FR 10635 [5 March 2003]); AFI 32-7065, *Cultural Resource Management Program* (1 June 2004); and DoD Instruction 4715.3, *Environmental Conservation Program* (3 May 1996). It should be noted that it has been previously judged (*National Indian Youth Council v. Andrus*, 1981; 10th Circuit Court) that certain cultural resource EOs are to be viewed as a "managerial tool" for the benefit of the executive branch. Likewise, DoD and Air Force directives serve as "managerial tools" for the benefit of these respective agencies. In the case of these EOs, statements of broad general intent, not specific mandates, are made. Neither these EOs nor DoD directives override congressional mandate provided in the NHPA or NEPA. The NHPA does allow for adverse impacts to historic properties so long as the agency properly follows the NHPA process and performs any necessary mitigations or actions as agreed upon by the consulting parties.

Moody AFB is also mandated by Section 110 of the NHPA to maintain an active historic preservation program and provide stewardship of cultural resources "consistent with the

preservation of such properties and the mission of the agency (16 U.S.C. §470 h-2(a)).” 16 U.S.C. §470 h-2(b) also mandates that “such properties under the jurisdiction or control of the agency as are listed in or may be eligible for the National Register are managed and maintained in a way that considers the preservation of their historic, archaeological, architectural, and cultural values in compliance with section 106 of this (NHPA) Act.”

The Native American Graves and Repatriation Act (1990) protects Native American burial sites and controls the removal of human remains, funerary objects, sacred objects, and items of cultural patrimony on federal and tribal lands. At present, no American Indian traditional resources, sacred sites, or spiritual areas have been identified on the installation. However, the nature and extent of Moody AFB’s cultural resources and its geographic size suggest a possibility that such resources may be identified in the future (ICRMP 2006).

3.7.2 Existing Conditions

This section describes known cultural resources within each of the project areas that are listed, eligible, or potentially eligible for listing in the National Register, or that may require further evaluation to determine their significance. The Air Force has identified numerous archaeological sites on Moody AFB. One site, 9LW71/9LW70, was recommended as eligible for listing in the National Register, while four sites 9LN17, 9LW52, 9LW63 and 9LW67, are listed as potentially eligible for listing in the National Register. Another site was determined to be eligible for listing on the National Register in 1985 but was then determined to be ineligible for listing in 1996. This is site 9LN4. One historic structure, Building 618, is a water tower and is listed as eligible for the National Register. None of the sites, with the exception of the water tower, are within the affected area in Main Base and Grand Bay Range. The closest site is located 1 mile from the Main Base area. Federal agencies must consider this and any other historic properties during the planning and execution of any federal undertaking that has the potential to affect them. Research has not identified any historic cemeteries within the boundaries of Moody AFB for listing on the National Register. While historic cemeteries are not normally eligible for the National Register, they may be nominated as a component of a greater site complex (Air Force 2004a) if they are found. To date, Moody AFB does not have any Traditional Cultural Resources and/or Sacred sites identified within its boundaries (ICRMP 2006). However, there have not been any surveys conducted that have specifically sought Traditional Cultural Resources or Sacred sites. Should any be uncovered in the future, these are subject to the same rules and regulations as all cultural resources; furthermore, an eligibility determination would need to be made for the National Register.

Main Base and Grand Bay Range

Moody AFB has determined that the entire Main Base Cantonment area and Grand Bay Range have been surveyed. This was required for the purpose of 1) determining if cultural resources were present in the subject areas and 2) determining if the alternatives would result in the potential for adverse effects. The Air Force should consult with the state historic preservation office to determine if it concurs that further cultural surveys are necessary.

The cultural context of Moody AFB and Grand Bay Range, located in Lowndes and Lanier Counties in Southeastern Georgia, is considered to be within the region of the Georgia Coastal

Plain. Lanier and Lowndes Counties straddle the Tifton upland region to the west and the wetlands of the Okefenokee Swamp to the east (ICRMP 2006). This region contains a varied and prehistoric cultural sequence. Inhabitants of the Georgia Coastal Plain are thought to have thrived from the Pre-Paleo-Indian (>11,000 years before present [B.P.]) through Paleo-Indian (11,000–9,000 B.P.) periods, the Archaic Period (9,800-2,500 B.P.), the Woodland Period (2,500 B.P.–A.D. 1000), and the Mississippian Period (A.D. 1000- 1540). Historic sites range from Mississippian times through the Cold War Era, with an Early European presence also represented on the Georgia Coastal Plain. Most of the archaeological sites on Moody AFB are of the Woodland and Mississippian Periods. However, relatively little historical archaeology has been conducted in Lowndes and Lanier Counties (ICRMP 2006). It is known, however, that Cold War Era sites do exist within the ROI, but these are not eligible for the National Register.

The numerous archaeological surveys have been conducted on Moody AFB during the timeframe 1985 through 1999. The four sites that are potentially eligible for listing on the National Register are 9LW67 (a multi-component site with historic and Woodland artifacts), 9LW63 (a prehistoric site of unknown origin), 9LN17 (a prehistoric lithic scatter of unknown origin), and 9LN4 (a multi-component site with prehistoric lithic scatters and historic artifacts). The two sites that have been determined as eligible for listing on the National Register are 9LW71, which incorporated 9LW70 (a multi-component site with Late Paleo-Indian, Early Archaic, and Woodland scatters) and the water tower on Main Base that was built in 1941 (structure 618, site number 9LW-M-3). The structure is a 200,000-gallon-capacity steel water tower with an elevated tank. The historic significance of the water tower is that this tower is one of the few remaining recognizable structures that has remained constant on Moody AFB. It is significant as part of World War II mobilization and training activities at a local level (ICRMP 2006).

As stated above, Moody AFB, including Grand Bay Range, has been surveyed for archeological resources. Only a small number of archeological sites have been recommended as either potentially eligible or eligible for listing in the National Register. However, there is always the possibility that undiscovered archaeological resources may exist. In the event that an archaeological site, Traditional Cultural Property or Sacred site is discovered during any military activities, the Base Historic Preservation Office (BHPO) and the Cultural Resources Division must be notified immediately and all work shall cease until further determination is made by the BHPO.

Townsend Range

All of Townsend Range has been surveyed and 14 archaeological loci have been recorded, resulting in a site density of one site for every 368 acres surveyed. The sites are both historic and prehistoric. Recovered artifacts include flakes (stone fragments), projectile points, pottery shards (broken pieces of pottery), and ceramic material. Two sites have been identified as possible dwellings that date to the 19th or 20th centuries. These 14 sites are dispersed throughout the range. A Phase II archaeological investigation was conducted on all sites with potential eligibility for the NRHP and the study determined that none of the sites were eligible for the NRHP.

Townsend Range, located in Southeast Coastal Georgia, has a rich history of prehistoric and historic sites. Prior to European settlement, the area was home to the Mississippian people, the first great civilization in North America. In the late 16th century, Franciscan friars from Spain established a mission on a bluff near Darien, located on the same site as a Native American

village. In 1721, the English built Fort King George at the mouth of the Altamaha River, the site of present day Darien (State of Georgia 2005). The Colonial site of Fort Barrington, which is listed in the National Register (Coastal Georgia Regional Development Center 1991), is located at the south end of Townsend Range on the banks of the Altamaha River. The fort was built as a defense against the Spaniards and Indians. The historical marker for the fort is posted along State Route 57 in Long County, about 15 feet from the McIntosh County line. Fort Barrington Park is located near the historic site, just east of Cox. Old Barrington Road, which formerly ran between Savannah and Fort Barrington, is still known as Old Barrington Road. The road became an important trade route between the Carolinas and Florida in the early 1700s. It also was critical during the Revolutionary War for troop movements (Vinson Institute of Government 2005). Various other sites important to the Civil War and reconstruction remain present in the region (State of Georgia 2005).

Airspace

There has been no formal record search to determine the definite number or type of cultural resources in these areas. Estimates of cultural resources underlying the affected airspace gathered from state archaeological files could number in the thousands. The National Register Information System lists a total of 95 NRHP-listed structures underlying the affected airspace (National Park Service 1997). Moody 1 MOA has the largest number of NRHP-listed properties with 64, followed by Live Oak MOA with 11, Moody 3 MOA with 10, VR-1065 with 4, and VR-1066 and Moody 2 North MOA both with 3 structures; no listed properties occur under Moody 2 South MOA. Seventeen known American Indian traditional cultural resource sites are located throughout the State of Georgia (Moody AFB 1997b). However, none of these sites are located under or near any of the affected airspace.

3.7.3 Environmental Consequences

Analysis of potential impacts to cultural resources includes impacts that may occur by physically damaging or destroying all or part of a resource, altering the surrounding environment that contribute to the resource's significance, or neglecting the resource to the extent that it deteriorates or is destroyed. Archeological sites are fragile and nonrenewable resources that may suffer varying degrees of impact from natural and human-created effects. A site's scientific value is closely tied to its context or deposition history. Therefore, any action that disturbs the soil or surface vegetation can damage or destroy that context and expose artifacts to looters. Impacts are assessed by identifying the types and locations of a proposed activity and determining the exact location of cultural resources that could be affected.

3.7.3.1 Proposed Action

Moody AFB and Grand Bay Range

Prehistoric cultural resources may be displaced or destroyed by explosive ordnance or construction activity. Construction activities present a host of dangers to archaeological resources. Soil borrow and dumping activities, tree removal, use of heavy equipment, and similar activities all have the potential to cause severe damage to known archaeological sites. Archaeological sites are considered highly sensitive to ground disturbance. However, no potential impacts are expected from the proposed construction and building alteration activities

and no eligible historic structures would be impacted by this action. The most proximal archaeological site (9LW70/71) is located approximately 1 mile away from any proposed construction activity within the Moody AFB Cantonment area. The only eligible historic structure (9LW-M-3) is within the Cantonment area and would not be affected by this action.

The proposed LOLA Extension area is located adjacent to the existing Hot Cargo Pad as shown on Figure 2.1-1 as Project 34. Two sites, 9LW70 and 9LW71, located within 0.5 mile of this location, were evaluated for eligibility listing on the National Register. In 1996, a survey of 9LW70 identified this site as ineligible for the NRHP. Site 9LW71 was identified as potentially eligible. In 1999 a Phase II was conducted on 9LW71, and its eligibility was confirmed. Additionally, it was discovered that this site was contiguous with 9LW70, thus merging these sites into one eligible site, 9LW71. This is a multi-component site with Paleo-Indian, Early Archaic and Woodland artifacts. Another site, 9LW63, is located to the southeast of the above listed sites. This site has a potential for listing on the National Register and is comprised of a lithic scatter of unknown origin. Site 9LW66 is located almost adjacent to 9LW63. This site is multi-component with both historic and prehistoric artifacts, but is not eligible for listing on the National Register (ICRMP, 2006). Due to the location of the proposed LOLA Extension, there is a potential to impact Cultural Resources and it is recommended that monitoring take place during construction. While avoidance of impacts is possible to the known, existing sites, the potential to disturb unknown sites in this vicinity does exist.

Utilization of the Grand Bay Range is not expected to adversely impact cultural resources. The mission of the range would remain constant, as this is already a current operations area at Moody AFB.

In the event that artifacts are unavoidably encountered, Moody's Cultural Resources Division and the BHPO should be immediately notified. They will then set a precedence that should be strictly followed.

Townsend Range

Although a wide variety of European and Native American sites exist within Townsend Range, utilization of the range is not expected to adversely impact cultural resources. The mission of the range would remain constant, as this is already a current operations area and practice range. Additionally, the European settlement sites have been noted and included in the National Register.

In the event that artifacts are unavoidably encountered, Moody's Cultural Resources Division and the BHPO should be immediately notified. They will then set a precedence that should be strictly followed.

Airspace

Impacts to cultural resources under Moody AFB airspace activities would not be expected under the Proposed Action. This airspace is currently in use for military operations and would continue to be used for the same purpose under the Proposed Action.

3.7.3.2 No-Action Alternative

The No-Action Alternative would be the continuation of current operations by AETC aircrews. Thus, the status quo would be maintained for avoidance and protection of existing cultural resources. Under this alternative there would be no known impacts to cultural resources.

3.8 Land Use

3.8.1 Definition of Land Use

Land use generally refers to human modification of land, often for residential or economic purposes. It also refers to the use of land for preservation or protection of natural resources such as wildlife habitat, vegetation, or unique features. Human land uses include residential, commercial, industrial, agricultural, and recreational. Unique natural features are often designated as national or state parks, forests, wilderness areas, or wildlife refuges.

Attributes of land use include general land use and ownership, land management plans, and special use areas. Land ownership is a categorization of land according to type of owner. The major land ownership categories include federal, state, Native American, and private. Federal lands are further described by the managing agency, which may include the USFWS, U.S. Forest Service, Bureau of Land Management, or the DoD. Land uses are frequently regulated by management plans, policies, ordinances, and regulations that determine the types of activities that are allowed or that protect specially designated or environmentally sensitive uses. Special-use land management areas (SULMAs) (e.g., wilderness areas) are identified by federal and state agencies as being worthy of more rigorous management.

3.8.2 Existing Conditions

3.8.2.1 Moody AFB

Moody AFB occupies 11,457 acres of federally owned land in Lowndes and Lanier Counties in south-central Georgia. The installation is divided into the main base (5,094 acres) and the Grand Bay Range (5,874 acres); an additional 489 acres is located at the Grassy Pond Recreational Annex, approximately 25 miles south of the base (Figure 3.8-1).

The majority of installation activities occurring on the base are concentrated in five main areas: Moody AFB airfield (main base), security forces and RQS training areas (main base), Grand Bay Weapons Range (Grand Bay Range), Bemiss Field (Grand Bay Range), and the EOD Range (Grand Bay Range). The Moody AFB airfield consists of two parallel runways oriented north to south. All aircraft operations at Moody AFB originate and terminate at this location.

Georgia State Highway 125 (Bemiss Road) divides the main base into two functional units, with the family housing area, golf course, trailer area, and wastewater treatment plant facility located to the west and the main portion of the installation to the east. The eastern portion includes the administrative, base support, aircraft operations, and maintenance areas, as well as the airfield with its two 8,000-foot parallel north/south runways. Predominant land use immediately adjacent to the main base includes agriculture and rural residential.

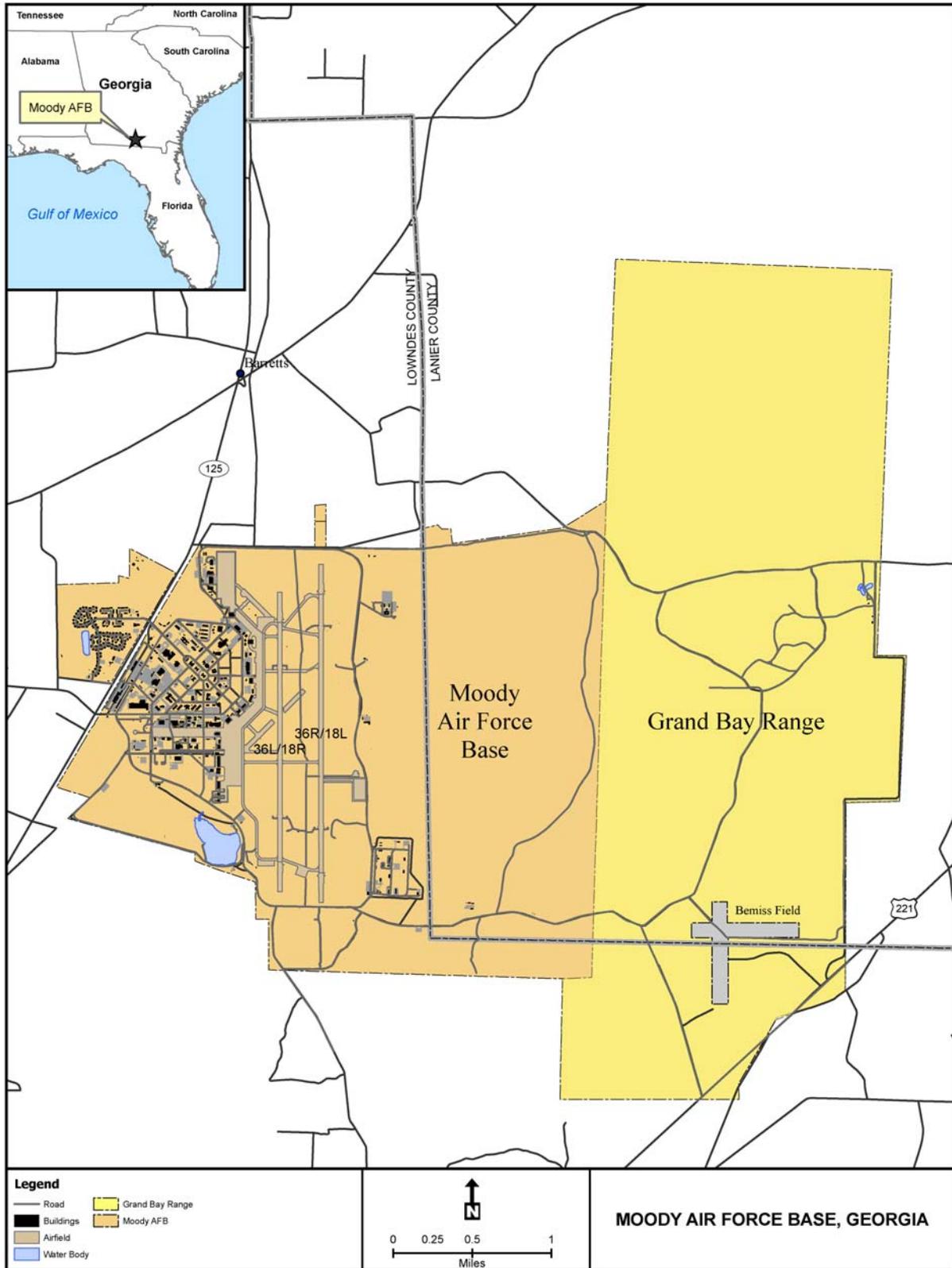


Figure 3.8-1. Base Map

A new, privatized base housing area is being constructed adjacent to the southwest boundary of the installation. The Magnolia Grove Housing Project will consist of 395 units in the western portion of a 703-acre area of privately owned property that is currently farmland and undeveloped land. The housing area will be fenced, and vehicle access to and from the base will be possible only via Stone Road.

Improved grounds on the main base, consisting of all covered areas (under buildings, sidewalks, and so on) as well as land around base buildings, the family housing area, and the trailer park, encompass approximately 887 acres. Semi-improved grounds, including the airfield, the ±100-acre golf course/driving range complex, recreational ball fields, and the grounds in the vicinity of Mission Lake, account for approximately 1,092 acres. The remaining 3,518 acres (64 percent) of the main base are classified as unimproved grounds and consist of commercial forest land and the 30-acre Mission Lake.

Moody AFB is a well-developed installation that has kept pace with changing requirements and missions. Land use on the main base is divided into 12 existing land use categories (Figure 3.8-2). Additional information for each of the land use categories can be found in the Moody AFB General Plan (Air Force 2004b). The land use categories, facility types, and approximate acreages are as follows:

1. Airfield – 266 acres
 - Arm/disarm pads
 - Parking/maintenance aprons
 - Paved overruns
 - Runways
 - Taxiways
2. Aircraft Operations and Maintenance – 834 acres
 - Aerospace ground equipment
 - Aircraft maintenance hangars
 - Air passenger and freight terminals
 - Avionics maintenance facility
 - Control Tower
 - Flying squadron operations
 - Fire Department
3. Administrative – 65 acres
 - Communications centers
 - Education center
 - Family services and support centers
 - Security Police operations
 - Various headquarters facilities
4. Industrial – 265 acres
 - Base Civil Engineering shops
 - Munitions storage

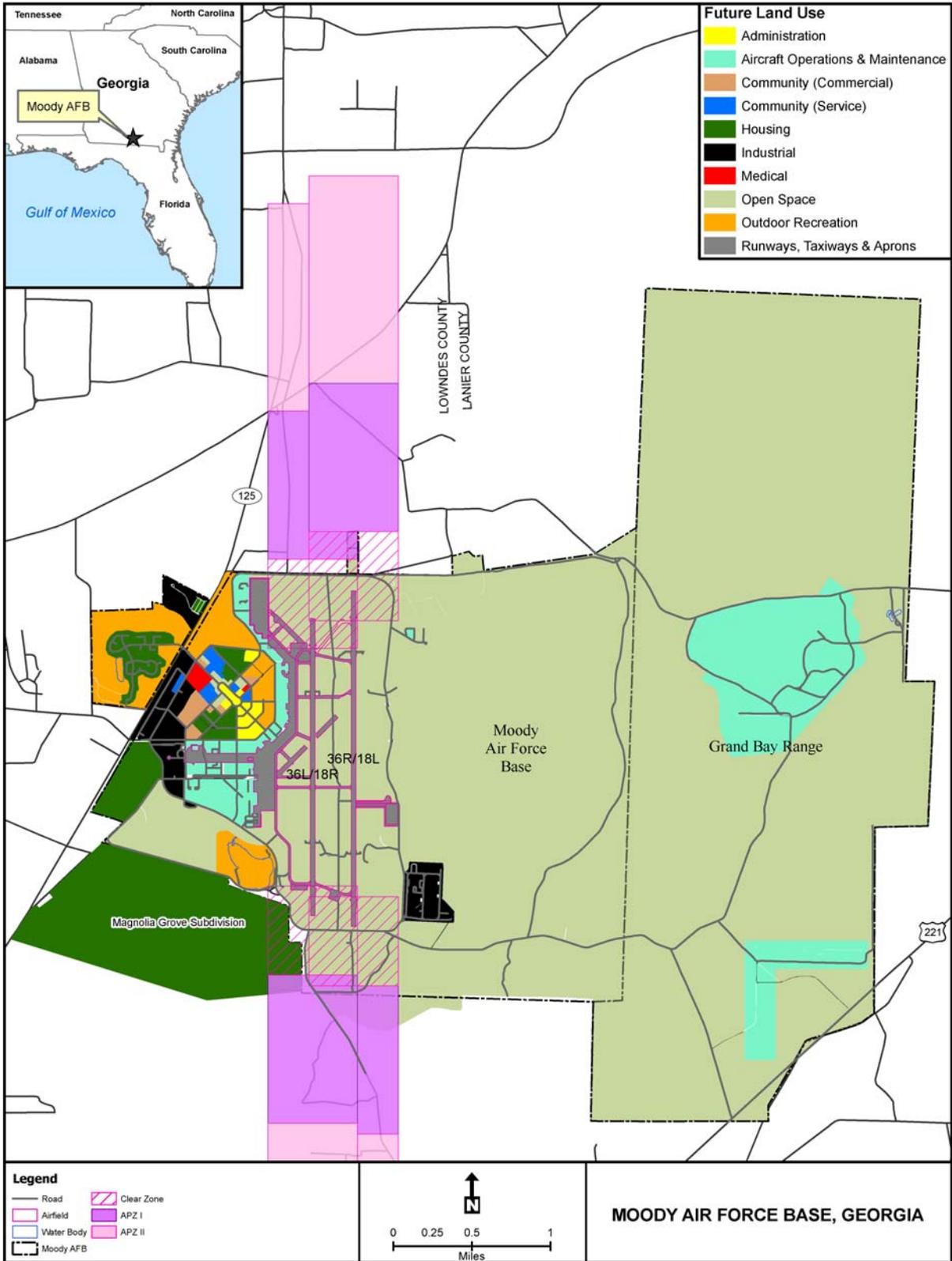


Figure 3.8-2. Land Use

- Petroleum, oil, and lubricants facilities
 - Wastewater treatment facility
 - Supply facilities
 - Utilities
 - Vehicle operation and maintenance
5. Community (Commercial) – 42 acres
- Army and Air Force Exchange System and Defense Commissary Agency
 - Indoor recreation facilities
 - Officer and enlisted dining facilities
 - Skills Development Centers
6. Community (Service) – 23 acres
- Chapel and religious education facilities
 - Child Development Center
 - Library
 - Post Office
7. Medical – 19 acres
- Installation hospital
 - Dental clinic
 - Medical storage facilities
 - Veterinary facility
8. Housing (Accompanied)
- Military family housing
9. Housing (Unaccompanied)
- Bachelor Quarters
 - Visiting Officer Quarters
 - Visiting Enlisted Quarters
10. Outdoor Recreation – 575 acres
- Baseball, softball, football, and soccer fields
 - Golf course
 - Outdoor swimming pools
 - Playgrounds
 - Tennis and basketball courts
 - Various other Morale, Welfare and Recreation Services support facilities
 - Grassy Pond Recreation Annex, Mission Lake, Quiet Pines Lake
11. Water – 367 acres
- Moody AFB (Mission Lake, Quiet Pines Lake, Shiner Pond)
 - Grassy Pond Recreation Annex (Grassy Pond, Lot Pond)

12. Open Space/Forested – 8,923 acres
 - Moody AFB
 - Grand Bay

Air Installation Compatible Use Zone Program

The Air Force provides land use recommendations to local jurisdictions through the Air Installation Compatible Use Zone (AICUZ) program. The purpose of the project is to promote compatible land use development in areas subject to aircraft noise and accident potential. These guidelines have been established on the basis of studies prepared and sponsored by several federal agencies, including the DoD. The guidelines recommend land uses that are compatible with airfield operations while allowing maximum beneficial use of adjacent properties.

According to the AICUZ study for Moody AFB, there are only minor encroachments in the vicinity of Moody AFB (Air Force 1994b). Noise contours from aircraft operations impact only small portions of the developed land off-base. The majority of the off-base land under the noise contours is undeveloped and is expected to remain as open space, agricultural, and low density for the foreseeable future. The majority of the Moody AFB clear zones lie on government property and within the base boundary the government has acquired the land by fee or easement. Accident Potential Zones I and II extend off base to the north and south.

3.8.2.2 Grand Bay Range

The eastern half of the installation is referred to as Grand Bay Range (Figure 3.8-1). This contiguous area is made up of 5,874 acres and contains the Grand Bay Weapons Range, Bemiss Field, and the EOD Range. The Grand Bay Weapons Range, which is located along the northeastern boundary of Grand Bay Range, is a bombing and gunnery range impact area that occupies approximately 450 acres. Grand Bay Range is co-managed by the GDNR under an Air Force license agreement for fish and wildlife management purposes. Grand Bay Range is combined with state-owned property to the south to form the Grand Bay Wildlife Management Area (WMA). Immediately north of Grand Bay Range is the Banks Lake NWR, administered by the USFWS. The predominant land use immediately adjacent to Grand Bay Range includes agriculture, forestry, recreation, and rural residential. With the exception of 2 acres of improved ground, the range area consists entirely of unimproved grounds.

While Bemiss Field is no longer used as an airstrip for landing purposes, the airstrip and the surrounding area are used for a variety of military operations, including parasailing, security forces training, C-130 drop zone, and helicopter landing/hovering areas.

The EOD Range is located west of Dudley's Hammock on a fill area in Rat Bay. This facility is used to conduct training of EOD personnel in the safe detonation of ordnance and the disposal of unexploded ordnance from military operations, including those conducted at Grand Bay Weapons Range. All activities on this facility are concentrated on the actual range, consisting of 1 acre.

3.8.2.3 Townsend Range

Townsend Range is an important air-to-ground inert ordnance training facility that is located on 5,183 acres in southeast Georgia. The range is located in McIntosh County and is approximately 60 miles south-southwest of Savannah, 20 miles inland from the Atlantic Ocean, and 2 miles west of the town of Townsend (Figure 3.8-3).

The range contains several administrative, command and control, and maintenance facilities in addition to stationary and strafing targets. The cantonment area is situated on a 49.5-acre parcel northeast of the range target area, and the flank tower is situated on a 0.5-acre parcel northwest of the target area. In addition to inert ordnance practice, Townsend Range is used for other types of operations including quick drop zone (standard aircraft training bundles), helicopter door gunnery, laser, Large-scale Target Sensor System for infra-red/electro-optics, and close air support operations.

Non-military uses of Townsend Range include forestry and limited and controlled hunting programs for harvesting deer, feral hogs, and coyotes. McIntosh County holds timber rights to 2,991 acres within the current range boundaries per an easement included in the land purchase agreement, and the federal government holds timber rights to the remaining 2,192 acres of the range.

The range is bordered by forest lands held by Sustainable Forest Limited Liability Company to the northwest and southeast and RTOC Limited Partnership to the northeast. A navigable portion of the Altamaha River basin lies to the southwest of the range. While the lands lying outside of the range are mostly forested or marshy lands without any permanent residents, there are several unpaved roads in the area that may be used by foresters, hunters, and hikers (SouthDiv 2004).

3.8.2.4 Vicinity and Regional Land Use

Moody AFB and Grand Bay Range

Land use in the immediate vicinity of the installation consists of mostly undeveloped wetlands to the east and south and rural residential, agricultural, and wetlands towards the west and north. Surrounding areas to the north and west are currently used primarily for farming, sod production, and residential development, while to the east and south, land is used predominantly for commercial forestry with limited agriculture (Figure 3.8-4).

Residential development around Moody AFB can be generally classified as low density, with several residential subdivisions located southwest of the base. A few small- to medium-sized mobile home parks are located adjacent to the northern end of the runways. In addition, mobile homes in the Green Valley and South Gate Manor mobile home parks, along with the Shady Grove mobile home park, are located to the west of the base just outside the south gate. Small areas of commercial development are located along State Highway 125 (Bemiss Road).

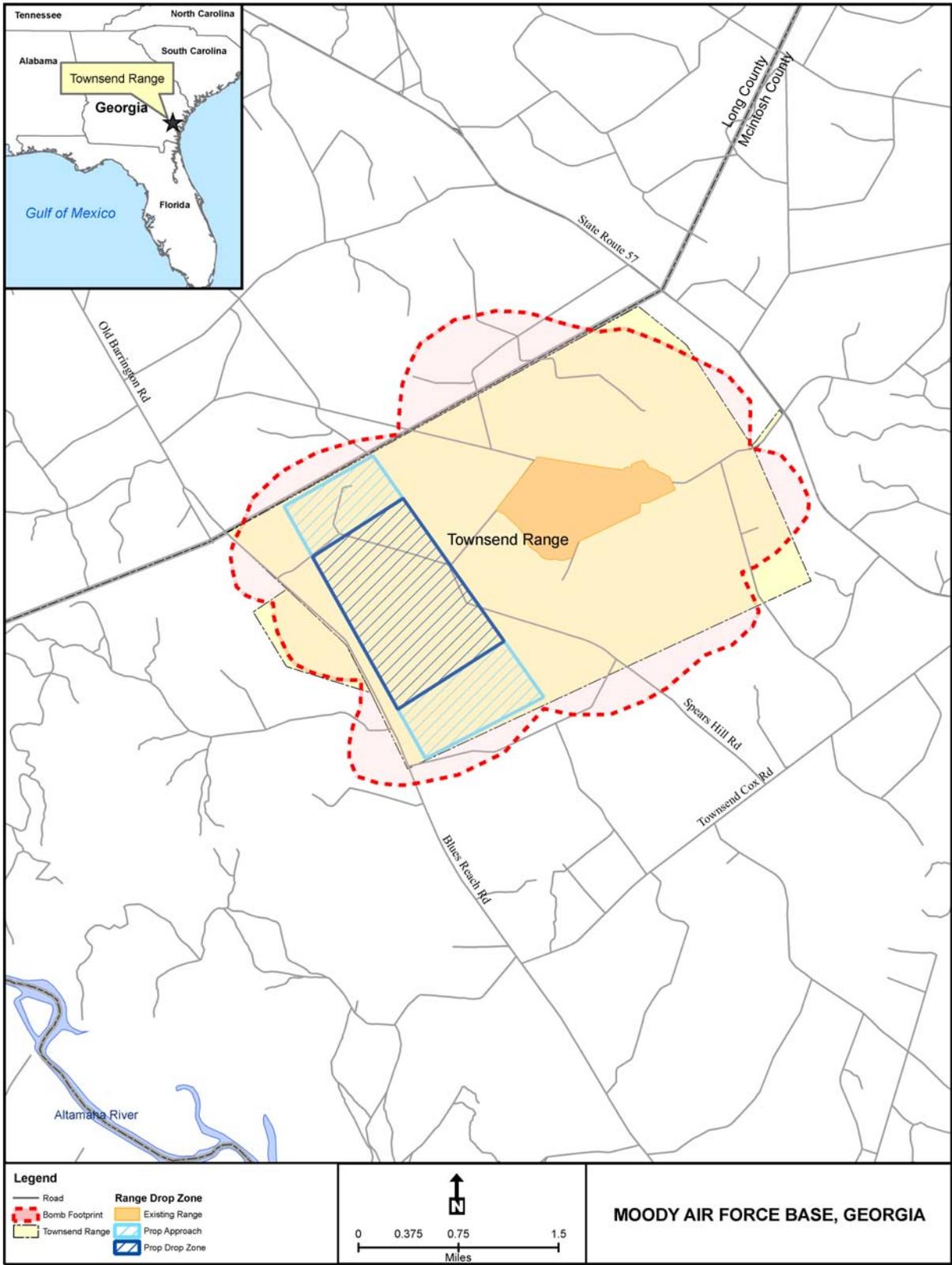


Figure 3.8-3. Townsend Land Use

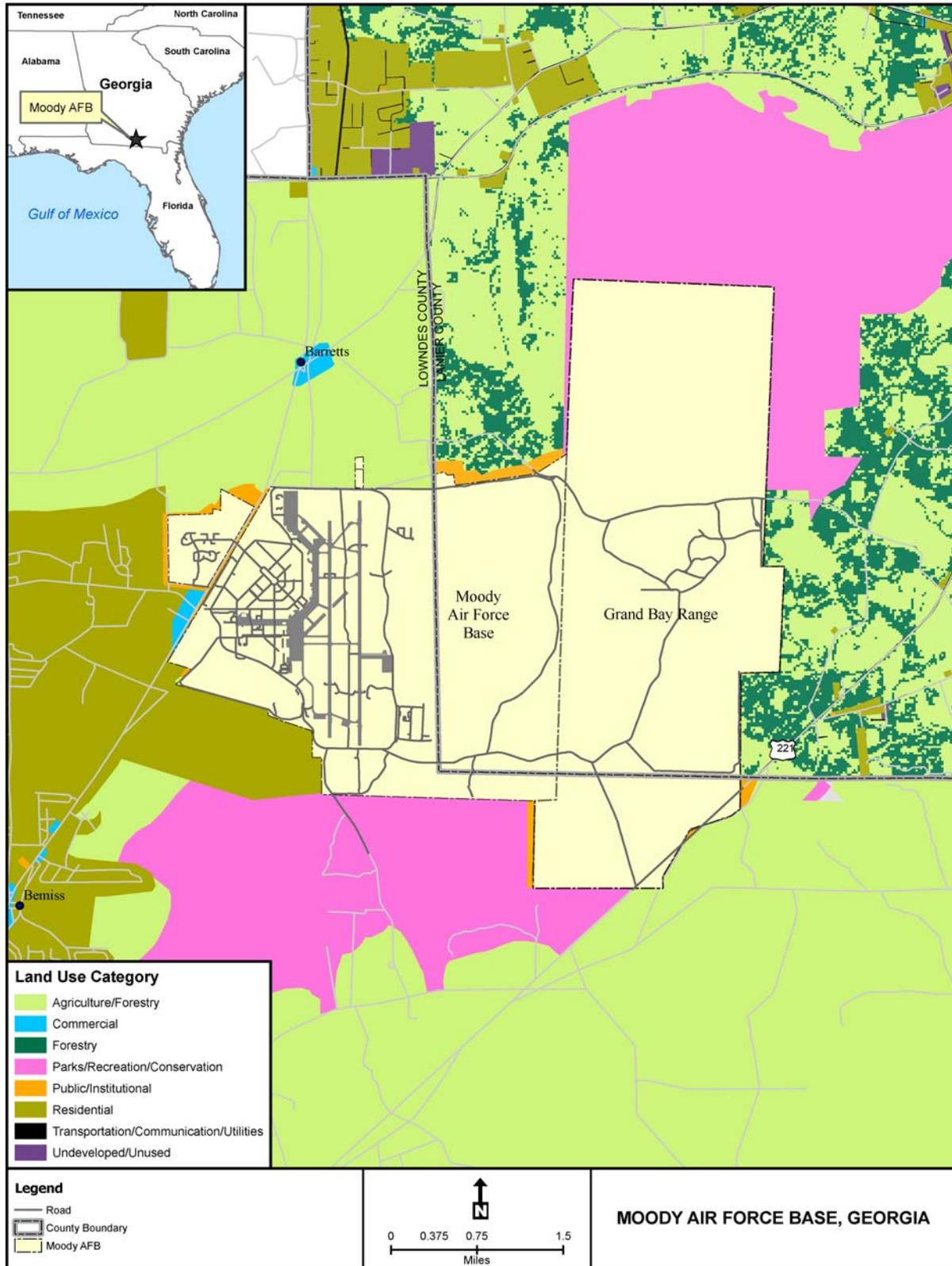


Figure 3.8-4. Vicinity Land Use

The area to the south of the base has been purchased by the state and is reserved for conservation purposes. The Grand Bay/Banks Lake wetland complex is located to the east and partially occurs within the political boundaries of Moody AFB. Exclusive of the Okefenokee Swamp, this area of over 13,000 acres is the largest freshwater lake/swamp system in the coastal plain of Georgia. Located within the Grand Bay/Banks Lake complex is the 4,049-acre Banks Lake NWR, which contains open water, marsh, hardwood swamp, and upland habitats. The habitats within the refuge provide for a wide diversity of native fauna and flora; protection for threatened and endangered species; opportunities for recreation, interpretation, and environmental education; showcases outdoor recreation for the physically challenged; and provides a quality naturally sustaining sport (trophy) fishery.

After recognizing that the Grand Bay/Banks Lake complex should be managed as one large ecosystem, irrespective of land ownership, the major landowners within this complex created the Grand Bay/Banks Lake Council to provide for a coordinated effort in the management of the ecosystem. The Grand Bay/Banks Lake Council includes Moody AFB, US Fish and Wildlife Service, Georgia Department of Natural Resources, Georgia Department of Transportation, The Nature Conservancy, and private landowners. The mission of the Council is to develop and implement a voluntary and cooperative stewardship plan for the Grand Bay/Banks Lake ecosystem with goals that ensure the long-term viability of the native plants and animals as well as the integrity of the ecosystem, while providing for compatible human uses. Council members use this forum to work towards protecting the ecosystem while still achieving the varied management goals of each member.

Most of Moody AFB is located in Lowndes County, including the entire main base. Lowndes County is the largest county along the southern state line. Although much of the county retains a rural agricultural character, the area has become increasingly developed and urbanized over the past 20 years.

The City of Valdosta is the most developed area in Lowndes County, located 10 miles southwest of Moody AFB. Land use in Valdosta is predominantly residential, commercial, industrial, and public. Small amounts of land north of Valdosta and along State Highway 125 near the installation remain undeveloped. However, the city has been guiding development toward the west side of Valdosta (away from the base and its flight patterns) to maintain compatibility with aircraft operations. Older homes in low-density or open agricultural areas are located in northeast Valdosta, nearest the base. However, these areas are not generally affected by Moody AFB flight activities. During normal flight operations, Moody AFB aircraft do not overfly the city (Air Force 2000).

The South Georgia Regional Development Center and the Greater Lowndes Planning Commission have been working together to develop a comprehensive long-range plan to guide growth in all of Lowndes County and its municipalities over the next 30 years (www.sgrdc.com/glpc/glpc.htm). The Lowndes County Board of Commissioners recently adopted a Unified Land Development Code (ULDC). The ULDC consolidates and coordinates the different land development processes and land development codes within the unincorporated areas of the county. The ULDC also includes a new zoning map, with several new zoning districts and the elimination of other districts. One of the zoning districts regulates

uses around Moody AFB (www.lowndescounty.com) to prevent conflicts with proposed military actions.

Lanier County overlaps onto the eastern portion of the base property and includes most of the Grand Bay Range. Lanier County consists almost entirely of rural agricultural land uses. Residential properties consisting of low-density, single-family houses and mobile homes are located throughout the county, primarily along U.S. Highway 221 connecting Valdosta with Lakeland, Georgia. Except for Lakeland, there are no other significant population centers in the county. Moody AFB avoids using flight patterns over the City of Lakeland.

Berrien County is located north of Moody AFB and is primarily a rural and agricultural region. Nashville is the only significant population center. Housing consists primarily of single-family, low-density, detached houses and mobile homes. Both Lanier and Berrien Counties have established zoning regulations, and Lanier County also has subdivision regulations. Land use issues for these counties are also addressed through local planning commissions (South Georgia Regional Development Center 2006). Moody AFB flight operations have had very little impact on land uses in these counties.

Townsend Range

McIntosh County is currently in the process of completing an update to its comprehensive plan. The county's current plan is a joint plan with the City of Darien (Coastal Georgia Regional Development Center 1991). The schedule is for the plan to be recertified by the Georgia Department of Community Affairs by February 2007. Long County's joint comprehensive plan with the city of Ludowici was completed in 1994 (Coastal Georgia Regional Development Center 1994). This Comprehensive Growth Management Plan is also in the process of being updated and was scheduled to be certified by the Georgia Department of Community Affairs by the end of June 2005, but is still under revision (Georgia Department of Community Affairs 2005).

While McIntosh County has zoning throughout the county, Long County lands are not zoned. In McIntosh County, the area along the Altamaha River to the east and south of the range is zoned Conservation-Preservation, which continues to the south to include the Lewis Island State Natural Area. Townsend Range is zoned General Agriculture-Forestry. Lands south and east of the range are zoned General Agriculture-Forestry except in the vicinity of the intersection of Old River Road and Steel Bridge Road—where there is a small area of Multi-Family Residential (duplexes)—and near the community of Cox—where there is a mix of Single and Multi-Family Residential (duplexes), General Agriculture-Forestry, and Neighborhood Commercial. The area east of the range in the community of Townsend is a relatively dense, mixed-zoning area with various classifications for residential and commercial zoning. The area south of the community of Townsend and east of the range between the communities of Townsend and Cox is primarily General Agriculture-Forestry with some areas zoned Single and Multi-Family Residential (duplexes) along State Route 251.

The dominant existing land use in the vicinity of Townsend Range is forestry. Approximately 91 percent of all land in Long County is in timberland, while 61 percent of McIntosh County is

in timberland. In the coastal Georgia region, about 67 percent of all land is in timberland (University of Georgia 2006).

Land use within the Agriculture-Forestry District includes forestry and allows structures to include housing, agricultural-forestry buildings, churches, cemeteries, riding stables, home business offices, playgrounds/parks, country clubs, lodges, kennels, and public buildings for utilities. Minimum lot area is 5 acres, except lots for churches, which require 1 acre. Land use within the Conservation-Preservation district is to “preserve and control development within certain land, marsh, and water areas of the county.” Structures permitted include boathouses, marinas, as well as public buildings for utilities, parks, farms for forestry, wildlife refuges, and museums exhibiting local history. Minimum lot area is 2 acres (SouthDiv 2004).

Other land uses to the south of the range include the Georgia Power Company transmission line, which borders portions of the range’s southwest boundary where it enters into McIntosh County from Long County and then turns southwest across the Altamaha River to Wayne County, Plum Orchard Cemetery, Old Fort Barrington, and various lakes. To the southeast of the range, other land uses include various churches and cemeteries along roads and communities, a power line, and the inactive Seaboard Coast rail line, which runs north-south from Townsend to Cox and continues northward toward Savannah and south toward Jessup. The Snuff Box Canal, which traverses the range northwest to southeast, continues southwest through the Snuff Box Swamp between the communities of Townsend and Cox.

The McIntosh County Development Authority developed the McIntosh County Industrial Park, which is a 94-acre area zoned for light industrial use. It is located less than a mile west of Interstate 95 and west of State Route 251 just north of its intersection with Old River Road. Existing industry includes a community service board, seafood processing plant, concrete plant, power sub-station, a cable company, and a remote office for a telephone company (Coastal Georgia Regional Development Center 2004).

3.8.2.5 Airspace

Existing land uses, including SULMAs, beneath the affected airspace (for those airspace units where operations would occur below 8,000 feet MSL) are described below. Table 3.8-1 presents the acreage of different land uses underneath the affected airspace. The majority of the land beneath the affected airspace consists of forest/vegetation (52.0 percent) and agriculture (33.0 percent). Wetland areas make up 13.1 percent, while the remainder (residential/urban, water, and other) collectively make up 1.9 percent (Air Force 2000).

Moody 1 MOA. Several towns including Adel, Fitzgerald, Lakeland, Moultrie, Mystic, Nashville, Pearson, Quitman, Sparks, Tifton, Valdosta, and Willacoochee are located beneath the Moody 1 MOA. Land beneath the MOA generally ranges from flat to gently sloping upland areas, interspersed with numerous marshes, swamps, and lakes. The primary land uses include forest/vegetation and agriculture, consisting of 1.9 million acres (47 percent) and 1.7 million acres (42 percent), respectively. Other land uses beneath the airspace include residential/urban, water, and wetland areas. The Banks Lake NWR, a SULMA, is located under the Moody 1

Table 3.8-1. Land Use under Affected Airspace

<i>Airspace</i>	<i>Category</i>	<i>Square Miles</i>	<i>Acres</i>	<i>% of Total</i>
Moody 1 MOA	Agriculture	2,601	1,664,685	41.7
	Forest/Vegetation	2,920	1,868,941	46.8
	Wetland Areas	592	378,682	9.5
	Residential/Urban	102	65,143	1.6
	Water	25	16,250	0.4
	Other	4	2,365	0.1
	Total	6,244	3,996,066	100.0
Moody 2 N/S MOAs	Agriculture	16	10,175	1.7
	Forest/Vegetation	677	433,008	70.6
	Residential/Urban	3	1,964	0.3
	Water	1	588	0.1
	Wetland Areas	262	167,500	27.3
	Total	959	613,234	100.0
Moody 3 MOA	Agriculture	880	563,455	53.2
	Forest/Vegetation	648	414,796	39.2
	Wetland Areas	95	60,608	5.7
	Residential/Urban	14	8,892	0.8
	Water	15	9,591	0.9
	Other	2	1,300	0.1
	Total	1,654	1,058,641	100.0
Live Oak MOA	Agriculture	542	346,957	33.9
	Forest/Vegetation	828	530,118	51.7
	Wetland Areas	184	117,548	11.5
	Residential/Urban	29	18,366	1.8
	Water	9	5,630	0.5
	Other	9	5,981	0.6
	Total	1,601	1,024,599	100.0

Table 3.8-1. Land Use under Affected Airspace (continued)

<i>Airspace</i>	<i>Category</i>	<i>Square Miles</i>	<i>Acres</i>	<i>% of Total</i>
Bulldog MOA	Agriculture	962	615,399	43.2
	Forest/Vegetation	1,044	668,101	46.9
	Wetland Areas	193	123,238	8.7
	Residential/Urban	20	13,065	0.9
	Water	4	2,878	0.2
	Other	2	1,351	0.1
	Total	2,225	1,424,032	100.0
VR-1065	Agriculture	378	242,014	25.6
	Forest/Vegetation	950	608,007	64.2
	Wetland Areas	104	66,616	7.0
	Residential/Urban	25	16,246	1.7
	Water	12	7,792	0.8
	Other	10	6,362	0.7
	Total	1,479	947,038	100.0
VR-1066	Agriculture	548	350,420	17.6
	Forest/Vegetation	1,803	1,153,734	58.0
	Wetland Areas	739	472,736	23.8
	Residential/Urban	12	7,881	0.4
	Water	8	5,124	0.3
	Other	1	354	0.0
	Total	3,111	1,990,250	100.0
Grand Total		17,273	11,053,860	

MOA = Military Operations Area

MOA. The Okefenokee NWR is located approximately 6 miles east of the Moody 1 MOA. State-managed SULMAs include the Grand Bay WMA and three state parks (Georgia Veterans Memorial, Jefferson Davis, and Reed Bingham).

Moody 2 North and South (N/S) MOAs. Underlying land uses associated with Moody 2 North/South MOAs are similar to those described for the Moody 1 MOA. There are several small communities beneath the airspace, including Homerville (the largest), Du Pont, and Thelma. The primary land uses include forest/vegetation and wetland areas consisting of approximately 433,000 (71 percent) and 167,500 (27 percent) acres, respectively. Other land uses beneath the airspace include agriculture, residential/urban, and water. No federal or state SULMAs are located underneath either of the Moody 2 MOAs. Moody 2 North/South MOAs lie within 24 and 6 miles, respectively, of the Okefenokee NWR.

Moody 3 MOA. The Moody 3 MOA overlies several small towns, including Blakely, Colquitt, and Ft. Gaines, Georgia. The primary land uses include agriculture and forest/vegetation, consisting of 563,000 acres (53 percent) and 415,000 acres (39 percent), respectively. Other land uses beneath the airspace include residential/urban, water, and wetland areas. Underneath this airspace lie the Kolomoki Mound and George T. Bagby state parks.

Live Oak MOA. The Live Oak MOA overlies several towns, including Branford, Fort White, Lake City, Live Oak, Mayo, and White Springs. Land uses are primarily forest/vegetation and agriculture consisting of 530,000 acres (52 percent) and 347,000 acres (34 percent), respectively. Other land uses beneath the airspace include agriculture and residential/urban. There are several SULMAs in the area, including the Ichetucknee Springs State Park, the Suwannee River, and the Big Shoals WMA. The Osceola National Forest is located about 3 miles east of Live Oak MOA.

Bulldog A and B MOA. The Bulldog MOA lies within Washington, Jefferson, Johnson, Glascock, Burke, Jenkins, and Emanuel counties in Georgia. Nearly all of the land in the area (99 percent) is privately owned. The primary land uses include agriculture and forest/vegetation, consisting of 615,400 acres (43 percent) and 668,100 acres (47 percent), respectively. Other land uses beneath the airspace include residential/urban, water, and wetland areas. SULMAs under the airspace include Big Dukes Pond Preserve, Di-Lane WMA, George L. Smith State Park, Magnolia Springs State Park, Ochoopee Dunes Natural Area, Piedmont NWR, Savannah Coastal NWR, and the Yuchi WMA.

VR-1065. The towns of Attapulgus, Beachton, Calvery, and Metcalf, Georgia, and Paxton, Caryville, Westville, Wausau, Altha, and Gretna, Florida, are located beneath VR-1065. The primary land use under VR-1065 is forest/vegetation consisting of 608,000 acres (64 percent). Located beneath this airspace is Torreya State Park, and located near this airspace are the Ponce de Leon Springs and Falling Waters state recreation areas.

VR-1066. Several towns, including Hazelhurst, Thelma, and Willacoochee, are located beneath VR-1066. VR-1066 passes over the northern section of the Okefenokee NWR. Noise-sensitive areas beneath the airspace include Alapaha and DuPont, Georgia. Forest/vegetation is the primary land use underneath VR-1066, consisting of 1.1 million acres (58 percent).

3.8.2 Environmental Consequences

3.8.2.1 Proposed Action

The Proposed Action would require construction of new facilities and modification of existing facilities. Potential construction and renovations would be limited primarily to pre-developed areas, and no changes to current land use would be made. The proposed construction and renovation projects would be compatible with current land use at the installation.

The Proposed Action would reduce the total number of aircraft sorties and airfield operations within the affected airspace. Land use impacts are not anticipated, since there would be no change in general land use patterns, land ownership, land management plans, or special use areas for the lands underlying the affected airspace.

For the affected airspace, projected noise levels with implementation of the Proposed Action would remain below 62 dB (DNL_{mr}). In addition, land uses under the affected airspace have been subjected to aircraft overflights in the past. The decrease in aircraft operations from the Proposed Action would not introduce different impacts to current land uses. Therefore, implementation of the Proposed Action would not have any impact.

3.8.2.2 No-Action Alternative

Under the No-Action Alternative, the proposed beddown of A/OA-10 aircraft, the associated ground-based training activities at Moody AFB and the change in airspace utilization by A/OA-10 aircraft would not occur. Consequently, baseline conditions as described in Section 3.8.2 would remain unchanged and no land use impacts would occur beyond those associated with ongoing activities and approved actions at Moody AFB.

Under the No-Action Alternative, no changes to any of the airspace currently utilized by Moody AFB operations would occur. Noise levels and visual aircraft sightings within the MOAs and along the MTRs would remain as under current conditions; therefore, no additional impacts to land use would be anticipated.

3.9 Transportation

3.9.1 Definition of Transportation

Transportation refers to the movement of vehicles on roadway networks. Transportation systems in the vicinity of Moody AFB (including Grand Bay Range) and Townsend Range include roads, airports, and railroads. These transportation networks provide accessibility between the local community and the installation and among the various land use areas on the base and ranges. Transportation systems beneath the airspace areas are not affected by aircraft overflights. Therefore, for transportation resources, the ROI for the Proposed Action and No-Action Alternative focuses on roadway networks on base and in the vicinity of Moody AFB and Townsend Range, as well as and those areas likely to be used for base access.

3.9.2 Existing Conditions

3.9.2.1 Moody AFB, Grand Bay Range, and vicinity

Moody AFB is located approximately 10 miles northeast of the City of Valdosta, Georgia. The primary arterial (i.e., major roadway) in the area is Interstate 75 (I-75) which passes through Valdosta and runs north to Macon and Atlanta. I-75 connects with I-10 (another major interstate that runs east-west across the United States) approximately 52 miles south of the base.

Moody AFB is connected to Valdosta and I-75 by State Highway 125 (Bemiss Road). This highway consists of four lanes with left-turn bays at the major intersections, and it was recently upgraded to include new designated turn lanes into Moody AFB and Moody AFB Quiet Pines Housing Area and golf course. Moody AFB has three access gates (Main, South, and North), all located within the cantonment area. The Main Gate is on Mitchell Road, and the South Gate is located on Robbins Road. Both of these gates open onto State Highway 125, where traffic is

controlled by signal lights. The third gate (North Gate) opens onto Hightower Road, which connects to State Highway 125.

The 39 miles of road system on Moody AFB are laid out in the standard “wagon wheel” pattern, with the hub of the wheel being Bradley Circle and Austin Ellipse. Streets are classified as arterials or collectors. Mitchell Boulevard, including Austin Ellipse, Robbins Road, and Robinson Road are considered the arterial streets that carry the majority of traffic. Nine streets are considered collector streets: Berger, Burrell, Davis, Dexter, George, Georgia, and Hickam Streets, Darque Boulevard, and Robinson Road. These streets support distribution of traffic from the arterials to local streets or directly to intended destinations. There is no existing mass transit system on the base.

Access to the Grand Bay Range from the main base is via a dirt and gravel road off South Perimeter Road, south of the munitions storage area. The range can also be accessed from the Lakeland Highway (State Highway 221) or from Shiner Pond Road. The main access to Grand Bay Range offices is from Shiner Pond Road. Access to Bemiss Field is primarily along Burma Road, with a secondary access from State Highway 221 (Figure 3.8-1).

Traffic congestion generally occurs at the gates during the start and end of every workday. The access control requirements due to anti-terrorism/force protection have increased the time delays for access to the base. However, the incorporation of flex time has greatly decreased traffic congestion by allowing personnel to begin work from 7:30 to 8:00 a.m. and leave from 4:30 to 5:00 p.m., thus spreading out traffic during peak hours (Air Force 2004b). As of July 2006, there were 13,933 vehicles registered with a permanent sticker on Moody AFB (Thackson 2006). Vehicle traffic includes full-time personnel, dependents of service personnel who utilize on-base services, and commercial vehicles making deliveries. In addition, the base issues approximately 950 temporary vehicle passes every month.

Parking at Moody AFB is considered adequate. Some overcrowding occurs in the 7000 block of Robbins Road and at the Mobility Processing Center during mobility operations. Military personnel on deployment usually park in their respective squadron areas for an extended time period (Air Force 1999c). At times, this creates parking congestion for permanently assigned personnel. However, these circumstances are intermittent and more of an inconvenience than a problem.

Commercial air transportation is available at the Valdosta Regional Airport, located 3 miles outside of Valdosta with flights to the Hartsfield–Jackson Atlanta International Airport. At a greater distance, commercial air transportation is also available at Tallahassee (79 miles) and Jacksonville (120 miles), Florida. None of these airports provides a significant cargo handling capability.

Valdosta is served by four railroad systems:

- Georgia Southern and Florida Railroad – runs north–south;
- CSX Rail Road – runs east–west;

- Norfolk Southern – runs north from Valdosta past Moody AFB (however, all on-base sidings have been removed); and
- Valdosta Southern Rail Road – runs south.

Amtrak provides passenger train transportation but does not pass directly through South Georgia. The Sunset Limited runs from Los Angeles to Orlando, stopping 52 miles south of Moody AFB in Lake City, Florida. The Amtrak Train makes three round trips per week.

3.9.2.2 Townsend Range and vicinity

State Route 57, which roughly parallels the northeastern boundary of Townsend Range, provides access to Tram Road, which leads to the range cantonment area. Smaller unpaved roads provide access to other parts of the range, including target areas and maintenance areas. Other highways and roads in the vicinity of the range include State Route 251, Spears Hill Road, Steel Bridge Road, Old River Road, Old Barrington Road, and Old Townsend Road.

Interstate 95 crosses the region from north to south. Interstate 16 bisects this corridor from east to west in the northern part of the region. A network of U.S. and state routes provides secondary transportation routes. The region is well served by railway infrastructure operated by CSX Transportation and Norfolk Southern Corporation. Brunswick and Savannah have large-scale port facilities. Navigable rivers include the Savannah, Altamaha, and St. Mary's rivers.

3.9.3 Environmental Consequences

3.9.3.1 Proposed Action

Construction-Related Impacts. Implementation of the Proposed Action would require delivery of materials to and removal of construction-related debris from construction and renovation sites. However, construction traffic would make up only a small portion of the total existing traffic volume in the area and at the base. Increased traffic during construction could contribute to increased congestion at gates and in the processing of access passes. The potential for short-term increases in traffic are not likely to substantially affect commute times. No long-term impacts to on- or off-base transportation systems would result.

Personnel Increases. Under the Proposed Action, about 1,002 additional personnel would be added, resulting in a slight increase of full-time personnel reporting to work each day. About 75 percent of the personnel at Moody AFB live off base. Assuming that the majority of full-time personnel work standard work days, live off base, and drive individually to the installation, personnel additions with implementation of the Proposed Action would result in an approximately 14 percent increase in daily commuting traffic to and from Moody AFB. This could result in a small increase in the amount of congestion that generally occurs at the gates during the morning and evening workday rush hours. In addition to the increase in personnel, there would also be a small increase in dependent and commercial traffic. This small increase would have a negligible impact on daily traffic. Any increase in daily commuting traffic to and from the base may be mitigated by the addition of the 395 houses in the Magnolia Grove Subdivision. This privatized military housing project is located adjacent to the southwest

boundary of the installation, and vehicle access to and from the base will be possible only via Stone Road.

In addition, a slight decrease in the availability of parking on base would occur due to the addition in the number of personnel. However, the installation had historically accommodated more than 4,500 personnel [i.e., before the drawdown of the OA/A-10s and F-16s and associated personnel (Air Force 1999c)], which is close to the approximately 5,150 personnel that would be assigned to Moody AFB under the Proposed Action. Vehicular circulation and available parking on the installation were adequate and accommodated the high number of personnel. Therefore, implementation of the Proposed Action would not be expected to have more than a minor impact on transportation.

3.9.3.2 No-Action Alternative

Under the No-Action Alternative, the proposed beddown of A/OA-10 aircraft, the associated ground-based training activities at Moody AFB, and the change in airspace utilization by A/OA-10 aircraft would not occur. Consequently, baseline transportation conditions as described in Section 3.9.2 would remain unchanged and no transportation impacts would occur beyond those associated with ongoing activities and approved actions at Moody AFB.

3.10 Socioeconomics

3.10.1 Definition of Socioeconomics

Socioeconomic resources are defined as the basic attributes associated with the human environment, generally including factors associated with regional demographics and economic activity. Demographics typically are described by the number, distribution, and composition of population and households. Economic activity is depicted by the region's major industries, employment, and income characteristics. Direct impacts to any of these factors may generate secondary effects on other factors, resulting in a series of potential socioeconomic ramifications within the affected area. The ROI for socioeconomics includes Lanier and Lowndes counties in Georgia, with particular emphasis on Moody AFB and the City of Valdosta. Areas under the affected airspace are not included in the socioeconomic analysis because no change to existing socioeconomic conditions would occur in these areas as a result of implementation of the Proposed Action.

3.10.2 Existing Conditions

Moody AFB is located in south-central Georgia, 10 miles northeast of the City of Valdosta. The installation consists of the main base, Grand Bay Range, and the Grassy Pond Recreation Area annex, comprising a total 11,402 acres of federally owned land in Lowndes and Lanier counties. While the base does provide some on-base housing and services, many additional services for base personnel and their dependents are provided in Valdosta, including off-base housing, schools, and other public services. Moody AFB personnel and military dependents account for about 22 percent of the Valdosta population.

3.10.2.1 Population and Housing

The baseline population associated with Moody AFB is 9,874 persons, including 4,251 military personnel, 4,030 military dependents, 402 appropriated fund civilian personnel, and 1,191 non-appropriated fund civilians, contractors, and private business employees (Moody AFB 2004). As presented in Table 3.9-1, it is estimated that 13 percent of the Moody AFB population resides on base, including 564 personnel and 760 dependents. The remaining 87 percent reside off base, totaling 5,280 personnel and 3,270 dependents.

Table 3.9-1. Moody AFB Baseline Population

	<i>Living On-Base</i>	<i>Living Off-Base</i>	<i>Total</i>
Appropriated Fund Military	564	3,687	4,251
Military Dependents	760	3,270	4,030
Appropriated Fund Civilians		402	402
Non-Appropriated Fund Civilians		1,191	1,191
Total	1,324	8,550	9,874

Source: Moody AFB 2004

The housing inventory on Moody AFB includes 303 family housing units, of which 274 are dedicated to enlisted personnel and the remaining 29 units are for officers. Eight dormitories on base provide accommodations for up to 1,000 unaccompanied personnel. About 70 percent of personnel are accompanied, with 11 percent of these military families living on base and the remaining 89 percent residing in surrounding communities off base (BBPA 2002). Currently under construction are 395 single-family homes in Magnolia Grove. This Military Housing Privatization Initiative would provide additional housing for Moody AFB military personnel and their families.

The City of Valdosta has a population of 45,059, comprising 43 percent of the two-county ROI population. Between 1990 and 2000, Valdosta experienced an increase in population of 6.5 percent. The population of the ROI, on the other hand, increased by 21.8 percent between 1990 and 2000 and has a current population of 99,356. By comparison, the population of the State of Georgia increased by 26.4 percent during the prior decade, reaching a current population of 9,072,576 (Census 2006).

According to the Census, there were 46,051 housing units in the ROI in 2000. The home ownership rate is 61.8 percent, and the median value is about \$85,000. There are 35,247 households in the ROI, yielding an average household size of 2.62 persons, compared to 2.65 for the state (Census 2006). The City of Valdosta has 18,907 housing units, of which 47.7 percent are owner-occupied. There are 16,692 households in Valdosta, with an average household size of 2.5 persons.

3.10.2.2 Economic Activity

Moody AFB provides an important economic contribution to the economies of Valdosta and Lowndes and Lanier counties. The base employs 5,844 direct personnel, including both military and civilian, with an associated payroll of \$211 million (Moody AFB 2004). Base activity generates an additional 1,911 indirect jobs and \$67 million of related income in the region. Contracts for services and purchases of supplies and equipment amount to \$55 million annually. The total annual economic impact generated by Moody AFB activities is estimated at \$334 million.

The civilian labor force in The ROI includes 44,895 persons, of whom 42,295 are employed. The unemployment rate is 5.8 percent (Census 2000). Median household income is \$32,414, and persons below the poverty level represent 17.7 percent of the population (Census 2006).

Prior to the 1970s, the economy of the region relied heavily on agricultural and forest products, with some light industry. Since then the regional economy, like many other areas nationally, has shifted toward services and retail trade, which are the two largest employment sectors (non-federal government) in the region, followed by government and government enterprises (Georgia Department of Community Affairs 2006). The top ten employers in the region, in alphabetical order, are Deep South EMS, Farmers & Merchants Bank, Levi Strauss, Louis Smith Hospital, Lowndes County Health Services, Patton Seed Company, South Georgia Medical Center, State Correctional Institution, Valdosta State University, and Wal-Mart.

3.10.3 Environmental Consequences

In order to assess the potential socioeconomic impacts of the Proposed Action, demographic and economics characteristics at Moody AFB, the City of Valdosta, and Lanier and Lowndes counties were analyzed. Potential socioeconomic consequences were assessed in terms of effects of the Proposed Action on the local economy, typically driven by changes in project personnel or expenditure levels. Economic multipliers, migration ratios, and other factors are utilized to determine the total economic effect of project-related changes on regional socioeconomic attributes.

For this EA, potential socioeconomic impacts are evaluated for two factors associated with the proposal at Moody AFB: personnel changes and facility construction and modifications. Personnel changes associated with the action alternatives result in population increases in the region, along with related changes in housing and service demand and induced employment and income. Construction activity associated with facility modifications on base often generates temporary economic benefits to the region in terms of employment and income; however, these benefits last only for the duration of the construction period.

3.10.3.1 Proposed Action

Under the Proposed Action, Moody AFB would receive an additional 1,002 personnel in support of the BRAC action, representing an increase of 17.1 percent to the existing base employment of 5,844 personnel and 2.4 percent to the existing ROI employment of 42,295. The overall net increase in personnel is composed of an increase of 1,221 enlisted personnel and

12 civilian personnel, offset by a loss of 231 officers. Based on existing family size ratios, it is anticipated that 930 military dependents would accompany the incoming military personnel, yielding a direct population impact of 1,932 persons. An increase of this size would raise the Moody AFB population to 11,806, representing an increase of 20 percent in the base population, 4.3 percent in the Valdosta population, and less than 2 percent in the ROI population. While these incoming personnel and their households would generate added demand for housing and services, the increase is not expected to result in significant socioeconomic consequences.

As stated in the methodology section above, construction activities associated with facility modifications under the Proposed Action would generate a number of jobs during the construction period and contribute to local earnings and induced spending. These effects would be temporary, however, occurring only for the duration of the construction period. No permanent or long-lasting socioeconomic impacts are anticipated as a result of construction activity associated with the Proposed Action.

3.10.3.2 No-Action Alternative

Under the No-Action Alternative, there would be no increase in personnel at Moody AFB and no facility modifications. Population on base and in the ROI would not be affected. In addition, the construction-related employment and earnings impacts associated with the Proposed Action would not occur. No impacts to socioeconomic resources would occur under implementation of the No-Action alternative.

3.11 Environmental Justice

3.11.1 Definition of Environmental Justice

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, directs federal agencies to address environmental and human health conditions in minority and low-income communities. The purpose of environmental justice studies is to determine whether or not actions of federal agencies disproportionately impact the human health and environmental conditions in potentially disadvantaged communities. EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, directs federal agencies to identify and assess environmental health and safety risks that may disproportionately affect children.

For purposes of this analysis, minority, low-income, and youth populations are defined as follows:

- *Minority Population*: Persons of Hispanic origin of any race, Blacks, American Indians, Eskimos, Aleuts, Asians, or Pacific Islanders;
- *Low-Income Population*: Persons living below the poverty level, based on an average poverty threshold for a family of four in 2000 of \$17,603 in annual income; and
- *Youth Population*: Children under the age of 18 years.

Estimates of these three population categories were developed based on data from the U.S. Bureau of the Census. The census does not report minority population, per se, but reports population by race and by ethnic origin. Low-income and youth population figures also were drawn from the Census 2000 reports (Census 2000). The ROI for environmental justice includes Lanier and Lowndes counties in Georgia. Areas under the affected airspace are not included in the environmental justice analysis because no change to existing environmental justice conditions would occur in these areas as a result of implementation of the Proposed Action.

3.11.2 Existing Conditions

Disadvantaged socioeconomic groups within the ROI are specifically considered in order to assess the potential for disproportionate occurrence of impacts (Table 3.11-1). Based on Census 2000 data (the most recent year for which detailed demographic data are available), the percentage of persons and families in the ROI with incomes below the poverty level was slightly higher than state levels. In the ROI during 2000, 17.8 percent of the population was living below the poverty level, compared to 13.3 percent in the State of Georgia as a whole. Lanier County had a slightly higher individual poverty rate of 18.7 percent in 2000, compared to 17.7 percent in Lowndes County.

Table 3.11-1. 2000 Population and Environmental Justice Data

<i>Area</i>	<i>Population</i>	Minority Persons		Persons Below Poverty		Children under 18	
		<i>Number</i>	<i>Percent</i>	<i>Number</i>	<i>Percent</i>	<i>Number</i>	<i>Percent</i>
State of Georgia	9,072,576	3,610,885	39.8	1,206,653	13.3	2,39,5160	26.4
Two-County ROI	104,258	40,345	38.7	18,529	17.8	27,204	26.1
Lanier County	7,553	2,243	29.7	1,412	18.7	1,964	26
Lowndes County	96,705	38,102	39.4	17,117	17.7	25,240	26.1

Notes: 1. The U.S. Census calculates percent low-income population for individual counties based on total county populations that differ slightly from the county populations reported in the first column.

2. Population figures for the each category are from different reporting years. Therefore, except for minority population, the percentage figures are not based on the total population presented in this table but from the relevant data year.

Source: Census 2006.

Minority persons represent 38.7 percent of the ROI population, compared to 39.8 percent of the state population. Black persons are by far the largest minority group, accounting for over three-fourths of the minority population. Persons of Hispanic or Latino origin represent less than 3 percent of the total population and less than 10 percent of the minority population in the ROI. The youth population, which includes children under the age of 18, accounts for 26.1 percent of the ROI population, compared to 26.4 percent at the state level.

3.11.3 Environmental Consequences

Disadvantaged groups within the vicinity of Moody AFB, including minority, low-income, and youth populations, do not represent a disproportionate segment of the population when compared with the region and the state. Nevertheless, potential health and safety factors associated with the Proposed Action are analyzed to determine whether any disproportionately high or adverse human health or environmental effects could occur. In addition, potential environmental health or safety risks associated with the Proposed Action are examined to assess potential affects to children.

3.11.3.1 Proposed Action

Construction Impacts

Facility modifications under the Proposed Action would include a total of 40 construction, renovation, or infrastructure improvement projects implemented over the period from 2006 to 2010 (refer to Table 2.1-3). Implementation of the Proposed Action would not result in any increased environmental health risks or safety risks to children. While there is residential housing on Moody AFB, no specific groups of children are known to occur in the immediate vicinity of the construction projects. Short-term safety risks associated with demolition facility construction could occur, but standard safety practices would minimize any potential risks. Similarly, intermittent and short-term noise from demolition and construction would not affect the health and well being of children.

Operational Impacts

The flight activity, facility modifications, and personnel changes associated with the Proposed Action options are not expected to create significantly adverse environmental or health effects. The minor increase in long-term operational employment and the short-term increase in construction employment are not expected to disproportionately affect disadvantaged populations. There would be no disproportionate impact upon children. No adverse health or safety risks to children are anticipated as a result of implementation of the Proposed Action.

3.11.3.2 No Action

Under the No-Action Alternative, the proposed BRAC action would not occur at Moody AFB at this time. The proposed facility modifications and personnel changes would not take place; therefore, no environmental justice effects or impacts to disadvantaged or youth populations would occur.

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4.0 CUMULATIVE EFFECTS AND OTHER ENVIRONMENTAL CONSIDERATIONS

4.1 Cumulative Effects Analysis

CEQ regulations stipulate that the cumulative effects analysis in an EA should consider the potential environmental impacts resulting from “the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 CFR 1508.7). Chapter 3.0 discussed the baseline conditions and potential effects of the Proposed Action and No-Action Alternative on environmental resources. This chapter identifies and evaluates projects that are reasonably foreseeable that could cumulatively affect environmental resources in conjunction with the Moody AFB A/OA-10 beddown.

Assessing cumulative effects begins with defining the scope of other actions and their interrelationship with the Proposed Action or alternatives (CEQ 1997). The scope must consider other projects that coincide with the location and timetable of the Proposed Action and other actions. Cumulative effects analyses evaluate the interactions of multiple actions. The first steps of the environmental impact analysis process helped identify other potential and planned actions. During scoping, the public and agencies were asked to provide information about ongoing regional projects and the potential interaction of the Moody AFB A/OA-10 beddown with such projects. These initial discussions defined the ROI for Shaw Airspace Training Initiative, which in turn defined what actions should be considered cumulatively. The ROI for cumulative effects would have both spatial and temporal dimensions.

The CEQ (1997) identified and defined eight ways in which effects can accumulate: time crowding; time lag; space crowding; cross boundary; fragmentation; compounding effects; indirect effects; and triggers and thresholds. Furthermore, cumulative effects can arise from single or multiple actions, and through additive or interactive processes. Actions not identified in this EA as the Proposed Action but that could be considered as actions connected in time or space (40 CFR 1508.25) may include projects that affect the base and airspace. This would include the shape or use (such as commercial use) of airspace in and near the proposed A/OA-10 beddown that affect environmental resources under the airspace.

This EA analysis addresses three questions to identify cumulative effects:

1. Does a relationship exist such that elements of the Proposed Action or an alternative might interact with elements of past, present, or reasonably foreseeable actions?
2. If one or more of the elements of the Proposed Action and another action could be expected to interact, would the Proposed Action or an alternative affect or be affected by impacts of the other action?
3. If such a relationship exists, does an assessment reveal any potentially significant impacts not identified when the Proposed Action or an alternative is considered alone?

An effort has been made to identify all actions that are being considered and that are in the planning phase at this time. To the extent that details regarding such actions exist and the actions have a potential to interact with the Moody AFB A/OA-10 beddown or an alternative, these actions are included in this cumulative analysis. This approach enables decision-makers to have the most current information available so that they can evaluate the environmental consequences of the Proposed Action.

4.1.1 Past, Present, and Reasonably Foreseeable Actions

This EA applies a stepped approach to provide decision-makers with not only the cumulative effects of the Proposed Action but also the incremental contribution of past, present, and reasonably foreseeable actions.

Past Actions Relevant to the Proposed Action

The following actions have been approved and are in various stages of implementation at Moody AFB.

Force Structure Actions. In 1998, the Air Force made the decision to implement the following force structure changes at Moody AFB: 1) drawdown 24 A/OA-10 aircraft and 563 personnel, and inactivate the 70 FS; 2) beddown an IFF pilot training program, its 57 T-38 aircraft and 408 personnel, and build and renovate facilities required to accommodate the IFF program; and 3) beddown 6 additional HH-60 helicopters and 168 personnel into the 41 RQS. An EA was prepared to assess the force structure actions, and a Finding of No Significant Impact was signed on September 23, 1998 (Air Force 1998a).

Air Combat Command Air Control Squadron Action. The purpose of this action was to relocate the 71st Air Control Squadron (71 ACS) from Moody AFB due to proposed mission changes and the need to alleviate the high stress levels on ACSs. This action resulted in the loss of 136 manpower authorizations, approximately 80 vehicles, and other associated equipment. This action was approved by a categorical exclusion (CATEX) (Air Force 1999d).

State Route 125/Bemiss Road. The Georgia Department of Transportation widened Bemiss Road (State Route 125) along an 8.8 mile stretch from Valdosta to just north of the Moody AFB boundary. The improvement project consisted of separating the existing four lane road with a 20-foot wide, concrete median. Left turn lanes were constructed in the median, including lanes providing access to the base. A CATEX was approved for this project (Georgia DOT 1997) and the Air Force issued a Finding of No Practicable Alternative (Air Force 1998b).

Drawdown of F-16 Aircraft. The Air Force streamlined fighter squadron operations in 2001 by removing 36 F-16 Block 40 PAI aircraft and approximately 1,259 military manpower authorizations associated with those aircraft. This action affected the airfield and airspace environment (reductions in jet noise and decreases in air pollutants) and resulted in a temporary decrease in economic activity in the local community due to the lost manpower authorizations (Air Force 1999a).

Beddown of the 820th Security Forces Group. In accordance with the FY 1999 Force Structure Announcement, the 820th SFG was located to Moody AFB. Over 600 personnel authorizations were assigned to the base. The mission of the 820 SFG is to provide trained, equipped, and deployable force protection to meet Air Force requirements in support of Combat Air Forces. Renovations to existing buildings occurred as part of this Proposed Action. In addition, the Bemiss Field area is being used for field training activities on a year-round basis.

The results of these actions are reflected in the baseline conditions of this EA.

Present Military Actions

Moody AFB, like any other major institution, also requires occasional new construction, facility improvements, and infrastructure upgrades. Current construction activities on base include the Consolidated Base Support Center, Child Development Center, and Housing Privatization. The Georgia Air National Guard and FAA are currently in the process of evaluating modifications to the Coastal MOA surrounding the Townsend Range near Jesup, Georgia.

Reasonably Foreseeable Actions

This category of reasonably foreseeable actions includes actions that have a potential to coincide, either partially in time or geographic extent, with the Proposed Action or the No-Action Alternative.

Future Military Actions

Moody AFB is under consideration for the establishment of the Common Battlefield Airman Training Program by FY 11. This program provides airman skills training and may require expansion of the cantonment area and supporting facilities. This program may involve an increase of approximately 2,000 military personnel at Moody AFB on an annual average basis.

Shaw AFB is proposing to improve airspace training for pilots of the 20 FW and pilots of the 169 FW at McEntire Air National Guard Station by modifying the training airspace overlying parts of South Carolina and Georgia. One component of the proposal is to expand Bulldog A MOA to the east to underlie and match the boundaries of existing Bulldog B MOA. This airspace was used in the past by Moody AFB A/OA-10 pilots and is proposed for use under the Moody AFB BRAC EA.

Under the Proposed Action, Moody AFB A-10s would routinely use Townsend Range and R-3007 for enhanced training and to supplement the use of Grand Bay Range (R-3008). Use of the Coastal MOA complex would occur on a non-routine basis but operations would not exceed those evaluated in the Supplemental Environmental Assessment. As future mission training requirements dictate, expanded use of R-3007 and the Coastal Airspace Complex may be required. If necessary, further environmental analysis (e.g., EA) would be conducted to evaluate the new requirements and potential environmental impacts.

Federal Aviation Administration

The FAA published its *National Aviation Research Plan 2004* which includes goals to increase the safety and efficiency of the NAS and to modernize and reengineer the National Airspace Architecture. The National Airspace Architecture describes changes in communications, navigation, surveillance, automation tools, avionics, and computers/networks. These changes will affect flight operations over Georgia, Florida, and the Gulf of Mexico. The FAA is planning to redesign ARTCCs to accommodate air traffic in the Jacksonville, Miami, and Houston ARTCCs. None of these changes would affect the airspace proposed for use by A/OA-10 aircraft.

4.1.2 Cumulative Effects Analysis

The following analysis examines (1) how the impacts of the actions presented in the previous sections might be affected by any resulting from the Proposed Action or an alternative, (2) whether such a relationship could result in potentially significant impacts not yet identified when the Proposed Action or alternatives are considered together with the cumulative actions, and (3) what any cumulative impacts might be.

4.1.3 Summary of Cumulative Effects

In summary, none of the projected impacts of the Proposed Action are individually significant. The incremental contribution of impacts of the Proposed Action, when considered in combination with other past, present, and reasonably foreseeable actions would not be significant. Overall impacts to socioeconomics would be beneficial with implementation of the Proposed Action. Implementation of the beddown of A-10 aircraft and the associated ground-based training activities at Moody AFB would help restore manpower authorizations that would be lost as a result of the drawdown of the T-38C and T-6A aircraft and would serve as an economic stimulus to the local community.

The use of Bulldog A MOA by A/OA-10 pilots would increase annual sortie operations by 312, but noise levels are projected to remain the same with no significant impact on the noise environment.

In an effort to enhance aviation system efficiency while ensuring safety, the FAA initiated a National Airspace Redesign program to review, redesign, and restructure the nation's airspace. This would help meet the changing and increasing operational demands on the NAS. The airspace associated with Moody AFB is encompassed by the FAA's Southern Region. There are no changes to the existing Southern Region airspace that would be impacted by the Proposed Action. In addition, there are no changes anticipated in the design or structure of the SUA used by Moody AFB under the Proposed Action. No cumulative environmental impacts to airspace management were identified within implementation of the Proposed Action at Moody AFB.

4.1.4 Irreversible and Irretrievable Commitment of Resources

NEPA requires that environmental analyses include identification of "...any irreversible and irretrievable commitments of resources which would be involved in the Proposed Action should it be implemented." Irreversible and irretrievable resource commitments are related to

the use of non-renewable 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 (e.g., energy and minerals) that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action.

For the Proposed Action, most resource commitments are neither irreversible nor irretrievable. Most impacts are short-term and temporary, or long-lasting but negligible. The proposed renovation at Moody AFB would require the consumption of fuels as well as building materials such as concrete, sand, bricks, steel, insulation, wiring, and paint. The Proposed Action would require the use of energy, both electric and fossil fuels, for ongoing operations and continued aircraft traffic. This would continue as long as the A/OA-10 program and the training requirements remain in operation.

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APPENDIX A
ORDNANCE AND DEFENSIVE COUNTERMEASURES

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APPENDIX B
PUBLIC AND AGENCY CORRESPONDENCE

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APPENDIX C
AIRSPACE

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APPENDIX D
NOISE

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APPENDIX E
AIR QUALITY

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APPENDIX F
SOLID WASTE/ MUNITIONS

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